Appendix A

OTH Critical Aircraft Runway Needs Assessment

Southwest Oregon Regional Airport
Critical Aircraft Runway Needs Assessment

Prepared for:

Coos County Airport District
1100 Airport Lane
North Bend, Oregon 97459

Prepared by:

Mead & Hunt, Inc.
9600 NE Cascades Pkwy, Ste. 100
Portland, Oregon 97220

March 16, 2021

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Attachments

Analysis in this memorandum provides an update to the critical aircraft determination that was prepared for the 2013 OTH Master Plan (2013 Plan). The 2013 Plan identified the existing critical aircraft for OTH as aircraft approach category (AAC) B, aircraft design group (ADG) III, for an aircraft reference code (ARC) of B-III. The 2013 Plan does note that the Bombardier CRJ-200 regional jet (a C-II aircraft) was scheduled to start service when the document was prepared but had not done so yet. The 2013 Plan indicated that a future ARC of C-III was likely. The Airport Layout Plan in the 2013 Plan shows Runway 4/22 (now Runway 5/23) as a C-III runway, and Runway 13/31 as a B-III runway (Southwest Oregon Regional Airport, 2013).

Section 1: Existing Critical Aircraft

OTH flight records were pulled from the Federal Aviation Administration (FAA) Traffic Flow Management System Counts (TFMSC) database for FAA fiscal years 2016-2020 and were sorted according to AAC, ARC, ADG, and Aircraft Type. Department of Defense (DoD) aircraft, including those operated by the U.S. Coast Guard, were removed as they are not eligible for project justification based on federal law and FAA Airport Improvement Program (AIP) guidance. It is recommended that DoD aircraft be considered during facility planning and collaborative funding arrangements discussed with the FAA and DoD as necessary. TFMSC records are shown in **Table 1: TFMSC Operations Records FY2016-2020**. Due to TFMSC limitations, described below the table, information from the FAA Terminal Area Forecast (TAF) are included as well.

Table 1: TFMSC Operations Records FY2016-2020

AAC	ADG	ARC	FY2016	FY2017	FY2018	FY2019	FY2020	Total
A	I	A-I	718	690	720	532	514	3,174
A	II	A-II	228	244	280	280	216	1,248
B	I	B-I	1,814	1,956	1,968	2,028	1,674	9,440
B	II	B-II	2,986	2,312	1,990	2,082	2,350	11,720
B	III	B-III	8	30	16	12	14	80
C	I	C-I	158	122	96	86	92	554
C	II	C-II	806	794	870	962	800	4,232
C	III	C-III	34	90	92	88	100	404
D	I	D-I	16	10	14	14		54
D	II	D-II	44	44	62	42	54	246
D	III	D-III	22	10	14	20	16	82
H	H	H-H	116	94	200	202	148	760
No Data	No Data	No Data	28	22	38	18	24	130
Total Operations – TFMSC			6,978	6,418	6,360	6,366	6,002	32,124
Total Operations – TAF			15,019	14,258	17,453	14,489	14,469	75,688
TFMSC as a Percentage of TAF			46%	45%	36%	44%	41%	42%

An operation is a takeoff or landing. An arrival and a departure count as two operations.
The FAA fiscal year is October 1 to September 31.
TFMSC operations counts are "adjusted." Where there is an uneven number of arrivals and departures, the larger of the two is doubled to generate the adjusted operations counts.
TAF values for 2019 and 2020 are noted as estimates for the TAF issued January 2020.
(FAA Operations & Performance Data, 2020)

TFMSC records have some limitations. They are based on flight plans flied to and from OTH, so aircraft that fly under visual flight rules are not counted, and neither are aircraft flying under instrument flight rules that cancel their flight plan before landing at OTH. It is generally agreed that TFMSC data is an acceptable count of larger aircraft operations (ARC B-II and larger), and a less acceptable count of operations by smaller aircraft and helicopters. For this memorandum, differences between the TFMSC data and the airports total annual operations counts were not considered important to discuss in detail; however, it is illustrated in **Table 1: TFMSC Operations Records FY2016-2020** that the TFMSC accounts for an average of 42 percent of the TAF.

Based on the TFMSC data, the critical aircraft for OTH has an ARC of C-II. AAC D aircraft average fewer than 100 annual operations and ADG III aircraft average just over 100 annual operations. FAA Advisory Circular (AC) 150/500-17, *Critical Aircraft and Substantial Use*, states that AIP eligibility generally requires over 500 annual operation by an aircraft, or family of aircraft with similar characteristics. The most common ARC C-II aircraft used at OTH is the Bombardier CRJ-200, which averages over 500 operations per year as shown in **Table 2: TFMSC Operations by ARC C-II Aircraft FY2016-2020**.

Table 2: TFMSC Operations by ARC C-II Aircraft FY2016-2020

Aircraft Type	FY2016	FY2017	FY2018	FY2019	FY2020	Total
CRJ2 - Bombardier CRJ-200	524	508	598	708	546	2,884
CL30 - Bombardier Challenger 300	82	88	64	84	40	358
CL60 - Bombardier Challenger 600/601/604	32	76	64	50	52	274
CL35 - Bombardier Challenger 300	20	22	38	46	98	224
GALX - IAI 1126 Galaxy/G200	12	12	30	22	18	94
ASTR - IAI Astra 1125	14	32	18	14	12	90
LJ75 - Learjet 75	8	14	26	26	8	82
CRJ7 - Bombardier CRJ-700	72	8			2	82
G150 - Gulfstream G150	14	6	16		2	38
GLF3 - Gulfstream III/G300	2	16	6	2	6	32
Other (<10 ops per type per year)	26	12	10	10	16	74
Total	**806**	**794**	**870**	**962**	**800**	**4,232**

An operation is a takeoff or landing. An arrival and a departure count as two operations.
The FAA fiscal year is October 1 to September 31.
TFMSC operations counts are "adjusted." Where there is an uneven number of arrivals and departures, the larger of the two is doubled to generate the adjusted operations counts.
(FAA Operations & Performance Data, 2020)

Section 1 Conclusion

The existing critical aircraft for OTH is the ARC C-II Bombardier CRJ-200, used by United Airlines to provide service between OTH and San Francisco International Airport (SFO). This aircraft averaged over 500 operations per year, and C-II aircraft averaged over 800 operations per year in total between fiscal years 2016 and 2020.

Section 2: Existing Critical Aircraft Runway Length Requirements

The CRJ-200 has a maximum takeoff weight (MTOW) of anywhere between 51,000 pounds and 53,000 pounds depending on the model (ER and LR). Runway length assessment uses OTH field elevation (17.4 feet above mean sea level) and OTH mean maximum temperature of the hottest month (66.7º Fahrenheit(F)). Aircraft Planning Manuals (APM) rarely match local conditions exactly, so the closest scenario modeled in the CRJ-200 APM was used: Sea Level (0 feet) at international standard atmosphere (ISA) conditions +8º Celsius (18ºC or 64.4ºF). The runway length requirements for the two CRJ-200 weight variants are shown in **Table 3: Runway Length Requirements for CRJ-200 Weight Variants**. Charts are included as **Attachment 1: Bombardier CRJ-200 Performance Charts**.

Table 3: Runway Length Requirements for CRJ-200 Weight Variants

Variant	MTOW (pounds)	MLW (pounds)	Takeoff (feet)	Landing (feet)
ER	51,000	47,000	5,900	4,900
LR	53,000	47,000	6,400	4,900
MTOW: Maximum Takeoff Weight, MLW: Maximum Landing Weight Takeoff length is at MTOW. Landing length assumes dry runway, full flaps. Scenarios assume sea level, ISA+8ºC conditions (64.4ºF) (Bombardier, Inc., 2016)				

Aircraft runway length requirements are highly variable based on the amount of weight carried. Modern commercial aircraft are highly capable and may not takeoff at MTOW to serve destinations that are well within their maximum range. The 2013 Plan included a runway length analysis that considered fuel load and payload to reach likely commercial destinations from OTH. The 2013 Plan recommended extending Runway End 5 by up to 1,000 feet, for a total length of 6,980 feet to meet the needs of the most demanding aircraft and provide adequate departure clearance over the shipping channel. An intermediate extension of 400 feet, for a total length of 6,380 feet, was considered and determined that it would provide benefits for departing aircraft. This analysis used the CRJ-200. The effect of these runway lengths on the CRJ-200 are presented in **Table 4: Allowable Takeoff Weight for CRJ-200 Weight Variants**.

Table 4: Allowable Takeoff Weight for CRJ-200 Weight Variants

Scenario	Runway Length (feet)	Max. ATOW (pounds)	% of MTOW
Existing	5,980	51,000	100% ER | 96% LR
Existing+400 ft.	6,380	53,000	100% ER |100% LR
Existing+1,000ft.	6,980	53,000	100% ER | 100% LR
MTOW: Maximum Takeoff Weight, ATOW: Allowable Takeoff Weight MTOWs: 51,000 pounds (ER), 53,000 pounds (LR) Model uses “Sea Level” elevation, ISA+0º conditions, CF 34-3B1 Engines, 20º flaps, zero wind, zero gradient. Allowable takeoff weight on existing+400 feet and existing + 1,000 feet runway scenarios is the same. (Bombardier, Inc., 2016)			

Section 2 Conclusion

Planning should refer to the 2013 Plan regarding the need for runway extension and maintenance of existing length. Based on existing use of the CRJ-200 at OTH, at a minimum, it is recommended that the existing runway lengths be maintained.

Section 3: Future Critical Aircraft

The 2013 Plan alludes to a change in the regional jet fleet at some point in the future. While the C-II Bombardier CRJ-200 is still in operation, it is expected that these aircraft are nearing retirement age and will be replaced by more fuel-efficient aircraft. The FAA Aerospace Forecast 2020-2040 states:

> *The regionals have less leverage with the mainline carriers than they have had in the past as the mainline carriers have negotiated contracts that are more favorable for their operational and financial bottom lines. Furthermore, the regional airlines are facing some pilot shortages. Their labor costs are increasing as they raise wages to combat the pilot shortage while their capital costs have increased in the short-term as they continue to replace their 50-seat regional jets with more fuel-efficient 70 seat jets.*

United Airlines and their regional partners have three aircraft with a similar size and seating capacity to the Bombardier CRJ-200 – the 50-seat C-II Embraer E145, the 50-seat C-II Bombardier CRJ-550, and the 70 seat C-II Bombardier CRJ-700. At a United Airlines employee town hall in April 2020, United CEO Scott Kirby stated “My guess the 50 seaters mostly will be gone, by the end of this” referring to the affect that the COVID-19 pandemic will have on United’s E145 and CRJ-200 fleets (Klint, 2020). For this reason, it is assumed that the existing critical aircraft at OTH will not be the Bombardier CRJ-200 in the years to come, and the Embraer E145 will not replace it. United and regional affiliate’s existing CRJ-200 fleet is 187 aircraft with an average age of 18.2 years. The E145 fleet is 41 aircraft with an average age of 16.1 years (Planespotters.net, 2020).

The CRJ-550 and CRJ-700 are the same aircraft with different internal configurations and the CRJ-550 has a lower MTOW than the CRJ-700. The internal configuration of the CRJ-550 features more premium class and extra legroom seats and more on-board luggage storage than the CRJ-700, which causes the lower seating capacity. The CRJ-550 operates out of United’s Chicago, Newark, and Washington Dulles hubs and is not currently used on the West Coast (United Airlines, 2019). The CRJ-700 operates across United’s network. There are 70 of these aircraft in United’s fleet with an average age of 14.7 years.

Two other regional aircraft that are candidates to replace the Bombardier CRJ-200 are the 76-seat C-III Bombardier CRJ-900 and the 70-76 seat C-III Embraer E170/E175. United does not currently operate the CRJ-900 on its own or through its regional affiliates and has not expressed plans to add this type to its fleet. United does operate the Embraer E170/E175 and uses the E175 at OTH on its seasonal route between OTH and Denver. E175 operate out of both United’s San Francisco and Denver hubs. United’s regional fleet is summarized in **Table 5: United Airlines Regional Fleet Notes**.

Table 5: United Airlines Regional Fleet Notes

Aircraft Type	ARC	Seats	Fleet Size	Average Age	Note
CRJ-200	C-II	50	187	18.2 years	Current OTH critical, retire soon.
E145	C-II	50	41	16.1 years	Not at OTH, retire soon.
CRJ-550/700	C-II	70	75	14.7 years	Not at OTH.
CRJ-900	C-III	N/A	0	N/A	Not operated by United.
E170	C-III	70	37	15.7 years	Older version on E175.
E175	C-III	76	188	4.3 years	Newest United regional aircraft.
Data sources: (United Airlines, 2019) (Planespotters.net, 2020)					

Section 3 Conclusion

It is expected that OTH will see additional E175 aircraft on routes served by United for the following reasons:

- The CRJ-200 is expected to be retired soon based on average aircraft age, comments from United Airlines management, and analysis in the FAA Aerospace Forecast 2020-2040.
- The similarly sized E145 is expected to be retired along with the CRJ-200.
- The slightly larger but similar seating capacity CRJ-550 does not currently operate from United's west coast hubs.
- The slightly larger CRJ-700 does operate from United's west coast hubs and may replace the CRJ-200 in the interim, but the average age of the fleet suggests that these aircraft will be retired in the next three to five years and replaced with newer aircraft.
- The E175 was selected by United for the seasonal route between OTH and Denver; therefore, the Airport can handle the aircraft.
- The E175 is currently operated on other routes from United's San Francisco hub, which is currently served from OTH by the CRJ-200.
- The average age of the E175 fleet is over 10 years younger than any of United's other regional aircraft and there are more of these aircraft than any other regional aircraft. This suggests that the E175 will be United's go-to regional aircraft for the foreseeable future.

It is expected that the E175 will replace the CRJ-200 as the critical aircraft in the coming years. After its first year of operation, it is expected that this aircraft will exceed the 500 operations threshold and become the critical aircraft. This will change the ARC of the critical aircraft from C-II to C-III. The effect of this change on airfield design standards was considered by the 2013 Plan and should be re-evaluated in the next planning effort based on the latest FAA airport design guidance.

Section 4: Future Critical Aircraft Runway Length Requirements

The E175 has a MTOW of anywhere between 82,673 pounds and 89,000 pounds depending on the model (STD, LR, and AR). FAA AC 150/5325-4B indicates that airport planners should consult the APM for runway length requirements when an aircraft has a MTOW of over 60,000 pounds. Runway length assessment uses OTH field elevation (17.4 feet above mean sea level) and OTH mean maximum temperature of the hottest month (66.7ºF). APMs rarely match local conditions exactly, so the closest scenario modeled in the E175 APM was used: Sea Level (0 feet) at international standard atmosphere (ISA) conditions (59º F). The runway length requirements for the three E175 weight variants are shown in **Table 6: Runway Length Requirements for E175 Weight Variants**. Charts are included as **Attachment 2: Embraer E175 Performance Charts.**

Table 6: Runway Length Requirements for E175 Weight Variants

Variant	MTOW (pounds)	MLW (pounds)	Takeoff (feet)	Landing (feet)
STD	82,673	74,957	7,000	4,600
LR	85,517	74,957	7,500	4,600
AR	89,000	75,177	8,800	4,600

MTOW: Maximum Takeoff Weight, MLW: Maximum Landing Weight
Takeoff length is at MTOW. Landing length assumes full flaps.
Scenarios assume sea level, ISA+0 conditions.
(Embraer Commercial Aircraft, 2015)

Aircraft runway length requirements are highly variable based on the amount of weight carried. Modern commercial aircraft are highly capable and may not takeoff at MTOW to serve destinations that are well within their maximum range. The 2013 Plan included a runway length analysis that considered fuel load and payload to reach likely commercial destinations from OTH. The 2013 Plan recommended extending Runway End 5 by up to 1,000 feet, for a total length of 6,980 feet to meet the needs of the most demanding aircraft and provide adequate departure clearance over the shipping channel. An intermediate extension of 400 feet, for a total length of 6,380 feet, was considered and determined that it would provide benefits for departing aircraft. This analysis used the E175. The effect of these runway lengths on the E175 are presented in **Table 7: Allowable Takeoff Weight for E175 Weight Variants**.

Table 7: Allowable Takeoff Weight for E175 Weight Variants

Scenario	Runway Length (feet)	Max. ATOW (pounds)	% of MTOW
Existing	5,980	79,000	96% ST | 92% LR | 89% AR
Existing+400 ft.	6,380	79,000	96% ST | 92% LR | 89% AR
Existing+1,000ft.	6,980	82,000	99% ST | 96% LR | 92% AR

MTOW: Maximum Takeoff Weight, ATOW: Allowable Takeoff Weight
MTOWs: 82,673 pounds (ST), 85,517 pounds (LR), 89,000 pounds (AR)
Model uses “Sea Level” elevation, ISA+0º conditions, CF 34-8E5 Engines on dry, smooth, paved, and level runway with ATTCS off and ECS off.
Allowable takeoff weight on existing runway and existing+400 feet runway scenarios is the same.
(Embraer Commercial Aircraft, 2015)

Section 4 Conclusion

Planning should consider extending one of OTH's runways to fully support E175 operations. Based on existing use of the E175 at OTH, at a minimum, it is recommended that the existing runway lengths be maintained. The 2013 Plan recommended extending Runway End 5 by up to 1,000 feet, for a total of 6,980 feet, to meet the needs of the most demanding aircraft (Southwest Oregon Regional Airport, 2013).

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Attachment 1: Bombardier CRJ-200 Performance Charts

canadair REGIONAL jet

AIRPORT PLANNING MANUAL

Usable Fuel.	The usable fuel available for the aircraft engines.

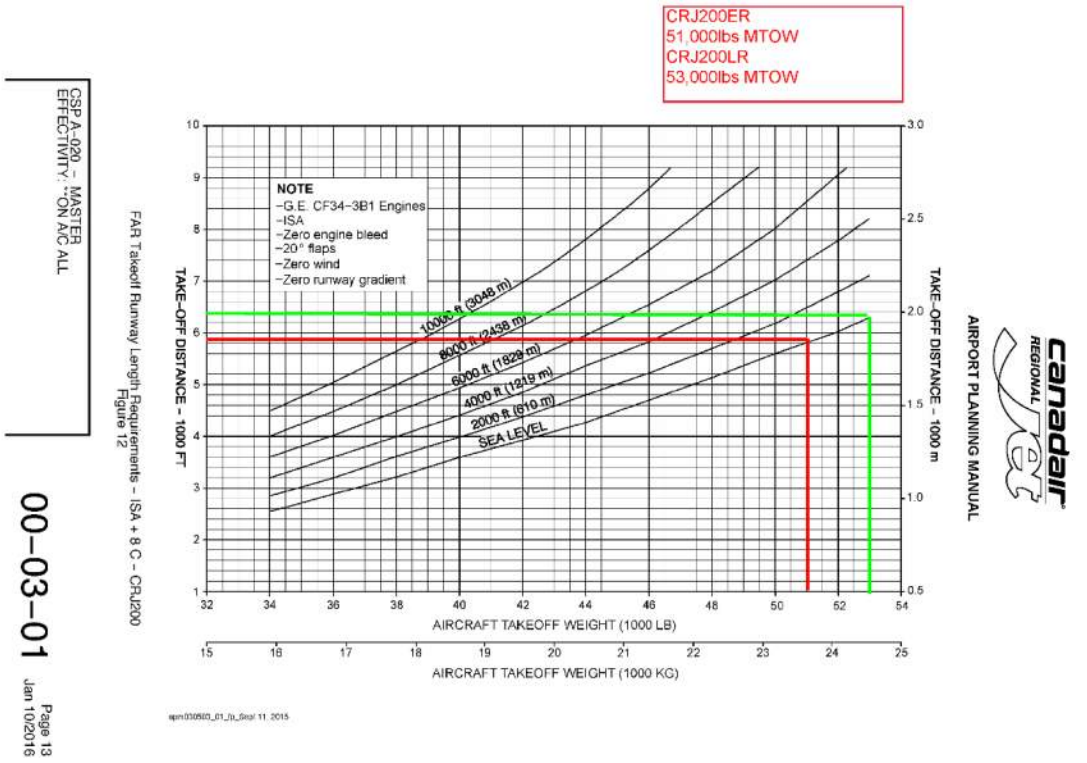
C. General Airplane Characteristics

Table 1 – Aircraft Characteristics

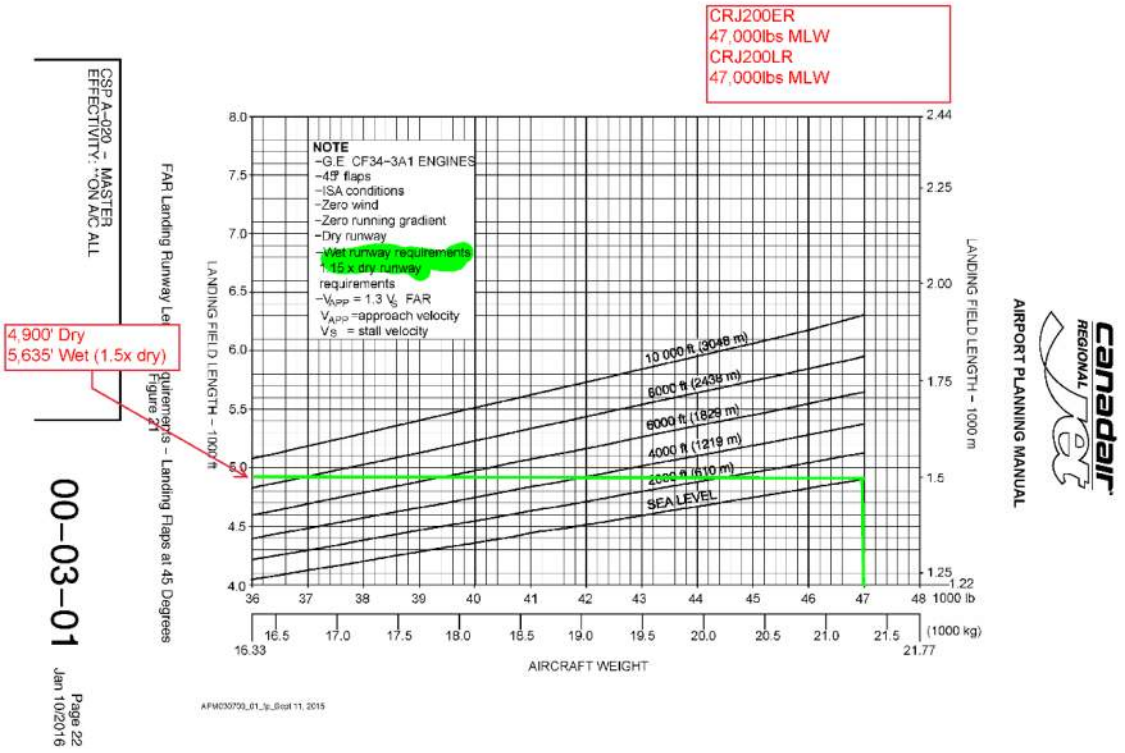
Model CL-600-2B19		CRJ100/200	CRJ100 ER	CRJ100 LR	CRJ200 ER	CRJ200 LR
Engines		2 GE CF34 -3A1/-3B1	2 GE CF34 -3A1	2 GE CF34 -3A1	2 GE CF34 -3B1	2 GE CF34 -3B1
Mode		Passenger	Passenger	Passenger	Passenger	Passenger
Maximum Seating Capacity		50	50	50	50	50
Maximum Design Taxi Weight (MTW)	Pounds Kilograms	47700 21636	51250 23247	53250 24154	51250 23247	53250 24154
Maximum Design Landing Weight (MLW)	Pounds Kilograms	44700 20276	47000 21319	47000 21319	47000 21319	47000 21319
Maximum Design Take-Off Weight (MTOW)	Pounds Kilograms	47450 21523	51000 23133	53000 24041	51000 23133	53000 24041
Operating Empty Weight (OWE)	Pounds Kilograms	30500 13835	30500 13835	30500 13835	30500 13835	30500 13835
Maximum Design Zero Fuel Weight (MZFW)	Pounds Kilograms	42200 19142	44000 19958	44000 19958	44000 19958	44000 19958
Usable Fuel	US Gallons Liters	1400 5300	2135 8081	2135 8081	2135 8081	2135 8081
Maximum Payload [1]	Pounds Kilograms	11700 5307	13500 6124	13500 6124	13500 6124	13500 6124

CSP A-020 – MASTER
EFFECTIVITY: **ON A/C ALL

00-02-01 Page 2 Jan 10/2016



Red: MTOW, ER weight variant, Green: MTOW, LR weight variant



Attachment 2: Embraer E175 Performance Charts

EMBRAER 175 AIRPORT PLANNING MANUAL

Maximum Payload

It is the difference between the MZFW and the BOW.

Maximum Seating Capacity

It is the maximum number of passengers specifically certified or anticipated for certification.

Maximum Cargo Volume

It is the maximum space available for cargo.

Usable Fuel

Fuel available for the aircraft propulsion.

Table 2.1 - Aircraft General Characteristics

DESIGN WEIGHTS[1]	AIRCRAFT MODELS		
	STD	LR	AR
MRW	37660 kg (83026 lb)	38950 kg (85870 lb)	40530 kg (89353 lb)
MTOW	37500 kg (82673 lb)	38790 kg (85517 lb)	40370 kg (89000 lb)
MLW	34000 kg (74957 lb)		34100 kg (75177 lb)
BOW [2]	21500 kg (47399 lb)		22500 kg (49604 lb)
MZFW	31700 kg (69886 lb)		32000 kg (70548 lb)
Maximum Payload [2]	10200 kg (22487 lb)		
Maximum Seating Capacity	84 passengers	80 passengers	86 passengers
Maximum Cargo Volume [3]	17.12 m^3 (604.59 ft^3)		
Usable Fuel[4]	9428 kg (20785 lb)		
	11625 ℓ (3071 gal.		

1. Applicable for standard models. For further information, refer to AFM and AOM.
2. Standard configuration (weights may vary according to optional equipment installed or interior layouts).
3. Standard configuration (volume may vary according to optional equipment installed).
4. Adopted fuel density of 0.811 kg/ℓ (6.77 lb/gal.)

2.2. GENERAL AIRCRAFT DIMENSIONS

2.2.1. External Dimensions - On aircraft with winglet or Pre-Mod SB 0170-57-0058

- Span over winglets - 26.00 m (85 ft 4 in.)
- Height (maximum) - 9.86 m (32 ft 4 in.)
- Overall length - 31.68 m (103 ft 11 in.)

2.2.2. External Dimensions - On aircraft with extended wingtip or Post-Mod SB 0170-57-0058

- Span over wingtips - 28.65 m (93 ft 11 in.)
- Height (maximum) - 9.86 m (32 ft 4 in.)

EFFECTIVITY: ALL

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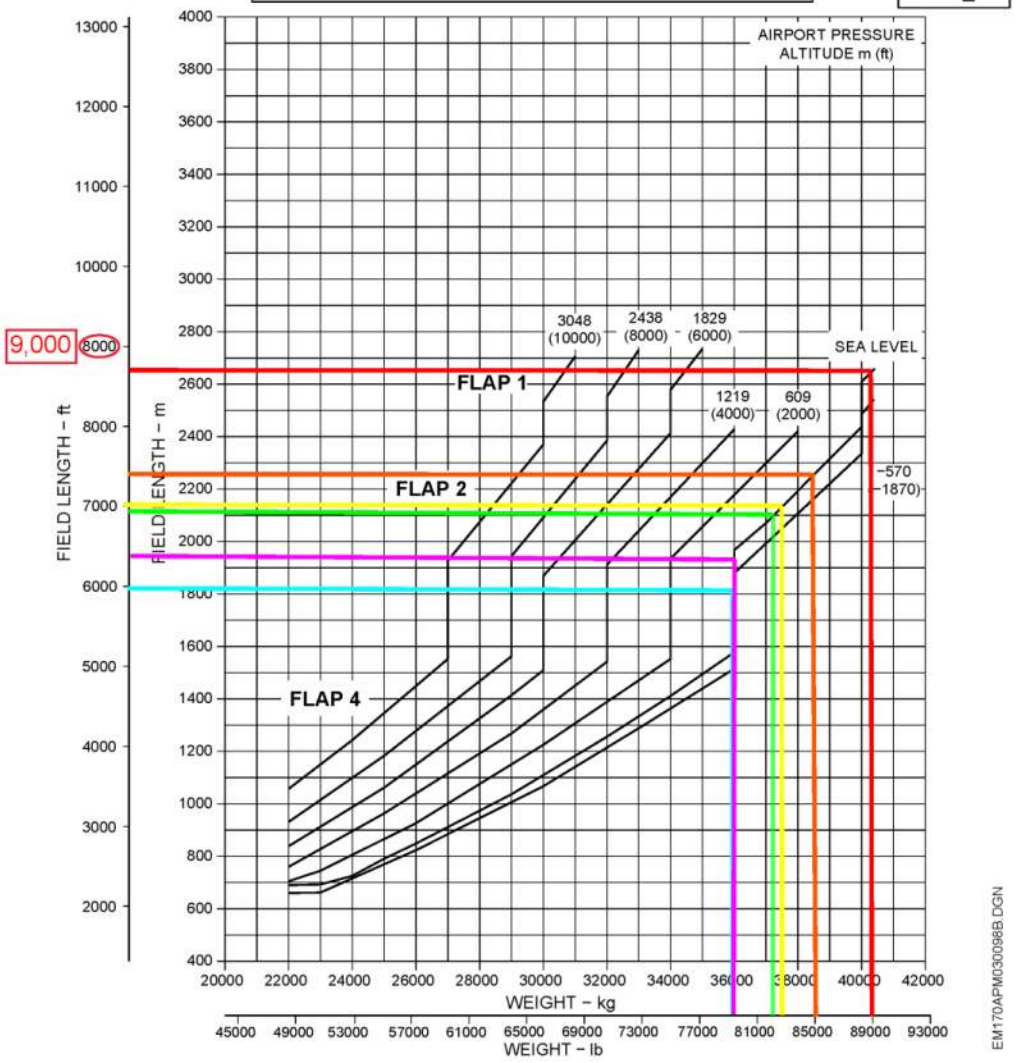
Oct 07/14

w-apm2259

EMBRAER 175 AIRPORT PLANNING MANUAL

MTOWs (pounds)
ST: 82,673
LR: 85,517
AR: 89,000

TAKEOFF FIELD LENGTH
CF 34-8E5 ENGINE@T/O-1 MODE
ATTCS: OFF / ECS: OFF
DRY, SMOOTH, HARD PAVED AND LEVEL RUNWAY
ISA



Takeoff Field Lengths - ISA Conditions
Figure 3.7

EFFECTIVITY: ALL

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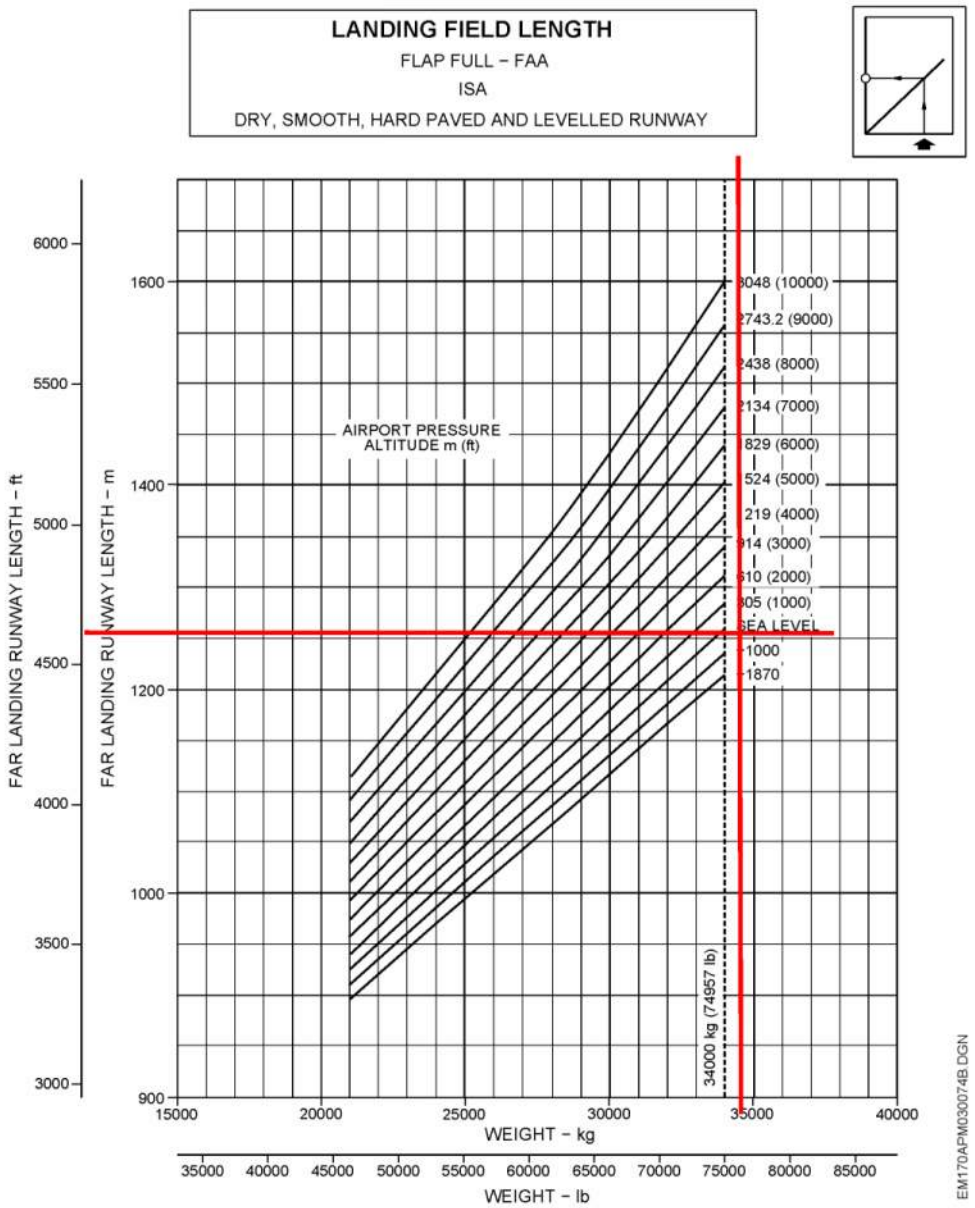
Oct 07/14

w-apm02259

Blue: ATOW, 5,980' runway, Purple: ATOW, 6,380' runway, Green: ATOW, 6,980' runway, Yellow: MTOW, ST weight variant, Orange: MTOW, LR weight variant, Red: MTOW, AR weight variant

EMBRAER 175 AIRPORT PLANNING MANUAL



Landing Field Lengths - Flaps Full
Figure 3.14

EFFECTIVITY: FAA-CERTIFIED ACFT

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w-apm2259

Appendix B

Part 139 Compliance Letter

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
1601 Lind Ave, S.W., Suite 315
Renton, WA 98057-3356

April 27, 2017

EIR Number: 2017NM800049

Ms. Theresa Cook
Airport Manager
Southwest Oregon Regional Airport
1100 Airport Lane, Floor 3
North Bend, OR 97459-2079

Compliance Letter

Dear Ms. Cook:

From April 17-18, 2017, the Federal Aviation Administration inspected your airport's organization, systems, facilities, and procedures for compliance with 14 CFR Part 139. At the end of that inspection, we advised you of the following findings:

139.309A – Operations: Safety Areas.

The safety area of Runway 4-22 does not meet standards. The aircraft design group was changed which required the runway safety area dimensions to be 500 feet wide, centered on the runway centerline, and extend to 1000 feet beyond the runway ends. The northwest corner of the Runway 22 safety area appears to drop off at approximately 900 feet from the runway end. The airport operator must provide a plan to the Seattle ADO for correcting the discrepancy.

Correction Date: December 31, 2017

139.329E – Operations: Pedestrians and Ground Vehicles.

Some individuals with access to the movement area did not receive driver training within 12ccm.

Access to the movement area for these individuals will be restricted until training is completed.

Correction Date: April 18, 2017

We have given consideration to all available facts and conclude that this matter does not warrant legal enforcement action. In lieu of such action, we are issuing this letter which will be made a matter of record. We will expect your future compliance with the regulations.

Sincerely,

Mark Gabel
Airport Certification Safety Inspector
Safety & Standards Branch
425-227-2607
mark.gabel@faa.gov

cc: Sandy Simmons, SEA-ADO

Appendix C
Agency Scoping Comments

Southwest Oregon Regional Airport (OTH) Environmental Assessment
Agency Scoping Meeting Notes
September 20, 2017

Introduction
Alternatives

- Chicago Midway accident jumpstarted interest in runway safety area programs
- OTH is one of the last known RSA compliance projects. Very important to FAA.

Questions and Discussion

- Tyler, USACE – Why was the RSA originally constructed this way?
  - Kevin, M&H – Increase in aircraft design group.
- Kevin, M&H – Agency comments requested by October 6.
- Laura – Will there be any changes in flight patterns as a result of the project that will affect the Snowy plovers
  - Kevin, M&H – There will be no changes in flight patterns as a result of this project.
- Chuck W., USFWS
  - There are three known species of threatened fish species.
  - Be cautious of any addition of impervious surfaces.
  - If construction of RSA fill involves driving piles impacts to marine mammals will need to be investigated.
  - Limits of previous eelgrass mitigation will be important to study.
- Sean C., FAA – Are there any known critical habitat in the immediate area.
  - Will formal consultation be required?
    - Chuck W. – Formal consultation will be required for in-water work involving vibratory pile placement. If in-water work not part of the project informal consultation possible.
- Bob H., OTH – A similar project filling in Pony Slough for deficient RSA on Runway 31 was completed in 2003. The project was completed primarily using a concrete block retaining wall system. This should be a consideration for this project.
  - Sean C., FAA – Are port-a-dams a good application for this?
    - Bob H., OTH – Tidal influence can be problematic for port-a-dams.
    - Skip, PBS – Supersacks could be another application to consider. Super sacks are deformable.
- Tyler, USACE – 404 permit corps document will require full vetting of alternatives, including upland alternatives. Metrics for analyzing the alternatives are cost, logistics, and existing technology. 404 permit is a separate process from the EA. Threshold for individual permit is 0.5 acres. Ratio for mitigation of eelgrass could be 2:1 or 3:1. Deference to local agencies for location of mitigation site.
- Todd, Coquille Tribe – No cultural? resources known in close proximity to the site. Protection of biological organisms is important.
- Dave Perry, DLDC – Need to show demonstrated need for the project.
- Jill, Coos County – The Airport is in the City of North Bend. Is the mitigation area known?
  - Kevin, M&H – Mitigation area not yet known.
- Sean C., FAA – No further comment.

Appendix D

Oregon JPA Kaizen Meeting Documentation

Southwest Oregon Regional Airport (OTH) Environmental Assessment
Pre-Application Meeting Notes
July 18, 2019

Project Overview

- Purpose and Need
- Alternatives based on highest impact to least impact
- ESA Critical habitat

Questions

- Glide slope box (location) clarification
- RSA fill area
  - Current proposed is approximately 90 feet by 70 feet
  - Bathymetric data is not accurate
  - Red dashed line = action area
  - Fill calculation approximately 3,000 cubic yards (likely under 5,000 cubic yards)
  - Approximately 35 feet from eelgrass bed
  - Construction methodology
    - Current rip-rap
    - If selected, rip-rap construction, impact is greater
    - Alternative preferred more vertical option

DSL Comments

- State owned impacts – tidal impacts
- Creating new land – state land board for approval
- Inspect every two months
- General authorization for diminutive, not this
- Need for bay impacts, describe alternatives
- Below mean tide
- Shellfish
- In-work water period
- Recommendations for improvements from USACE
  - Fetch maps?
- Proposed glideslope triangle in water
- South slope
- Potential to utilize multiple treatment measures
  - Vertical residue

Debra (M&H)

- Eelgrass – no direct or permanent impacts
- Still potential for indirect impacts due to proximity
- Likely related to construction and turbidity which can be minimized
    - Overlap with in-water work with growing season (May-September)
- Second area for control/reference area

ODEQ - Water Quality

- DEQ turbidity requirements US/DSL limits
- DEQ would look for feedback on limits related to eelgrass and adjust monitoring points to accommodate
- Monitor's plan needed (conservation measures utilized)
  Low water and isolation
- Silt curtain good but not as effective in high current
- Possible to work in low/negative tide?
- Consider seasonal in-water work and low tide timing
- 2006/2007 project – Ecoblock design
- Ecoblock retaining wall/sheet pile, worked at lowtide/containment (construction methodology)
- Mitigation site, if needed, would be on state owned lands and require permit

ODFW

- Eelgrass – close proximity, indirect rather than direct impact
- Change in hydrology may change season

USACE

- No additional comments
- Tribal consultation – Coquille Tribe is very active
- FAA in consultation

DEQ

- Recapped stormwater impacts
- No increase in impervious; net decrease
- Issues that presented added timeline/coordination:
    - Eelgrass mitigation needed? No direct impact, minimum indirect impact, monitoring
    - ODFW habitat mitigation policy
    - Filling on state own lands
    - Fill into tide flats – will likely need mitigation

- Note every step; every reduction
- Ideal scenario
- Minimum requirement scenario

Attachment:
Pre-app Meeting Screening Matrix
Eelgrass Presence in RSA Area Map

Appendix E
Stakeholder Outreach

Agency Name	Contact Person					Correspondence Log	
	Name	*Phone*	*Email*	*Website*	*Address*	*Document Name/Description*	*Date*
City of North Bend	Chelsea Schnabel	541-756-8535	cschnabel@northbendcity.org	https://www.northbendoregon.us/	835 California Ave. North Bend, OR 97459	OTH Tsunami Zone Compliance	5/30/2019
						LUCS - JPA	9/17/2021
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians	Courtney Krossman	541-888-9577 ext. 7547	ckrossman@ctclusi.org	https://ctclusi.org/	1245 Fulton Ave. Coos Bay, OR 97420	FAA Initiation w/ the Tribes for North Bend RSA Improvement Project	12/28/2018
	Stacy Scott	541-888-7513	sscott@ctclusi.org	https://ctclusi.org/	1245 Fulton Ave. Coos Bay, OR 97420	North Bend - RSA Improvement Coord. Letter, 2017 09 12 OTH Scoping, Agency Contact List	10/1/2017
						North Bend Airport Government to Government Consultation	5/30/2019
							5/30/2019
							6/13/2019
							6/20/2019
						Cultural Awareness Presentation	8/19/2020
						Docks Proposed for Removal	2/22/2021
						FW: OTH RSA EA - 106 consultation - mitigation addendum submitted to SHPO & tribes	5/26/2021
Confederated Tribes of the Grand Ronde Community of Oregon	Cheryl K. Pouley	503-879-1667	cheryl.pouley@grandronde.org	grandronde.org	9615 Grand Ronde Road Grand Ronde, OR 97347	Archeological Surveys at OTH (Response)	1/24/2019
Confederated Tribes of the Warm Springs Reservation of Oregon (CTWS)	Christian Nauer	541.553.2026	christian.nauer@ctwsbnr.org	https://warmsprings-nsn.gov/	1233 Veterans Street PO Box C Warm Springs, OR 97761	OTH Tribal Consultation email response	5/18/2020
Coos County Airport District	Helen Mineau	541-267-3685	helenmineau@mail.com	https://cooscountyairportdistrict.com/	2670 Broadway St. North Bend, OR 97459	OTH EA Open House #1	5/30/2019
Coos County Planning Department	Jill Rolfe	541-396-7770	planning@co.coos.or.us	http://www.co.coos.or.us/Departments/Planning.aspx	250 North Baxter Street Coquille, OR 97423	OTH EA Discussion / Overview of EA and Map	1/31/2020
Coquille Indian Tribe	Kassandra Rippee	541-808-5554	kassandrarippee@coquilletribe.org	www.coquilletribe.org	495 Miluk Drive Coos Bay, OR 97420	FAA Initiation w/ the Tribes for North Bend RSA Improvement Project	12/28/2018
	Todd Martin	541-217-5721		www.coquilletribe.org	3050 Tremont Ave. North Bend, OR 97459	CRT19119_North Bend Airport Projects_Sean Callahan	6/10/2019
						Coquille Comment re: APP0062768	9/8/2020
Federal Aviation Administration	Sean Callahan	206-231-4143	sean.callahan@faa.gov	faa.gov	2200 S. 216th St. Des Moines, WA 98198	North Bend Airport Government to Government Consultation	5/1/2019
						North Bend Project Cultural Survey Submittal	5/1/2019
							4/29/2020
							4/29/2020
						FAA Response to NMFS EFH Conservation Recommendations	8/18/2020
	Ilon Elizabeth Logan	206-231-4220	ilon.logan@faa.gov	faa.gov	2200 S. 216th St. Des Moines, WA 98198	Gov't-to-Gov't Tribal Consultation, Section 106 of NHPA	5/21/2021
						SHPO Case No. 17-1582 Cover Letter	5/25/2021
						FW: OTH RSA EA - 106 consultation - mitigation addendum submitted to SHPO & tribes	5/26/2021
						FW: OTH RSA EA - 106 consultation - mitigation addendum submitted to SHPO & tribes	5/26/2021

						FW: OTH RSA EA - 106 consultation - mitigation addendum submitted to SHPO & tribes	5/26/2021
	Timothy Stott	206-231-2693	timothy.stott@faa.gov	faa.gov	2200 S. 216th St. Des Moines, WA 98198	North Bend (OTH) MALSR Project	4/9/2018
Field Representative for Peter DeFazio	Kathy Erickson	541-269-2609	kathy.erickson@mail.house.gov	https://defazio.house.gov/	125 Central Room, Room 350 Coos Bay, OR 97420	OTH EA Open House #1	5/30/2019
Fish and Wildlife Service	Jim Thrailkill	541-975-3470	jim_thrailkill@fws.gov	www.fws.gov	777 Garden Valley Blvd Roseburg, OR 97471	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
Jordan Cove	Donna Nichols	541-266-7510	dnichols@pembina.com	http://www.pembina.com/	201 Central Ave. Coos Bay, OR 97420	OTH EA Open House #1	5/30/2019
Kaizen PreConsultation Meeting							9/20/2017
Mead & Hunt, Inc.	Aaron Killgore	503-307-3712	aaron.killgore@meadhunt.com	meadhunt.com	9600 NE Cascades Pkwy Portland, OR 97220	Archeological Surveys at OTH	12/28/2018
							12/28/2018
						Cultural Resources Addendum	5/1/2021
NOAA	Chuck Wheeler, Fisheries Biologist	541-957-3379	chuck.wheeler@noaa.gov	www.noaa.gov	2900 Stewart Parkway Roseburg, OR 97471	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/12/2017
	Kim W. Kratz	503-231-2155	kim.kratz@noaa.gov	www.noaa.gov	2900 Stewart Parkway Roseburg, OR 97471	ESA Section 7(a)(2) Biological Opinion	7/29/2020
City of North Bend, WA	David Miller	425-888-7640	dmiller@northbendwa.gov	www.northbendwa.gov	920 SE Cedar Falls Way PO Box 896 North Bend, WA 98045	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
Oregon Deparment of Land Conservation & Development	Matt Spangler	541-574-1095	matt.spangler@state.or.us	https://www.oregon.gov/lcd/Pages/index.aspx	635 Capitol Street NE, Ste 150 Salem, OR 97301	OTH Runway EA	1/22/2019
						JPA Pre-application Kaizen	9/20/2017
Oregon Department of Aviation	Heather Peck	503-378-3168	heather.peck@aviation.state.or.us	https://www.oregon.gov/aviation	3040 25th Street SE Salem, OR 97302	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
Oregon Department of Environmental Quality	Sara Christensen	503-229-5051	christensen.sara@deq.state.or.us	https://www.oregon.gov/deq/pages/index.aspx	700 NE Multnomah St. Ste 600 Portland, OR 97232	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
	Haley Teach	503-229-5051	Haley.TEACH@state.or.us	https://www.oregon.gov/deq/pages/index.aspx	700 NE Multnomah St. Ste 600 Portland, OR 97232	DEQ 401 WQC for Southern Oregon Regional Airport Runway Safety Area Bulkhead (2017-337)	9/11/2020
	Steve Mrazik	503-229-5263		https://www.oregon.gov/deq/pages/index.aspx	700 NE Multnomah St. Ste 600 Portland, OR 97232	Nationwide 401 Water Quality Certification Approval	9/11/2020
						Nationwide 401 Water Quality Certification Approval; NWP Categories 3, 14, and 27	9/11/2020

Oregon Department of Fish and Wildlife Service	Steve Rumrill	541-867-0300	steven.s.rumrill@state.or.us	https://www.dfw.state.or.us/	2040 SE Marine Science Dr. Newport, OR 97365	OTH EA Open House #1	5/30/2019
Oregon Department of State Lands	Amber McKernan	541-388-6345	amber.mckernan@state.or.us	www.oregon.gov/dsl	1645 NE Forbes Rd., Ste. 112 Bend, OR 97701	DSL submerged lands update	10/9/2019
						OTH - Possible submerged land acquisition for RSA	10/9/2019
	Jacob Taylor, Proprietary Coordinator for Coos	503-986-5303	jacob.taylor@state.or.us	www.oregon.gov/dsl	1645 NE Forbes Rd., Ste. 112 Bend, OR 97701	OTH - Possible submerged land acquisition for RSA	10/9/2019
						DSL Proprietary Permit Authorization	7/28/2020
	Bob Lobdell	503-986-5282	bob.lobdell@state.or.us	www.oregon.gov/dsl	1645 NE Forbes Rd., Ste. 112 Bend, OR 97701	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
						JPA Coordination	8/1/2020 - 2021
						JPA Pre-application Kaizen	6/1/2020
						CTCLUSI Comments re: APP0062768	9/18/2020
	Lynne McAllister	503-986-5300	lynne.mcallister@state.or.us	https://www.oregon.gov/DSL/Pages/index.aspx			1/1/2019
	Peter Ryan	503-986-5200	peter.ryan@state.or.us	www.oregon.gov/dsl	775 Summer St. NE, Ste. 100 Salem, OR 97301	WD20190260 Agency Decision	10/15/2019
	Lauren Brown	503 302 3290	Lauren.brown@dsl.state.or.us				
Oregon Parks & Recreation Department (State Preservation Office)	Tracy Schwartz	(503) 986-0677	tracy.schwartz@oregon.gov	www.oregonheritage.org	725 Summer St. NE Ste C Salem, OR 97301-1266	SHPO Case No. 17-1582	5/23/2019
	Jamie French	(503) 986-0729	jamie.french@oregon.gov	www.oregonheritage.org	725 Summer St. NE Ste C Salem, OR 97301-1266	SHPO Case No. 17-1582	1/4/2019
	Tracy Schwartz	(503) 986-0677	tracy.schwartz@oregon.gov	www.oregonheritage.org	725 Summer St. NE Ste C Salem, OR 97301-1266	SHPO Case No. 17-1582	12/26/2018
	Robert Olguin		robert.olguin@oregon.gov	oregon.gov	725 Summer St. NE Ste C Salem, OR 97301-1266	Q'alya ta Kukwis shichdii me Traditional Cultural Property Historic District Nomination	2/21/2019
						Q'alya ta Kukwis shichdii me Traditional Cultural Property Historic District Nomination	5/8/2019
	Ian Johnson	503-986-0678	ian.johnson@oregon.gov	oregon.gov	725 Summer St. NE Ste C Salem, OR 97301-1266	OPRD News Release re: NPS returns proposed TCP nomination	7/11/2019
	Christine Curran			oregonheritage.org	726 Summer St. NE Ste C Salem, OR 97301-1266	Status of proposed National Register nomination for TCPHD	12/9/2019
						Cultural Resources Addendum	5/1/2021
Oregon Parks and Rec. Department, Heritage Division	Mary Beth Grover	503-986-0672	marybeth.grover@oregon.gov	www.oregon.gov/	725 Summer St. NE Ste C Salem, OR 97301-1266	Below ground letter (archaeological resources) for SHPO	10/29/2019
				www.oregon.gov/	726 Summer St. NE Ste C Salem, OR 97301-1266	National Register, Q'alya ta Kukwis shichdii me (Jordan Cove and the Bay of the Coos People) Traditional Cultural Property Historic District	1/31/2019
Oregon SHPO			ORSHPO.clearance@oregon.gov	www.oregonheritage.org	725 Summer St. NE Ste C Salem, OR 97301-1266	FAA Initiation of Consultation w/ SHPO on North Bend RSA Improvement Project	12/7/2018
PBS Coos Bay	Paul Slater	541-266-8200	paul.slater@pbsusa.com	https://www.pbsenv.com/		20170921 OTH Agency Scoping Meeting	9/19/2017

Port of Coos Bay	Joe Caruso		jcaruso@portofcoosbay.org	https://www.portofcoosbay.com/	125 Central Ave., Ste 300 Coos Bay, OR 541-267-7678	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
	Rick Adamek		radamek@portofcoosbay.com	https://www.portofcoosbay.com/	125 Central Ave., Ste 300 Coos Bay, OR 541-267-7678		
	John Buckley		jbuckley@portofcoosbay.com	https://www.portofcoosbay.com/	125 Central Ave., Ste 300 Coos Bay, OR 541-267-7678		
State of Oregon	Evan Haas		haas.evan@state.or.us	https://www.oregon.gov/		Southwest Oregon Regional Airport - Runway Safety Area Improvements EA	9/19/2017
	Dave Perry		dave.perry@state.or.us	https://www.oregon.gov/		Southwest Oregon Regional Airport - Runway Safety Area Improvements EA	9/19/2017
	Christopher Claire		christopher.w.claire@state.or.us	https://www.oregon.gov/		Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
	Deanna Caracciolo	503-934-0026	deanna.caracciolo@state.or.us	https://www.oregon.gov/		OTH EA Project Description	11/14/2019
						OR DLCD CMZA Coord.	11/14/2019
United States Department of the Interior, National Park Service	Joy Beasley				1849 C Street, N.W. Washington, D.C. 20240	Proposed National Register Nomination for the Q'alya ta Kukwis shichdii me Traditional Cultural Property Historic District, Coos Co., Oregon	7/2/2019
U.S. Department of Fish & Wildlife	Paul Henson	503-231-6179		https://www.fws.gov/	2600 SE 98th Ave., Ste. 100 Portland, OR 97266	Copy of Inal OTH TA Letter 3_5_19	3/9/2019
	Jeff Everett	503-213-6952	jeff_everett@fws.gov	https://www.fws.gov/	2600 SE 98th Ave., Ste. 100 Portland, OR 97266	NMFS Comments_Responses	1/30/2020
						Nessecary Data Form from CMZA	11/14/2019
US Army Corps of Engineers	Tyler Krug	541-756-2097	tyler.j.krug@usace.army.mil	https://www.nwp.usace.army.mil	2201 N Broadway, Ste. C North Bend, OR 97459	Southwest Oregon Regional Airport - Runway Safety Area Improvements EA Agency Scoping Meeting	9/19/2017
						OTH Expansion Project, Coos Bay (email w/	4/9/2020
						New JPA, Corps. No. NWP-2017-337	8/14/2020
						OTH 408 Permit Review correspondence	5/18/2020
						NWP-2017-337 - SORA Expansion	9/21/2017
						NWP-2017-337; Water Quality Certification – Neighboring Jurisdiction Determination for a project in Coos Bay and Pony Slough, Coos County, Oregon	8/5/2020
						NWP-2017-337; Water Quality Certification – Neighboring Jurisdiction Determination for a project in Coos Bay and Pony Slough, Coos County, Oregon	9/11/2020
						20210820 EFH-Corps Response to NMFS Con Rec NWP-2017-337	8/20/2021
						Joint Permit Application (received by USACE)	8/5/2020
						Nationwide 401 Water Quality Certification Approval; NWP Categories 3, 14, and 27	9/11/2020

Appendix F
Cost Estimate

Technical Memorandum

Date: November 9, 2021

Subject: OTH EA Cost Estimate

Probable cost estimates for the build-alternatives were prepared for the OTH Environmental Assessment and each are listed and described below. An overview of cost estimates for the alternatives is included as an attachment (**Attachment 1**) to this memorandum.

Alternative 2: Reduce Runway 5/23 Length

Alternative 2 reduces the available landing distance by 80 feet on Runway 23 End (from 5,980 feet to 5,900 feet). Remarking the existing runways has a minimal cost.

Alternative 3: Shift Runway 5/23 and Taxiway C to the South Probable Estimate of Cost

Alternative 3 shifts Runway 5/23 and Taxiway C 70 feet to the south into Coos Bay and maintains the existing runway length. This alternative relocates Runway 5/23 taxiway connectors, the RPZ, MALSR, glide slope, and other NAVAIDS. It also relocates the water treatment facility south of Taxiway C. The estimated cost for Alternative 3 is $79,200,000.

Alternative 4: Extend Runway 5/23 and Taxiway C to the West Probable Estimate of Cost

Alternative 4 constructs 100 feet of new runway on the west end of Runway 5/23 into Coos Bay, lengthening the runway to 6,080 feet. This alternative relocates the taxiway connectors, MALSR, REILs, and other NAVAIDs. The estimated cost for Alternative 4 is $30,480,000.

Alternative 5: Install Materials Arresting System (EMAS) Probable Estimate of Cost

Alternative 5 installs a 340-foot-long EMAS arrester bed at the Runway 23 End.

In a cost estimate provided by Runway Safe in 2020, EMAS installation at OTH is $6.2 million. There are additional site preparation ($725,000), construction administration ($675,000), and 20-percent design contingency ($1.355 million) costs. Therefore, the total cost for installation would be $8.785 million. FAA Order 5200.9 (2004) indicates that annual maintenance costs should be estimated assuming $0.33 per square foot per year, uses an inflation rate 7% and results in an estimated present maintenance cost of $0.64/square yard per year as in 2021. Based upon the size of the EMAS bed estimated by Runway Safe, the annual maintenance cost would be $33,075. Evaluating a 20-year system life cycle cost, results in a present value to construct EMAS system of $8.692 million. FAA Order 5200.9 includes guidance on the maximum feasible RSA improvement cost in Figure 4. Maximum Feasible Cost for RSA Improvement. Based upon the EMAS bed length noted above, the maximum feasible cost for RSA improvement is $13 million.

Mead & Hunt prepared a life cycle cost analysis for the EMAS, including installation, replacement, and yearly maintenance costs, which totaled $9,836,500 (**Attachment 2**). The EMAS 20-year design cost was

compared with the RSA Bulkhead 20-year design cost (**Attachment 3**), showing that the RSA Bulkhead is significantly lower in cost.

Alternative 6: Runway 5/23 Safety Area Bulkhead Probable Estimate of Cost

Alternative 6 installs a 0.07-acre concrete block bulkhead at the Runway 23 End in Coos Bay, which would maintain the 5,980-foot runway (**Attachment 4**). This alternative will construct 2,215 cubic yards of fill into Coos Bay. The estimated cost for Alternative 6 is $3,450,000.

Conclusion

Alternative 6: Runway 5/23 Safety Area Bulkhead, is the most cost-effective alternative that also meets the purpose and need.

Attachments:
Attachment 1 – Overview of Cost Estimates
Attachment 2 – EMAS Lifecycle Cost Analysis
Attachment 3 – EMAS 20-year Design Cost vs RSA Bulkhead 20-year Design Cost
Attachment 4 – Basis of Design Memorandum

Southwest Oregon Regional Airport
Project: Alternative 3 - Shift Runway 5/23 and Taxiway A to the South

Probable Estimate of Cost

Item	Description	Unit	Qty	Cost	Total
1	Runway 5/23 and Taxiway A Shift	SF	1,650,000	$32.00	$52,800,000.00
				TOTAL	**$52,800,000.00**

*7 ft. depth

	Total Project Cost
Construction	$52,800,000.00
Estimated Design (15%)	$7,920,000.00
Construction Administration (10%)	$5,280,000.00
Contingency (20%)	$13,200,000.00
Total	**$79,200,000.00**

Southwest Oregon Regional Airport
Project: Alternative 4 - Extend Runway 5/23 and Taxiway C to the West
Details: Extending runway and taxiway 400 feet to the west

Probable Estimate of Cost

Item	Description	Unit	Qty	Cost	Total
1	Runway End 4 Extension	SF	125,000	$32.00	$4,000,000.00
2	Runway Extension Embankment	CY	138,000	$115.00	$15,870,000.00
3	MALSR	LS	1	$450,000.00	$450,000.00
				TOTAL	**$20,320,000.00**

*7 ft. depth

Alt 5

	Total Project Cost
Construction	$20,320,000.00
Estimated Design (15%)	$3,048,000.00
Construction Administration (10%)	$2,032,000.00
Contingency (20%)	$5,080,000.00
Total	**$30,480,000.00**

Southwest Oregon Regional Airport
Project: Alternative 6 - Proposed Action
Details: Adding an embankment to the RSA fill area;

Probable Estimate of Cost

Item	Description	Unit	Qty	Cost	Total
8	RSA Safety Non-Compliant Fill	CY	20,000	$115.00	$2,300,000.00
				TOTAL	**$2,300,000.00**

*7 ft. depth

Total Project Cost ($2019)	
Construction	$2,300,000.00
Estimated Design (15%)	$345,000.00
Construction Administration (10%)	$230,000.00
Contingency (20%)	$575,000.00
Total	**$3,450,000.00**

EMAS Lifecycle Cost Analysis
for Southwest Oregon Regional Airport (OTH)
Prepared by Mead & Hunt, Inc.
May 12, 2021

Inputs		
EMAS Installation	$	6,500,000
EMAS Replacement	$	6,200,000
Maintenance Costs (yearly)	$	17,039
FAA Airport Benefit-Cost Analysis Guidance		
Life Cycle		20 years
EMAS material replacement		10 years
Time value of money discount Rate		7%

Present value of life cycle costs of EMAS solution	Plife	Pemas + Prepl + Pm9	$9,836,535.58
Present value of EMAS installation	P_{emas}	cost of the contracts(s) to install standard EMAS	$6,500,000.00
Present value of EMAS replacement after 10 years	P_{repl}	$P_{repl}=F/(1+i)^n$	$3,151,765.61
Present value of annual maintenance for 9 years	P_{m9}	$P_{m9} = A[((1+i)^n-1)/(i(1+i)^n)]$	$119,674.81
Present value of annual maintenance for years 11 through 19	P_{m19}	$P_{m19} = P_{m9}/(1+i)^n)$	$65,095.17
	F	Future replacement costs (in current dollars)	$6,200,000.00
	i	Discount rate	7%
	n (P_{repl})	Number of interest periods	10
9 years because EMAS will be replaced in year 10	n (P_{m9})	Number of periods (for 9 years)	9
Year 20 maintenance not required due to end of life cycle	n (P_{m19})	Number of periods (cost 10 years into future)	10
	A	annual recurring maintenance costs	$17,039.00

Round to nearest 100		
P_{life}	**$**	**9,836,500**
P_{emas}	$	6,500,000
P_{repl}	$	3,151,800
P_{m9}	$	119,700
P_{m19}	$	65,100

Calculation Example

Assume the following costs:

EMAS installation = $5,000,000

EMAS replacement = $2,000,000

Annual inspection and maintenance = $20,000

$\mathbf{P_{emas}}$ =	$5,000,000
$\mathbf{P_{repl}} = 2{,}000{,}000/(1+0.07)^{10}$ =	1,017,000
$\mathbf{P_{m9}} = 20{,}000((1+0.07)^{9}-1)/(.07(1+.07)^{9})$ =	130,300
$\mathbf{P_{m19}} = 130{,}300/(1+0.07)^{10}$=	66,200
$\mathbf{P_{life}}$ =	$6,213,500

OTH EA - EMAS vs Bulkhead
Initial Construction Worksheet

ASSUMPTIONS	
Mobilization / Safety and Security Markup	15%
Construction Contingency Markup	20%

INITIAL CONSTRUCTION WORKSHEET - EMAS, 20 YEAR DESIGN LIFE

PROJECT COST ESTIMATE

Location: Southwest Oregon Regional Airport
Project: EA EMAS - Site Preparation
Description: Site Preparation + EMAS

ITEM	SECTION	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT PRICE
General Conditions					
1	GP-50-07	Construction Survey	1	LS	$ 15,000.00
2	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 13,458.64
3	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 55,000.00
4	C-105	Mobilization	1	LS	$ 50,644.43
5	NS-200	Airfield Safety and Traffic Control	1	LS	$ 38,453.24
Pavement Rehabilitation					
5	P-101-5.5	Asphalt Cold Milling, 4 inch	8,400	SY	$ 12.50
6	P-401-8.1	Asphalt Surface Course	2,040	TN	$ 130.00
7	P-603-5.1	Emulsified Asphalt Tack Coat	840	GAL	$ 3.40
8	P-620-5.3a	Pavement Marking, Yellow	2,800	SF	$ 2.75
9	P-620-5.3b	Pavement Marking, Black	680	SF	$ 2.75
10	P-620-5.4	Reflective Media	212	LB	$ 9.00

Note: Total rounded up to the nearest $5,000

Total Estimated Construction Cost	
EMAS Sytem	
Construction Administration	
Contingency (20%)	
Total Estimated Project Cost	

INITIAL CONSTRUCTION WORKSHEET - Bulkhead, 30 YEAR DESIGN LIFE

Spec.	Item	Quantity	Unit	Unit Cost	Cost
-	Embankment Fill	2215	CY	$85.00	$188,275.00
-	Subgrade Preparation	3150	SY	$9.50	$29,925.00
-	Dewatering	90	DAY	$815.00	$73,350.00
-	Coffer Dam, 36' - 48' Deep	3240	SF	$48.50	$157,140.00
-	Bulkhead, Concrete Blocks	3458	SY	$710.00	$2,455,180.00
-	Rip Rap - Toe Armoring	160	SY	$190.00	$30,400.00
-	Geotextile - Woven separation	632	SY	$12.00	$7,584.00
-	Geotextile - Nonwoven subgrade	290	SY	$15.00	$4,350.00
-	Geogrid	290	SY	$28.00	$8,120.00
-	Crushed Aggregate Base	200	CY	$145.00	$29,000.00
	Concrete Foundation	60	CY	$240.00	$14,400.00
	Geotechnical Borings	10	EA	$2,000.00	$20,000.00
Mobilization / Safety and Security Markup			15%		$449,658.60
Construction Administration			10%		$346,738.26
Construction Contingency Markup			20%		$693,476.52
Total Initial Construction Cost - Bulkhead, 20 Year Design Life:					**$4,507,597.38**

OTH EA - EMAS vs Bulkhead
Maintenance Worksheet

ASSUMPTIONS	
Discount Rate/Interest Rate (Present Worth Factor):	7.0%
Asphalt Construction Cost Escalation Rate:	6.0%
Concrete Construction Cost Escalation Rate:	5.0%
Minor Maint. Mark-Up (Internal Construction):	10%
Major Maint. Mark-Up (External Contractor):	30%

MAINTENANCE SCHEDULE - ASPHALT PAVING

Crack Sealing Maintenance - Asphalt				
Crack Repair:	Cracks per FT of Taxiway:		8.00	LF/FT
	Crack Repair Unit Cost:		$3.00	/LF
	Total - Crack Repair/FT		$24.00	/FT
Minor Maint. Mark-Up:		10%	$2.40	/FT
Total Crack Sealing Maintenance - Asphalt			**$26.40**	**/FT**
Fog & Crack Sealing Maintenace - Asphalt				
Minor & Major Crack Repair:	Minor Cracks per FT of Taxiway:		4.00	LF/FT
	Major Cracks per FT of Taxiway:		2.00	LF/FT
	Minor Crack Repair Unit Cost:		$1.35	/LF
	Major Crack Repair Unit Cost:		$4.00	/LF
	Total - Crack Repair/FT		$13.40	/FT
Fog Sealing:	Fog Seal per FT of Taxiway:		5.556	Syd/FT
	Fog Seal Unit Cost		$2.60	/Syd
	Total - Fog Sealing/FT		$14.45	/FT
Minor Maint. Mark-Up:		10%	$2.78	/FT
Total Fog & Crack Sealing Maintenace - Asphalt			**$30.63**	**/FT**
Asphalt Surface Maintenance - 2" Mill and Overlay				
2" AC Removal:	Asphalt Removal per FT of Blast Pa		0.28	CY/FT
	2" Asphalt Removal Unit Cost		$2.50	/CY
	Total - Asphalt Removal/FT		$0.70	/FT
2" Asphalt Placement:	Asphalt Qty per FT of Taxiway		0.60	Ton/FT
	Asphalt Unit Cost		$130.00	/Ton
	Total - Asphalt Placement		$78.00	/FT
Major Maint. Mark-Up:		30%	$23.61	/FT
Total Asphalt Surface Maintenance - 2" Mill and Overlay			**$102.31**	**/FT**
Slurry & Crack Sealing Maintenace - Asphalt				
Major Crack Repair:	Cracks per FT of Taxiway:		2.00	LF/FT
	Crack Repair Unit Cost:		$4.00	/LF
	Total - Crack Repair/FT		$8.00	/FT
Fog Sealing:	Slurry Seal per FT of Taxiway:		5.556	Syd/FT
	Slurry Seal Unit Cost		$6.00	/Syd
	Total - Slurry Sealing/FT		$33.34	/FT
Minor Maint. Mark-Up:		10%	$4.13	/FT
Total Slurry & Major Crack Sealing Maintenace - Asphalt			**$45.47**	**/FT**
Total Bulkhead Maintenance - yearly			**$33,075**	**/YR**
Bulkhead Annual Maintenance			**$300.00**	**/FT/YR**

Southwest Oregon Regional Airport (OTH)
RSA Improvements - Runway 5/23
Life Cycle Cost Analysis
Mead Hunt, Inc.

ANALYSIS AREA:	Runway 23 RSA
CONSTRUCTION ALTERNATIVE:	EMAS System + Site Prep
DESCRIPTION:	EMAS Maintenance

		CONSTRUCTION & MAINTENANCE COSTS						
Year	**PW Factor** 7.0%	Description	Length	Unit	Cost Per FT	Cost per Activity	Escalated Cost 6.0%	NPV 7.0%
0	1.0000	Initial Construction	1	LS	$8,785,000	8,785,000	8,785,000	8,785,000
1	0.9346	Annual Maintenance				33,075	35,060	
2	0.8734					33,075	37,163	
3	0.8163					33,075	39,393	
4	0.7629	Crack Seal + AM	930	FT	$26.40	57,627	72,753	55,503
5	0.7130					33,075	44,262	
6	0.6663					33,075	46,918	
7	0.6227					33,075	49,733	
8	0.5820	Fog & Crack Seal + A	930	FT	$30.63	61,561	98,119	57,106
9	0.5439					33,075	55,880	
10	0.5083	Replacement	1	EA	$3,541,000	3,541,000	6,341,392	
11	0.4751					33,075	62,786	
12	0.4440	Crack Seal + AM	930	FT	$26.40	57,627	115,957	51,486
13	0.4150					33,075	70,547	
14	0.3878					33,075	74,779	
15	0.3624	2" Mill & Overlay + AM	930	FT	$102.31	128,223	307,295	111,378
16	0.3387					33,075	84,022	
17	0.3166					33,075	89,063	
18	0.2959					33,075	94,407	
19	0.2765					33,075	100,072	
20	0.2584	Salvage (1 Years)	930	FT	-$18.60	-17,300	-55,482	-14,338
						Total:	Cost	NPV
							16,549,116	**9,046,135**

Southwest Oregon Regional Airport (OTH)
RSA Improvements - Runway 5/23
Life Cycle Cost Analysis
Mead Hunt, Inc.

ANALYSIS AREA:	Runway 23 RSA
CONSTRUCTION ALTERNATIVE:	EMAS System + Site Prep
DESCRIPTION:	Bulkhead Maintenance

		CONSTRUCTION & MAINTENANCE COSTS						
Year	**PW Factor** 7.0%	Description	Quantity	Unit	Unit Cost	Cost per Activity	Escalated Cost 5.0%	NPV 7.0%
0	1.0000	Initial Construction	1	LS	$4,507,597	4,507,597	4,507,597	4,507,597
1	0.9346	Annual Maintenance	160	EA	$300	48,000	50,400	47,103
2	0.8734	Annual Maintenance	160	EA	$300	48,000	52,920	46,222
3	0.8163	Annual Maintenance	160	EA	$300	48,000	55,566	45,358
4	0.7629	Annual Maintenance	160	EA	$300	48,000	58,344	44,511
5	0.7130	Annual Maintenance	160	EA	$300	48,000	61,262	43,679
6	0.6663	Annual Maintenance	160	EA	$300	48,000	64,325	42,862
7	0.6227	Annual Maintenance	160	EA	$300	48,000	67,541	42,061
8	0.5820	Annual Maintenance	160	EA	$300	48,000	70,918	41,275
9	0.5439	Annual Maintenance	160	EA	$300	48,000	74,464	40,503
10	0.5083	Annual Maintenance	160	EA	$300	48,000	78,187	39,746
11	0.4751	Annual Maintenance	160	EA	$300	48,000	82,096	39,003
12	0.4440	Annual Maintenance	160	EA	$300	48,000	86,201	38,274
13	0.4150	Annual Maintenance	160	EA	$300	48,000	90,511	37,559
14	0.3878	Annual Maintenance	160	EA	$300	48,000	95,037	36,857
15	0.3624	Annual Maintenance	160	EA	$300	48,000	99,789	36,168
16	0.3387	Annual Maintenance	160	EA	$300	48,000	104,778	35,492
17	0.3166	Annual Maintenance	160	EA	$300	48,000	110,017	34,829
18	0.2959	Annual Maintenance	160	EA	$300	48,000	115,518	34,178
19	0.2765	Annual Maintenance	160	EA	$300	48,000	121,294	33,539
20	0.2584	Salvage (9 Years)	1	EA	-$1,014,209.41	-1,014,209	-2,691,000	-695,405
						Total:	Cost	NPV
							3,355,764	**4,571,411**

OTH EA - EMAS vs Bulkhead

	Initial Construction		Maintenance		Initial + Maintenance		
	Total		Total Over 20 Yrs		Total Over 20 Yrs		
Construction Alternative	Cost	Rank	Cost	Rank	Cost	NPV	Rank
EMAS	$8,785	0.0%	$7,764	0.0%	$16,549	$9,046	0.0%
Bulkhead	$4,508	-48.7%	-$1,152	-774.1%	$3,356	$4,571	-49.5%

OTH EA - EMAS versus Bulkhead
LIFE CYCLE COST SUMMARY - AREA 1
May 12, 2021

	Initial Construction		Maintenance				Initial + Maintenance			
Construction	Total		Maintenance Cost		Total Over 20 Yrs		Total Over 20 Yrs			Description
Alternative	Cost	Rank	Through Year 19	Salvage	Cost	Rank	Cost	NPV	Rank	
EMAS - 20 Year Design Life	$8,785	94.9%	$7,820	-$55	$7,764	0.0%	$16,549	$9,046	97.9%	1 Year Salvage Remains
Bulkhead - 20 Year Design Life	$4,508	0.0%	$1,539	-$2,691	-$1,152	-774.1%	$3,356	$4,571	0.0%	30 Year Life, 9 Year Salvage Remains

General Assumptions:
Costs in Thousands of Dollars
Estimated prices based on available bid information

Construction Contingency:	20%
Discount Rate (Present Worth):	7.0%
Asphalt Construction Cost Escalation Rate:	6.0%
Concrete Construction Cost Escalation Rate:	5.0%
Pavement Design Life:	As Noted

A Salvage Value has been determined based on expected Life Remaining
Soft Costs and Operational Costs are not included in analysis.
No maintenance after Year 20.

Technical Memorandum

Date: August 2, 2019

Subject: Basis of Design for Runway Safety Area Fill Volumetric Calculations

(1) Introduction and Background

A portion of the Runway Safety Area (RSA) and the Runway Object Free Area (ROFA) do not meet the FAA RSA and ROFA criteria for C-III aircraft. RSA requirements for a C-III aircraft approach category (AAC) and airplane design group (ADG) requires a 1,000-foot RSA beyond the departure end. Various alternatives have been considered throughout the master planning and NEPA process. The preferred alternative includes adding a bulkhead to northwest end of the Runway 4/22 RSA, in the adjacent Coos Bay, to meet FAA safety standards. In-water work in Coos Bay is managed by various agencies including USFWS, Coos County, NOAA, USACE and Oregon Dept of State Lands.

Depending on the size of the extended ground, the RSA Fill Area may overlap with a surveyed area of eelgrass, a federally designated Essential Fish Habitat (EFH) and a Habitat of Particular Concern under the Magnuson-Stevens Fishery Conservation and Management Act.

This memorandum describes the approach used to quantify the proposed RSA bulkhead area and volume for the purposes of the Environmental Assessment.

(2) Approach

Filling a section of Coos Bay to meet the required area of the RSA has been determined as the preferred alternative in the OTH Master Plan. The options for fill design include the following:

1. Place fill material level to the existing runway edge and surround with riprap along a 15-degree fill slope, which terminates in the bay.

2. Place fill material level to the existing runway edge and install eco-block or sheet pile at the limits of the fill.

Option 1 has a significantly larger surface area and volume, and the extended footing of this method will directly impact the eelgrass, and have more significant indirect impacts. Option 2 is approximately 35 feet from the eelgrass beds and is not expected to directly impact the eelgrass, based on the 2019 survey results of eelgrass presence of Coos Bay (2019 OTH Biological Assessment). Option 2 is the preferred option.

(3) Analysis

The various data sources that Mead & Hunt used for the analysis were in different vertical datums. As discussed below, Mead & Hunt converted all the data sources to the North American Vertical Datum of 1988 (NAVD88).

Airport Design:
FAA eNASR data was used to input runway end points, runway centerline was derived from eNASR runway end latitude and longitude. Runway end points were converted from WGS84 to NAD 1983 2011 State Plane Oregon South FIPS 3602 Ft International. RSA layer was created by offsetting C-III design distances from runway end points/centerline.

Bathymetry:
For the analysis, Mead & Hunt used publicly available bathymetry, compiled and combined by the University of Oregon (Eidam, 2019). The bathymetry was stored as depth (in meters) below Mean Sea Level (MSL). Mead & Hunt converted the data to elevation (in feet, NAVD88).

The University of Oregon data is in TIN format, so the horizontal spacing of points varies. Because the data is a mosaic of multiple data sources, vertical accuracy is not reported. The original datasets, referenced by the University of Oregon, also do not discuss vertical accuracy.

Reference: Eidam, E. (2019, April 22). Coos Bay Bathymetry. Retrieved from Github: https://github.com/das7105/Coos-Bay-Bathymetry.

Topography:
Publicly available topography data from the Oregon Department of Geology and Mineral Industries (DOGAMI) was used to represent the overbank area. The DOGAMI data is in raster format, with a horizontal cell size of 3 feet by 3 feet. The vertical datum is NAVD88.

Because this data is a mosaic of multiple data sources, vertical accuracy is not reported. The following disclaimers are listed in the metadata:

> *This mosaic data set provides a mosaic of digital elevation model (DEM) rasters collected in Oregon. This dataset includes DEM lidar data collected by the Oregon Department of Geology and Mineral Industries (DOGAMI) and the Oregon Lidar Consortium as well as other organizations that have provided a copy of lidar data to DOGAMI. This dataset provides high resolution elevation data that is used to produce three-dimensional models of the earth surface for the purpose of managing natural resources and mapping natural hazards.*

Reference: Oregon Department of Geology and Mineral Studies. (2019, February 27). Data and Publications - LiDAR. Retrieved from State of Oregon Department of Geology and Mineral Industries: https://www.oregongeology.org/lidar/

Combined surface:
The two elevation data sources were combined in Esri's ArcMap v10.3.1 as utilized as a composite representation of existing conditions for planning purposes.

Fill calculations:

The existing runway surface is at elevation 12.0 feet (NAVD88). To evaluate the fill options, the existing runway surface was extended, level with the runway, to the edge of the proposed fill.

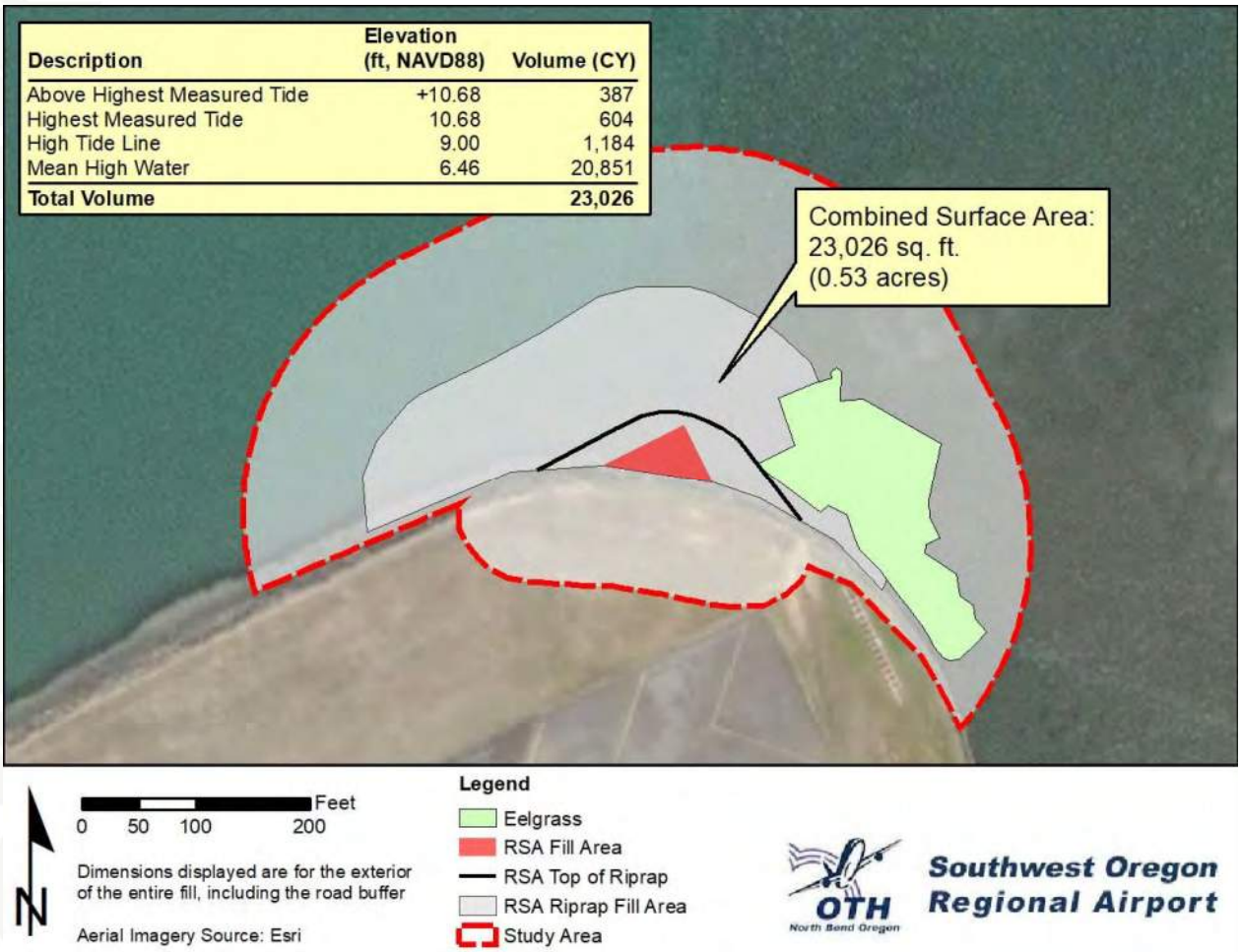
1. For Option 1, the top of slope was established outside of the Runway RSA, with no point along the top of slope being within 10-feet of the edge of the Runway RSA. The top of slope was defined to match the curvature of the existing fill that defines the airport. From the top of slope, the riprap was projected downward at a 15-percent slope until the surface intersected the existing bathymetry. At the deepest point, the fill is approximately 23 feet high. The total fill volume is approximately 23,026 cubic yards. **Figure 1** displays the details of Option 1.

2. For Option 2, there is a 10-foot buffer around the Runway RSA to accommodate a road around the Runway RSA. Because Option 2 includes eco-block or sheet pile, the edge of fill is vertical. Including the 10-foot buffer, the north side of the fill is approximately 89 feet and the east side of the fill is approximately 67 feet. The fill area is approximately triangular. At the deepest point, the fill is approximately 23 feet high. The total fill volume is approximately 2,215 cubic yards. **Figure 2** displays details of Option 2, which is the preferred option.

The jurisdictional elevations of the surface waters (Coos Bay and Pony Slough) for the project area were established in Table 2 and mapped on Figure 6B of the *Wetland Delineation Report* (PBS, 2019). The fill below each of these jurisdictional elevations was calculated for regulatory discussions.

Reference: PBS, *Wetland Delineation Report* – SW Oregon Regional Airport Safety Improvements, February 15, 2019

Technical Memorandum
Basis of Design for RSA Fill Volumetric Calculations
August 2, 2019
Page 4



Description	Elevation (ft, NAVD88)	Volume (CY)
Above Highest Measured Tide	+10.68	387
Highest Measured Tide	10.68	604
High Tide Line	9.00	1,184
Mean High Water	6.46	20,851
Total Volume		**23,026**

Figure 1. RSA fill area and sloped riprap for Fill Option 1.

Technical Memorandum
Basis of Design for RSA Fill Volumetric Calculations
August 2, 2019
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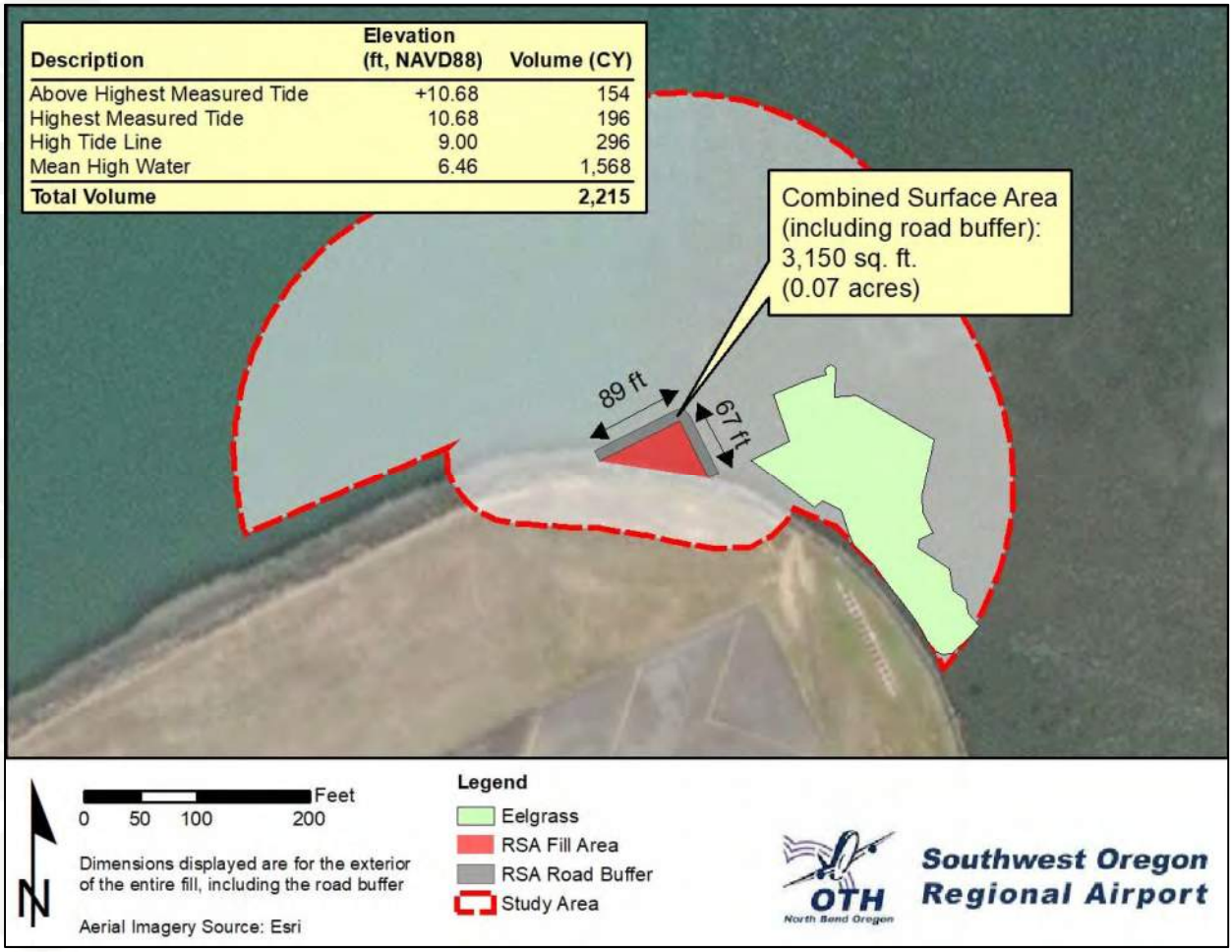


Description	Elevation (ft, NAVD88)	Volume (CY)
Above Highest Measured Tide	+10.68	154
Highest Measured Tide	10.68	196
High Tide Line	9.00	296
Mean High Water	6.46	1,568
Total Volume		**2,215**

Figure 2. RSA fill area and buffer for Fill Option 1 (Preferred Fill Option).

(4) Conclusion

Using the preferred option, the estimated fill as a result of this analysis was approximately 2,215 cubic yards.

(5) Recommendation

The vertical accuracy of both the topographic and bathymetric data sets was not reported. Therefore, a topographic and bathymetric survey of actual site conditions is recommended prior to design of improvements and final quantification of fill impacts.

Appendix G
Biological Opinion

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OR 97232-1274

Refer to NMFS Consultation No.:
WCRO-2019-03422

July 29, 2020

Sean Callahan
Federal Aviation Administration
2200 S 216th Street
Des Moines, Washington 98198

William D. Abadie
Chief, Regulatory Branch
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Southwest Oregon Regional Airport Runway Safety Area Improvements, North Bend, Oregon

Dear Mr. Callahan and Mr. Abadie:

Thank you for your letter of October 15, 2019, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Southwest Oregon Regional Airport runway safety area improvements. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016). Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

In this biological opinion (opinion), we conclude that the proposed action is not likely to jeopardize the continued existence of Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*), southern distinct population segment Pacific eulachon (eulachon) (*Thaleichthys pacificus*), or southern distinct population segment North American green sturgeon (green sturgeon) (*Acipenser medirostris*). We also conclude the project will not result in the destruction or adverse modification of designated critical habitat for OC coho salmon or green sturgeon. The effects of this action would occur outside the geographic range of designated critical habitat for eulachon.

As required by section 7 of the ESA, we are providing an incidental take statement (ITS) with the opinion. The ITS describes reasonable and prudent measures we consider necessary or appropriate to minimize the impact of incidental take associated with this action.

The ITS sets forth nondiscretionary terms and conditions, including reporting requirements, and the Federal Aviation Administration (FAA) must comply with them to implement the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species. Exceeding the specified level of take in the ITS would trigger reinitiation of this consultation.

This document also includes the results of our analysis of the action's likely effects on EFH and includes four conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. Three of these conservation recommendations are a subset of the ESA take statement's terms and conditions. Section 305(b) (4) (B) of the MSA requires Federal agencies to provide a detailed written response to us within 30 days after receiving these recommendations.

If the response is inconsistent with the EFH conservation recommendations, the FAA must explain why the recommendations will not be followed, including the scientific justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, we established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we request that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

Please contact Chuck Wheeler, fisheries biologist in the Oregon Coast Branch, at 541.957.3379 if you have any questions concerning this section 7 consultation, or if you require additional information.

Sincerely,

Kim W. Kratz, Ph.D
Assistant Regional Administrator
Oregon Washington Coastal Office

cc: Tyler Krug, Corps of Engineers

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the

Southwest Oregon Regional Airport Runway Safety Area Improvements

NMFS Consultation Number: WCRO-2019-03422

Action Agencies: Federal Aviation Administration
U.S. Army Corps of Engineers

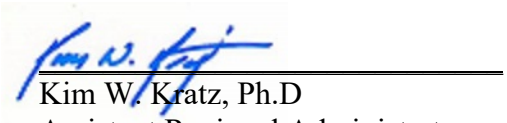
Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Oregon Coast coho salmon	Threatened	Yes	No	Yes	No
Southern distinct population segment North American green sturgeon	Threatened	Yes	No	Yes	No
Southern distinct population segment Pacific eulachon	Threatened	Yes	No	No	No

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes
Pacific Coast Groundfish	Yes	Yes
Coastal Pelagic Species	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service
West Coast Region

Issued By:



Kim W. Kratz, Ph.D
Assistant Regional Administrator
Oregon Washington Coastal Office

Date: July 29, 2020

TABLE OF CONTENTS

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3, below.

1.1 Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402, as amended. We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome].

1.2 Consultation History

On October 16, 2019, we received a biological assessment (BA) from the Federal Aviation Administration (FAA) along with a letter requesting formal consultation on the potential effects of the runway safety area improvement projects at the Southwest Oregon Regional Airport.

In a December 11, 2019, email from Chuck Wheeler (NMFS) to you, we asked for additional information pertaining to mitigation and stormwater management plans. We received adequate information about mitigation in an email on January 30, 2020. We received adequate information about stormwater management in an email on April 13, 2020, and acknowledged sufficient information to initiate formal consultation on that day. The Corps of Engineers (Corps) will issue a permit (NWP-2017-337) for this work under their authorities and requested to be part of this consultation on April 8, 2020.

The FAA determined the action may affect and is likely to adversely affect Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) North American green sturgeon (*Acipenser medirostris*) (hereafter referred to as 'green sturgeon'), and designated critical habitat for these species. The FAA determined the action may affect, but is not likely to adversely affect southern DPS Pacific eulachon (*Thaleichthys pacificus*) (hereafter referred to as 'eulachon').

1.3 Proposed Federal Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). Under the MSA, the

Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910). The FAA is proposing to fund the Southwest Oregon Regional Airport (Airport) to complete five improvement projects. The Corps of Engineers will issue a permit (NWP-2017-337) for this work under their authorities. The five projects are:

- Installation of a bulkhead at the northeast end of Runway 4/22 to address runway safety area compliance.
- Reconstruction of the main apron pavement and relocation of the taxiway connectors.
- Relocation and reconstruction of the Aircraft Rescue and Firefighting (ARFF) facility according to FAA standards.
- Improvements to the approach lighting system with runway alignment indicator lights on catwalk.
- Relocation of the glide slope tower to 150 feet south of the Runway 4/22 centerline.

The only in-water construction work is fill for installation of the bulkhead. The Airport will fill 0.07 acres of Coos Bay to construct the bulkhead in compliance with FAA runway safety requirements. All in-water work will occur between October 1 and February 15 in compliance with the Oregon Department of Fish and Wildlife (ODFW) preferred in-water work window for Coos Bay. In-water work will occur on outgoing tides, reducing the potential for sedimentation on eelgrass beds upstream in Pony Slough. Prior to excavation, the Airport will construct a cofferdam to isolate the work area. The Airport will use an excavator and/or hydraulic suction dredge operated from a floating barge to excavate substrate in preparation for bulkhead construction. The Airport will ensure daily testing of all equipment for fluid leaks, and repair of any leaks before operation resumes. The Airport will ensure diapering of all stationary power equipment operated within 150 feet of Coos Bay to prevent leaks.

The Airport will mitigate for filling 0.07 acres of Coos Bay with two actions. The first is removing an abandoned wooden boat ramp (approximately 800 square feet) and approximately 60 creosote-treated piles. These activities will enhance approximately 0.09 acres of bay. The second action will remove approximately 40 creosote-treated piles from an abandoned pier. This activity will enhance approximately 0.08 acres of bay.

The new ARFF site currently has 0.93 acres of impervious surfaces. After construction, the site will have 0.84 acres of impervious surfaces. As part of the construction activity, the Airport will provide stormwater treatment. The stormwater treatment plan consists of treating 50% of the 2-year, 24-hour storm for runoff from 0.69 acres of impervious surfaces. Treatment consists of biofiltration facilities designed in accordance with the Washington State Department of Transportation, Aviation Stormwater Design Manual: Managing Wildlife Hazards Near Airports (WSDOT 2008). Due to site constraints, 0.15 acres of new impervious surfaces are not treatable. As an offset for these untreated areas, the Airport will remove 0.1 acres of impervious surface at the old ARFF site and the 0.09 acres of impervious surface at the new site. This results in a net reduction of 0.19 acres of impervious surfaces. Furthermore, the Airport will treat 0.05 acres of impervious surfaces unrelated to the ARFF site.

We considered whether or not the proposed action would cause any other activities and determined that it will not.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide an opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

The FAA determined the action may affect, but is not likely to adversely affect eulachon. We do not concur with this determination and included them in this biological opinion. The effects of this action would occur outside the geographic range of designated critical habitat for eulachon.

2.1 Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02).

The designations of critical habitat for OC coho salmon and green sturgeon use the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not

change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: 1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species, or 2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the essential PBFs that help to form that conservation value.

One factor affecting the status of ESA-listed species considered in this opinion, and aquatic habitat at large, is climate change. Climate change is likely to play an increasingly important role in determining the abundance and distribution of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. The largest hydrologic responses are expected to occur in basins with significant snow accumulation, where warming decreases snow pack, increases winter flows, and advances the timing of spring melt (Mote *et al*. 2014, Mote *et al.* 2016). Rain-dominated watersheds and those with significant contributions from groundwater may be less sensitive to predicted changes in climate (Tague *et al*. 2013, Mote *et al*. 2014).

During the last century, average regional air temperatures in the Pacific Northwest increased by 1-1.4°F as an annual average, and up to 2°F in some seasons (based on average linear increase

per decade; Abatzoglou *et al*. 2014, Kunkel *et al*. 2013). Warming is likely to continue during the next century as average temperatures are projected to increase another 3-10°F, with the largest increases predicted to occur in the summer (Mote *et al*. 2014). Decreases in summer precipitation of as much as 30% by the end of the century are consistently predicted across climate models (Mote *et al.* 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007, Mote *et al*. 2013, Mote *et al*. 2014). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007, Mote *et al.* 2014). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events), in the western United States (Dominguez *et al*. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote *et al*. 2014).

Overall, about one-third of the current cold-water salmonid habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (Mantua *et al.* 2009). Higher temperatures will reduce the quality of available salmonid habitat for most freshwater life stages (ISAB 2007). Reduced flows will make it more difficult for migrating fish to pass physical and thermal obstructions, limiting their access to available habitat (Mantua *et al*. 2010, Isaak *et al*. 2012). Temperature increases shift timing of key life cycle events for salmonids and species forming the base of their aquatic foodwebs (Crozier *et al*. 2011, Tillmann and Siemann 2011, Winder and Schindler 2004). Higher stream temperatures will also cause decreases in dissolved oxygen and may also cause earlier onset of stratification and reduced mixing between layers in lakes and reservoirs, which can also result in reduced oxygen (Meyer *et al*. 1999, Winder and Schindler 2004, Raymondi *et al*. 2013). Higher temperatures are likely to cause several species to become more susceptible to parasites, disease, and higher predation rates (Crozier *et al*. 2008, Wainwright and Weitkamp 2013, Raymondi *et al*. 2013).

As more basins become rain-dominated and prone to more severe winter storms, higher winter stream flows may increase the risk that winter or spring floods in sensitive watersheds will damage spawning redds and wash away incubating eggs (Goode *et al*. 2013). Earlier peak stream flows will also alter migration timing for salmon smolts, and may flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and reducing smolt survival (McMahon and Hartman 1989, Lawson *et al*. 2004).

In addition to changes in freshwater conditions, predicted changes for coastal waters in the Pacific Northwest as a result of climate change include increasing surface water temperature, increasing but highly variable acidity, and increasing storm frequency and magnitude (Mote *et al*. 2014). Elevated ocean temperatures already documented for the Pacific Northwest are highly likely to continue during the next century, with sea surface temperature projected to increase by 1.0-3.7ºC by the end of the century (IPCC 2014). Habitat loss, shifts in species' ranges and abundances, and altered marine food webs could have substantial consequences to anadromous, coastal, and marine species in the Pacific Northwest (Tillmann and Siemann 2011, Reeder *et al*. 2013).

Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. Acidification also impacts sensitive estuary habitats,

where organic matter and nutrient inputs further reduce pH and produce conditions more corrosive than those in offshore waters (Feely *et al*. 2012, Sunda and Cai 2012).

Global sea levels are expected to continue rising throughout this century, reaching likely predicted increases of 10-32 inches by 2081-2100 (IPCC 2014). These changes will likely result in increased erosion and more frequent and severe coastal flooding, and shifts in the composition of nearshore habitats (Tillmann and Siemann 2011, Reeder *et al*. 2013). Estuarine-dependent salmonids such as chum and Chinook salmon are predicted to be impacted by significant reductions in rearing habitat in some Pacific Northwest coastal areas (Glick *et al*. 2007).

Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances, and therefore these species are predicted to fare poorly in warming ocean conditions (Scheuerell and Williams 2005, Zabel *et al*. 2006). This is supported by the recent observation that anomalously warm sea surface temperatures off the coast of Washington from 2013 to 2016 resulted in poor coho and Chinook salmon body condition for juveniles caught in those waters (NWFSC 2015). Changes to estuarine and coastal conditions, as well as the timing of seasonal shifts in these habitats, have the potential to impact a wide range of listed aquatic species (Tillmann and Siemann 2011, Reeder *et al*. 2013).

The adaptive ability of these threatened and endangered species is depressed due to reductions in population size, habitat quantity and diversity, and loss of behavioral and genetic variation. Without these natural sources of resilience, systematic changes in local and regional climatic conditions due to anthropogenic global climate change will likely reduce long-term viability and sustainability of populations in many of these salmon evolutionarily significant units (ESUs) and steelhead DPSs (NWFSC 2015). New stressors generated by climate change, or existing stressors with effects that have been amplified by climate change, may also have synergistic impacts on species and ecosystems (Doney *et al*. 2012). These conditions will possibly intensify the climate change stressors inhibiting recovery of ESA-listed species in the future.

2.2.1 Status of the Species

Table 1 provides a summary of listing and recovery plan information, status, and limiting factors for the species addressed in this opinion. More information can be found in recovery plans and status reviews for these species. These documents are available on the NMFS West Coast Region website (http://www.westcoast.fisheries.noaa.gov/) and cited in the References Section of this opinion.

Table 1. Listing classification and date, recovery plan reference, most recent status review, status summary, and limiting factors for each species considered in this opinion.

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
Oregon Coast (OC) coho salmon	Threatened 6/20/11; reaffirmed 4/14/14	NMFS 2016	NWFSC 2015	This ESU comprises 56 populations including 21 independent and 35 dependent populations. The last status review indicated a moderate risk of extinction. Significant improvements in hatchery and harvest practices have been made for this ESU. Most recently, spatial structure conditions have improved in terms of spawner and juvenile distribution in watersheds; none of the geographic area or strata within the ESU appear to have considerably lower abundance or productivity. The ability of the ESU to survive another prolonged period of poor marine survival remains in question.	• Reduced amount and complexity of habitat including connected floodplain habitat • Degraded water quality • Blocked/impaired fish passage • Inadequate long-term habitat protection • Changes in ocean conditions
Southern DPS green sturgeon (green sturgeon)	Threatened 4/7/06	NMFS 2018	NMFS 2015	The Sacramento River contains the only known green sturgeon spawning population in this DPS. The current estimate of spawning adult abundance is between 824-1,872 individuals. Telemetry data and genetic analyses suggest green sturgeon generally occur from Graves Harbor, Alaska to Monterey Bay, California and, within this range, most frequently occur in coastal waters of Washington, Oregon, and Vancouver Island and near San Francisco and Monterey bays. Within the nearshore marine environment, tagging and fisheries data indicate that green sturgeon prefer marine waters of less than a depth of 110 meters.	• Reduction of its spawning area to a single known population • Lack of water quantity • Poor water quality • Poaching

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
Southern DPS Pacific eulachon (eulachon)	Threatened 3/18/10	NMFS 2017	Gustafson *et al*. 2016	The Southern DPS of eulachon includes all naturally-spawned populations that occur in rivers south of the Nass River in British Columbia to the Mad River in California. Sub populations for this species include the Fraser River, Columbia River, British Columbia and the Klamath River. In the early 1990s, there was an abrupt decline in the abundance of eulachon returning to the Columbia River. Despite a brief period of improved returns in 2001-2003, the returns and associated commercial landings eventually declined to the low levels observed in the mid-1990s. Although eulachon abundance in monitored rivers has generally improved, especially in the 2013-2015 return years, recent poor ocean conditions and the likelihood that these conditions will persist into the near future suggest that population declines may be widespread in the upcoming return years.	• Changes in ocean conditions due to climate change, particularly in the southern portion of the species' range where ocean warming trends may be the most pronounced and may alter prey, spawning, and rearing success. • Climate-induced change to freshwater habitats • Bycatch of eulachon in commercial fisheries • Adverse effects related to dams and water diversions • Water quality, • Shoreline construction • Over harvest • Predation

2.2.2 Status of the Critical Habitat

This section describes the status of designated critical habitats affected by the proposed action by examining the condition and trends of the essential PBFs of that habitat throughout the designated areas. These features are essential to the conservation of the ESA-listed species because they support one or more of the species' life stages (e.g., sites with conditions that support spawning, rearing, migration and foraging). For several of the species covered in this opinion, we have not designated critical habitat or it is designated, but outside of the action area. The BA included detailed analysis of the status of critical habitat. We incorporate that discussion by reference here, also.

A summary of the status of critical habitats considered in this opinion is provided in Table 2, below.

Table 2. Critical habitat, designation date, federal register citation, and status summary for critical habitat considered in this opinion.

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
Oregon Coast (OC) coho salmon	2/11/08 73 FR 7816	Critical habitat encompasses 13 subbasins in Oregon. The long-term decline in OC coho salmon productivity reflects deteriorating conditions in freshwater habitat as well as extensive loss of access to habitats in estuaries and tidal freshwater. Many of the habitat changes resulting from land use practices over the last 150 years that contributed to the ESA-listing of OC coho salmon continue to hinder recovery of the populations; changes in the watersheds due to land use practices have weakened natural watershed processes and functions, including loss of connectivity to historical floodplains, wetlands and side channels; reduced riparian area functions (stream temperature regulation, wood recruitment, sediment and nutrient retention); and altered flow and sediment regimes (NMFS 2016). Several historical and ongoing land uses have reduced stream capacity and complexity in Oregon coastal streams and lakes through disturbance, road building, splash damming, stream cleaning, and other activities. Beaver removal, combined with loss of large wood in streams, has also led to degraded stream habitat conditions for coho salmon (Stout et al. 2012).
Southern DPS of green sturgeon (hereafter green sturgeon)	10/09/09 74 FR 52300	Critical habitat has been designated in coastal U.S. marine waters within 60 fathoms depth from Monterey Bay, California (including Monterey Bay), north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; tidally influenced areas of the Columbia River estuary from the mouth upstream to river mile 46; and certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, Yaquina Bay, and Nehalem Bay), and Washington (Willapa Bay and Grays Harbor), including, but not limited to, areas upstream to the head of tide in various streams that drain into the bays, as listed in Table 1 in USDC (2009). The CHRT identified several activities that threaten the PBFs in coastal bays and estuaries and necessitate the need for special management considerations or protection. The application of pesticides is likely to adversely affect prey resources and water quality within the bays and estuaries, as well as the growth and reproductive health of green sturgeon through bioaccumulation. Other activities of concern include those that disturb bottom substrates, adversely affect prey resources, or degrade water quality through re-suspension of contaminated sediments. Of particular concern are activities that affect prey resources. Prey resources are affected by: commercial shipping and activities generating point source pollution and non-point source pollution that discharge contaminants and result in bioaccumulation of contaminants in green sturgeon; disposal of dredged materials that bury prey resources; and bottom trawl fisheries that disturb the bottom (but result in beneficial or adverse effects on prey resources for green sturgeon).

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For this action, the action area is defined as the footprints of all areas involved in constructing the improvements. The action area also includes Coos Bay beginning at the confluence with the Pacific Ocean upstream to river mile 9. Because of tidal ebb and flow, this 9-mile reach of Coos Bay may be affected by some level of contaminants from project-related stormwater. River mile 9 is the transition point between the lower bay subsystem and upper bay subsystem (ODFW 1979). The lower bay subsystem is a confined channel with high velocities likely to carry contaminants far distances. The upper bay subsystem is an unconfined channel approximately 3 times wider than the lower. Velocities during flood tides within the upper bay subsystem are significantly lower and less likely to transport contaminants than those in the lower subsystem. Because of the lower flood velocities in the upper bay subsystem and distance from the outfall, contaminants from project-related stormwater are not reasonably certain to distribute above river mile 9. The action area occurs in sixth-field hydrologic unit code (HUC) watershed #171003040306.

2.4 Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

The Coos Bay estuary, contains habitats for the Coos population of OC coho salmon, eulachon, and green sturgeon. Over the last 10 years (2009-2018), the average annual adult return of OC coho salmon is 13,845 to the Coos population (Sounhein *et al*. 2019). Eulachon returning to Coos Bay tributaries are likely part of the Columbia River subpopulation, which has a 10-year (2009-2018) average annual adult return of approximately 57 million (Langness *et al*. 2018). The total population of green sturgeon is estimated at 17,548 individuals (Mora *et al*. 2017).

The estuary is classified as a drowned river mouth type estuary, where winter flows discharge high volumes of sediment through the estuary. In summer, when discharge is lower, seawater inflow dominates the estuary. ODFW researchers have divided the estuary into subsystems: marine (mouth to river mile 2.5), lower bay (river mile 2.5 to river mile 9), upper bay (river mile 9 to river mile 17), riverine and slough. These categories were based on sediments, habitat types and geographic locations.

The airport is within the lower bay subsystem. Berg *et al.* (2013) described the lower bay subsystem as:

> "The lower bay subsystem experiences substantial oceanic influence, but is not strongly affected by wave action. Habitat has considerable bearing on the type of fish present, and generally this area is relatively protected from turbulence. Marsh and eelgrass habitat are more common in this subsystem and these vegetated areas appear to exhibit greater species diversity and are preferred by aquatic species. Many species are also found in great numbers over sandy substrates. Most fish species of Coos Bay use the flats of the lower bay at some time during the year. Sediments of the lower bay are predominately sand. Subtidal habitats include unconsolidated bottom substrates of the dredged ship channel and adjacent areas and aquatic beds in shallower areas."

Wetland functions within the estuary have been affected by dikes, tide gates, roads and railroads, ditches, and dams that restrict tidal flows and/or have changed tidal flow patterns. Agricultural land uses have contributed to erosion of channels and, along with channel armoring, have affected vegetation diversity in wetlands, channel shading, and salmonid habitat function; tidal wetlands have also been affected by excavations and disposal of dredged materials. Extensive filling and diking of Coos Bay and its sloughs, estuaries, and tributaries have changed the form and function of the estuary. Approximately 90% of the salt marshes of Coos Bay have been diked or filled to accommodate industry, residential areas, and agriculture and for dredged material disposal sites (Hoffnagle and Olson 1974).

Dredging of the navigation channel has deepened channels and thereby changed circulation, physical processes, and bathymetry in the systems. In 2017, NMFS consulted with the Corps and found their proposed maintenance dredging of the Federal Navigation Channel would not jeopardize any species or result in adverse modification of any critical habitats (NMFS No. WCR-2016-5055). The Corps removes up to 2,350,000 cubic yards of sediment from Coos Bay annually. The Corps may place some of this material within the bay, particularly when the entrance channel bar is impassable, but the vast majority of the material is taken offshore. Intense development in and around the estuary has impacted the shoreline and intertidal zone by removing vegetation and habitats.

2.5 Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

2.5.1 Effects on Designated Critical Habitat

The proposed construction will occur within and adjacent to Coos Bay. The proposed action will affect the lower portion of the Coos Bay fifth-field watershed (HUC# 1710030403), which is designated OC coho salmon and green sturgeon critical habitat. The PBFs essential for OC coho

salmon present in the action area are forage, free of artificial obstruction, natural cover, salinity, water quality, and water quantity. The PBFs for green sturgeon present in the action area are food resources, migratory corridor, sediment quality, water flow, water depth, and water quality.

Potential habitat effects from the proposed action are reasonably certain to include: (1) Temporary and localized reductions in water quality from construction-related suspended sediment; (2) permanent, localized reductions in natural cover and forage/food resources from bulkhead construction; (3) permanent, localized improvements in natural cover and forage/food resources from mitigation actions; and (4) episodic and permanent effects on water quality from pollutants in stormwater runoff. These effects are described in greater detail below.

Construction-related suspended sediment (water quality PBFs)

The Airport will construct a cofferdam to isolate the area needed for bulkhead installation. The substrate in the cofferdam footprint is mostly fines, which are susceptible to becoming suspended in the water column. Construction and removal of the cofferdam will cause short-term increases of suspended sediment in Coos Bay (two periods up to eight hours each). The suspended sediment plume is likely to extend up to 250 feet from shore and 1,000 feet from the cofferdam area. Because the Airport will time this work with outgoing tides, suspended sediment will only affect areas west of the cofferdam. Therefore, construction-related suspended sediment will have a localized, temporary negative effect on the water quality PBFs.

Habitat displacement from bulkhead installation (natural cover and forage/food resources PBFs)

The Airport will fill 0.07 acres of Coos Bay tidelands (lands submerged at high tide but exposed at low tide) to construct the bulkhead. This constitutes a permanent loss of habitat used for sheltering and feeding. Coos Bay has approximately 4,569 acres of tidelands (ODEQ 2004). Therefore, bulkhead construction will eliminate 0.0015% of available similar habitat. This constitutes a permanent, but small and localized negative effect on the natural cover and forage/food resources PBFs.

Habitat improvement from mitigation actions (natural cover and forage/food resources PBFs)

The Airport will improve 0.17 acres of Coos Bay tidelands by removing an abandoned boat ramp and creosote-treated wood pilings. Mitigation activities will improve almost 2.5 times the acreage affected by bulkhead installation. This constitutes a permanent, but small and localized positive effect on the natural cover and forage/food resources PBFs.

Contaminant discharge from stormwater systems (water quality PBFs)

The Airport will decrease the total amount of impervious surfaces on their property by 0.04 acres. They will also treat 0.89 acres of previously untreated impervious surfaces. Stormwater runoff from impervious surfaces delivers a wide variety of pollutants to aquatic ecosystems, such as metals (e.g. copper and zinc), petroleum-related compounds (polycyclic aromatic hydrocarbons - PAHs), and sediment washed off the roads, parking lots, driveways, etc. (Driscoll

et al. 1990, Buckler and Granato 1999, Colman *et al.* 2001, Kayhanian *et al.* 2003, Van Metre *et al.* 2006, Peter *et al.* 2018).

The proposed stormwater treatment method is vegetated biofiltration swales. These swales primarily target sediments and dissolved and particulate metals, although secondary pollutant targets include nutrients, oil, grease, and PAHs (ODOT 2011). Vegetated swales (bioswales) have been shown to reduce total and dissolved copper and zinc concentrations in stormwater (ODEQ 2003, Clary *et al*. 2011). ODEQ (2003) describes bioswale pollutant reduction efficiencies for copper (46%), total and dissolved zinc (63% and 30%), oil/grease (75%), and total suspended solids, including sediment (83%-92%). The exact concentrations of contaminants remaining in the stormwater discharge are unknown and are likely to be highly variable depending on the timing and intensity of individual storm events.

Stormwater runoff only occurs when there is rainfall. The greatest discharge of pollutants is typically during the first-flush storm when rainfall mobilizes pollutants accumulated during dry periods between storms (Kayhanian *et al.* 2003, Lee *et al.* 2004, Soller *et al.* 2005, Kayhanian *et al.* 2008, Nason *et al.* 2011). In Oregon's climate, the most significant of these rain events is the first fall rain; lesser events may occur 2-5 times annually per autumn, winter, or spring, given the seasonality of precipitation patterns in Oregon.

There is a lot of uncertainty regarding the duration of elevated stormwater pollutant concentrations during first-flush events, largely due to the inherent unpredictability and natural variability in rainfall events. In general, the elevated concentrations of stormwater pollutants associated with first-flush events occurs within the first few minutes and up to the first hour after detection of observable runoff (Tiefenthaler and Schiff 2003, Stenstrom and Kayhanian 2005). Therefore, adverse effects on water quality from stormwater will occur at their greatest intensity in the fall after the first significant precipitation. However, they will also occur at lower intensity episodically throughout the remainder of the year.

The proposed action will result in less untreated impervious surface and less stormwater contaminants than are delivered to Coos Bay currently. However, the treatment is not 100% effective and stormwater contaminants will still be delivered to Coos Bay. The amount of contaminants generated from the surfaces will be small because the AARF facility has very low traffic and the stormwater is treated to current standards. While some action-related contaminants are likely to disperse throughout the lower bay, measurable amounts are unlikely further than a few feet (maximum of 10 feet) from the outfall. This is due to the low concentrations of contaminants from the proposed action and the overwhelming volume of water in Coos Bay relative to the discharge of the outfall. Therefore, stormwater discharge will have a permanent, but small and localized negative effect on the water quality PBFs.

Summary of effects on critical habitats

Cofferdam installation will result in temporary and localized negative effects on the water quality PBF from construction-related suspended sediment. Bulkhead installation will result in a permanent, but small and localized negative effect on the natural cover and forage/food resources PBFs. Mitigation activities will result in a permanent, but small and localized positive effect on

the natural cover and forage/food resources PBFs. Stormwater discharge will have a permanent, but small and localized negative effect on the water quality PBFs.

2.5.2 Effects on Species

Exposure

In our analysis of the effects of the action on critical habitat, we found adverse effects on water quality, natural cover, and forage/food resources. To understand how listed species present in the action area respond to these effects, we must first understand how these species will be exposed to the effects. Individuals of these species do not reside in the Coos Bay portion of the action area year round.

OC coho salmon. Historically, researchers believed juvenile coho salmon rear in freshwater streams for a year, migrating out to sea in the spring at age 1. More recently, the flexibility of pre-smolt coho salmon life histories, including estuary rearing during all parts of the year, has been documented (Bennett *et al*. 2014). Miller and Sadro (2003) observed pre-smolt OC coho salmon entering the estuary in the South Slough of Coos Bay during spring and remaining up to 8 months, when they moved back upstream to overwinter. They also found pre-smolts moving into the estuary in the fall and winter with individuals having a mean residence time of 48 to 64 days per year.

However, these results were from the stream-estuary ecotone portion of the estuary where salinities are low (maximum 10 parts per thousand). Waters in the action area will have much higher salinities, approaching full strength sea water (around 35 parts per thousand) during the summer months. Salinity in the action area all year around is likely higher than the incipient lethal threshold (22 parts per thousand) for pre-smolt coho salmon (Otto 1971). Therefore, pre-smolt juvenile OC coho salmon may be in these portions of the action area throughout the year, but any one individual is unlikely to remain in it for more than a few days. When they are present, pre-smolts will be seeking habitats for refuge and feeding.

The juvenile pre-smolts begin their physiological change to smolts the spring after they are born. From February through June, the smolts migrate through the action area on the way to the ocean. Miller and Sadro (2003) found the mean residence time in the lower estuary of South Slough was 5.2 days. Those smolts could have moved through within 24 hours, but choose to remain, likely as the final physiological preparation for ocean salinities (Miller and Sadro 2003). This time period is applicable to residence times for OC coho salmon smolts in the action area, as the physical features are the same. As with pre-smolts, smolts will likely favor the shorelines where the habitat types occur that provide feeding and sheltering.

From September to December, adult OC coho salmon return from the ocean and pass through the action area. These returning adults are highly mobile, use the tide to their advantage, and are unlikely to require more than an hour to traverse through the action area.

Green sturgeon. Green sturgeon use the Coos River estuary for subadult and adult growth, development, and migration. Green sturgeon congregate in coastal waters and estuaries,

including non-natal estuaries. Beamis and Kynard (1997) suggested that green sturgeon move into estuaries of non-natal rivers to feed. Data from Washington studies indicate that green sturgeon will only be present in estuaries from June until October (Moser and Lindley 2007). Recent fieldwork indicates that green sturgeon generally inhabit specific areas of coastal estuaries near or within deep channels or holes, moving into the upper reaches of the estuary, but rarely into freshwater (WDFW and ODFW 2012). Green sturgeon in these estuaries may move into tidal flats areas, particularly at night, to feed (Dumbauld *et al*. 2008).

When they are not feeding in the shallows, green sturgeon likely will be holding in the deepest habitat available (WDFW and ODFW 2012). In Coos Bay, the navigational channel is maintained at 37 feet below mean lower low water and runs adjacent to the entire length of the action area. It is likely that a few green sturgeon will feed in the action area or swim through it on their way to or from feeding.

Eulachon. Eulachon have been observed in the Coos River (Gustafson *et al.* 2010), but likely occur on an infrequent basis and in small numbers (Monaco *et al*. 1990, Emmett *et al*. 1991, Hutchinson 1979 as cited in Gustafson *et al.* 2010). On March 3, 2015, a pre-spawn female was collected in a screw trap being operated in Winchester Creek, a tributary of South Slough within Coos Bay.[1] Eulachon spawners have returned in the Columbia River as early as mid-December to as late as mid-February, with an average of mid-January (Gustafson *et al.* 2010). First appearance of eulachon spawners in the Coos River has not been studied, but based on the available information for eulachon run-timing, small numbers of spawners, and frequency of occurrence, adult eulachon will probably migrate through the action area from mid-January through May. Individual adults will likely only be in the action area for an hour or two as they swim upstream to spawning habitat.

Eggs hatch in 20 to 40 days and larval eulachon, which are feeble swimmers, are carried downstream within hours or days. Thus, larval eulachon could be present in the action area from February through June. Some studies found larval eulachon may be retained for weeks or months in inlets or fjords of estuaries on the British Columbia mainland coast (McCarter and Hay 2003), but no such habitat features exist in the action area. The action area is a constriction between the ocean and the large upper Coos Bay. Therefore, individual larval eulachon will likely only be present an hour or two in the action area as they are carried out to sea. These individuals are unlikely to be feeding while in the action area as larval nutrition is provided by the yolk sac prior to first feeding (WDFW and ODFW 2001).

Construction-related suspended sediment

Of key importance in considering the detrimental effects of suspended sediment on fishes are the concentration and duration of the exposure. High levels of suspended sediment can be lethal; lower levels can cause chronic sublethal effects including loss or reduction of foraging capability, reduced growth, reduced resistance to disease, reduced respiratory ability, increased stress, and interference with cues necessary for homing and migration (Bash *et al*. 2001). Sublethal effects (such as olfactory effects) are those that are not directly or immediately lethal,

[1] Email from Gary Vonderohe, ODFW, to Ken Phippen, NMFS, March 5, 2015, (notifying NMFS of the collection of a eulachon in Coos Bay)

but are detrimental and have some probability of leading to eventual death via behavioral or physiological disruption. These responses can include changes in territorial behavior, alarm reactions with downstream displacement and increased predation and competition, avoidance behavior, decreased feeding, and reduced growth (Noggle 1978, Berg 1983, Lloyd 1987, Newcombe and Jensen 1996, Bash *et al*. 2001, Robertson *et al.* 2006).

We anticipate the proposed action will result in two occurrences of a 250-foot wide, 1,000-foot long suspended sediment plume up to 8 hours in duration.

OC coho salmon. Robertson *et al.* (2006) completed a literature review on coho salmon juveniles and found the following effects for suspended sediment concentrations and durations:

- Mortality – 96 hour exposure to concentration greater than 100,000 milligrams per liter (mg/L) killed 50% of individuals
- Gill damage – 96 hour exposure to concentrations greater than 40,000 mg/L
- Coughing – 96 hour exposure to concentrations of 240 mg/L
- Stress – 7 day exposure to concentrations of 2,000 mg/L
- Reduced feeding – 7 day exposure to concentrations of 2,000 mg/L

All three life stages of OC coho salmon could be in the action area during the suspended sediment plumes. A portion of the suspended sediment plumes will likely have sufficient concentration and duration to illicit coughing, stress, reduced feeding, and gill damage. We expect this portion to be 100-feet wide and 300-feet long. Mortality is unlikely due to short duration (8 hours). Quantifying the number of individuals exposed to adverse concentrations of suspended sediment is very difficult for several reasons. Density of any of the life stages in Coos Bay is low and their locations hard to predict. The plumes will only effect a narrow strip, approximately 250 feet wide, and coho salmon are known to move and avoid suspended sediment plumes (Servizi and Martens 1992). Also, the portion of the action area affected by the plumes is extremely small (0.01% of Coos Bay tidelands) and has no features to congregate or hold any of the life stages. Therefore, while we cannot predict the exact number of OC coho salmon affected precisely, we are reasonably certain it will be a small number.

Green sturgeon. Due the in-water work timing, exposure of green sturgeon to suspended sediment plumes is not reasonably certain.

Eulachon. Due to the in-water work timing, exposure of larval eulachon to suspended sediment plumes is not reasonably certain. While adequate information exists to analyze the effect of suspended sediment on coho salmon, little exists for adult eulachon. In the absence of information we assume, because of their similar size, the thresholds for effects on adult eulachon are similar to those for juvenile coho salmon. However, adult eulachon will only be actively migrating through the action area and unlikely to spend more than an hour or two exposed to the plumes. Thus, individuals may experience coughing, stress, and gill damage, but mortality is unlikely due to the short duration of exposure.

Quantifying the number of individuals exposed to adverse concentrations of suspended sediment is very difficult for several reasons. Density of adult eulachon is extremely low due to their infrequent basis and small numbers in Coos Bay and the portion of the action area affected by

the plumes is extremely small (0.01% of Coos Bay tidelands). Therefore, while we cannot predict the exact number of eulachon affected precisely, we are reasonably certain it will be a small number.

Habitat displacement from bulkhead installation

Bulkhead construction will permanently eliminate 0.07 acres of Coos Bay's tidelands.

OC coho salmon. All life stages of OC coho salmon use this area for migration. The new bulkhead is located on the edge of the channel where a bulkhead already exists. There will not be a change to any flow or habitat condition that will impede migration or movement.

Juvenile and smolt OC coho salmon use the bulkhead area for feeding and sheltering. Because the shoreline habitat constructed by the new bulkhead is similar to that of the old bulkhead, its value for sheltering is likely similar. There are also no significant habitat features or forage in the area eliminated by the bulkhead, so few individuals are likely to congregate or remain feeding for extended periods. Therefore, the adverse effects of losing 0.07 acres of tidelands (0.01% of similar habitat in Coos Bay) will result in loss of forage to OC coho salmon, but will only affect a small number. Because these 0.07 acres are a small portion of the action area, and OC coho salmon juveniles and smolts are unlikely to spend much time in the action area (juveniles for no more than a few days, smolts on average 5.2 days), we find the loss of forage from the proposed action is not reasonably certain to result in changes to their growth or survival rates.

Green sturgeon. Subadult and adult green sturgeon may use this area for movement. The new bulkhead is located on the edge of the channel where a bulkhead already exists. There will not be a change to any flow or habitat condition that will impede migration or movement.

Subadult and adult green sturgeon also use the bulkhead area for feeding. Because the area is small and has no particularly important forage resources, it is unlikely any individual green sturgeon will preferentially choose it over the rest of the 4,569 acres of tidelands in Coos Bay. The loss of 0.07 acres of tidelands (0.01% of similar habitat in Coos Bay) will result in loss of forage to green sturgeon, but this loss is so small it is not reasonably certain to result in changes to their growth or survival rates.

Eulachon. Adult and larval eulachon migrate past the bulkhead area. The new bulkhead is located on the edge of the channel where a bulkhead already exists. There will not be a change to any flow or habitat condition that will impede eulachon migration.

Habitat improvement from mitigation actions

The Airport will improve 0.17 acres of Coos Bay tidelands constituting a permanent, but small and localized positive effect.

OC coho salmon. All life stages of OC coho salmon use the mitigation area for migration. Removing the boat ramp and pilings will improve passage. However, this area is small and located just off the main channel of Coos Bay where most migrating individuals may not go.

Juvenile and smolt OC coho salmon use the mitigation area for feeding and sheltering. The area is small, but has habitat features (such as eelgrass) that provide significant sheltering and forage resources. Thus, the positive effects of improving these 0.17 acres will result in a disproportionately large positive effect on OC coho salmon, albeit still small because the area is such a small proportion of Coos Bay. Therefore, the effects from mitigation on migration, feeding, and sheltering of OC coho salmon are small, but likely to result in slight improvements of growth and survival rates.

Green sturgeon. Subadult and adult green sturgeon use the mitigation area for movement and feeding. The area is small, but has habitat features (such as eelgrass) that provide significant forage resources. Therefore, the positive effects of improving these 0.17 acres will result in a disproportionately large positive effect on green sturgeon, albeit still small because the area is such a small proportion of Coos Bay. Therefore, the effects from mitigation on movement and feeding of green sturgeon are small, but likely to result in slight improvements of growth and survival rates.

Eulachon. Adult and larval eulachon use the mitigation area for migration. Removing the boat ramp and pilings will improve passage. However, this area is small and located just off the main channel of Coos Bay where most migrating individuals will not go. Therefore, the positive effects to OC coho salmon migration will be small.

Contaminant discharge from stormwater systems

As discussed in Section 2.5.1, the proposed action will result in less untreated impervious surface and less stormwater contaminants than are delivered to Coos Bay currently. However, the treatment is not 100% effective and a small amount of stormwater contaminants will still be delivered to Coos Bay. Measurable amounts are not reasonably certain further than a few feet (maximum of 10 feet) from the outfall.

Stormwater pollutants are a source of potent adverse effects on fish, even at ambient levels (Loge *et al.* 2006, Spromberg and Meador 2006, Hecht *et al.* 2007, Johnson *et al*. 2007, Sandahl *et al.* 2007). These pollutants can accumulate in prey and in tissues of fish where, depending on the level of exposure, they cause a variety of lethal and sublethal effects. These adverse effects include disrupted behavior, reduced olfactory function, immune suppression, reduced growth, disrupted smoltification, hormone disruption, disrupted reproduction, cellular damage, and physical and developmental abnormalities (Fresh *et al.* 2005, Hecht *et al.* 2007, LCREP 2007). Aquatic contaminants often travel long distances in solution or attached to suspended sediments, or gather in sediments until they are mobilized and transported by the next high flow (Anderson *et al.* 1996, Alpers *et al.* 2000a, 2000b).

Most published literature addresses acute toxicity of single pollutants, although pollutants from stormwater exist in mixtures and interact with each other (e.g., Niyogi *et al.* 2004, Feist *et al.* 2011). Rand and Petrocelli (1985) state that in "assessing chemically induced effects (responses), it is important to consider that organisms may be exposed not to a single chemical but rather to a myriad or mixture of different substances at the same or nearly at the same time." Environmental conditions (i.e., non-chemical conditions) can also influence the toxicity of pollutants and fish

vulnerability by altering susceptibility to pollutants (Brooks *et al.* 2012, Laetz *et al.* 2014). Exposure to two or more pollutants simultaneously may produce a response that is simply additive of the individual responses or one that is greater (synergistic) or less (antagonistic) than expected from the addition of their individual responses (Denton *et al.* 2002, Laetz *et al.* 2013). For example, mixtures of zinc and copper have greater than additive toxicity to a wide variety of aquatic organisms including freshwater fish (Eisler 1993). Although the large number of pollutants and much larger number of toxicological interactions in stormwater make specific mechanisms of toxicological effects on fish difficult to predict, there is ample evidence that the mixture of toxins in stormwater can degrade habitat enough to substantially reduce its ability to support salmon spawning, feeding, and growth to maturity.

For example, Baldwin *et al.* (2003) exposed juvenile coho salmon to various concentrations of copper to evaluate sublethal effects on sensory physiology, specifically olfaction. These researchers demonstrated that short pulses of dissolved copper at concentrations as low as 2 micrograms per liter (µg/L) over experimental background concentrations of 3 µg/L reduced olfactory sensory responsiveness within 20 minutes such that the response evoked by odorants was reduced by approximately 10%. At 10 µg/L over background, responsiveness was reduced by 67% within 30 minutes. They calculated neurotoxic thresholds sufficient to cause olfactory inhibition at 2.3-3.0 µg/L over background. They also referenced three studies that reported copper exposures over four hours caused cell death of olfactory receptor neurons within rainbow trout, Atlantic salmon, and Chinook salmon. The concentrations tested are lower than common concentrations in stormwater outfalls, and thus indicate toxicity even after stormwater has been moderately diluted. The measured exposure times are likewise shorter than typical stormwater outfall discharge times. Inhibiting olfaction is detrimental to fish because olfaction plays a significant role in the recognition and avoidance of predators and migration back to natal streams to spawn (Baldwin *et al.* 2003). Additional research indicates that the effect of 2 µg/L concentrations over experimental background concentrations of 3 µg/L reduces the survival of individuals (Hecht *et al.* 2007). Juvenile wild coho salmon exposed to low levels of dissolved copper did not display an alarm response (i.e., sharp reduction of swimming activity) in the presence of a predator or in response to other olfactory signals as compared to unexposed wild juveniles (McIntyre *et al.* 2012). Predators were also more successful in capturing copper-exposed juvenile coho salmon (McIntyre *et al.* 2012).

Also, fish embryos and larvae exposed to PAHs are likely to experience adverse changes in heart physiology and morphology, including pericardial edema and heart failure, leading to mortality, even with only temporary exposure to low concentrations (Hicken *et al.* 2011, Incardona *et al.* 2012, Brette *et al.* 2014, Incardona *et al.* 2014). Although exposed embryos and larvae may grow to look like normal fish on the outside, internally there are subtle changes in heart shape and also a significant reduction in swimming performance reducing individual survival due to long-term physiological impairment (Hicken *et al.* 2011). Reduced larval feeding associated with pericardial edema can lead to death during the transition period to juvenile stages (Hicken *et al.* 2011). Other individuals may experience a disturbance in heartbeat rhythm (Brette *et al.* 2014). Cardiotoxic PAHs are present in urban stormwater; their sources include vehicle exhaust, fuel spills, oil and grease, treated wood, and coal dust (N. Scholz, pers comm., Northwest Fisheries Science Center, Ecotoxicology Program Manager, February 2, 2014).

OC coho salmon. Some individuals of all life stages of OC coho salmon will be exposed to project-related stormwater contaminants at some time. It is not reasonably certain that adults will require more than a few seconds to migrate through the affected area, so they are unlikely to experience any effects. Adverse effects to juveniles and smolts are reasonably certain to include a variety of sublethal and behavioral effects that will reduce growth, fitness, and survival. Sublethal effects (such as olfactory effects) are those that are not directly or immediately lethal, but are detrimental and have some probability of leading to eventual death via behavioral or physiological disruption.

Quantifying the number of juvenile and smolt OC coho salmon experiencing adverse effects caused by project-related stormwater pollutants is impractical. This is because the area affected by measureable amounts of project contaminants is so small and the distribution and abundance of individuals in the action area is inexact and show wide, random variations due to biological and environmental processes operating at much larger demographic and regional scales. Additionally pollutant exposure is episodic and densities of coho salmon near the outfall are likely to vary significantly over short periods of time (minutes to hours).

Although calculating the exact number of OC coho salmon exposed to measurable levels of project-related stormwater pollutants is impracticable, we are confident the number is small. This is primarily because the affected area is only 157 square feet (calculated as a 10-foot semicircle), which is approximately 0.00001% of the 4,569 acres of tidelands in Coos Bay. Also, few juveniles or smolts are likely to remain in the area for extended periods since there are no significant habitat features or forage.

Green sturgeon. Some individual subadult and adult green sturgeon are reasonably certain to enter the 157 square-foot area at some time looking for forage. Because the area is small (approximately 0.00001% of the 4,569 acres of tidelands in Coos Bay) and has no particularly important forage resources, it is unlikely any individual green sturgeon will remain for an extended period. Therefore, any sublethal effects to individual green sturgeon are not guaranteed, and if they occur, will only affect a small number of individuals.

Eulachon. Adult and larval eulachon migrate past the outfall area. Because the measurable effects from stormwater contaminants extend only a few feet (up to 10 feet) from the shore and the channel is 2,500 feet across at its narrowest, only a very small portion of migrating eulachon will be exposed. It is not reasonably certain for any adult eulachon swimming that close to shore to need more than a few seconds to migrate through the area, and are unlikely to experience any sublethal effects. Larval eulachon, carried on the tide, may spend a few minutes in the measurably affected area. Because of their larval state, they are likely more susceptible than fish in the research cited above and at least some individuals are reasonably certain to experience sublethal effects from project-related stormwater contaminants. However, the number of larval eulachon affected will be small as they should be well dispersed across the channel and the affected area only encompasses approximately 0.4% (10 feet of the 2,500-foot width).

Summary of effects on species

A small number of OC coho salmon and adult eulachon will experience sublethal effects from exposure to construction-related suspended sediment. Bulkhead installation will result in a permanent loss of 0.07 acres of tideland in Coos Bay (0.01% of similar habitat), which will result in a small loss of forage for green sturgeon and juvenile and smolt OC coho salmon. However, the loss is so small it is not reasonably certain to change their growth or survival rates. The effects from mitigation on OC coho salmon and green sturgeon are small, but likely to result in slight improvements of growth and survival rates. Project-related stormwater contaminants are likely to result in sublethal effects to a small number of juvenile and smolt OC coho salmon, green sturgeon, and larval eulachon.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. We were unable to identify any specific future non-Federal actions reasonably certain to occur that would affect the action area.

The contribution of non-Federal activities to the current condition of ESA-listed species and designated critical habitats within the action area was described in the Status of the Species and Critical Habitats and Environmental Baseline sections, above. Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

Information from Willapa Bay and Grays Harbor in Washington and Tillamook, Yaquina, and Coos bays in Oregon show that coastal communities are growing more slowly than the respective states overall, populations are relatively old, and the extractive natural resource industries (fishing, aquaculture, agriculture, forest products) are declining in importance relative to tourism, recreation, and retirement industries (Hupert *et al.* 2003). Between 2010 and 2019, the population of Coos County increased by 2.3% from 63,043 in 2010 to 64,487 in 2019.[2]

These trends suggest human uses of the estuaries are changing in character (Hupert *et al.* 2003). Residents choose to live in these communities to enjoy the views and scenery, experience rural living, to be near the ocean, and to recreate outdoors (Hupert *et al.* 2003). However, increased tourism and residential development can also impact estuary shorelines, water quality, and wildlife (Hupert *et al.* 2003).

[2] U.S. Census Bureau, State and County Quickfacts, Jackson County. Any county available: https://www.census.gov/quickfacts/fact/table/US/PST045219. (Last Accessed May 2020).

The City of Coos Bay developed a land use plan in 2000 to guide future development. The plan postulates that: 1) The city will experience renewed growth from in-migration and commercial employment, 2) Additional housing will be needed, 3) Commercial and industrial areas will need to be redeveloped, and 4) Waterfront areas are an asset to commercial ventures.

The Coos Bay Estuary Management Plan (Plan) sets out the basis of land, water use, and community development regulations for lands lying within the estuary and its shorelands, as designated within the Plan. It designates appropriate areas for the location of various existing and future uses and activities. These plans postulate that there will be some growth in the future that may affect the quality of habitat within the Coos Bay estuary. However, these growth plans may or may not come to fruition.

Despite changes to less consumptive use of estuary resources, future uses are reasonably certain to continue to have a depressive effect on aquatic habitat quality in the action area. Given the increasing ability for the restoration community at funding and implementing activities, restoration and recovery actions are also reasonably certain to continue. These activities are likely to provide significant benefits to habitat quality, albeit on a project by project basis.

When we consider all these influences collectively, we expect trends in habitat quality to remain flat or improve gradually over time. In turn, this habitat trend will, at best, have a positive influence on population abundance and productivity for the species considered in this consultation. In a worst case scenario, we expect cumulative effects will have a relatively neutral effect on population abundance trends. Similarly, we expect the quality and function of critical habitat PBFs to express a slightly positive to neutral trend over time as a result of the cumulative effects.

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: 1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or 2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

2.7.1 Critical Habitat

OC coho salmon and green sturgeon have designated critical habitat within the action area. The value of PBFs for their critical habitat has declined due to numerous factors, mostly related to human development. For OC coho salmon, critical habitat major limiting factors include extensive loss of access to habitats and habitat changes resulting from land use practices. For green sturgeon, the major limiting factor in coastal bays and estuaries is prey reduction.

The environmental baseline has been degraded by the effects of past land use, urbanization, and water development. The long-term decline of species inhabiting these areas reflects deteriorated critical habitat conditions. Many of the changes to critical habitat resulting from land use practices over the last 150 years have stabilized, but continue to hinder recovery of the populations. Restoration activities have gained popularity in recent decades. Restoration actions may have short-term adverse effects, but generally result in long-term improvements to critical habitat conditions. Climate change is reasonably certain to exacerbate degraded conditions, including sea level rise.

As described in the analysis of the effects of the action, the proposed action will result in adverse impacts to OC coho salmon and green sturgeon critical habitat. Cofferdam installation will result in temporary and localized negative effects. Bulkhead installation and stormwater discharge will result in a permanent, but small and localized negative effect. Mitigation activities will result in a permanent, but small and localized positive effect on approximately the same acreage.

Cumulative effects from future state and private activities are reasonably certain to have a neutral to slightly positive effect over time on the critical habitat considered in this opinion. Resource-based activities will continue to adversely affect habitat, but industry-wide standards and shifts away from resource extraction will gradually decrease their effects over time. The human population in the action area is expected to continue to increase, counterbalancing the improved extraction standards and shift away from resource extraction to a mixed economy. We expect the public's growing environmental awareness will reduce the impacts of some activities affecting critical habitat. As interest in restoration activities continues, their positive effects are likely to continue.

Because the adverse effects caused by the proposed action are short-term or small in scale and the beneficial effects are long-term and similar in spatial scale, when we add them to the current population status, environmental baseline, and consider cumulative effects and climate change, we find the proposed action will not appreciably diminish the value of any critical habitat for the conservation of either species at the designation level. Thus, the critical habitats will retain their current ability to play their intended conservation role.

2.7.2 Species

The status of each species considered in this opinion varies considerably from high risk to moderate risk. The species addressed in this opinion have declined due to numerous factors. One factor for decline of all species inhabiting the action area is degradation of their habitat. Human development has caused significant negative changes throughout their ranges.

The environmental baseline has been degraded by the effects of past land use, urbanization, and water development. The long-term decline of species inhabiting these areas reflects deteriorated habitat conditions. Many of the habitat changes resulting from land use practices over the last 150 years have stabilized, but continue to hinder recovery of the populations. Restoration activities have gained popularity in recent decades. Restoration actions may have short-term adverse effects, but generally result in long-term improvements to habitat conditions. Climate change is reasonably certain to exacerbate degraded conditions, including sea level rise.

As described in the analysis of the effects of the action, the proposed action is reasonably certain to injure and/or harass a small number of OC coho salmon, eulachon, and green sturgeon. A small number of OC coho salmon and adult eulachon will experience sublethal effects from exposure to construction-related suspended sediment. Bulkhead installation will result in a permanent loss of 0.07 acres of tideland in Coos Bay (0.01% of similar habitat), which will result in a small loss of forage for green sturgeon and juvenile and smolt OC coho salmon. However, the loss is so small it is not reasonably certain to change their growth or survival rates. The effects from mitigation on OC coho salmon and green sturgeon are small, but likely to result in slight improvements of growth and survival rates. Project-related stormwater contaminants are likely to result in sublethal effects to a small number of juvenile and smolt OC coho salmon, green sturgeon, and larval eulachon.

Cumulative effects from future state and private activities are reasonably certain to have a neutral to slightly positive effect over time on the species considered in this opinion. Resource-based activities will continue to adversely affect species, but industry-wide standards and shifts away from resource extraction will gradually decrease their effects over time. The human population in the action area is expected to continue to increase, counterbalancing the improved extraction standards and shift away from resource extraction to a mixed economy. We expect the public's growing environmental awareness will reduce the impacts of some activities affecting listed species. As interest in restoration activities continues, their positive effects are likely to continue.

For OC coho salmon, at the ESU scale, the status of individual populations determines the ability of the species to sustain itself or persist well into the future, thus impacts to individual populations are important to the survival and recovery of the species. Because the adverse effects caused by the proposed action are short-term or small in scale and the beneficial effects are long term and similar in scale, when we add them to the current population status, environmental baseline, and consider cumulative effects and climate change, we find the proposed action will not appreciably reduce the likelihood of the survival or recovery of the Coos River population of OC coho salmon. Given our conclusion that the populations will not be impeded in recovery as a result of the proposed action, the proposed action will also not appreciably reduce the likelihood of the survival or recovery of OC coho salmon at the ESU level.

For eulachon, at the DPS scale, we found the adverse effects caused by the proposed action are short-term or small in scale and the beneficial effects are long term and similar in scale. When we add those effects to the current subpopulation status, environmental baseline, and consider cumulative effects and climate change, we find the proposed action will not appreciably reduce the likelihood of the survival or recovery of the Columbia River subpopulation. Given our conclusion that this subpopulation will not be impeded in recovery as a result of the proposed action, the proposed action will also not appreciably reduce the likelihood of the survival or recovery of eulachon at the DPS level.

The DPS of green sturgeon contains one population. Because the adverse effects caused by the proposed action are short-term or small in scale and the beneficial effects are long-term and similar in scale, when we add them to the current population status, environmental baseline, and consider cumulative effects and climate change, we find the proposed action will not appreciably reduce the likelihood of the survival or recovery of the Sacramento River spawning population.

Because the population is the DPS, the proposed action will also not appreciably reduce the likelihood of the survival or recovery of southern DPS green sturgeon.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitats, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of OC coho salmon, green sturgeon, or eulachon, or destroy or adversely modify designated critical habitat for OC coho salmon or green sturgeon.

2.9 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

The NMFS has not yet promulgated an ESA section 4(d) rule prohibiting take of threatened eulachon. Anticipating that such a rule may be issued in the future, we have included a prospective incidental take exemption for eulachon. The elements of this ITS for eulachon would become effective on the date on which any future 4(d) rule prohibiting take of eulachon becomes effective. Nevertheless, the amount and extent of eulachon incidental take, as specified in this statement, will serve as one of the criteria for reinitiation of consultation pursuant to 50 C.F.R. § 402.16(a), if exceeded.

2.9.1 Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as harm from suspended sediment releases during cofferdam construction and removal and stormwater runoff from impervious surfaces. Incidental take from suspended sediment plumes will occur in an area extending 100 feet out from the cofferdam area and 300 feet downstream. Incidental take from stormwater discharge will occur within 10 feet of the outfall.

Take caused by the habitat-related effects of this action cannot be accurately quantified as a number of fish because the abundance of these species occurring within the areas affected at the time when the effects occur are not readily predictable. These unpredictable factors include

precipitation events, tidal elevations and flow, time of day, time of year, competition, predation, and the previous year's spawning success. In such circumstances, we use take surrogates causally linked to the expected level and type of incidental take from the proposed action. For the proposed action, the best available surrogates are:

Suspended sediment plumes during cofferdam construction and removal. The best available incidental take surrogate for this pathway is the duration of suspended sediment plumes. In the effects analysis, we expected the plume associated with installing and removing the cofferdam will not exceed 8 hours each. This surrogate is connected causally to the amount of take that will occur because an increase in duration (over 8 hours) translates into a proportional increase in the impact to listed species (i.e., exposure time is one factor determining the severity of adverse effects from elevated suspended sediment). The duration of suspended sediment plumes is also easily monitored, allowing the surrogate to serve as a clear reinitiation trigger.

Stormwater runoff from impervious surfaces. The best available incidental take surrogate for this pathway is implementation of a stormwater facility inspection and maintenance plan according to the following specifications. Proper implementation will determine whether the system continues to reduce concentrations of pollutants as designed, and thus reflect the amount of incidental take analyzed in the opinion. This surrogate is appropriate for the proposed action because it has a rational connection to the release of stormwater pollutants that cause take of listed species. Implementation of a plan is also easily monitored, allowing the surrogate to serve as a clear reinitiation trigger.

1. Inspection. Each part of the proposed stormwater system must be inspected:
    a. For the first three years:
        i. At least quarterly; and,
        ii. At least three times per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.
    b. After three years:
        i. At least twice a year thereafter; and,
        ii. At least once per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.
2. Maintenance. Maintenance will bring the system back to original design specifications within 7 days of any of the following occurring:
    a. Stormwater does not drain out of the biofiltration swales within 24-hours after rainfall ends;
    b. Any structural component, including inlets and outlets, do not freely convey stormwater;
    c. Desirable vegetation in the biofiltration swales does not cover at least 90% of the facility any time after 3 years – excluding dead or stressed vegetation, dry grass or other plants, and weeds.

2.9.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to any of the species considered in this opinion or destruction or adverse modification of their critical habitat.

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

1. Minimize incidental take from exposure to suspended sediment.
2. Minimize incidental take from exposure to stormwater pollutants.
3. Conduct monitoring sufficient to document the proposed action does not exceed the parameters analyzed in the effects section or the extent of take described above, and report results to NMFS.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the FAA, Corps, and Airport must comply with them in order to implement the RPMs (50 CFR 402.14). The FAA, Corps, and Airport have a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action will likely lapse.

1. To implement reasonable and prudent measure #1 (suspended sediment), FAA, the Corps, and the Airport shall ensure:
    a. Suspended sediment monitoring occurs hourly during installation and removal of the cofferdam.
    b. Suspended sediment monitoring occurs daily for the duration of time the cofferdam is in place.
2. To implement reasonable and prudent measure #2 (stormwater), FAA, the Corps, and the Airport shall ensure the Airport drafts and implements a stormwater facility inspection and maintenance plan that includes:
    a. Inspection. Each part of the proposed stormwater system must be inspected:
        i. For the first three years:
            1. At least quarterly; and,
            2. At least three times per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.
        ii. After three years:
            1. At least twice a year thereafter; and,
            2. At least once per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.

b. Maintenance. Maintenance will bring the system back to original design specifications within 7 days of any of the following occurring:
   i. Stormwater does not drain out of the biofiltration swales within 24-hours after rainfall ends.
   ii. Any structural component, including inlets and outlets, do not freely convey stormwater.
   iii. Desirable vegetation in the biofiltration swales does not cover at least 90% of the facility any time after 3 years – excluding dead or stressed vegetation, dry grass or other plants, and weeds.

3. To implement reasonable and prudent measure #3 (monitoring and reporting), FAA, the Corps, and the Airport shall ensure the Airport completes the following monitoring and reporting:
   a. A project completion report within 60-days of completing construction, including:
      i. Project name
      ii. Airport contact person
      iii. FAA contact person
      iv. Construction completion date
      v. As-built drawings of all project components
      vi. Results of the suspended sediment monitoring from T&C #1
      vii. Square footage of fill installed for the bulkhead
      viii. Photos of the mitigation areas (including date of photograph, GPS site location of photo point, name of photographer, and other relevant information)
   b. Annual reports of the stormwater facility inspection and maintenance plan after the first three full years following construction, including the following information:
      i. Name of person completing each inspection
      ii. Date of each inspection
      iii. Findings of each inspection
      iv. Description of any structural repairs, maintenance, or facility cleanout, e.g., sediment and oil removal and disposal, vegetation management, erosion control, structural repairs or seals, ponding water, pests, trash or debris removal
      v. An estimate of the percent cover of healthy vegetation in the swales, including a description of any corrective action needed to ensure 90% coverage within three years
   c. Each of the above reports and/or plans must be submitted annually to NMFS at the following address, no later than September 30:

National Marine Fisheries Service
Attn: WCRO-2019-03422
2900 NW Stewart Parkway
Roseburg, Oregon 97471

2.10 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). The following conservation recommendation is a discretionary measure that we believe is consistent with this obligation and therefore should be carried out by the FAA:

1. The FAA should consider initiating and completing consultation with NMFS on a programmatic biological opinion that addresses FAA airport improvement projects where they coincide with listed-fish under NMFS' jurisdiction. The primary benefits of programmatic consultation are more consistent use of conservation measures, the ability to address the effects of multiple activities at larger scales, efficient workload management, improved internal communication, better public relations, and a sharper vision of interagency consultation overall.

Please notify NMFS if the FAA carries out this recommendation so that we will be kept informed of actions that are intended to improve the conservation of listed species or their designated critical habitats.

2.11 Reinitiation of Consultation

This concludes formal consultation for the Southwest Oregon Regional Airport Runway Safety Area Improvements project.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or

injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by FAA and descriptions of EFH for Pacific Coast groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and Pacific Coast salmon (PFMC 2014); contained in the fishery management plans developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The proposed action and the action area for this consultation are described above in Sections 1.3 and 2.3. The action area is also designated by the PFMC as EFH as EFH for coastal pelagic species, Pacific Coast groundfish, and Pacific salmon. The action area is an estuarine area; estuaries are designated by the PFMC as habitat areas of particular concern (HAPC) for groundfish species. While the HAPC designation does not add any specific regulatory process, it does highlight certain habitat types that are of high ecological importance.

3.2 Adverse Effects on Essential Fish Habitat

The ESA portion of this document describes the adverse effects of this proposed action on coho salmon, green sturgeon, and eulachon. This ESA analysis of effects is also relevant to EFH. Based on information provided by the action agency and the analysis of effects presented in the ESA portion of this document, we conclude the proposed action will adversely affect designated EFH for coastal pelagic species, Pacific Coast groundfish, and Pacific salmon. These adverse effects occur from suspended sediment plumes and delivery of contaminants in stormwater.

3.3 Essential Fish Habitat Conservation Recommendations

The following four conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on the above described impacts to EFH. Three of these conservation recommendations are a subset of the ESA terms and conditions.

1. FAA, the Corps, and the Airport should minimize adverse effects from suspended sediment by implementing ESA Term and Condition #1 (Section 2.9.4).
2. FAA, the Corps, and the Airport should minimize adverse effects from stormwater contaminants by implementing ESA Term and Condition #2 (Section 2.9.4).
3. FAA, the Corps, and the Airport should ensure completion of a monitoring and reporting program to confirm the program is meeting the objective of limiting adverse effects by implementing ESA Term and Condition #3 (Section 2.9.4).
4. The FAA should consider initiating and completing a programmatic consultation with NMFS that addresses FAA airport improvement projects where they coincide with EFH.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, FAA and the Corps must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

The FAA and/or the Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The DQA specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are FAA, the Corps, and the Airport. Other interested users could include citizens of affected areas and others interested in the conservation of the affected ESUs/DPSs. Individual copies of this opinion were provided to FAA and the Corps. The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adheres to conventional standards for style.

Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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Appendix H
Joint Permit Application

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)

■ Individual

☐ Other:_____

Corps: ☒ Nationwide No.: 14 and 27 ☐ Regional General _____

DSL: ☐ DSL Waiver ☒ DSL GA ☐ DSL No State Permit Required

(2) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ■ Consultant ☐ Contractor
Name (Required)	Theresa Cook		Aaron Killgore
Business Name	Coos County Airport Dist.		Mead & Hunt, Inc.
Mailing Address	1100 Airport Lane North Bend, OR 97459		9600 NE Cascades Pkwy #100 Portland, OR 97220
Business Phone	541-756-8531		503-548-1494
Cell Phone	541-404-2161		
Fax	541-751-1010		
Email	theresa@flyoth.com		Aaron.killgore@meadhunt.com

(3) PROJECT INFORMATION

A. Provide the project location

Project Name				Latitude & Longitude (decimal)
Southwest Oregon Regional Airport Runway Safety Area Bulkhead				43.421800°, -124.238512°
Project Address / Location		City (nearest)		County
1100 Airport Lane / OTH Airport		North Bend		Coos
Township	Range	Section	Quarter/Quarter	Tax Lot(s)
25S	13W	09	NE	100

Brief Directions to the Site

NE end of Runway 5/23 at OTH Airport

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	River Mile	6th Field HUC Name	6th Field HUC (12 digits)
Coos Bay	9	Coos Bay	171003040405

C. Indicate the project category.		
☐ Commercial Development	☐ Industrial Development	☐ Residential Development
☐ Institutional Development	☐ Agricultural	☐ Recreational
☐ Transportation	☐ Restoration	☐ Bank Stabilization
☐ Dredging	☐ Utility lines	☐ Survey or Sampling
■ In- or Over-Water Structure	☐ Maintenance	☐ Other:

(4) PROJECT DESCRIPTION

A. Summarize the overall project, including work in areas both in and outside of waters or wetlands.

The proposed project at the Southwest Oregon Regional Airport (OTH) involves the placement of an 89-foot by 67-foot triangular bulkhead into Coos Bay at the end of Runway 5/23 to meet Federal Aviation Administration (FAA) Runway Safety Area (RSA) design standards. The RSA is defined as a surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway. The FAA requires that the RSA at OTH be 500 feet wide, centered on the runway centerline, and to extend 1,000 feet beyond each end of the runway. The northeast portion of Runway 5/23 RSA extends into Coos Bay and requires the installation of a bulkhead to maintain the existing runway length compliance.

The project will take place at the northeastern corner of the Airport property adjacent to and within Coos Bay. (The project area includes an in-water construction buffer of 1000 feet for in-water fill activities associated the 89-foot by 67-foot triangular fill area (**Attachment A, Figure 5 – Project Area Overview**). On land, an additional 60-foot area is provided for vehicle support and construction staging. Construction crews and equipment will utilize existing Airport roadways and paved areas as haul routes to the project site.

Preceding the construction of the bulkhead, a portion of the existing riprap will be removed to install a sheet pile cofferdam, and the remaining construction will proceed from the existing shoreline during the Oregon Department of Fish and Wildlife (ODFW) designated in-water work window (Oct.1– Feb 15). A 3,150 square-foot pre-cast concrete block bulkhead will be constructed to form 0.07-acre triangular surface area at the northeastern corner of Runway 5/23. The bulkhead will be created by using a Mechanically Stabilized Earth (MSE) retaining wall constructed with pre-cast concrete blocks, which was determined to have the smallest construction footprint and have the least environmental impact on Coos Bay and Pony Slough. The foundation of the bulkhead will be stabilized with sand and 3 inches of rock topped with native slough soils.

The Proposed Action will result in the loss of 3,150 square feet (0.07 acre) of designated critical habitat for Oregon Coast Coho salmon and Southern DPS green sturgeon due to the bulkhead. A Permittee Responsible Mitigation Plan outlines the removal of two adjacent remnant docks (0.14-acre mitigation site) in Pony Slough to enhance ESA critical habitat and EFH at a 2:1 ratio (**Figure 4-3 Mitigation Site**) to the impacted area.

B. Describe work within waters and wetlands

The Airport is surrounded by the open waters of Coos Bay to the north and southwest and by the open waters of Pony Slough to the east. A single 0.48-acre emergent tidal wetland was delineated adjacent to the project area; however, the wetland is located approximately 700 feet southeast of the RSA fill site within Pony Slough. Project activities will avoid this wetland, and there will be no impact to wetlands within the project area.

The bulkhead will utilize existing riprap cobbles within the construction area will be salvaged and reused as armoring stone along the toe of the bulkhead. The armoring would extend slough-ward by approximately 8 feet to dissipate wave energy erosion, decrease scouring and undercutting of the bulkhead structure, and increase structural

stability of the bulkhead. To prepare for construction, a temporary single-face sheet pile cofferdam will be installed 12 feet from the exposed slough-ward bulkhead wall for dewatering and excavation of the foundation.

The subgrade of the bulkhead will require stabilization by excavating approximately 2 feet below the wall and 2 feet into Pony Slough and backfilling the area with sand and 3 inches of rock. The prepared subgrade will then be lined with non-woven geotextile fabric and backfilled with structural drainrock. The bulkhead foundation system will then be constructed followed by the installation of slough-ward toe armoring stone. Upon completion of the bulkhead foundation, pre-cast blocks will be vertically placed, and the associated bulkhead area will be infilled. The subgrade stabilization will then be buried beneath 12-inches of native slough soils in order to restore existing grades and slough bottom conditions (**Attachment A, Figure 6 – Conceptual Seawall/Bulkhead Detail**). The bulkhead wall will be constructed from large, pre-cast concrete blocks which can be installed from shore without the use of a tall crane, significantly reducing Airport closures during construction. The fill material would be trucked onto the project site and placed around the foundation from shore.

The existing runway surface is at 12.0 feet elevation using the North American Vertical Datum of 1988 (NAVD88). Fill was based on the existing runway surface being extended, level with the runway, to the edge of the proposed fill. Including the 10-foot waterward access buffer, the length of the north side of the fill from the shoreline is approximately 89 feet and the east side fill from the shoreline is approximately 67 feet. At the deepest point, the fill is approximately 23 feet high. The total fill volume is approximately 2,215 cubic yards.

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

Construction will proceed during the in-water work period (October 1 – February 15) as follows (**Attachment A, Figure 6 – Conceptual Seawall/Bulkhead Detail**):

1. **Remove a portion of the existing riprap bulkhead** – Sections of the existing riprap armoring will need to be removed for sheet pile placement. Riprap will be removed carefully to minimize disturbance of the substrate. Water quality monitoring will be in place to track any increase in turbidity and sedimentation that could impact nearby eelgrass beds.
2. **Construct temporary coffer dam** – Erosion control will be installed and a temporary coffer dam will be constructed 2 feet from the edge of the requested easement, approximately 12 feet outside of the bulkhead wall limits.
3. **Dewater the construction area** – Dewatering will be done through sediment outflow filters. The water will drain into Coos Bay on the west side of the coffer dam/RSA fill area during tidal outflows to reduce turbidity and sedimentation near the eelgrass to the greatest extent possible.
4. **Salvage existing riprap** – Once the construction area has been dewatered, the remainder of the existing riprap armoring will be removed from the construction area for reuse in the foundation.
5. **Subgrade excavation** – A foundation trench will be excavated approximately 4 to 6 feet below the wall toe extending a maximum of 4 feet outside of the wall line. Excavation will be performed from an access road behind the wall line, within the permitted construction limits. Excavated soils will be re-utilized as bulkhead fill (see Step 10).
6. **Subgrade preparation** – The bulkhead foundation subgrade will be prepared by lining the exposed substrate with geotextile and backfilling the area with structural drainrock.
7. **Bulkhead foundation** – The bulkhead foundation will be created on compacted structural drainrock.
8. **Toe armoring stone** – An 8-foot-wide roll of geotextile will be placed on the prepared toe armoring stone subgrade. The toe of the grid will extend 8 feet past the slough-ward bulkhead wall line with a depth of the armoring stone being approximately 3 feet. Cover the geotextile with salvaged riprap stone and additional imported armoring stone along the toe of the bulkhead, shape, and grade to match the existing slough grade line.
9. **Bulkhead structure** – As the bulkhead concrete blocks are installed vertically, the structural drainrock and geotextile will extend upward to the final design grade of the retained bulkhead. The bulkhead fill shall support the geotextile and drainrock as the site is infilled (see Step 10).
10. **Bulkhead Fill** – Infill the bulkhead area with salvaged slough soils, in even layers not to exceed 8 inches in loose uncompacted earth, until the final grade is established.

The in-water extent of the project area beyond the project footprint is based on the potential for a temporary increase in

turbidity and sedimentation. Dewatering of the construction site will be conducted through outflow sediment filters to on the west side of the coffer dam to further reduce sedimentation within Pony Slough. Installation and removal of the coffer dam would result in the highest level of turbidity during the course of the project. Work associated with both will be timed with the outflow of tides to reduce the potential for sedimentation on adjacent eelgrass beds.

The Mitigation Plan includes:

1) NMFS terms and conditions:

a. To implement reasonable and prudent measure #1 (suspended sediment), FAA, the US Army Corps of Engineers (USACE), and the Airport shall ensure:

- Suspended sediment monitoring occurs hourly during installation and removal of the cofferdam.
- Suspended sediment monitoring occurs daily for the duration of time the cofferdam is in place.

b. To implement reasonable and prudent measure #2 (stormwater), FAA, the Corps, and the Airport shall ensure the Airport drafts and implements a stormwater facility inspection and maintenance plan that includes:

- Inspection.
- Maintenance.

c. To implement reasonable and prudent measure #3 (monitoring and reporting), FAA, the Corps, and the Airport shall ensure the Airport completes the following monitoring and reporting:

- A project completion report within 60-days of completing construction.
- Annual reports of the stormwater facility inspection and maintenance plan after the first three full years following construction.
- Each of the above reports and/or plans must be submitted annually to NMFS no later than September 30.

2) NMFS EFH Conservation Recommendations:

a. FAA, the Corps, and the Airport should minimize adverse effects from suspended sediment by implementing ESA Term and Condition #1 (Section 2.9.4).

b. FAA, the Corps, and the Airport should minimize adverse effects from stormwater contaminants by implementing ESA Term and Condition #2 (Section 2.9.4).

c. FAA, the Corps, and the Airport should ensure completion of a monitoring and reporting program to confirm the program is meeting the objective of limiting adverse effects by implementing ESA Term and Condition #3 (Section 2.9.4).

d. The FAA should consider initiating and completing a programmatic consultation with NMFS that addresses FAA airport improvement projects where they coincide with EFH.

3) CMZA conservation measures:

a. The FAA should seed all rip-rap armoring within the project areas with whole oyster shells post-construction.

4) Pony Slough Dock removal:

a. FAA will remove the two remnant structures in Pony slough during the ODFW in-water work window October 15 - February 1 utilizing NOAA BMP's for creosote pile removal (**Appendix H – Permitee-Responsible Mitigation Plan**).

The FAA accepted the Terms and Conditions and Conservation Recommendations provided in the Biological Opinion on August 18, 2020 (see **Appendix H – Permitee-Responsible Mitigation Plan**).

All conditions of Oregon Department of Environmental Quality's (ODEQ) 401 Water Quality Certification will be followed. All construction equipment will be inspected daily for fluid leaks and any detected leaks will be repaired before operation resumes. Stationary power equipment operated within 150 feet of the Coos River will be diapered to prevent leaks. A Pollution Control Plan (PCP) that includes the following will be prepared by the Contractor and carried out commensurate with the scope of the project:

1. Best Management Practices (BMPs) to confine, remove, and dispose of construction waste.
2. Procedures to contain and control a spill of any hazardous materials.

To satisfy FEMA requirements and the City of North Bend's Ordinance No. 2027, a hydraulic model was prepared to show that the fill will not increase the water surface elevations (See **Attachment H – Water Resources Report**).

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

24 inches of native slough soils, taken from the bottom of the Bay during foundation excavation, will be placed on top of the bulkhead foundation to restore existing grades and slough bottom conditions (**Table 1 – Slough Bottom**).

E. Construction timeline.

What is the estimated project start date? October 1, 2022

What is the estimate project completion date? February 15, 2023

Is any of the work underway or already complete? ☐ Yes ■ No

If yes, describe.

Table 1. Summary of Permanent and Temporary Impacts to Waters and/or Wetlands

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.)**	**Volume (c.y.)**		
Coos Bay	89	67	2	3,150	233	During construction	Slough bottom
Coos Bay	115	8	4		136	During construction	Riprap*

Total Removal Volumes and Dimensions			
	Length (ft.)	**Area (sq. ft.)**	**Volume (c.y.)**
Total Removal to Wetlands			369
Total Removal Below Ordinary High Water			369
Total Removal Below Highest Measured Tide			369
Total Removal Below High Tide Line			369
Total Removal Below Mean High Water Tidal Elevation			369

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.)**	**Volume (c.y.)**		
Coos Bay	89	67	Varied	3,150	2,215	Permanent	Concrete, soil, gravel, rock
Coos Bay	170	8	3		151	Permanent	Riprap**

I. Total Fill Volumes and Dimensions			
	Length (ft)	Area (acres)	Volume (c.y.)
Total Fill to Wetlands			2,215
Total Fill Below Ordinary High Water			296
Total Fill Below Highest Measured Tide			196
Total Fill Below High Tide Line			296
Total Fill Below Mean High Water Tidal Elevation			1,568
Total Fill to Wetlands			2,215

* The existing riprap is approximately 115' long along the waterline where it meets the proposed RSA fill area. Assuming the width of the riprap is 8' wide by 4' deep results in 136 CY of riprap to be removed and salvaged for re-use as bulkhead toe armoring stone.
** The length of the toe armoring stone at the base of the bulkhead is approximately 170'. At 8' wide by 3' deep, this results in 151 CY or riprap. Thus, approximately 15 CY of additional riprap will be necessary beyond what may be salvaged.

(5) PROJECT PURPOSE AND NEED

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

The purpose of the proposed action is to improve deficiencies in safety-related infrastructure at the Airport to meet FAA requirements. FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, provides required airport safety area guidance and defines an RSA as a surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway. The FAA requires the RSA at OTH to be 500 feet wide, centered on the runway centerline, and to extend 1,000 feet beyond each end of the runway. Currently, the northeast portion of Runway 5/23 is approximately 60 x 80 feet short of compliance with the FAA requirements.

(6) DESCRIPTION OF RESOURCES IN PROJECT AREA

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

OTH is located along the lower Coos estuary navigation channel (**Attachment A, Figure 1 – Location Map**). In general, the environmental baseline within the Action Area has been impacted by urbanization, past industrialization, and human development activities in the watershed. The predominant substrate in the basin is mud or mud/sand mixture. This is a high-energy area of the river with strong lateral currents and steep banks that limit near-shore shallow habitat suitable for juvenile fish rearing and provides very little habitat complexity. The riverbank at this location is armored with riprap and concrete and contains minimal riparian vegetation. OTH is south of the flowing channel, armored by riprap shorelines, pilings for catwalk instrumentation, and a concrete boat launch to the east. River flows in the Coos estuary are subject to twice-daily tidal fluctuations.

The project region is developed land with small areas of coniferous regeneration. Our on-site investigation (October 2018) found five distinct wetland sub-classes within the basin as follows: subtidal channel and basin, intertidal mudflats, low salt marsh (*Carex* dominated), intertidal high salt marsh (*Juncus/Salicornia/Caret* dominated), and intertidal high brackish marsh (*Scirpus* dominated). In addition, a tidally influenced stream channel extends to the west of the basin.

According to the US Fish and Wildlife Service National Wetlands Inventory, prior wetland delineations, and a wetland field survey conducted in 2018, there are three non-coastal wetlands located on Airport property, which include:

1. One freshwater emergent wetland (approximately 0.27 acres) located between Taxiway B and the Airport property boundary.
2. One estuarine and marine wetland (approximately 1.38 acres) located south of the Runway 31 threshold.
3. An emergent tidal wetland (0.48 acres) beyond the southeast portion of the Runway Safety Non-Compliant Fill Action Area. The wetland is located within a sloping alcove, formerly a boat ramp.

A single emergent tidal wetland was identified and delineated within the southeast portion of Study Area B, approximately 700 feet from the Action Area. The RSA Fill Action Area has since been reduced in size to avoid impacts to the adjacent wetland, which is located within a sloping alcove in the southeast portion of the project area. Vegetation within this wetland is dominated by American glasswort (*Salicornia virginica)* and saltmarsh rush (*Juncus gerardi*). The boundary of the wetland

was determined through observations of topography, vegetation patterns, and other indicators of regular tidal inundation such as debris racks, drift lines, and sediment deposits. Wetland sample plots were located in areas of the suspected wetland/upland interface.

Positive indicators of wetland hydrology included saturation to the surface. Indicators of hydric soils included low chroma color soil matrices and bright concentrations within the upper 6 inches of the soil profile. The eastern boundary of the wetland was flagged at the point where emergent vegetation transitioned to bare sand. Vegetation at this point comprised less than five percent of land cover.

Non-wetland waters on the site are present within the study area in the form of the open waters of Coos Bay. These non-wetland waters are subject to tidal fluctuations; therefore, tidal height records were obtained. Tidal datums from the Charleston, Oregon station (Station #9432780) were downloaded from the National Oceanic and Atmospheric Administration (NOAA). The Highest Measured Tide (HMT) elevation was converted to NAVD88. Based on conversations with United States Army Corps of Engineers (USACE) project manager Tyler Krug, the Mean High Water (MHW) was left in Mean Lowest Low Water (MLLW) datum. Additionally, Mr. Krug recommended that the high tide line be measured instead of utilizing the Mean Higher-high Water (MHHW) datum elevation (Krug, 2019). This line is established through observations of water lines, algae, debris racks, and other indicators of normal high tide levels. Based on observations in the field and lidar topographic data, this elevation was estimated at 9.5 feet using the MLLW datum and 9 feet when referenced to NAVD88 datum. Table 2 below summarizes the different jurisdictional elevations of surface waters for the project.

Federal Emergency Management Agency (FEMA) develops and maintains maps which identify areas of regulated floodplains and floodways. The Flood Insurance Rate Map (FIRM) is the most widely referenced of those maps. The project area is covered by FIRM No. 41011C0186E. There are Zone AE floodplains adjacent to the Airport and on Airport property. According to this map, much of the Airport lies within a one-percent annual chance flood hazard area, known as the base flood or 100-year flood area (**Attachment I – FEMA FIRM Map**). The decommissioned runway and Runway 23 End lie within a 0.2-percent annual chance flood hazard area, known as the 500-year flood area.

To ensure compliance with the National Flood Insurance Program (NFIP), the City has a floodplain management ordinance (Coos Bay Municipal Code Chapter 17.195) in place to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHA). A SFHA is a high-risk area defined as any land that would be inundated by a flood having a one percent chance of occurring in a given year, or 100-year flood zone (Zone AE).

The proposed RSA fill area was analyzed by Mead & Hunt, Inc. using hydrologic and hydraulic analyses of Pony Slough. Publicly available bathymetry and topography were used for the model geometry and the hydrologic data published in the most recent FEMA Flood Insurance Study (FIS) was used for model boundary conditions. The results of the hydraulic model show that the proposed fill will cause no increase in the water surface elevation of the base flood level in Pony Slough. The proposed fill area meets the requirements of both 44 CFR Ch.1, Section 60.3, c. and the City of North Bend Ordinance No. 2027 and no further analysis is required (**Attachment H – Water Resources Report, Attachment A, Technical Memorandum – Regulatory Compliance for Fill at the Southwest Oregon Regional Airport**).

Table 2. Tidal Elevations

Tidal Elevation	Station 9432780 MLLW values	NAVD88 Benchmark Elevation	Resulting NAVD88 Elevation	Elevational boundary/Jurisdiction
Highest measured tide (HMT)	10.26	0.50	10.68	Tidal Waterway/DSL
Mean high water (MHW)	6.96	0.50	6.46	Section 404 (RHA) waters /USACE
High Tide Line	9.5*	0.50	9.0	Section 10 (CWA) Waters/USACE

**Determined through observations in the field and discussions with Tyler Krug, Portland USACE*

These various elevations were obtained from the Oregon Department of Geology and Mineral Industries (DOGAMI). The only portions of the study area that intersect with the shorelines of Coos Bay are Project Areas A and B.

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

Coos Bay, home to the Oregon International Port, is one of the largest coastal deep-water channels from San Francisco to the Puget Sound. The navigation channel is just 15 miles long, taking only two hours to reach open ocean from river mile 15. Every year, more than 1.5 million tons of cargo move through Coos Bay harbor and over 10,000 tons of seafood are landed at the Charleston Marina. The Marina and the Charleston Shipyard serve various local markets that include commercial fishing and seafood processing, recreational fishing and boating, and tourism.

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. The area is popular for both commercial and recreational fishing and is home to one of the largest commercial fishing fleets in the state of Oregon. The Bay is also a central feature of Oregon's "Adventure Coast," the third-highest grossing tourism area in Oregon. There are four boat launch locations in the Bay that cater to charter boat services and kayaking and canoeing outfitters. The area supports year-round fishing, crabbing, and clamming. Fish in Coos Bay include Chinook Salmon, Herring, and Surfperch while the Coos River includes Chinook Salmon, Searun Cutthroat Trout, and Steelhead.

(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 waterway or wetland.

Five airfield development alternativeswere considered for the project:

- Alternative 1: Shorten Runway 5/23 by approximately 80 feet
- Alternative 2: Shift Runway 5/23 to the south approximately 60 feet
- Alternative 3: Shift Runway 5/23 to the west approximately 80 feet
- Alternative 4: Install Engineer Materials Arresting System (EMAS) on Runway 5 departure end
- Alternative 5: Proposed Action – Install Runway 5/23 Safety Area Bulkhead

Each of the analyzed alternatives either: 1) did not meet the purpose and need of the project or 2) were not reasonable and feasible.

For purposes of the analysis, a reasonable and feasible alternative would not cause safety or operational challenges or result in environmental or social impacts that could not be resolved easily. Alternatives may not completely meet all the criteria of Screening Level 2, so this level of screening identifies and compares alternatives that meet most of the requirements and that do not have unique problems, costs, or an accumulation of impacts

Alternative 5 – Proposed Action – Construct a bulkhead to the northeast end of the Runway 5/23 RSA
The Preferred Alternative was found to have the least environmental impacts and is the most cost effective, while meeting the existing operational requirements of the Airport. Mitigation for the 0.07-acres loss of ESA-listed fish critical habitat will be accomplished by removing two remnant creosote structures 1,000 feet away in Pony Slough, at a 2:1 ratio.

The study limits were defined based on the anticipated disturbance associated with the project. The Area of Potential Effect (APE) and the Action Area have been developed in cooperation with the FAA and appropriate regulatory agencies.

(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? **If yes, attach TSP review as a separate document for DSL.**	☐ Yes	☒ No	☐ Unknown
Is the project site within a designated Marine Reserve? **If yes, certain additional DSL restrictions will apply.**	☐ Yes	☒ No	☐ Unknown
Will the overall project involve ground disturbance of one acre or more? **If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).**	☐ Yes	☒ No	☐ Unknown
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? **If yes, explain in Block 6 and provide references to any physical/chemical testing report(s).**	☒ Yes	☐ No	☐ Unknown
Has a cultural resource (archaeological) survey been performed on the project area? **If yes, provide a copy of the survey with this application to the Corps only. Do not describe any resources in this document.**	☒ Yes	☐ No	☐ Unknown
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**			

Identify any other federal agency that is funding, authorizing or implementing the project.			
Agency Name Federal Aviation Administration	Contact Name Ilon Login	Phone Number 206-231-4143	Most Recent Date of Contact 9/10/2021

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 from Oregon DEQ. Please not 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 on project complexity. See http://www.oregon.gov/deq/wq/wqpermits/Pages/Section-401-Fees.aspx

Approving Agency	Certificate / approval / denial description	Date Applied
US Department of the Interior/USFWS	01EOFW00-2019-TA-0281 *No federally-listed species under the jurisdiction of the Service are present in the immediate project area.*	03/05/2019
NOAA/NMFS	Biological Opinion	10/16/2019
USACE	Nationwide Permit (NWP)	TBD
USACE	Section 408 Determination: *"No alteration or impact to a Corps federally authorized project, therefore, no further 408 review necessary."*	05/12/2020
Coquille Indian Tribe	*Concurrence with 'no adverse effect'*	06/10/2019
Confederated Tribes of the Coos, Lower Umpqua, and Siiuslaw Indians	*State-level determination of eligibility for the area as a Traditional Cultural Property. Tribe requests consultation to discuss project and concerns.*	05/30/2019
Oregon Parks & Recreation Department	SHPO Case No. 17-1582 *'no historic properties effected'*	05/23/2019
Oregon Dept. of Land Conservation & Development	Coastal Zone Management Act Compliance	TBD
Oregon Department of State Lands	In-water land ownership: *OTH owns the submerged land where the bulkhead will be placed. The State of Oregon conveyed tidelands at the project location in 1884 & 1885, resolving any questions about the need to apply to fill in a state-owned waterway* (Amber McKernan, Property Manager, Oregon DSL)	10/09/2019
Oregon Department of State Lands	Removal/Fill Individual Permit (ORS 196.795-990)	TBD
Oregon Department of State Lands	Wetland Delineation # 2019-0260 *Concur with wetland and waterway boundaries as mapped in revised Figures 6-1, 6-2, and 6A-6G*	10/15/2019
Oregon Dept. of Environmental Quality	Construction Stormwater General Permit 1200-C	TBD
Oregon Dept. of Environmental Quality	401 Water Quality Certification	TBD
Oregon Dept. of Environmental Quality	Section 401 Removal/Fill Certification	TBD
Oregon Dept. of Environmental Quality	Erosion and Sediment Control Plan	TBD
Oregon Dept. of Environmental Quality	Section 404	TBD
City of North Bend	Ordinance 2028 Tsunami Waiver correspondence	12/30/19

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 USC 408 authorization)				
■ 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 #	WD # 2019-0260
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, COMPENSATORY MITIGATION

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

Permanent/Direct Impacts:
There will be an approximate 3,150 square-foot (0.07-acre) permanent adverse modification of critical habitat of Coho salmon and Southern green sturgeon.

Temporary Impacts: The project will result in short-term localized increases in background turbidity and minor alteration to in-water substrates within a designated critical habitat. To minimize these impacts, in-water work will be performed between October 1 and February 15, within a coffer dam, and will be timed with the outflow of the tides. Turbidity will be monitored during construction within the 100-foot buffer to avoid sedimentation impacts to adjacent eelgrass beds. Construction activities exceeding 1 acre of land disturbing activity will be required to obtain coverage under the 1200-C Construction Storm Water General Permit and must include an Erosion and Sediment Control Plan.

Indirect Impacts: The bulkhead will be located adjacent to eelgrass beds and will be constructed in an area of Coos Bay that has been identified as Essential Fish Habitat (EFH). The project will increase the surface area of OTH by 0.07 acre and has the potential to alter sedimentation regimes that may impact adjacent eelgrass beds. Monitoring for turbidity will be in place prior to construction, during construction, and post-construction within the 250-foot in-water construction buffer. A baseline will be established prior to coffer dam construction and monitoring will continue at designated locations and at regular intervals during construction. A two-year post-construction monitoring plan for eelgrass presence/absence (within 100-feet in deeper habitat) and density (>100-feet in shallow habitat) will be compared with an adjacent control site to monitor potential impacts of the project on EFH.

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

No vegetation will be directly impacted by this proposed action due to the existing riprap armored shoreline.

Compensatory Mitigation			
C. Proposed mitigation approach. Check all that apply:			
■ Permittee-responsible Onsite Mitigation	☐ Permittee-responsible Offsite Mitigation	☐ Mitigation Bank or in-lieu fee program	☐ 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.

The proposed mitigation focuses on improving EFH (eelgrass) and Coho salmon habitat. The identified mitigation site is the location of a former boat launch and dock associated, located approximately 1,000 feet south from the proposed RSA fill area. The creosote-covered pilings from those structures remaining in Pony Slough will be removed to improve habitat and water quality within the slough. The removal of the pilings within Pony Slough will return the substrate to natural conditions and remove impediments within the channel. An improvement in the slough bottom could induce the spread of eelgrass into the area, improving foraging habit and increasing the availability of feeder species.

On approval of the Permitee-Responsible Mitigation Plan, Section 106 consultation was reinitiated on May 21, 2021, for the remnant dock and ramp. No historic properties were noted, and they were deemed not eligible for the Register of Historic Places. No comments from Tribal governments or SHPO were received.

Mitigation Bank / In-Lieu Fee Information:

Name of mitigation bank or in-lieu fee project: Pony Slough Creosote Pile Removal

Type of credits to be purchased: N/A

If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?

■ **Yes.** Submit the plan with this application and complete the remainder of this section.

☐ **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 #
Southwest Oregon Regional Airport Runway Safety Area Bulkhead	1100 Airport Lane / OTH	25S13W10 1600 25S13W09 100
County	**City (nearest)**	**Latitude & Longitude (in DD.DDDD format)**
Coos	North Bend	43.421800°, -124.238512°

Township	Range	Section	Quarter/Quarter
25S	13W	09	NE

(10) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE

☐ **Pre-printed labels of adjacent property owners attached (only required if more than 5 adjacent owners)**

The Airport property is bordered to the north and west by Coos Bay River, to the east by Pony Slough, and to the south by the City of North Bend. The project is located at the northeast corner of the Airport property, surrounded by water on both sides. There are no adjacent property owners to the project.

(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.

X This project is consistent with the comprehensive plan and land use regulations with the following:

- ☐ Conditional Use Approval
- X Development Permit
- X 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 X has not been filed for approvals required above.

Local planning official name (print)	Title	City/County
Chelsea Schnabel	City Planner	North Bend

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. A 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 review 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
Teresa Cook	Airport Director

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	$ 992 (submitted online)

Applicant Signature	
Print Name Teresa Cook	Title Executive Director
Signature	Date

Authorized Agent Signature	
Print Name Aaron Killgore	Title Senior Environmental Planner
Signature	Date

Landowner Signature(s)* Landowner of the Project Site (if different from applicant)	
Print Name	Title
Signature	Date

Landowner of the Project Site of 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 (items in bold are required)**

- ☒ **Location map with roads identified** (Attachment A, Figure 1)
- ☒ **U.S.G.S. topographic map** (Attachment A, Figure 2)
- ☒ **Tax lot map** (Attachment A, Figure 3)
- ☒ **Recent aerial photo** (Attachment A, Figure 4)
- ☒ **Site plan(s)/Action Areas Overview Map** (Attachment A, Figure 5)
- ☒ **Cross section drawing(s)** (Attachment A, Figure 6)
- ☐ Project photos
- ☐ Erosion and Pollution Control Plan(s), if applicable
- ☒ DSL/Corps Wetland Concurrence letter and map, if approved and applicable (Attachment B)

☐ 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 (Attachment C)

☐ Wetland functional assessment and/or stream functional assessment

☒ Alternatives analysis (Attachment D)

☒ Biological Assessment (if requested by the Corps) (Attachment E)

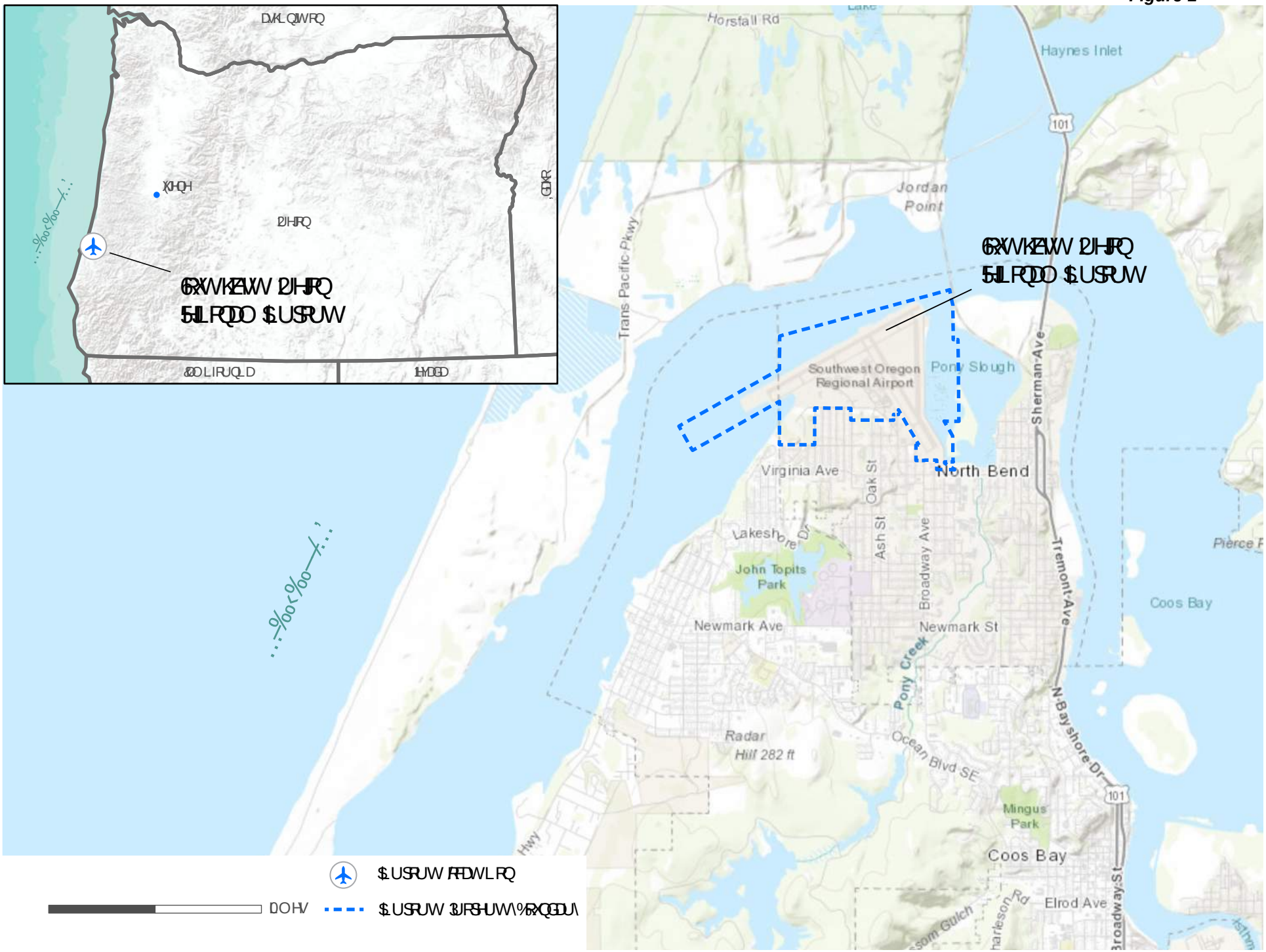
☒ Stormwater management plan (may be required by the Corps or DEQ) (Attachment F)

☒ Other:

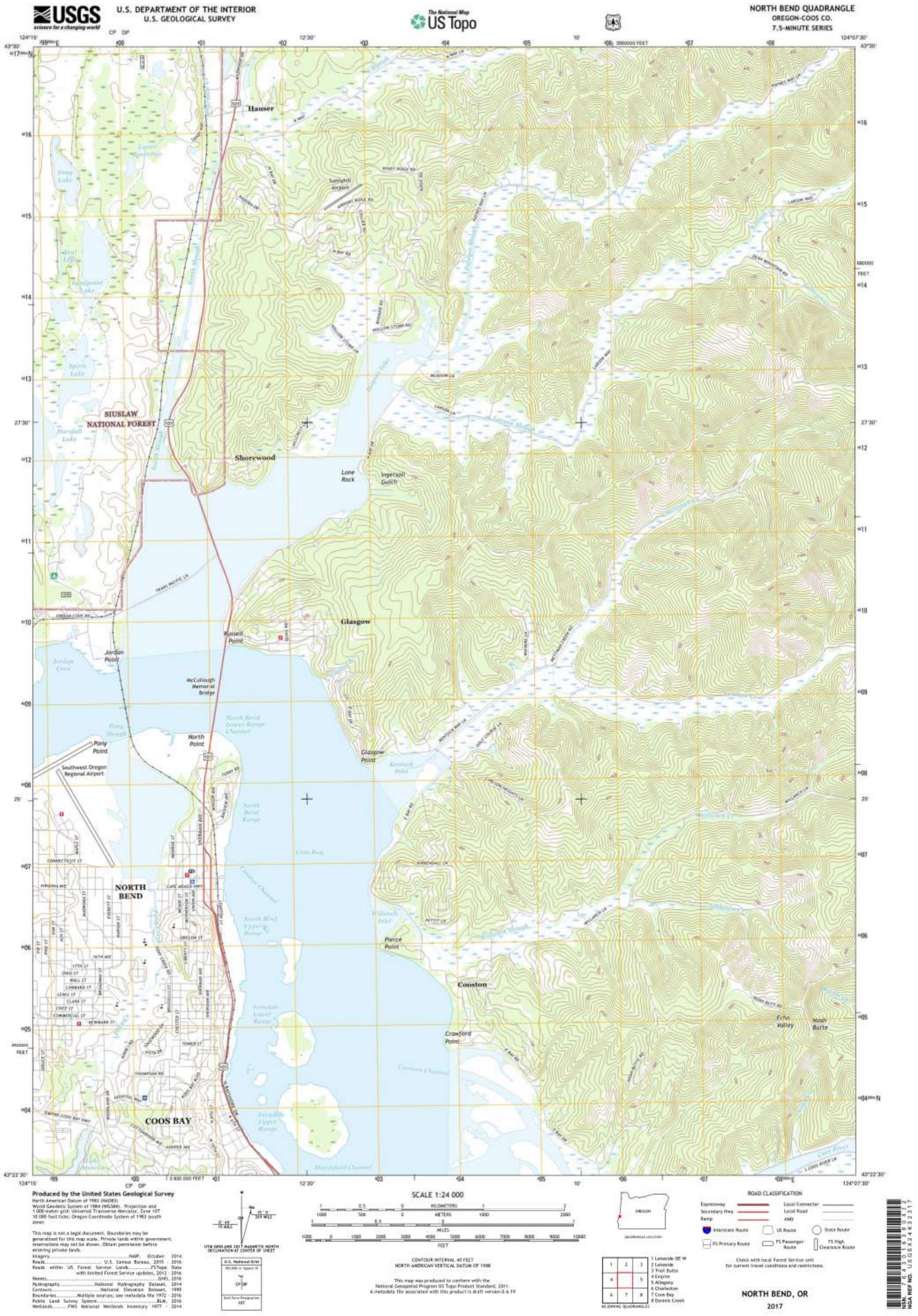
- ☒ RSA Fill Area Map (Attachment G)
- ☒ Water Resources Report (Attachment H)
- ☒ FEMA FIRM Map (Attachment I)
- ☒ Oregon Department of State Lands Preliminary Ownership Summary (Attachment J)

Send Completed form to: US Army Corps of Engineers ATTN: CENWP-OD-GP Box 2946 Portland, OR 97208-2946 503-808-4373 portlandpermits@usace.army.mil **OR** US Army Corps of Engineers ATTN: CENWP-OD-GE 1600 Executive Parkway Suite 210 Eugene, OR 97401-2156 541-465-6868	**Counties:** Baker, Clackamas, Clatsop, Columbia, Gilliam, Grant, Hood River, Jefferson, Lincoln, Malheur, Morrow, Multnomah, Polk, Sherman, Tillamook, Umatilla, Union, Wallowa, Wasco, Washington, Wheeler, Yamhill **Counties**: Benton, Coos, Crook, Curry, Deschutes, Douglas, Jackson, Josephine, Harney, Klamath, Lake, Lane, Lin, Marion	Send Completed form to: DSL - West of the Cascades: Department of State Lands 775 Summer Street NE, Suite 100 Salem, OR 97301-1279 503-986-5200 **OR** DSL - East of the Cascades: Department of State Lands 1645 NE Forbes Road, Suite 112 Bend, Oregon 97701 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 by Calling 503-986-5253** **Or go Online:** https://apps.oregon.gov/dsl/EPS/

Attachment A
Figure 1



Attachment A
Figure 2



Attachment A
Figure 3

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY

SECTION 9 T25S R13W W.M.
COOS COUNTY

1" = 400'

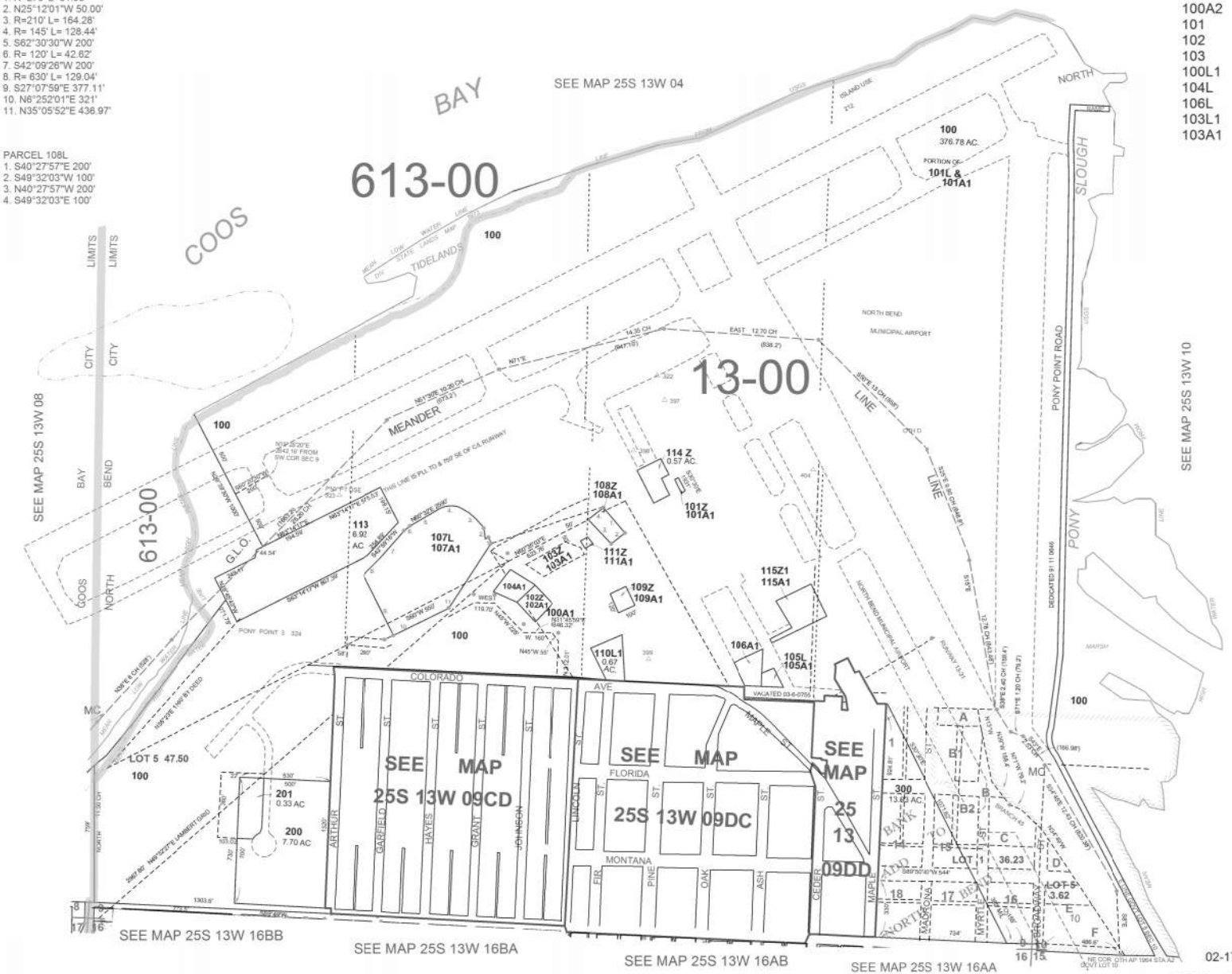
25S 13W 09
& INDEX
NORTH BEND

CANCELLED NO.

100A1
100A2
101
102
103
100L1
104L
106L
103L1
103A1

PARCEL 107L
1. R=270' L=31.96'
2. N25°12'01"W 50.00'
3. R=210' L= 164.28'
4. R= 145' L= 128.44'
5. S62°30'30"W 200'
6. R= 120' L= 42.62'
7. S42°09'26"W 200'
8. R= 630' L= 129.04'
9. S27°07'59"E 377.11'
10. N6°252'01"E 321'
11. N35°05'52"E 436.97'

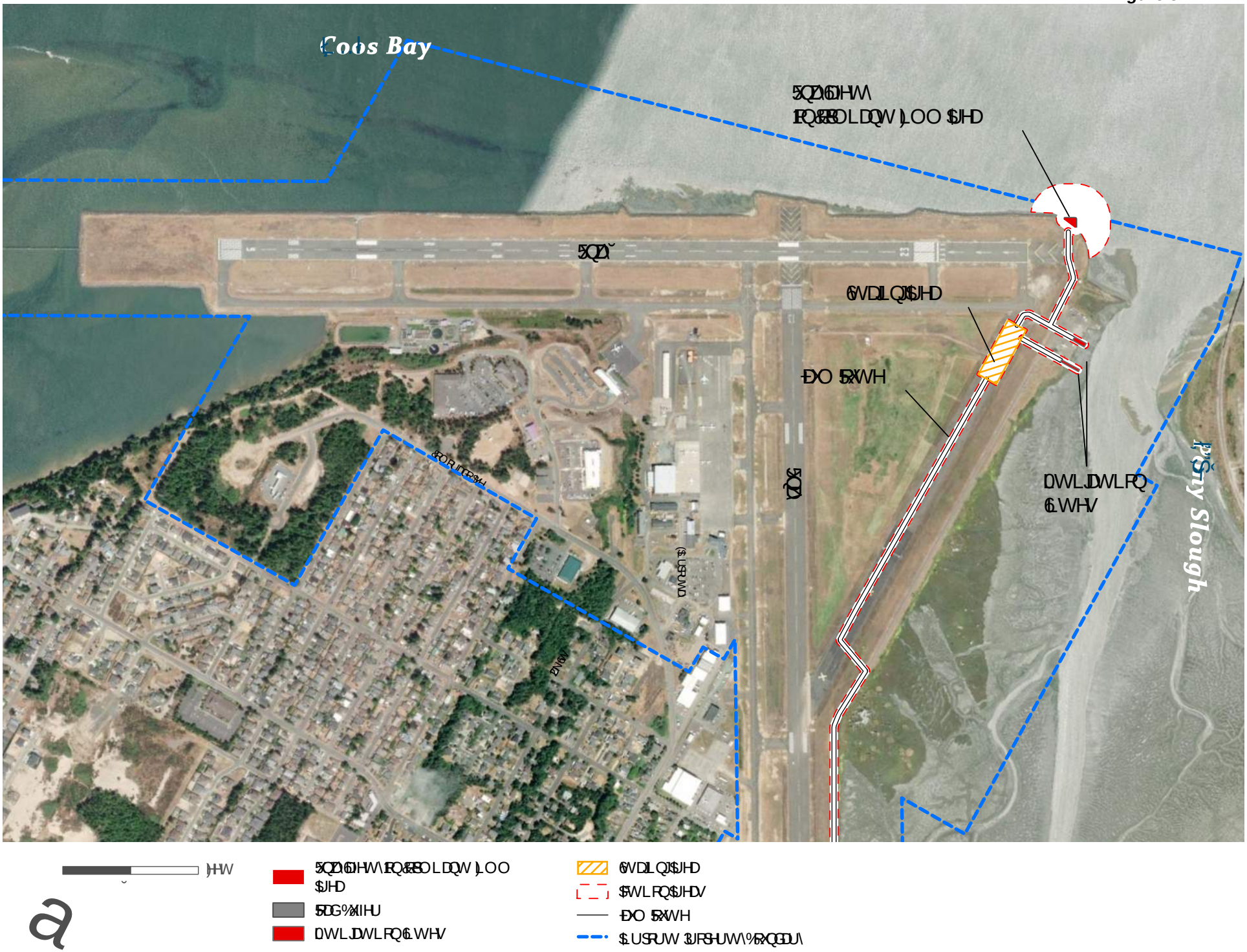
PARCEL 108L
1. S40°27'57"E 200'
2. S49°32'03"W 100'
3. N40°27'57"W 200'
4. S49°32'03"E 100'

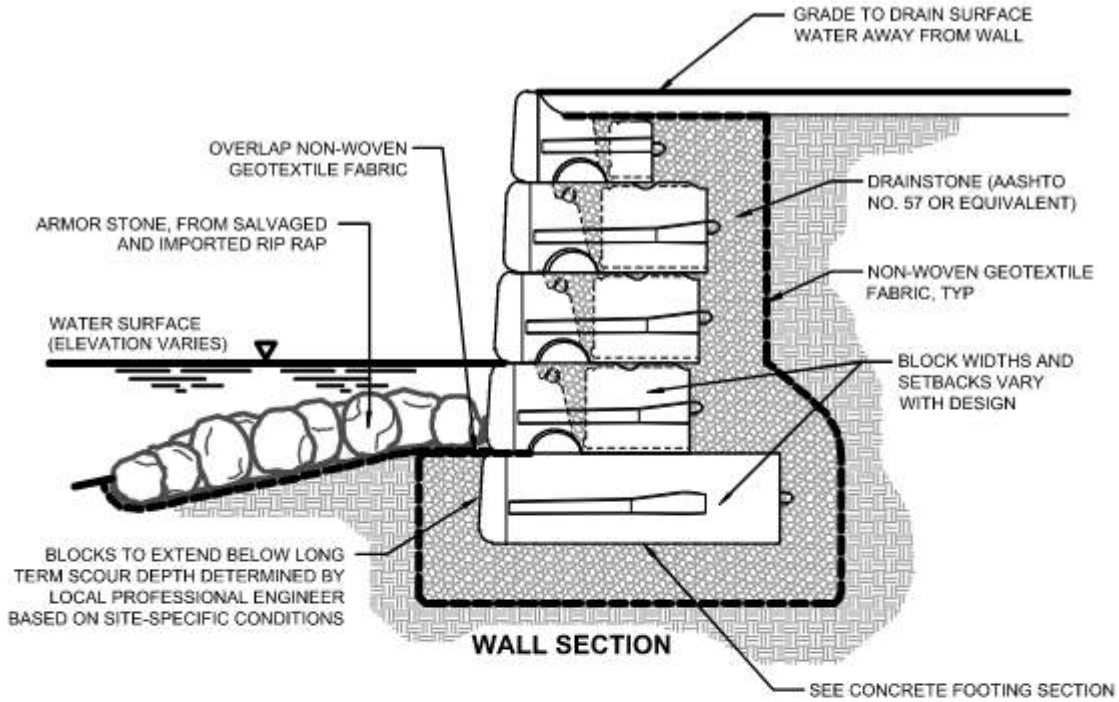


02-17-2016

25S 13W 09
& INDEX
NORTH BEND

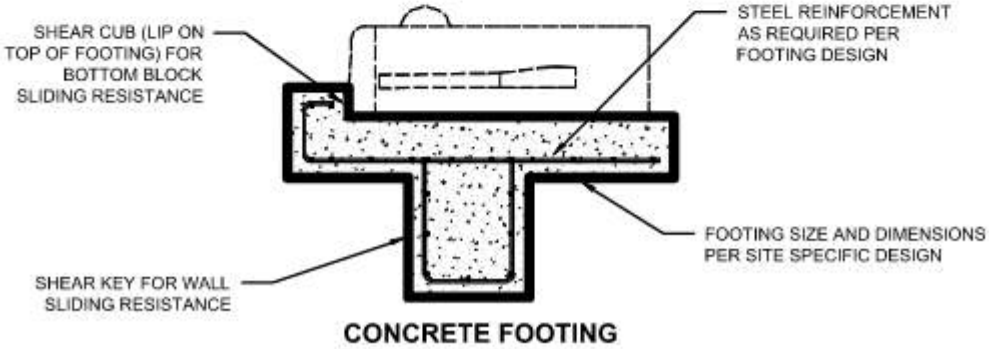
Attachment A
Figure 5





NOTES:

- USE ASTM NO. 57 STONE (OR AS SPECIFIED BY LOCAL PROFESSIONAL ENGINEER) TO INFILL BETWEEN BLOCKS.
- ACTUAL DESIGN BY PROFESSIONAL ENGINEER FOR SPECIFIC DETAILS AND FINAL DESIGN.
- WALLS MAY REQUIRE GEOGRID REINFORCEMENT.
- REFER TO FINAL ENGINEERING PLANS.



CONCEPTUAL SEAWALL/BULKHEAD DETAIL

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

October 15, 2019

Bob Hood
11000 Airport Lane
North Bend, OR 97459

Re: WD # 2019-0260 **Approved**
Wetland Delineation Report for SW Oregon Regional Airport Improvement Project, Coos County; T25S R13W S8, TL100 (Portion); and S9, TLs 100, 3114Z, 101Z, 115Z1, and 114Z1 (Portions); RGL # 6380

Dear Mr. Hood:

The Department of State Lands has reviewed the wetland delineation report prepared by PBS Engineering and Environmental for the site referenced above. Please note that the study areas include only portions of the tax lots described above (see the attached maps). Based upon the information presented in the report and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in revised Figures 6-1, 6-2, and 6A-6G of the report. Please replace all copies of the preliminary wetland maps with these final Department-approved maps.

Within the project's 5 study areas, one wetland (Wetland A, totaling approximately 0.48 acres) and an undetermined area of estuarine habitat within the Coos Bay Estuary were identified, and these features are subject to the permit requirements of the state Removal-Fill Law. Normally, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2-year recurrence interval flood elevation if OHWL cannot be determined). However, the Coos Bay Estuary and all hydrologically connected wetlands (Wetland A) are designated essential salmonid habitat; therefore, any ground disturbance within the wetland or below the Highest Measured Tide (HMT) elevation for the estuary may require a state permit. In addition, Wetland A is part of a DSL compensatory wetland mitigation site (RGL # 6380), and impacts to a mitigation site may be prohibited or require additional mitigation. Please contact Bob Lobdell, Resource Coordinator for Coos County, for information regarding any additional permit requirements for the site. (The HMT elevation along this portion of the estuary is 11.18 feet above MLLW or 10.68 feet above NAVD88).

This concurrence is for purposes of the state Removal-Fill Law only. We recommend that you attach a copy of this concurrence letter to any subsequent state permit application to speed application review. Federal or local permit requirements may apply

as well. The U.S. Army Corps of Engineers will determine jurisdiction under the Clean Water Act, which may require submittal of a complete Wetland Delineation Report.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. If you have any questions, please contact the Jurisdiction Coordinator for Coos County, Lynne McAllister, at (503) 986-5300.

Sincerely,

Peter Ryan Digitally signed by Peter Ryan
Date: 2019.10.15 08:45:59
-07'00'

Peter Ryan, PWS
Aquatic Resource Specialist

Enclosures

ec: Brian Bieger, PBS Engineering and Environmental
Coos County Planning Department
Tyler Krug, Corps of Engineers
Lauren Brown, DSL
Oregon Coastal Management Program (Coastal Zone, coastpermits@state.or.us)

Attachment B

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

Fully completed and signed report cover forms and applicable fees are required before report review timelines are initiated by the Department of State Lands. Make checks payable to the Oregon Department of State Lands. To pay fees by credit card, go online at https://apps.oregon.gov/DSL/EPS/program?key=4.

Attach this completed and signed form to the front of an unbound report or include a hard copy with a digital version (single PDF file of the report cover form and report, minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Salem, OR 97301-1279.** A single PDF of the completed cover form and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail DSL instructions on how to access the file from your ftp or other file sharing website.

Contact and Authorization Information

☒ Applicant ☐ Owner Name, Firm and Address: Bob Hood 11000 Airport Lane North Bend, OR 97459	Business phone # 541-756-8531 x 105 Mobile phone # (optional) E-mail: bob@flyoth.com
☐ Authorized Legal Agent, Name and Address: N/A	Business phone # Mobile phone # E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: Bob Hood **Signature:** Bob Hood

Date: _____ Special instructions regarding site access: Please call ahead before accessing site.

Project and Site Information

Project Name: SW Oregon Regional Airport Improvement Project	Start: Latitude: 43.413635 Longitude: -124.263763 deg. End: Latitude: 43.422866 Longitude: -124.240316 deg
Proposed Use: Improvements to existing airport	Tax Map # 25s13w08 Tax Lot(s) 100 (partial),
Project Street Address (or other descriptive location): 11000 Airport Lane, North Bend, OR	Tax Map # 25s13w09 Tax Lot(s) 100 (partial) 3114Z(partial), 101Z(partial),115Z1 (partial),114Z1 (partial). Township Range Section QQ 25S 13W 09 25S 13W 08
City: North Bend County: Coos	Waterway: Coos bay River Mile: N/A

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: PBS Engineering and Environmental, Attn: Brian Bieger 415 W 6th Street, Suite 601,Vancouver, WA 98660	Phone # 360-567-2103 Mobile phone # 503-828-8566 E-mail: brian.bieger@pbsusa.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: [signature] Date: 02/15/19

Primary Contact for report review and site access is ☐ Consultant ☒ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: approx. 63 ac. Total Wetland Acreage: .20 waters

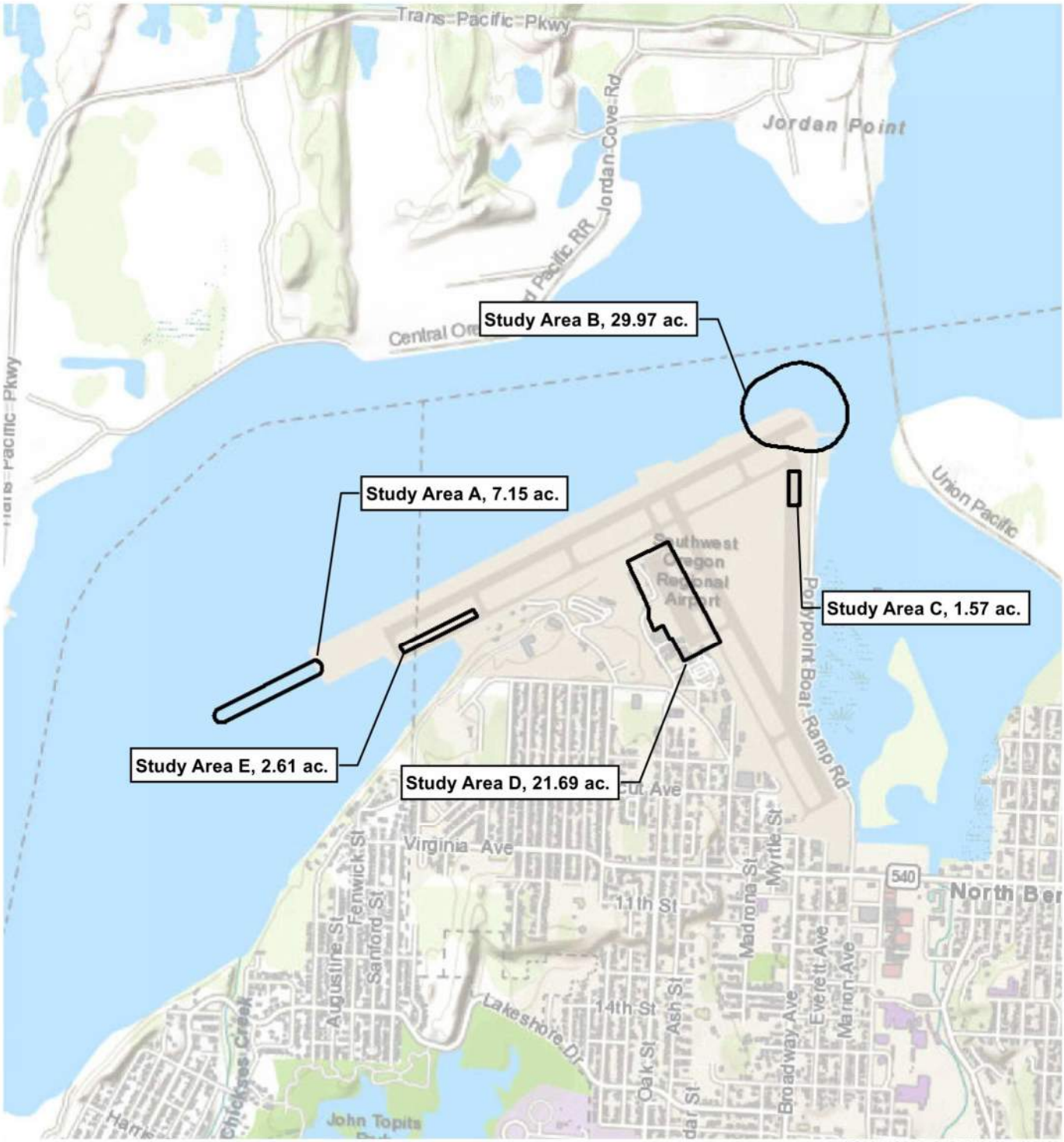
Check Applicable Boxes Below

☐ R-F permit application submitted	☒ Fee payment submitted $ 437
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Industrial Land Certification Program Site	☐ Request for Reissuance. See eligibility criteria. (no fee)
☐ Wetland restoration/enhancement project (not mitigation)	DSL# _____ Expiration date _____
☐ Previous delineation/application on parcel If known, previous DSL #	☐ LWI shows wetlands or waters on parcel Wetland ID code

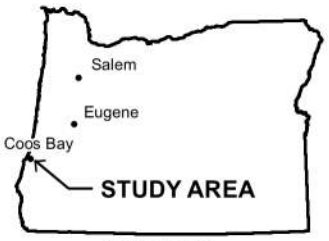
For Office Use Only

DSL Reviewer: LM Fee Paid Date: ____ / ____ / ____ DSL WD # 2019-0260

Date Delineation Received: 4 / 22 / 19 Scanned: ☐ Electronic: ☒ DSL App. # _____



ESRI WORLD STREET MAP (2019).



OREGON

SCALE: 1" = 2,000'

0' 1,000' 2,000' 8,000'

PREPARED FOR: MEAD AND HUNT INC.

PBS

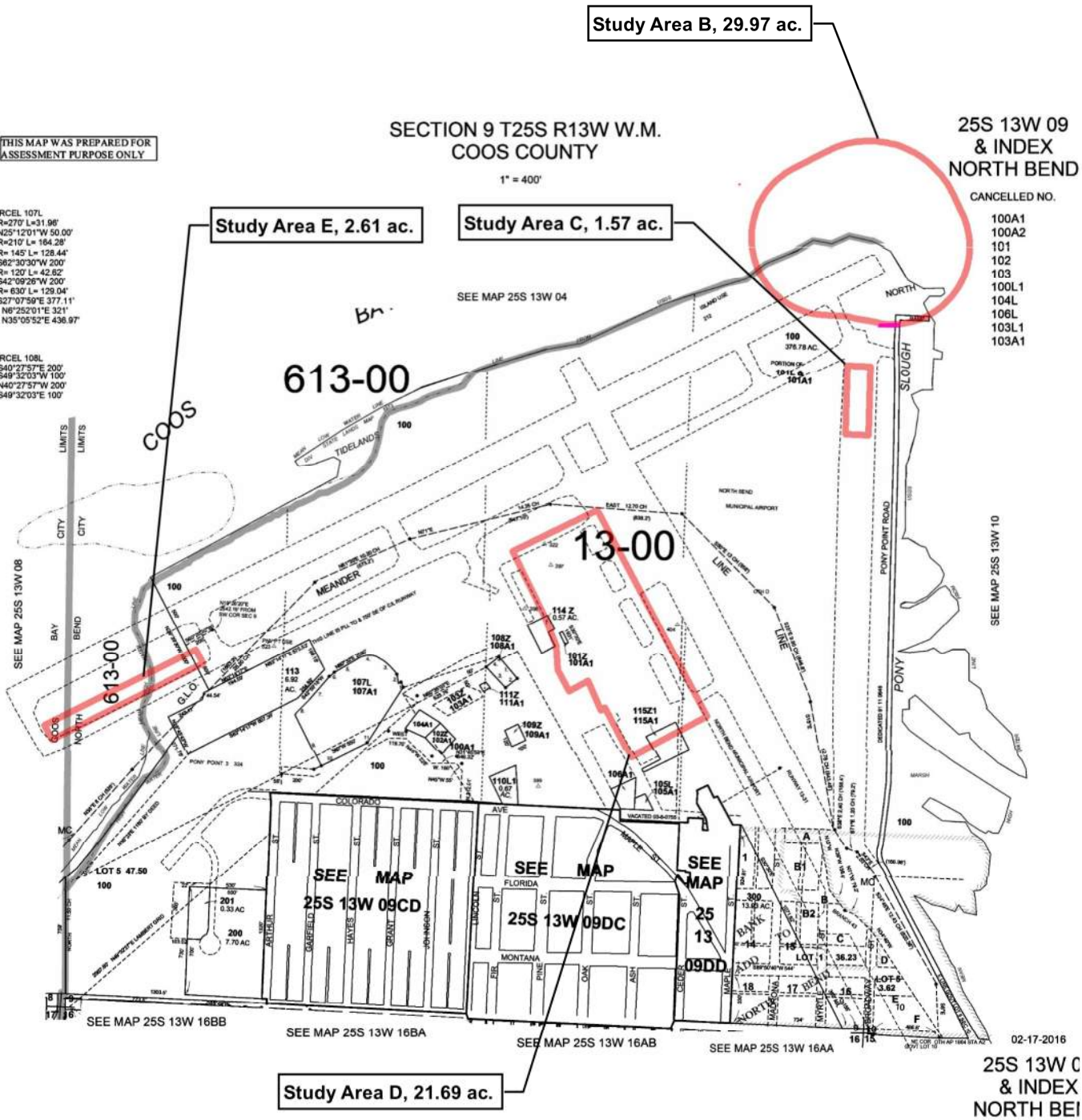
LOCATION MAP

SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
1

Attachment B



PREPARED FOR: MEAD AND HUNT INC.

PBS

TAX LOT MAP 25S 13W 09

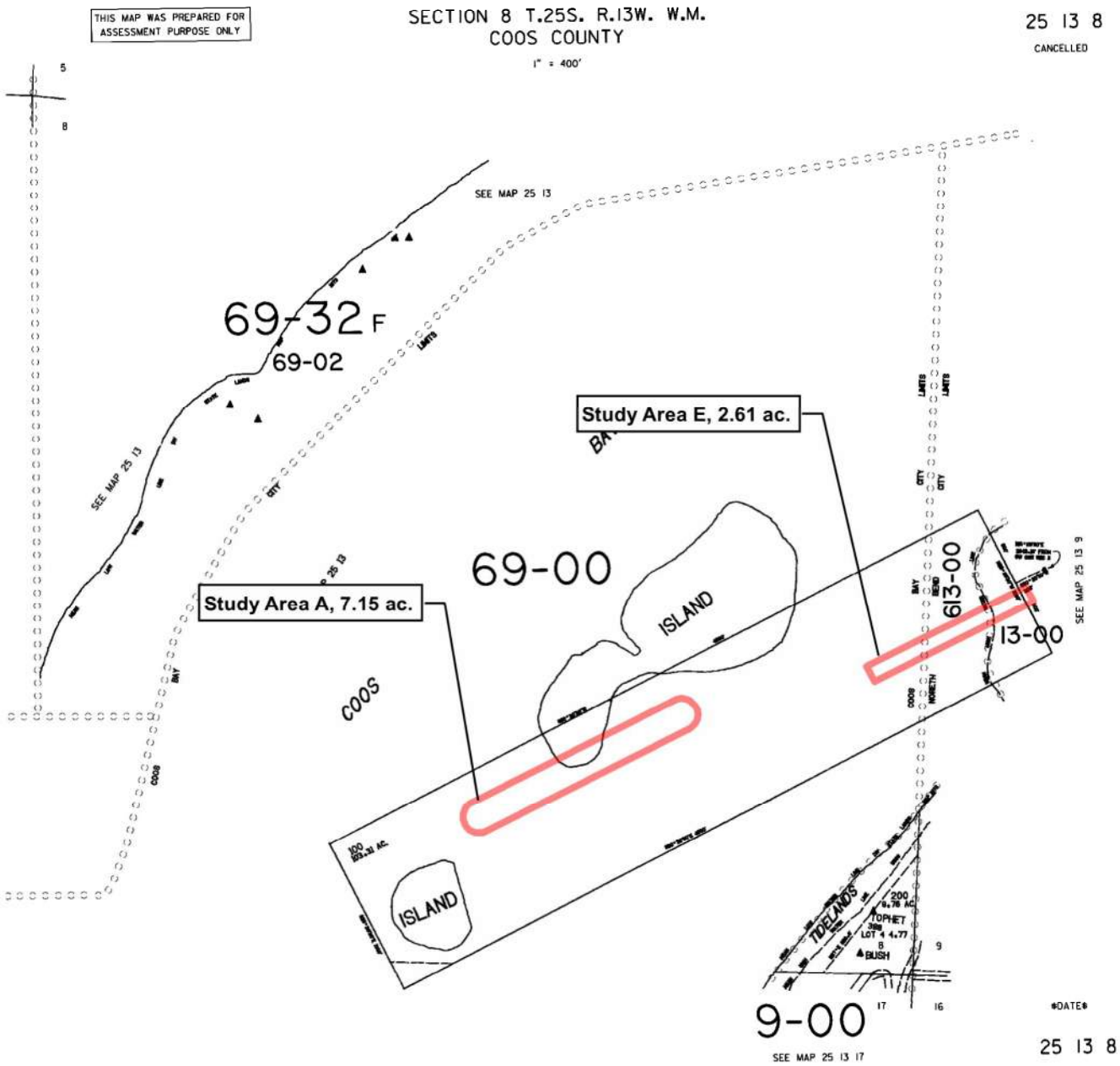
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS

NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
2A

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 4:37:12 PM



ORMAP (2019).

SCALE: 1" = 1,000'

0' 500' 1,000' 2,000'

PREPARED FOR: MEAD AND HUNT INC.

PBS

TAX LOT MAP 25 13 08

SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS

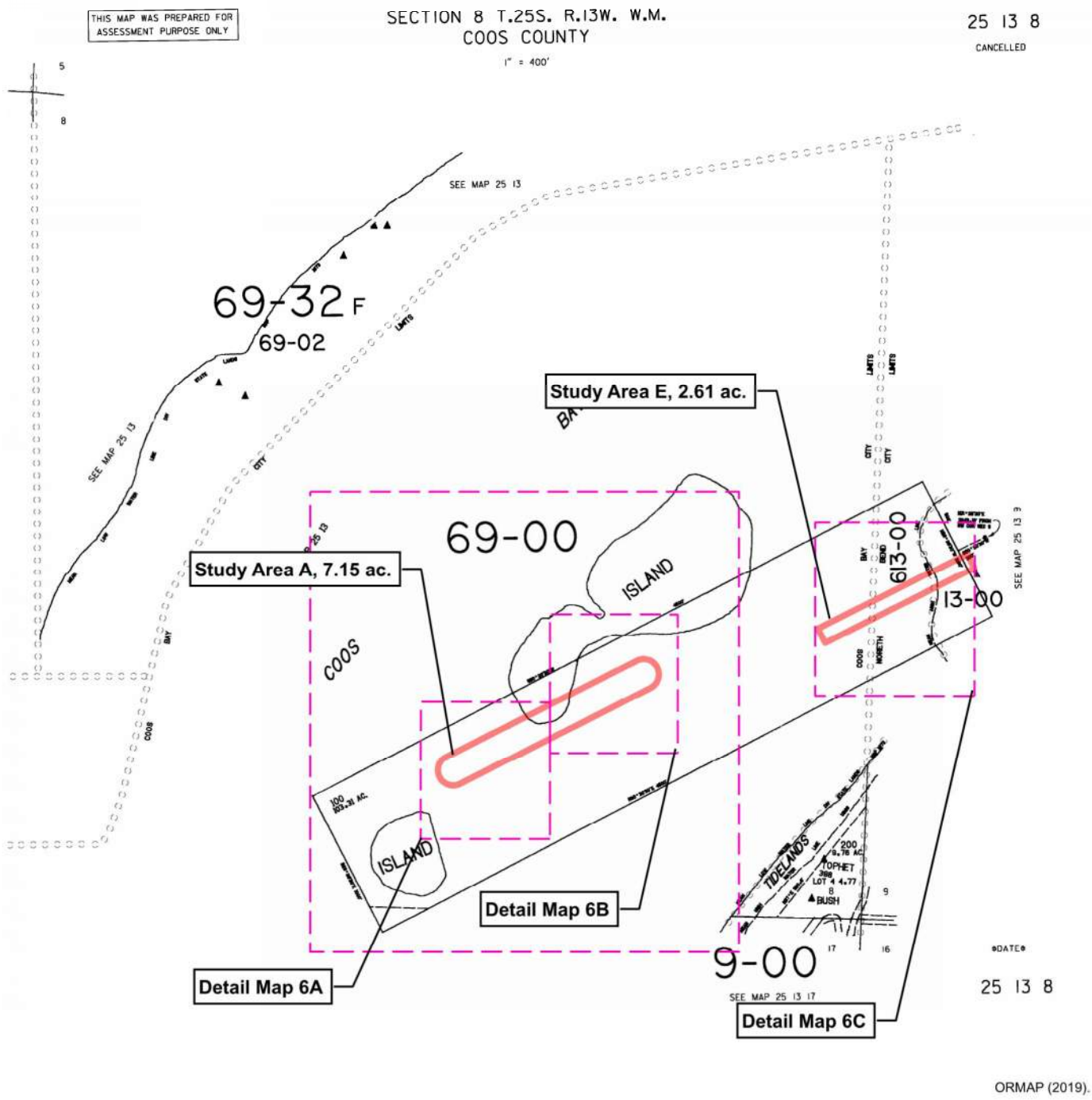
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE

2B

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 4:43:28 PM



ORMAP (2019).

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 1,000'

0' 500' 1,000' 2,000'

PREPARED FOR: MEAD AND HUNT INC.

PBS

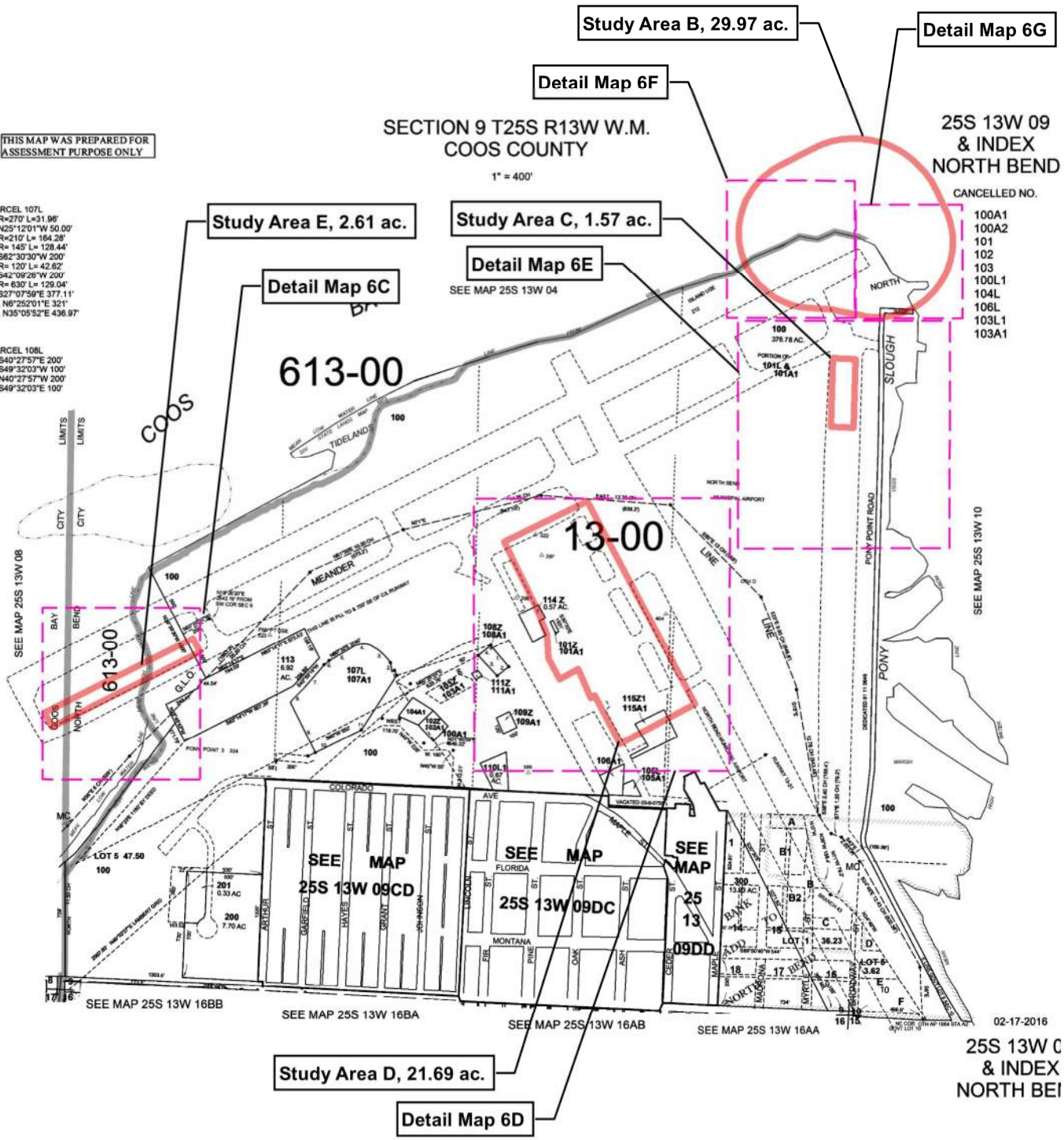
WETLAND DELINEATION INDEX MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6-1

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 9/17/2019 1:38:41 PM

Attachment B



DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

PREPARED FOR: MEAD AND HUNT INC.

PBS

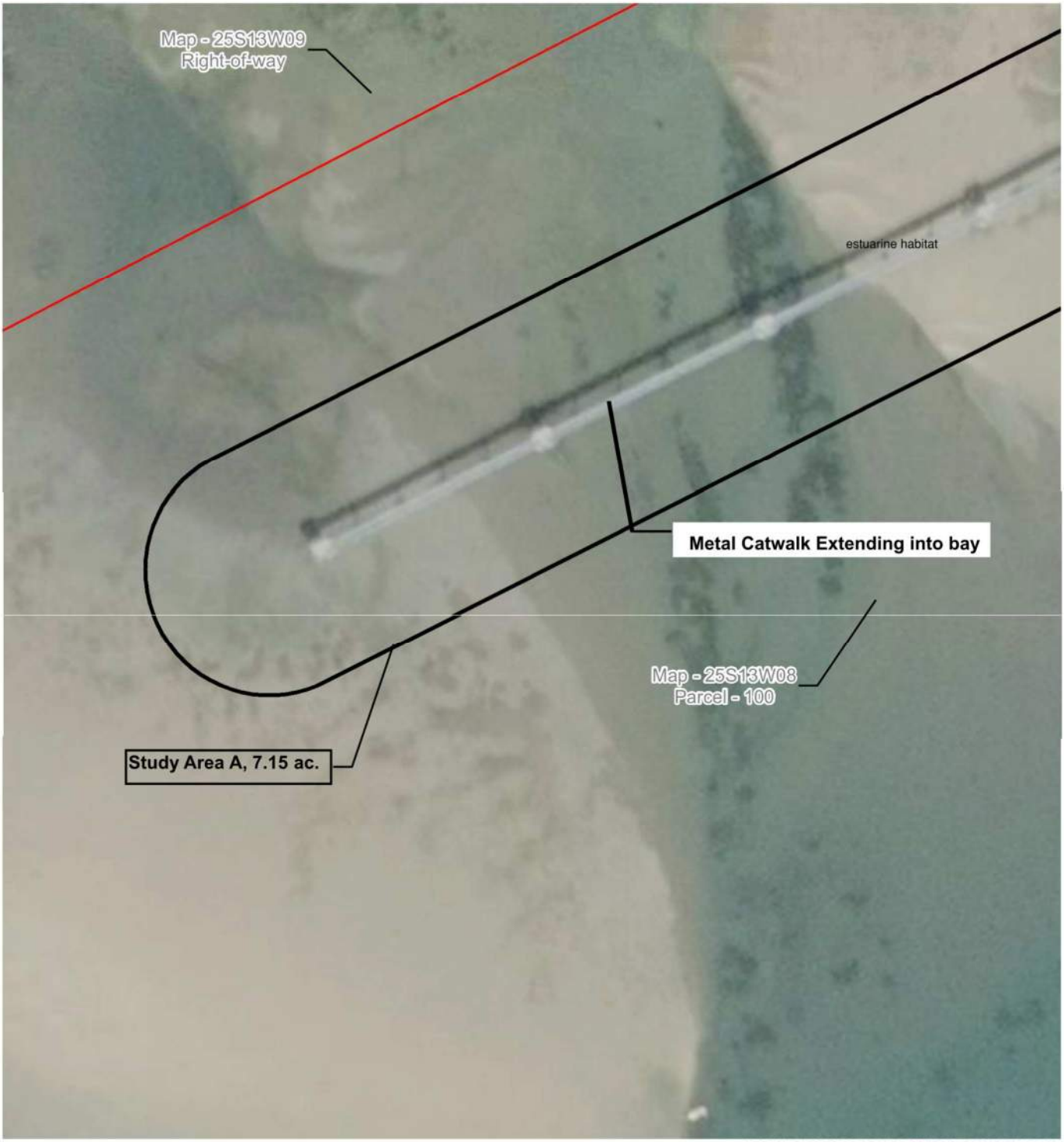
WETLAND DELIENATION INDEX MAP

SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6-2

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 4:37:12 PM



AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 120'

0' 60' 120' 240'

PREPARED FOR: MEAD AND HUNT INC.

PBS

WETLANDS & WATERS OF THE US/OREGON MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6A

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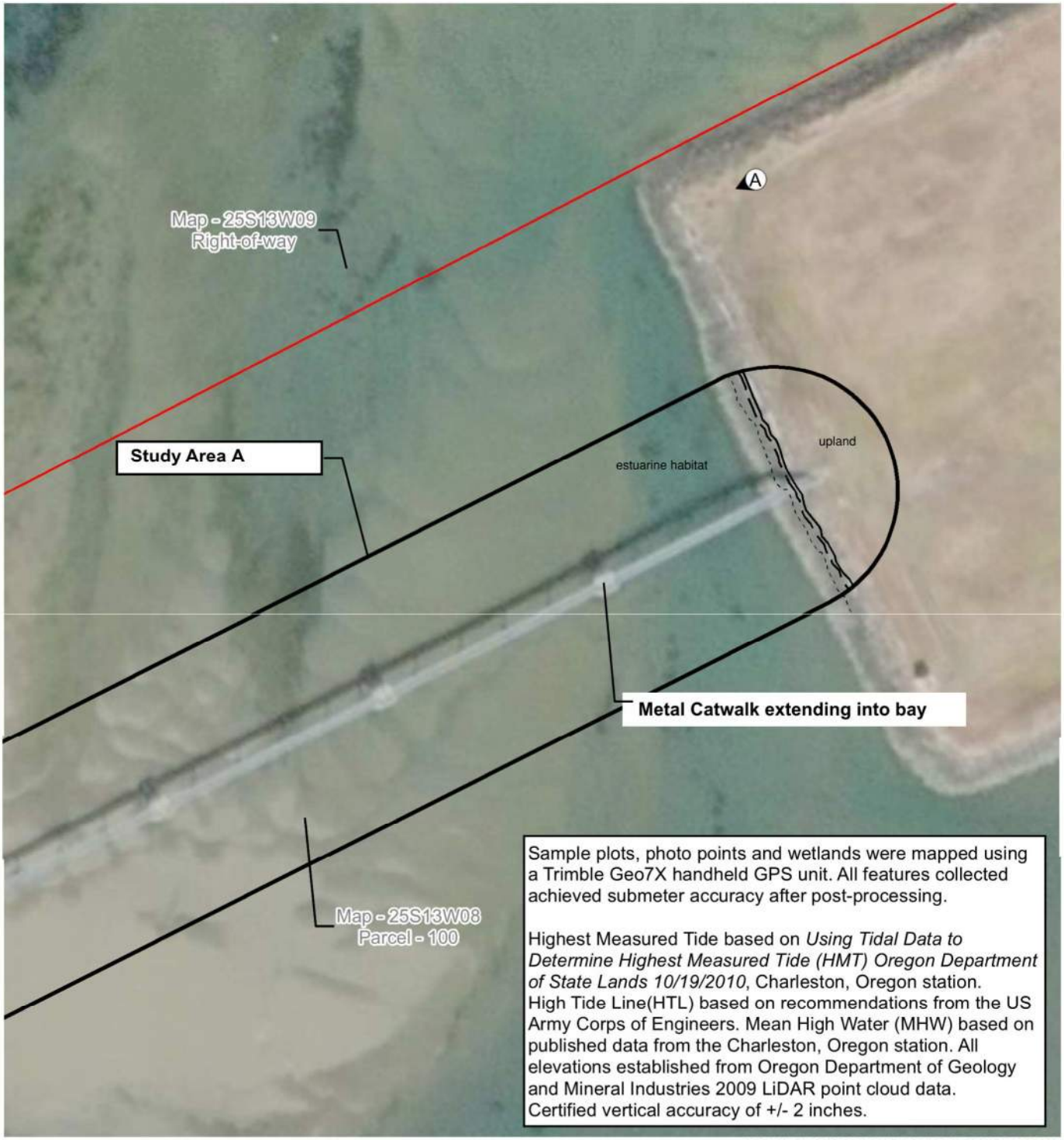


Sample plots, photo points and wetlands were mapped using a Trimble Geo7X handheld GPS unit. All features collected achieved submeter accuracy after post-processing.

Highest Measured Tide based on *Using Tidal Data to Determine Highest Measured Tide (HMT) Oregon Department of State Lands 10/19/2010*, Charleston, Oregon station. High Tide Line(HTL) based on recommendations from the US Army Corps of Engineers. Mean High Water (MHW) based on published data from the Charleston, Oregon station. All elevations established from Oregon Department of Geology and Mineral Industries 2009 LiDAR point cloud data. Certified vertical accuracy of +/- 2 inches.

AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

Legend

- Photo Points
- Highest Measured Tide 10.68' NAVD88 (11.18' MLLW)
- High Tide Line 9.0' NAVD88 (9.5' MLLW)
- Mean High Water 6.46' NAVD88 (6.96 MLLW)

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 120'

0' 60' 120' 240'

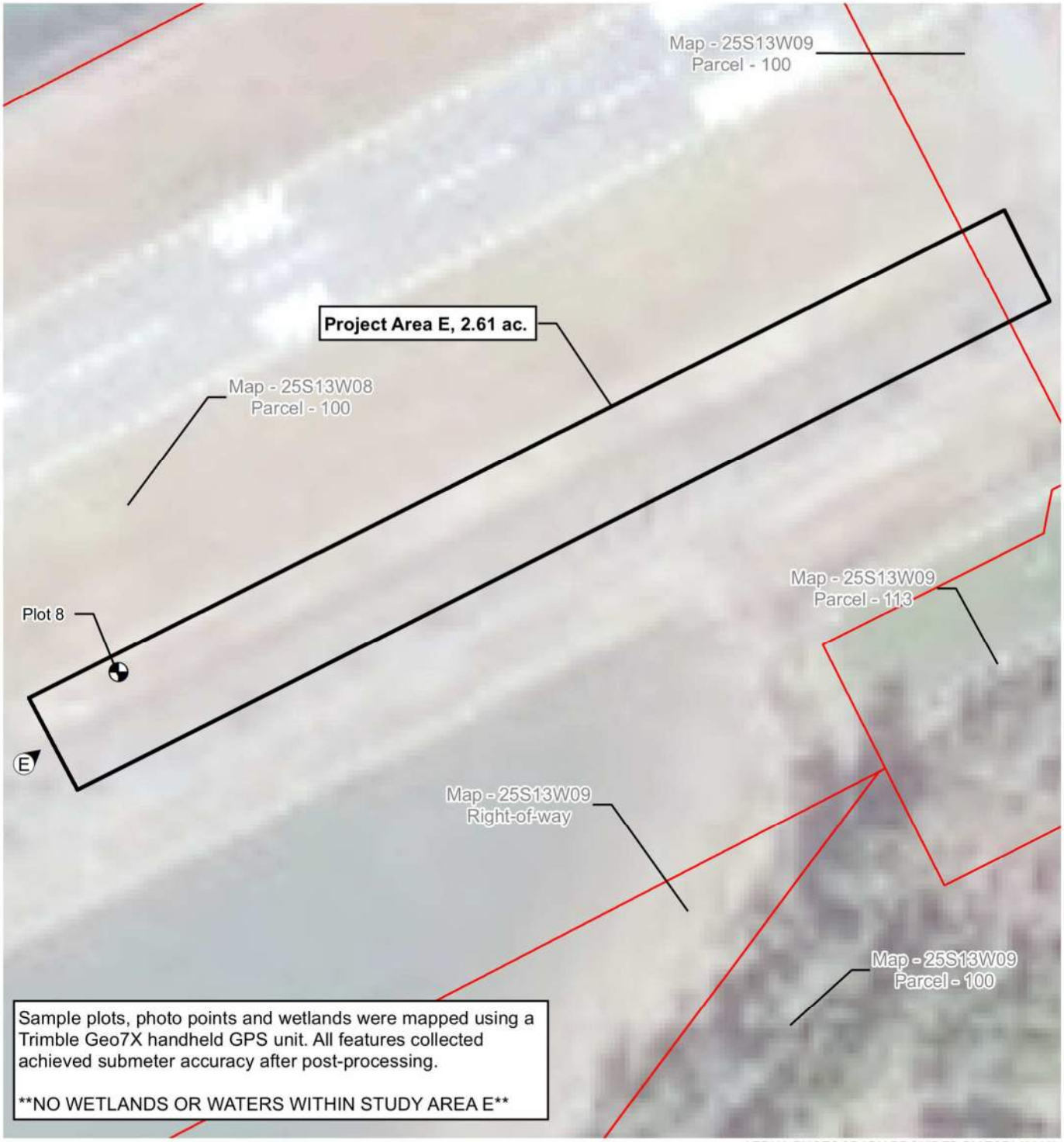
PREPARED FOR: MEAD AND HUNT INC.

PBS

WETLANDS & WATERS OF THE US/OREGON MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6B



AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

Legend

- Photo Points
- Plots

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 150'

0' 150' 150' 600'

PREPARED FOR: MEAD AND HUNT INC.

PBS

STUDY AREA E MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6C

AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

Legend

- Photo Points
- Plots

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 240'

0' 150' 240' 600'

PREPARED FOR: MEAD AND HUNT INC.

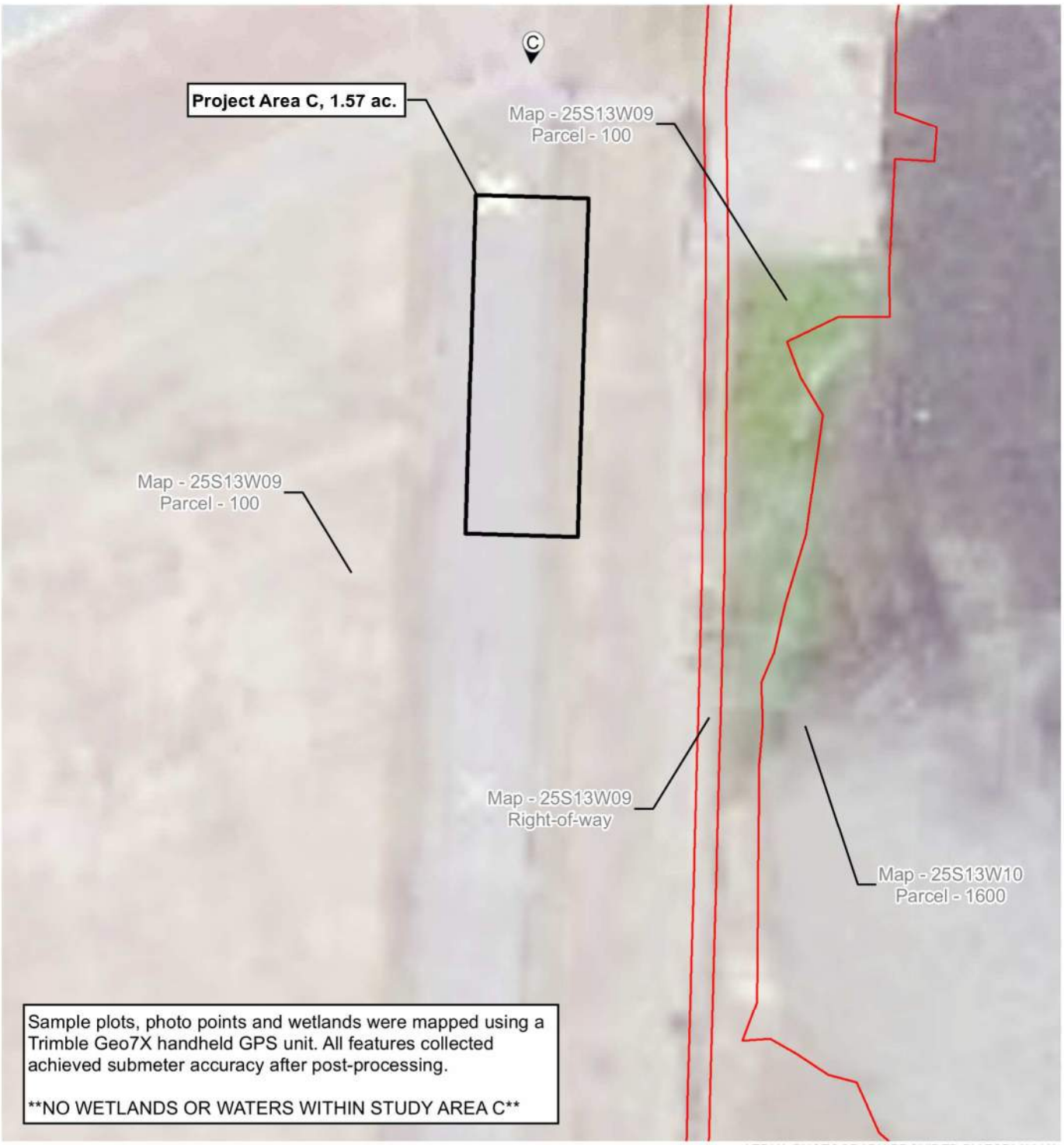
PBS

STUDY AREA D MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6D

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 3:07:59 PM



Sample plots, photo points and wetlands were mapped using a Trimble Geo7X handheld GPS unit. All features collected achieved submeter accuracy after post-processing.

NO WETLANDS OR WATERS WITHIN STUDY AREA C

AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

Legend

Photo Points

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 200'

0' 100' 200' 400'

PREPARED FOR: MEAD AND HUNT INC.

PBS

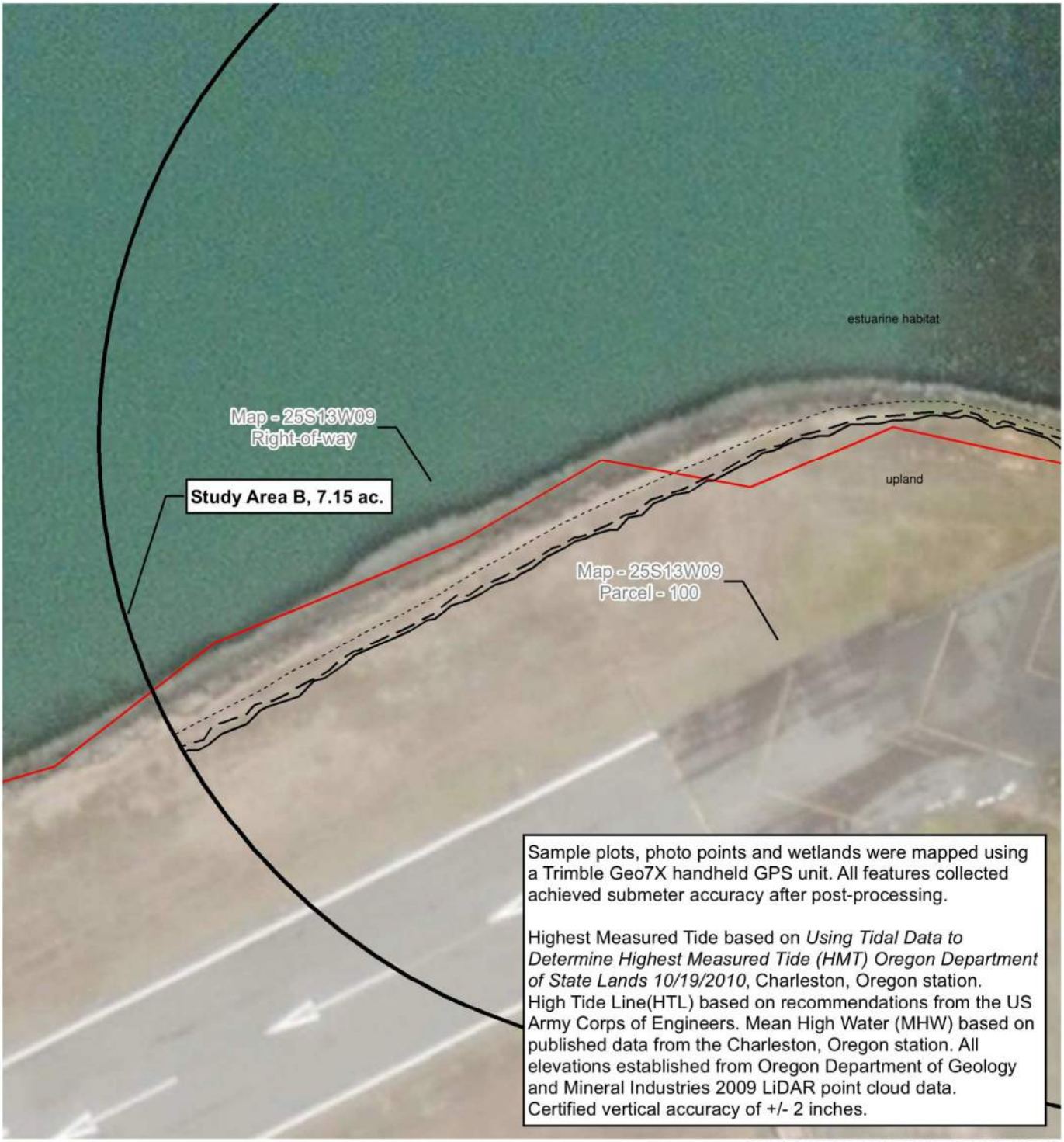
STUDY AREA C MAP

SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6E

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 3:11:58 PM



Sample plots, photo points and wetlands were mapped using a Trimble Geo7X handheld GPS unit. All features collected achieved submeter accuracy after post-processing.

Highest Measured Tide based on *Using Tidal Data to Determine Highest Measured Tide (HMT) Oregon Department of State Lands 10/19/2010*, Charleston, Oregon station. High Tide Line(HTL) based on recommendations from the US Army Corps of Engineers. Mean High Water (MHW) based on published data from the Charleston, Oregon station. All elevations established from Oregon Department of Geology and Mineral Industries 2009 LiDAR point cloud data. Certified vertical accuracy of +/- 2 inches.

AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

Legend

- Mean High Water 6.46' NAVD88 (6.96 MLLW)
- High Tide Line 9.0' NAVD88 (9.5' MLLW)
- Highest Measured Tide 10.68' NAVD88 (11.18' MLLW)

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 120'

0' 120' 120' 480'

PREPARED FOR: MEAD AND HUNT INC.

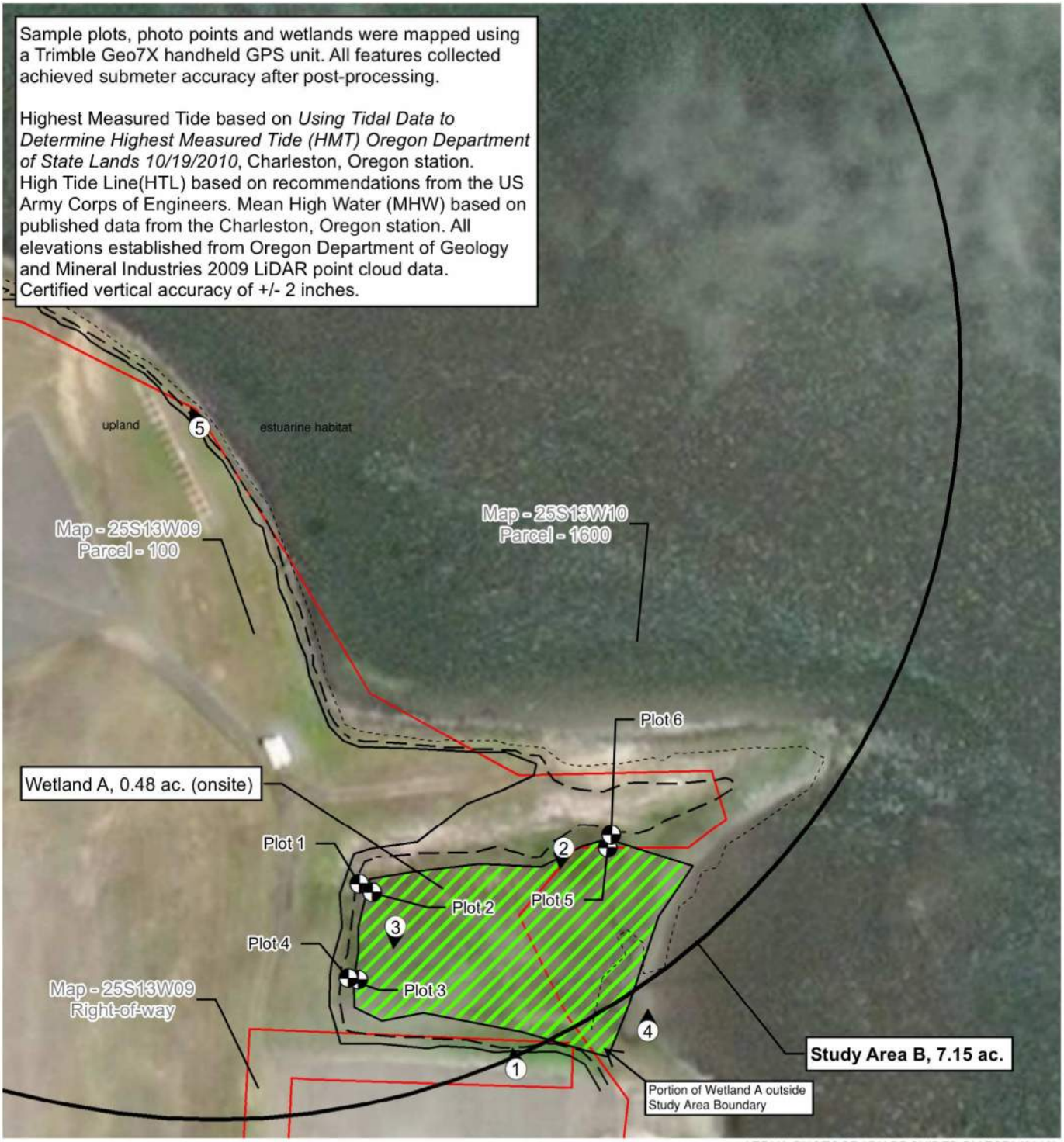
PBS

WETLANDS & WATERS OF THE US/OREGON MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6F

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 3:10:53 PM



AERIAL PHOTOGRAPH PROVIDED BY ESRI (2019).

Legend

- Plots
- Photo Points
- Mean High Water 6.46' NAVD88 (6.96 MLLW)
- High Tide Line 9.0' NAVD88 (9.5' MLLW)
- Highest Measured Tide 10.68' NAVD88 (11.18' MLLW)

DSL WD # 2019-0260
Approval Issued 10/15/2019
Approval Expires 10/15/2024

SCALE: 1" = 100'

0' 120' 100' 480'

PREPARED FOR: MEAD AND HUNT INC.

PBS

WETLANDS & WATERS OF THE US/OREGON MAP
SW OREGON REGIONAL AIRPORT SAFETY AREA IMPROVEMENTS
NORTH BEND, COOS COUNTY, OREGON

FEB 2019
90368.000

FIGURE
6G

Filename: L:\Projects\90000\90300-90399\90368 SW OR Reg Airport\GIS\OTH_Regional_Safety_REV20190815.mxd Plot Date/Time: 8/15/2019 4:51:03 PM

Permittee-Responsible Mitigation Plan

Environmental Assessment

Runway Safety Area Improvements (Runway 5/23)

Southwest Oregon Regional Airport

Report Prepared By

Mead & Hunt

www.meadhunt.com

November 10, 2021[1]

Mead & Hunt Project No. 1417700-171679.01

[1] updated to reflect Runway designation name change

1. Project Information

Project Name: Southwest Oregon Regional Airport (OTH) Runway Safety Area Bulkhead

NWP Permit No.:

Project Location: 43° 25' 18.4794"N, -124° 14' 18.6432"W (43.421800°, -124.238512°)

Mitigation Site Location(s) (if different): 43°25'18.02"N, -124°14'17.24"W (43.421672°, -124.238122°) (1000ft SE of project site)

Watershed(s): Coos Bay, HUC 171003040405

County or Counties: Coos County

1.1 Plan Overview

This permittee-responsible mitigation plan addresses the permanent adverse modification of critical habitat for Coho salmon and Southern green sturgeon in the Coos River as a result of proposed construction of a triangular bulkhead adjacent to the Southwest Oregon Regional Airport (OTH) in North Bend, Oregon. The Federal Aviation Administration (FAA) requires[2] that the Runway Safety Area (RSA) have a 500-foot width and extend 1,000 feet beyond the ends of the runway. Currently, the northeast portion of Runway 5/23 is approximately 60 feet short of compliance.

Work will take place at the northeastern corner of the Airport property adjacent to and within Coos Bay. The project Action Area includes all areas of OTH, and the Coos Bay estuary directly or indirectly affected by the proposed project (**Figure 1, Runway Safety Area Fill and Construction Buffer**). The Action Area includes an in-water construction buffer of 250 feet for proposed fill activities within the 89-foot by 67-foot triangular fill area, the mandatory RSA, and a 10-foot road buffer for emergency vehicle access. An additional 60-foot Action Area on land is provided for vehicle support and construction staging. Construction crews and equipment will utilize haul routes to the project site via existing Airport roadways and paved areas.

2. Avoidance and Minimization

2.1 Avoidance

An alternatives analysis to meet FAA RSA compliance was conducted during the Master Plan update (2013).[3] These alternatives were further analyzed in the OTH RSA Environmental Assessment, which discusses the impacts to natural resources of each alternative to meet RSA compliance. A triangular bulkhead at the northeast end of Runway 5/23 was identified as the preferred alternative because it had the smallest footprint and the least impact to critical habitat of Endangered Species Act (ESA) listed species in Coos Bay. Construction haul routes and staging areas were designed to use existing impervious surfaces when possible and avoid adjacent wetlands.

---

[2] [1]FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, provides required airport safety area guidance and defines the RSA as a surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway.

[3] Southwest Oregon Regional Airport Master Plan Update, 2013. https://cooscountyairportdistrict.com/coos-county-aiport-district-master-plan/

2.2 Minimization

Appropriate and practical measures have been identified to minimize impacts to the aquatic ecosystem that cannot reasonably be avoided. Work will be performed during the Oregon Department of Environmental Quality (OR DEQ) in-water work window of October 1 to February 15 and will be timed with the outflow of the tides to avoid sedimentation impacts to adjacent eelgrass beds.

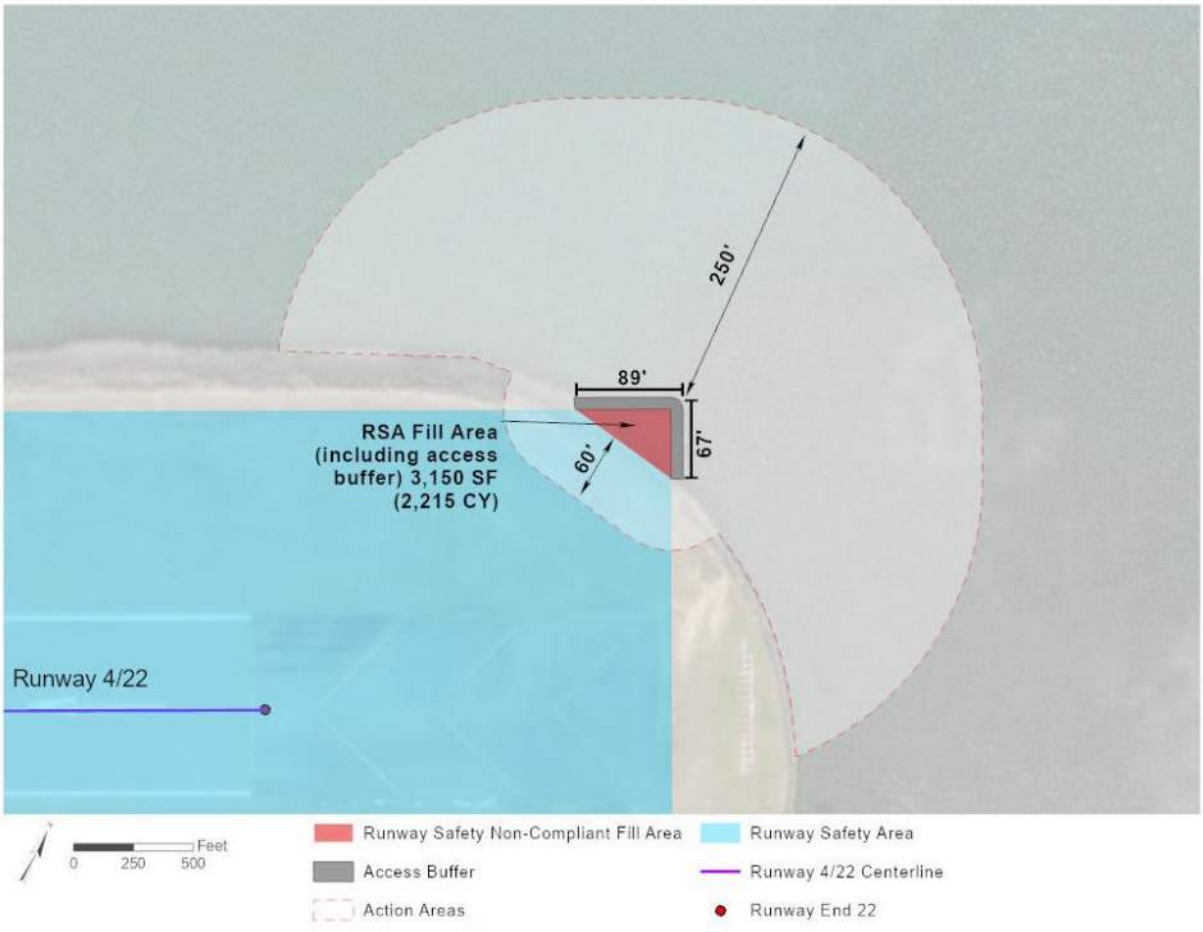


Figure 1: Runway Safety Area Fill and Construction Buffer

A 3,150 square-foot pre-cast concrete block bulkhead will be constructed to form a 0.07-acre (89-foot by 67-foot) triangular surface area at the northeastern corner of Runway 5/23. The bulkhead will be created by using a Mechanically Stabilized Earth (MSE) retaining wall constructed with pre-cast concrete blocks, which was determined to have the smallest construction footprint and have the least environmental impact on Coos Bay and Pony Slough. The foundation of the bulkhead will be stabilized with sand and 3 inches of rock topped with native slough soils.

Existing riprap cobbles within the construction area will be salvaged and reused for the final structure as armoring stone along the toe of the bulkhead. The armoring would extend slough-ward by approximately 8 feet to dissipate wave energy erosion, decrease scouring and undercutting of the bulkhead structure, and

increase structural stability of the bulkhead. To prepare for construction, a temporary single-face sheet pile cofferdam will be installed 12 feet from the exposed slough-ward bulkhead wall for dewatering and excavation of the foundation.

Dewatering of the construction site will be conducted through outflow sediment filters on the west side of the coffer dam to further reduce sedimentation within Pony Slough. Installation and removal of the coffer dam would result in the highest level of turbidity during the course of the project. Work associated with both will be timed with the outflow of tides to reduce the potential for sedimentation on adjacent eelgrass beds. Due to the relative size of the Coos River and proposed timing of in-water work, it is expected that any increase in turbidity would not result in adverse effects.

A 60-foot Action Area on land will be used for vehicle support and construction staging. Construction crews and equipment will access the project site via existing Airport access routes, embankments within the construction area, and floating barges for the installation of the temporary coffer dam. The contractor staging and laydown area will be on land immediately adjacent to the identified construction area.

3. Compensatory Mitigation

3.1 Goals and Objectives

Compensatory mitigation (CM) involves activities conducted by a permittee or third party to create, restore, enhance, or preserve the functions and values of the waters of the state to compensate for the removal/fill-related adverse impacts of project development to waters of the state.

3.2 Ecological Goals

The principal goal of this mitigation plan is to replace the function for the waters of the US that will be lost for the RSA bulkhead construction. The bulkhead site functions as critical habitat for Coho salmon and Southern green sturgeon in the Coos River estuary (Table 1). According to the 2019 Biological Assessment, the impacts on the environmental baseline conditions (habitat Primary Constituent Elements) within the construction area include: 1) the 3,150- square foot permanent adverse modification of critical habitat for ESA-listed fish, and 2) short-term, localized increases in background turbidity and minor alteration of substrates.[4]

[4] Mead & Hunt. Biological Assessment for the Southwest Oregon Regional Airport Runway Safety Area Improvements, October 2019. Chapter 4: Environmental Baseline, p.8.

Table 1. ESA-Listed Species with The Potential to Occur within the Project Area

Species	Population (ESU/DPS)	Federal Status	Closest Designated Critical Habitat	Potential Site Use
Coho salmon *Oncorhynchus kisutch*	Oregon Coast ESU	Threatened (76 FR 35755)	Coos Bay	Rearing and migration
Green Sturgeon *Acipenser medirostris*	Southern DPS	Threatened (71 FR 17757)	Coos Bay	Foraging
Eulachon *Thalichthys pacificus*	Southern DPS	Threatened (75 FR 13012)	Approximately 17 miles north of project area at Umpqua River	Rearing and migration

Sources: NMFS (National Marine Fisheries). 2018. Northwest Regional Office, ESA Salmon Listings. http://www.westcoast.fisheries.noaa.gov/index.html.
StreamNet. 2018. Data Query and Critical Habitat Mapper. http://www.streamnet.org/.
USFWS (U.S. Fish and Wildlife Service). 2018. Critical Habitat Mapper. https://ecos.fws.gov/ecp/report/table/critical-habitat.html

3.3 Ecological Objectives

There are two primary objectives of this mitigation plan:

1) to restore functional losses of aquatic critical habitat for ESA-listed fish, and

2) to enhance the project area shoreline to improve habitat for benthic organisms.

The restoration of 8,000 square feet of adjacent critical habitat and Essential Fish Habitat (EFH) eelgrass beds represents a 2:1 ratio over the area of critical habitat permanently adversely modified due to the bulkhead. Restoration will be accomplished by removing creosote piles and remnant dock structures in Pony Slough. The removal of these items will return the substrate to natural conditions and remove impediments to fish migration and foraging habitat within Pony Slough. Improvements in the slough bottom can induce the spread of eelgrass into the area, improving cover from predation and increasing the availability of feeder species. The surrounding Pony Slough estuary includes eelgrass beds that provide complex habitat and are an important foraging area for multiple species, including ESA-listed fish.

In the last phase of construction of the RSA bulkhead, the toe of the eco-block wall will be armored with rip-rap to structurally stabilize the wall and provide habitat for marine organisms. This new rip-rap toe, as well as adjacent existing rip-rap within 500 feet, will be seeded with crushed oyster shells. This enhancement hopes to provide a fully functioning, three-dimensional bed system that provides associated ecosystem services and biological functions, such as marine biodiversity, shoreline protection, sediment trapping, water quality improvement, and recreational fishing opportunities. If successfully established, the oyster beds will also protect and enhance the adjacent sea grass beds and mitigate for substrate alteration and rip-rap removal during bulkhead construction. [5]

[5] *"NOAA Habitat Conservation | Restoration Center | Restoration Techniques and Monitoring | Oyster Restoration"*. *Habitat.noaa.gov.*

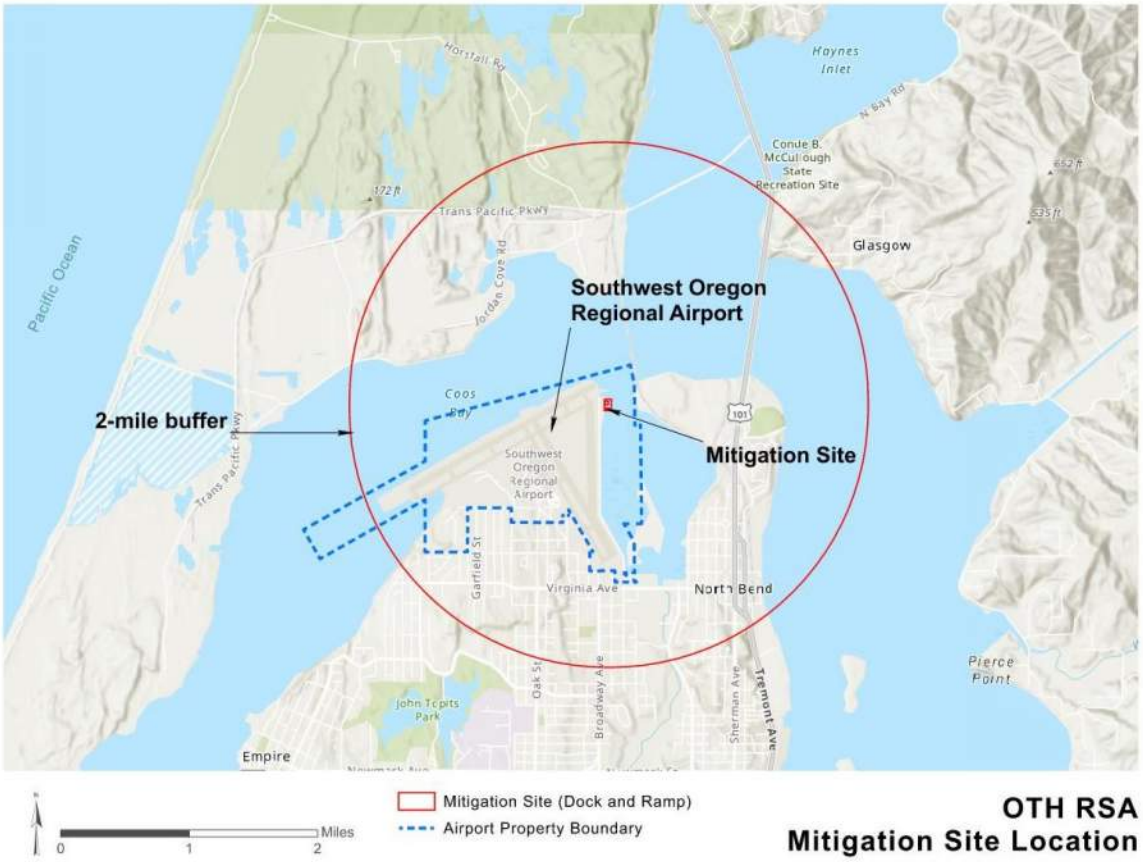


Figure 2: OTH RSA Mitigation Site Location

To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent annual monitoring surveys will be conducted at a similar time during the growing season (e.g. June to early July) using the methodology utilized in baseline surveys conducted in June 2019. Detailed survey methodology is included in **Section 11. Performance Standards/Monitoring Requirements**.

4. Site Selection

Selection of the site was driven primarily by the goal of restoring ecosystem function and providing high-quality habitat for fish. Proximity to project area was also given consideration. The selected sites were determined to be ecologically suitable for providing the desired compensatory mitigation and are adjacent to existing aquatic resources.

The proposed mitigation sites are located 1,000 feet southeast of the RSA fill bulkhead, east of Runway 5/23 (**Figure 2**). This area is the former location of Ponypoint Park, a City of North Bend facility that accommodated five recreational vehicle camp sites and included a walking trail, a boat ramp, and parking lot. The 3.5-acre mitigation site includes the creosote piles of a boat launch and dock structure within Pony Slough to the east of the paved parking area.

A visual survey of the site identified the structural remnants of an approximate 4,000 square-foot boat dock consisting of at least 68 piles, and an approximate 4,000 square-foot boat ramp with 50 piles and wood planks (**Figure 3**). Exposed piles were found to be creosote coated with metal fasteners.

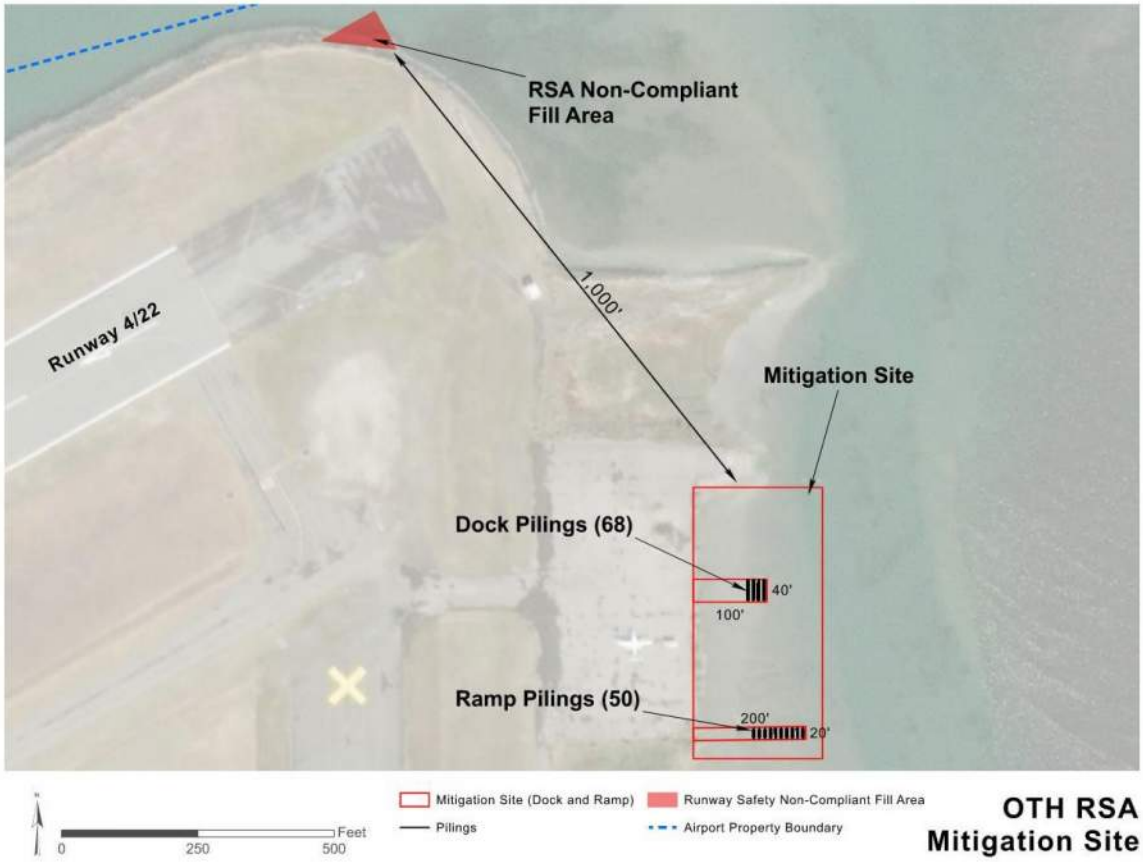


Figure 3: OTH RSA Mitigation Site

Eelgrass beds are located 100 feet from the RSA Fill Action Area and have been designated as EFH, while dispersed eelgrass exists within 30 feet of the construction site. No direct impact to eelgrass is anticipated due to the construction of a coffer dam; however, any in-water work has the potential to increase sedimentation and turbidity in the surrounding area. Monitoring any potential long-term impacts to eelgrass bed growth will be based on comparing existing and future eelgrass density with an adjacent designated control plot.

Given the existing baseline conditions within the project area and net of in-water/overwater structures, it is reasonably certain that the proposed project will not result in any adverse change to the instream or downstream functions (i.e., hydrologic, geomorphic, biological, or chemical/nutrient) of the Coos River. Potential direct effects of the proposed project on ESA-listed species and their habitats (i.e., hydroacoustic impacts, temporary degraded water quality, and minor alteration of substrates) will be consistent with those addressed under the SLOPES V In-water/Overwater Structures Programmatic Agreement.

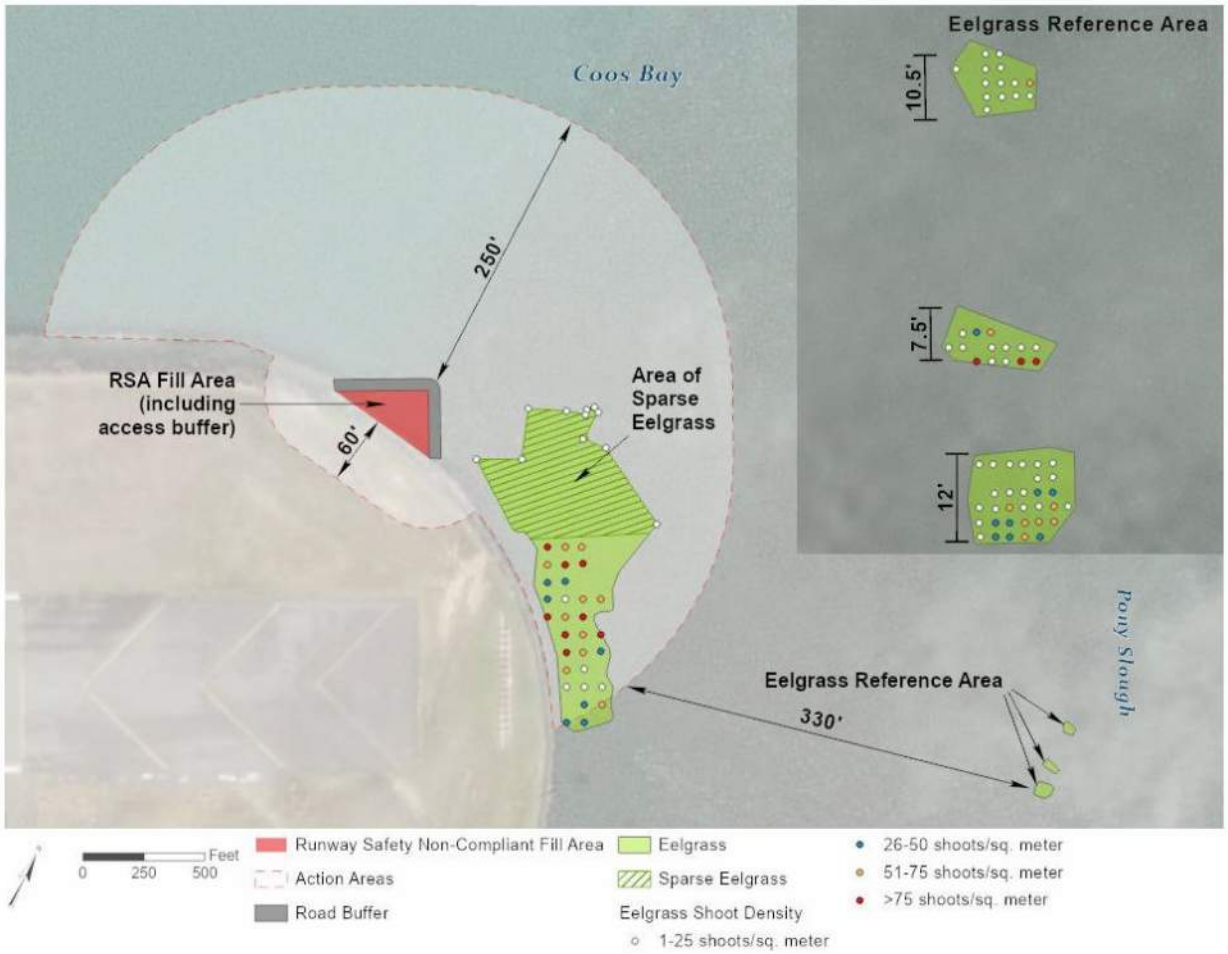


Figure 4: Eelgrass Density Adjacent to RSA Fill Area

5. Easements or Encumbrances

No easements or encumbrances are known to exist. The project site is within tidal water and managed by the Oregon Department of State Lands.

6. Baseline Information

OTH is a triangular-shaped property that is surrounded on multiple sides by the Coos Bay Estuary. The northwest side of the property is surrounded predominantly by the open water of the Coos Bay estuary. The east boundary of OTH is defined by Pony Slough and its estuarine intertidal wetland system.

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. It ranges from 0.5 mile to 1.5 miles wide, is 15 miles long, and has approximately 30 tributaries. The Coos River is the major tributary flowing into Coos Bay and is an important shipping channel. Pony Slough is identified as an estuarine intertidal wetland system (E2USN) by the USFWS National Wetland Inventory (NWI). Freshwater is supplied into the slough by Pony Creek, a perennial stream.

Three federally listed anadromous fish species spend a portion of their lifecycle within the estuarine environment of Coos Bay. Oregon Coast Coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) Green sturgeon (*Acipenser medirostris*), and southern DPS Pacific eulachon (*Thaleichthys pacificus*), were each federally listed as threatened under the Endangered Species Act (ESA). Use of the Coos Bay system by Pacific eulachon and Green sturgeon is sporadic; however, migrating habitat exists for Coho salmon in the RSA Fill Action Area and Coos Bay is considered Critical Habitat for Coho salmon.

Pony Slough has been designated EFH and a Habitat Area of Particular Concern (HAPC) for Coho salmon. EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." A HAPC is a subset of EFH that is rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts.

Estuarine areas are crucial for juvenile salmonids given their multiple functions as areas for rearing/feeding, freshwater-saltwater acclimation, and migration. Nearshore areas also provide important habitat for rearing/feeding and migrating salmonids.[6] Eelgrass supports aquatic organisms, including salmon, by providing food, refuge from predation, and nursery areas. The integrity of nearshore ecosystems where juvenile salmon reside and the capacity of these habitats to provide prey can thus influence overall salmon returns.[7]

Oyster reefs create important habitat for hundreds of other marine species and filter and clean the surrounding water. Species like mussels, barnacles, and sea anemones settle on them, creating abundant food sources for commercially valuable fish species. Oyster reefs provide habitat to forage fish, invertebrates, and other shellfish. Approximately 1 mile away from the project site at the western portion of the airport, significant cockle, shrimp, and bivalve habitat exists in Coos Bay.[8]

Seagrass beds known as eelgrass (*Zostera spp.*) are a major habitat component of Coos Bay and Pony Slough. Vegetated shallows that support eelgrass are considered special aquatic sites under the 404(b)(1) guidelines of the CWA (40 CFR § 230.43). Two eelgrass species are known to be present in this ecoregion, the native *Z. marina,* and the non-native *Z. japonica. Z. japonica* was first reported in 1957 in Willapa Bay, Washington, and is thought to have been introduced in the early twentieth century along with oyster stock imported from Japan (Shafer, Kaldy, and Gaeckle 2014).

Both eelgrass species contribute to ecosystem functions at multiple levels: as primary and secondary

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[6] Final Assessment of NOAA Fisheries' Critical Habitat Analytical Review Team (CHART) for the Oregon Coast Coho Salmon Evolutionarily Significant Unit. Accessed February 2020

[7] Eelgrass as Valuable Nearshore Foraging Habitat for Juvenile Pacific Salmon in the Early Marine Period. Accessed February 2020. (https://afspubs.onlinelibrary.wiley.com/doi/pdf/10.1002/mcf2.10018)

[8] https://www.dfw.state.or.us/mrp/shellfish/docs/SEACOR%20environmental%20all.pdf

producers, as habitat structuring elements, as a substrate for epiphytes and epifauna, and as sediment stabilizers and nutrient cycling facilitators. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish such as the Pacific herring. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help ameliorate the effects of ocean acidification.

Creosote has been used as a wood preservative for more than a century to treat telephone poles, railroad ties, piers, docks, and floats. Thousands of derelict creosote pilings remain in Oregon coastal waters. Many eventually break up and distribute tons of debris onto beaches throughout the Sound. Creosote comprises more than 300 chemicals that, together, are very effective at achieving their intended purpose of preventing decay or insect infestation.

But chemicals in treated wood—such as those on beaches or old dock pilings—can be harmful and even toxic to marine species. Polycyclic aromatic hydrocarbons (PAHs) are the chemicals of most concern. When exposed to ultraviolet light or sunshine, the chemicals in creosote become more toxic and are more likely to leach from the wood. A piling that contains creosote can leach throughout its lifetime. Studies show that herring eggs exposed to creosote have a high mortality rate. PAHs are known to increase disease and alter growth and reproductive function in English sole. These chemicals affect juvenile salmonids that migrate through contaminated estuaries by reducing their growth and altering immune function.[9]

7. Mitigation Work Plan

All work will take place during the OR DEQ designated in-water work window (IWWW) of October 1 – February 15, the period during which ESA-listed species are least likely to be present within the vicinity of the project area. The proposed project will require approximately four to eight weeks of in-water/overwater work. Construction crews and equipment will access the project site from the shoreline and from a floating barge. The existing dock and pier (approximately 8,000 square feet total) and 118 pilings will be removed with a crane and/or excavator operating from a floating barge. Removal of any sections of sunken dock and/or pier will occur at low tide so workers can locate and remove the debris without causing turbidity. The 118 existing pilings will be dislodged with a vibratory hammer and slowly lifted from the sediment and placed into a contained area for appropriate upland disposal. No dredging or excavation will be required.

Piling and other structure removal includes untreated and chemically treated wood pilings, piers, boat docks and potentially other structures comprised of plastic, concrete, and other materials. Piling and other structure removal from waterways will improve water quality by eliminating chronic sources of toxic contamination and associated impacts to riparian dependent species. Pilings and other structures occur in estuaries, lakes, and rivers and are typically used in association with boat docks and other facilities.

[9] Washington Department of Natural Resources Derelict Creosote Piling Removal Best Management Practices For Pile Removal & Disposal https://www.dnr.wa.gov/publications/aqr_rest_creosote_bmps_pilings.pdf?w8th9

Equipment such as boats, barges, excavators, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

When removing an intact pile:

- Install a floating surface boom to capture floating surface debris.
- To the extent possible, keep all equipment (e.g., bucket, steel cable, vibratory hammer) out of the water, grip piles above the waterline, and complete all work during low water and low current conditions.
- Dislodge the piling with a vibratory hammer, whenever feasible. Never intentionally break a pile by twisting or bending.
- Slowly lift piles from the sediment and through the water column.
- Place chemically treated piles in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment. A containment basin for the removed piles and any adhering sediment may be constructed of durable plastic sheeting with sidewalls supported by hay bales or another support structure to contain all sediment.
- Fill the holes left by each piling with clean, native sediments located from the project area.
- Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.

When removing a broken pile:

- If a pile breaks above the surface of uncontaminated sediment, or less than 2 feet below the surface, every attempt short of excavation will be made to remove it entirely. If the pile cannot be removed without excavation, excavate sediments, and saw the stump off at least 3 feet below the surface of the sediment.
- If a pile breaks above contaminated sediment, saw the stump off at the sediment line: if a pile breaks within contaminated sediment, make no further effort to remove it and cover the hole with a cap of clean substrate appropriate for the site.
- If dredging is likely in the area of piling removal, use a global positioning device (GPS) to note the location of all broken piles for future use in site debris characterization.[10]

Measures to Minimize Impacts: The following conservation measures have been incorporated into the proposed project design and construction methods to minimize and avoid potential adverse effects to ESA- listed fish species, their designated Critical Habitat elements, and Essential Fish Habitat:

- All work conducted below the Highest Median Tide (HMT) will occur during the OR DEQ-preferred IWWW for the Coos River estuary (October 1 – February 15), a period when ESA-listed species are

[10] Removal of Creosote-Treated Pilings and Structures from San Francisco Bay-Environmental Assessment https://www.sfei.org/sites/default/files/biblio_files/ReportNo605_Creosote_Dec2010_finalJan13.pdf

less likely to be present within the vicinity of the project area.

- All heavy equipment (i.e., crane) will access the project site via existing piers and/or floating barges.
- All pilings will be removed with a vibratory hammer. During piling removal, the following criteria will be implemented to minimize creosote release, sediment disturbance and sediment resuspension:
  - Install a floating surface boom to capture floating surface debris.
  - Consider the best tidal condition for piling removal, try to remove in-the-dry.
  - Keep all equipment (e.g., bucket, cable, vibratory hammer) out of the water, grip piles above the waterline, and complete work during low water and low current conditions.
  - Dislodge piling with a vibratory hammer, when possible; never intentionally break a pile.
  - "Wake" the piling by vibrating to break the friction bond between the piling and sediment.
  - Slowly lift the pile from the sediment and through the water column.
  - Place the pile in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment.
  - Fill the holes left by each piling with clean, native sediments immediately upon removal.
  - Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.
- When a pile breaks or is intractable during removal, removal will continue as follows:
  - Every attempt short of excavation will be made to remove each piling, if a pile in uncontaminated sediment is intractable, breaks above the surface, or breaks below the surface, cut the pile or stump off at least 3 feet below the surface of the sediment.
- The following conditions will apply when removing preservative-treated wood:
  - To the extent possible, ensure no wood debris falls into the water. If wood debris does fall into the water, remove it immediately.
  - Wood debris will be placed in an appropriate dry storage site until removed from the site.
  - Wood construction debris will not be left in the water or stacked on the bank or below HMT.
  - Wood debris removed during the project will be evaluated to ensure proper disposal.
- The contractor will initiate daily "soft-start" procedures to provide a warning and/or give species near piling removal and installation activities a chance to leave the area prior to a vibratory hammer or impact driver operating at full capacity; thereby, exposing fewer species to loud underwater and airborne sounds.
  - A soft start procedure will be used at the beginning of in-water piling removal and installation, or any time piling removal/installation has ceased for more than 30 minutes.
  - For vibratory hammer operation, the contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.
  - For impact pile driving (if necessary), the contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two

subsequent sets. (The reduced energy of an individual hammer cannot be quantified given the variations between individual drivers. In addition, the number of strikes will vary at reduced energy given that raising the hammer at less than full power and then releasing it results in the hammer bouncing as it strikes the pile, resulting in multiple strikes).

- A Pollution Control Plan (PCP) will be prepared by the contractor and carried out commensurate with the scope of the project that includes the following:
  - Best management practices to confine, remove, and dispose of construction waste.
  - Procedures to contain and control a spill of any hazardous material.
- All conditions of Oregon Department of Environmental Quality's (ODEQ's) 401 Water Quality Certification will be followed.
- All equipment will be inspected daily for fluid leaks. Any leaks detected will be repaired before operation is resumed. Stationary power equipment (i.e., cranes) operated within 150 feet of the river will be diapered to prevent leaks.
- All new pilings will be fitted with devices to prevent perching by piscivorous birds.
- All floatation material will be permanently encapsulated to prevent dispersal into the water.
- Replacement overwater piers and floats will be grated to allow for 50 percent light penetration.
- The proposed project will result in a net reduction of approximately 7 square feet of existing overwater area and will result in a net reduction of in-water pilings.

Oyster bed seeding will occur post removal of the coffer dam and rip-rap installation. The site must also have a minimum water depth of one foot, even during extreme low-tide conditions. Oysters will die if they become smothered in silt or freeze out of the water, but they will not die if they freeze in the water. Whole oyster shells will be used.

8. Determination of Credits

The construction of the RSA bulkhead is unavoidable and presents the lowest possible impact to EFH and ESA-listed critical habitat. Mitigation of the creosote contamination in Pony Slough proposes over a 2:1 ratio. The project has a high likelihood of success and provides a much higher functioning estuarine habitat in Pony Slough than the impact site. Since the likelihood of success is greater and the impacts to potentially valuable migration corridors are reduced during construction, aquatic resource restoration is the best option for permittee-responsible mitigation.

9. Monitoring Plan

Based on the potential for in-water impacts to EFH adjacent to Runway 5/23 during construction, additional BMPs will be put in place to monitor water quality. The construction schedule will be timed to adhere to OR DEQ in-water work windows for the Coos River (October 1 – February 15) and tidal outflows. Sediment outflow filters will be utilized during dewatering to minimize turbidity in Coos Bay.

A 2-year post-construction monitoring plan for eelgrass presence/absence (within 100 feet in deeper habitat) and density (>100 feet in shallow habitat) will be compared with an adjacent control site to monitor potential impacts of the project on EFH. See the attached Biological Assessment for more details on monitoring protocol for eelgrass.

Additionally, a year one visual monitoring report will be sent to the USACE to ensure that the piles have been removed and that the clam bed reseeding has occurred. This report will be sent to:

Tyler Krug
Regulatory Project Manager | USACE Portland District | North Bend Field Office
2201 Broadway Suite C | North Bend, Oregon 97459
Office: 541.756.2097 |Mobile: 541.520.6278 |E-mail: Tyler.J.Krug@usace.army.mil

10. Site Protection Instrument

The project site is within tidal waters owned by the Coos County Airport District and will be protected by a deed restriction over the 8000 acres at both pile removal sites.

11. Performance Standards / Monitoring Requirements

According to the 2020 Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Southwest Oregon Regional Airport Runway Safety Area Improvements, North Bend, Oregon, the following monitoring requirements will be implemented:

- To implement reasonable and prudent measure #1 (suspended sediment), FAA, the Corps, and the Airport shall ensure:
  - Suspended sediment monitoring occurs hourly during installation and removal of the cofferdam.
  - Suspended sediment monitoring occurs daily for the duration of time the cofferdam is in place.
- To implement reasonable and prudent measure #2 (stormwater), FAA, the Corps, and the Airport shall ensure the Airport drafts and implements a stormwater facility inspection and maintenance plan that includes:
  - Inspection. Each part of the proposed stormwater system must be inspected:
    a. For the first three years:
       1. At least quarterly; and,
       2. At least three times per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.
    b. After three years:
       1. At least twice a year thereafter; and,
       2. At least once per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.

- <u>Maintenance</u>. Maintenance will bring the system back to original design specifications within 7 days of any of the following occurring:
  a. Stormwater does not drain out of the biofiltration swales within 24-hours after rainfall ends.
  b. Any structural component, including inlets and outlets, do not freely convey stormwater.
  c. Desirable vegetation in the biofiltration swales does not cover at least 90% of the facility any time after 3 years – excluding dead or stressed vegetation, dry grass or other plants, and weeds.

- To implement reasonable and prudent measure #3 (monitoring and reporting), FAA, the Corps, and the Airport shall ensure the Airport completes the following monitoring and reporting:
  - A project completion report within 60-days of completing construction, including:
    a. Project name
    b. Airport contact person
    c. FAA contact person
    d. Construction completion date
    e. As-built drawings of all project components
    f. Results of the suspended sediment monitoring from T&C #1
    g. Square footage of fill installed for the bulkhead
    h. Photos of the mitigation areas (including date of photograph, GPS site location of photo point, name of photographer, and other relevant information)
  - Annual reports of the stormwater facility inspection and maintenance plan after the first three full years following construction, including the following information:
    a. Name of person completing each inspection
    b. Date of each inspection
    c. Findings of each inspection
    d. Description of any structural repairs, maintenance, or facility cleanout, e.g., sediment and oil removal and disposal, vegetation management, erosion control, structural repairs or seals, ponding water, pests, trash, or debris removal
    e. An estimate of the percent cover of healthy vegetation in the swales, including a description of any corrective action needed to ensure 90% coverage within three years
  - Each of the above reports and/or plans must be submitted annually to NMFS at the following address, no later than September 30:

National Marine Fisheries Service
Attn: WCRO-2019-03422
2900 NW Stewart Parkway
Roseburg, Oregon 97471

Due to the avoidance and minimization measures described previously, this project is not likely to adversely affect EFH (eelgrass). However, a 2-year monitoring plan will be implemented in order to assess the potential for indirect effects to eelgrass as a result of project construction. To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent monitoring surveys will be conducted at a similar time during the growing season (e.g. June - early July) and using the same methodology as the baseline surveys conducted in June 2019. Analysis of the monitoring data will

focus on detecting changes in the location of the eelgrass bed boundary, total areal coverage of eelgrass within a 250-foot radius of the project footprint, and changes in eelgrass shoot density.

Baseline surveys were conducted in June 2019 to delineate and characterize eelgrass beds in the vicinity of the proposed Action Area. June 3 and 4, 2019 were identified as appropriate sampling dates for the survey based on a strong minus morning low tide to maximize dewatering of the bay and resultant exposure of Z. marina. The survey team identified and delineated the boundaries and spatial distribution of the eelgrass beds in accordance with the protocols outlined in the document US Army Corps of Engineers Seattle District (2018), using the eelgrass bed edge definition described in NOAA Fisheries Western Region (2014).

To remain consistent with the 2019 baseline survey, monitoring surveys will consider eelgrass beds continuous if any eelgrass is within a one square meter quadrat and within one meter of another shoot. In areas where there are too few native eelgrass shoots to meet the bed thresholds described above, the survey map will indicate that widely scattered or sparse eelgrass shoots are present in the area, with no discernable beds. Within each bed, eelgrass shoot density will be measured using a series of ¼ square meter plots arranged in a regularly spaced grid. The positions of the survey points will be shown on GIS mapping. Data values will be converted to numbers of eelgrass shoots per square meter. Baseline surveys were also conducted in a reference area for use in interpreting the results of subsequent eelgrass monitoring surveys.

12. Maintenance/Long-term/Adaptive Management Plan

Creosote removal has proven to have such a high success rate for water quality restoration that the Washington Department of Natural Resources has removed 21,300 tons from the Puget Sound area in the last 15 years. Once conditions improve, eelgrass will naturally colonize the site and ongoing maintenance will not be necessary. Similarly, oyster seeding only requires an initial application, with no maintenance necessary. The proposed mitigation will not require maintenance nor long-term planning.

13. Financial Assurances

As a small primary, reliever, and general aviation airport, FAA Airport Improvement Project (AIP) grants cover a range of 90-95 percent of eligible costs, based on statutory requirements. The funding for this project is currently part of the 2021 AIP funding cycle, which includes mitigation as part of the construction of the RSA fill bulkhead.

Table 2-3 Impact Overview Evaluation

Category	Criterion	**Alternative 1** (No Action)	**Alternative 2** (Shorten Runway 5/23)	**Alternative 3** (Shift Runway 5/23 south)	**Alternative 4** (Shift Runway 5/23 west)	**Alternative 5** (Installing EMAS on Runway 5 departure end)	**Alternative 6** (Preferred Alternative - Install Runway 5/23 Safety Area Bulkhead)
Impacts	**Cultural Sensitivity**	N/A	Low	Low	Low	Medium	Low
	Impacts to Sensitive Species	N/A	No	Yes- essential salmon habitat and clamming beds	Yes- clamming beds	Yes-clamming beds	No
	Impacts to Wetlands and Other Waters of the U.S.	N/A	No	Yes- Estuarine, Intertidal, Unconsolidated shore, Regularly flooded	Yes- Estuarine, Intertidal, Unconsolidated shore, Regularly flooded	Yes- Estuarine, Intertidal, Unconsolidated shore, Regularly flooded	Yes- Estuarine, Intertidal, Unconsolidated shore, Regularly flooded
	In-Water Work	N/A	Low (None)	High **	High**	Low**	Low (0.5 acres)
	Highly Controversial on Environmental Grounds	N/A	Low	High	High	Medium	Low
	Mitigation for Environmental Impact	N/A	Low	High	High	Medium	Low
	Costs (Low, Medium, High) *	N/A	$ 1,087,500	$ 38,587,500	$ 30,480,000	$ 9,836,535	$ 3,450,000

It should be noted that impacts with Alternative 6 have been refined and in most cases, greatly reduced, after selection of the preferred alternative.

*Cost Assumptions based on previous experience with similar airports. May require further investigation.
** Requires engineering estimates

BIOLOGICAL ASSESSMENT
Southwest Oregon Regional Airport Runway Safety Area Improvements
(Coos County, Oregon)
HUC 17100304

Prepared for the Port of Coos Bay
Prepared by Aaron Killgore, Biologist
Mead & Hunt
10/10/2019

Likely to Adversely Affect
Biological Assessment
Southwest Oregon Regional Airport Runway Safety Area Improvements
(Coos County, Oregon)

1. INTRODUCTION

This Biological Assessment (BA) has been prepared to address the effects of potential impacts on fish and wildlife species associated with proposed projects for Runway Safety Area Improvements at Southwest Oregon Regional Airport (OTH or Airport). This document also addresses the potential effects of the proposed project on designated or proposed Critical Habitat and on Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation Act (MSA). Due to the federal funding associated with the proposed actions, and that the proposed project will require a U.S. Army Corp of Engineers (Corps) permit under Section 10 of the Rivers and Harbors Act and Section 404 of the federal Clean Water Act (CWA), this federal nexus requires a BA.

The United States Endangered Species Act (ESA) of 1973 serves to administer permits, implement recovery plans, and monitor federally protected threatened and endangered species. The ESA is administered and regulated by the US Fish and Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration (NOAA)-National Marine Fisheries Service (NMFS). The State of Oregon also regulates species with a distinct state ESA of 1987, which limits jurisdiction to state-owned, leased, or easement land. Species listed as threatened and endangered by the Oregon State ESA are not subject to federal Section 7 jurisdiction.

This BA was prepared pursuant to Section 7(c) of the ESA by Mead and Hunt, Inc. for OTH, on behalf of the Port of Coos Bay (the Port), to facilitate the Corps' compliance with Section 7(a)(2) of the ESA, as amended. Section 7(a)(2) ensures that through consultation (or conferencing for proposed species) with the NMFS and USFWS, federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species or result in the destruction or adverse modification of designated or proposed Critical Habitat.

1.1 Purpose and need

The purpose of the proposed action is to improve deficiencies in safety-related infrastructure at the Airport to meet Federal Aviation Administration (FAA) compliance. In addition to addressing safety compliance, the purpose of this project is to update aging Airport infrastructure (medium intensity approach lighting system with runway alignment indicator lights (MALSR) unit and apron repavement).

The proposed action will address objectives outlined in the Master Plan Update (2013). The Master Plan is available through the Coos County Airport District website[1]. The project supports these objectives by allowing the Airport to continue operations while carrying out safety improvements and infrastructure updates identified through the Master Plan process, which includes:

- Meet FAA safety standards at the northwest end of the Runway 4/22 Runway Safety Area (RSA).
- Relocate taxiway connectors to enhance safety.

[1] https://cooscountyairportdistrict.com/coos-county-aiport-district-master-plan/

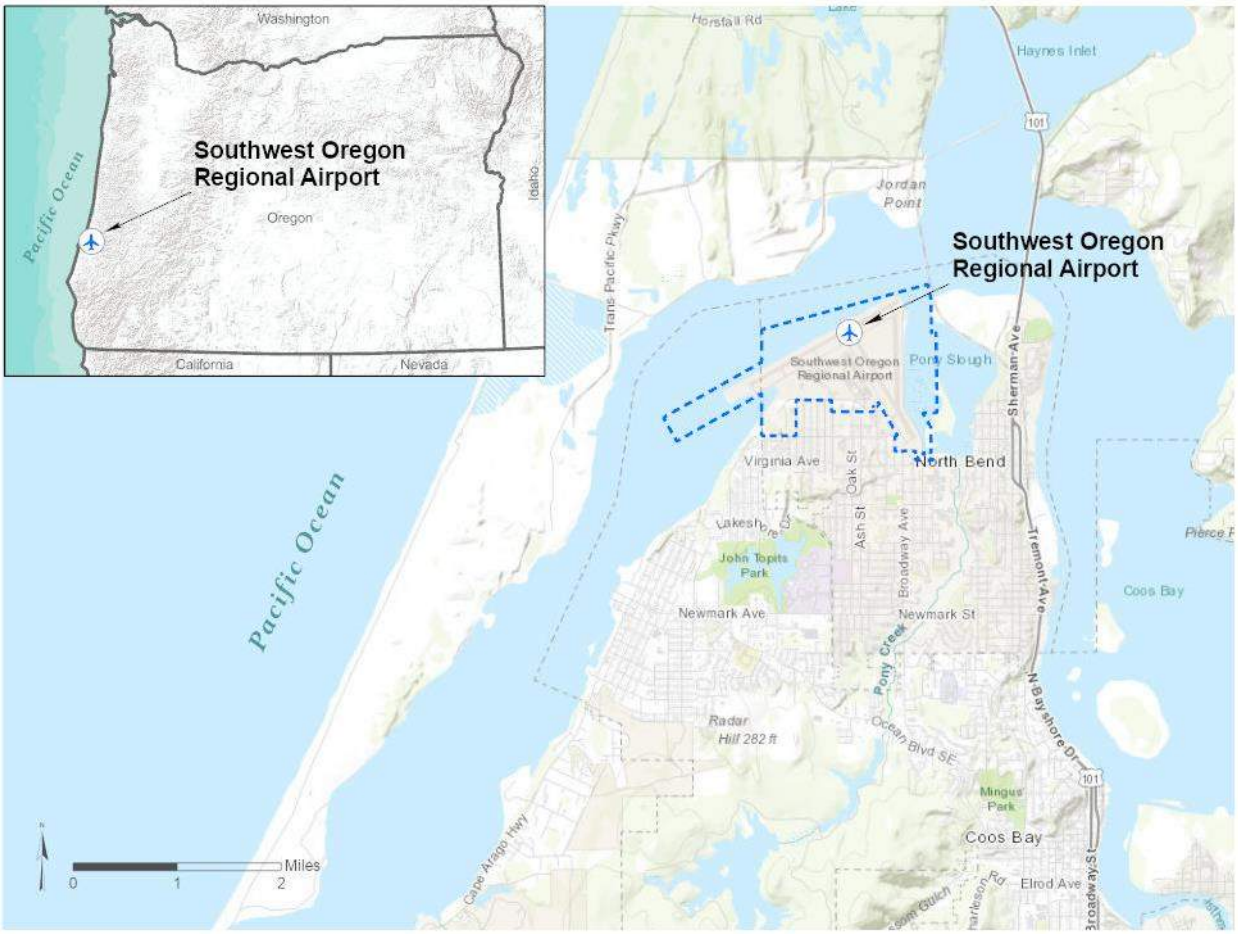
- Reconstruct the main general aviation apron pavement.
- Install maintenance improvements to the MALSR.
- Relocate the glide slope 150 feet from center of Runway 4/22 to meet minimum safety distance requirements.

Failure to meet FAA safety regulations would lead to de-certification of the Airport by the FAA, which could jeopardize continued commercial passenger and cargo service to North Bend. This would have a significant impact on the economy of the Coos Bay - North Bend area, and the wider southern Oregon coast region.

2. PROJECT BACKGROUND

The Airport is a commercial service airport located on the southern coast of Oregon within the City of North Bend, in Coos County, Oregon (**Figure 1: Southwest Oregon Regional Airport Location Map**). The proposed project is located in Township 25 South, Range 13 West, Section 9 and is split between two United States Geologic Survey (USGS) 7.5-minute topographic quadrangle maps (1971 North Bend, OR and 1970 Empire, OR). The Airport is 1.5 miles northwest of the city center of North Bend, Oregon, and 3.5 miles northwest of the city of Coos Bay, Oregon. The Airport is located in hydrologic unit number 17100304.

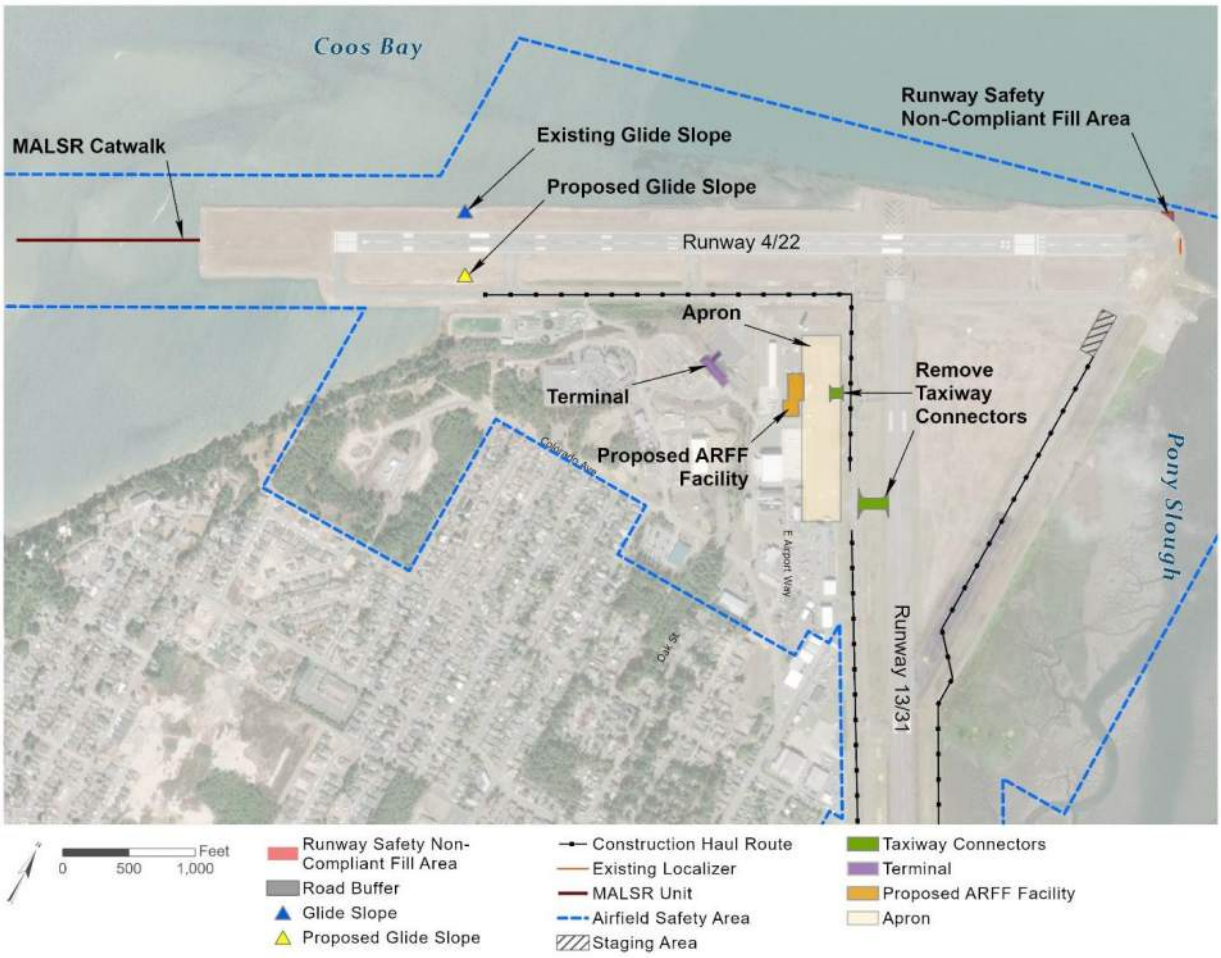
Figure 1: Southwest Oregon Regional Airport Location Map



As the only commercial airline service currently on the Oregon coast, OTH serves as a general aviation (GA) airport with two runways, parallel taxiways, a terminal building, hangars, an Aircraft Rescue and Firefighting (ARFF) facility, and a GA apron for aircraft parking. The Airport's operational area, called the Airport Safety Area (**Figure 2: Action Areas Overview**), includes airfield land and an extended object free area over the adjacent waterways. The primary runway, designated as Runway 4/22, is 5,980 feet long and 150 feet wide. The parallel taxiway serving Runway 4/22 (Taxiway C) is 50 feet wide and has several connector taxiways between the apron, hangars, and runway. Coos Aviation, a fixed-base operator (FBO) located at the Airport, provides 11,250 square feet of maintenance space, ground handling equipment, fuel trucks, fuel storage, etc. The design aircraft for OTH is C-III, which is defined as aircraft with wingspans between 79 and 117 feet and tail heights between 30 and 45 feet. The Airport currently has 45 based aircraft. The five proposed projects are located throughout the Airport (**Figure 2: Action Areas Overview**) and include:

- Installation of a bulkhead at the northeast end of the Runway 4/22 to address RSA compliance.
- Reconstruction of the main GA apron pavement and relocation of the taxiway connectors.
- Relocation and reconstruction of the Aircraft Rescue and Firefighting (ARFF) facility according to FAA standards
- Installation of maintenance improvements to the MALSR catwalk.
- Relocation of glide slope tower to 150 feet south of the Runway 4/22 centerline.

Figure 2: Action Areas Overview



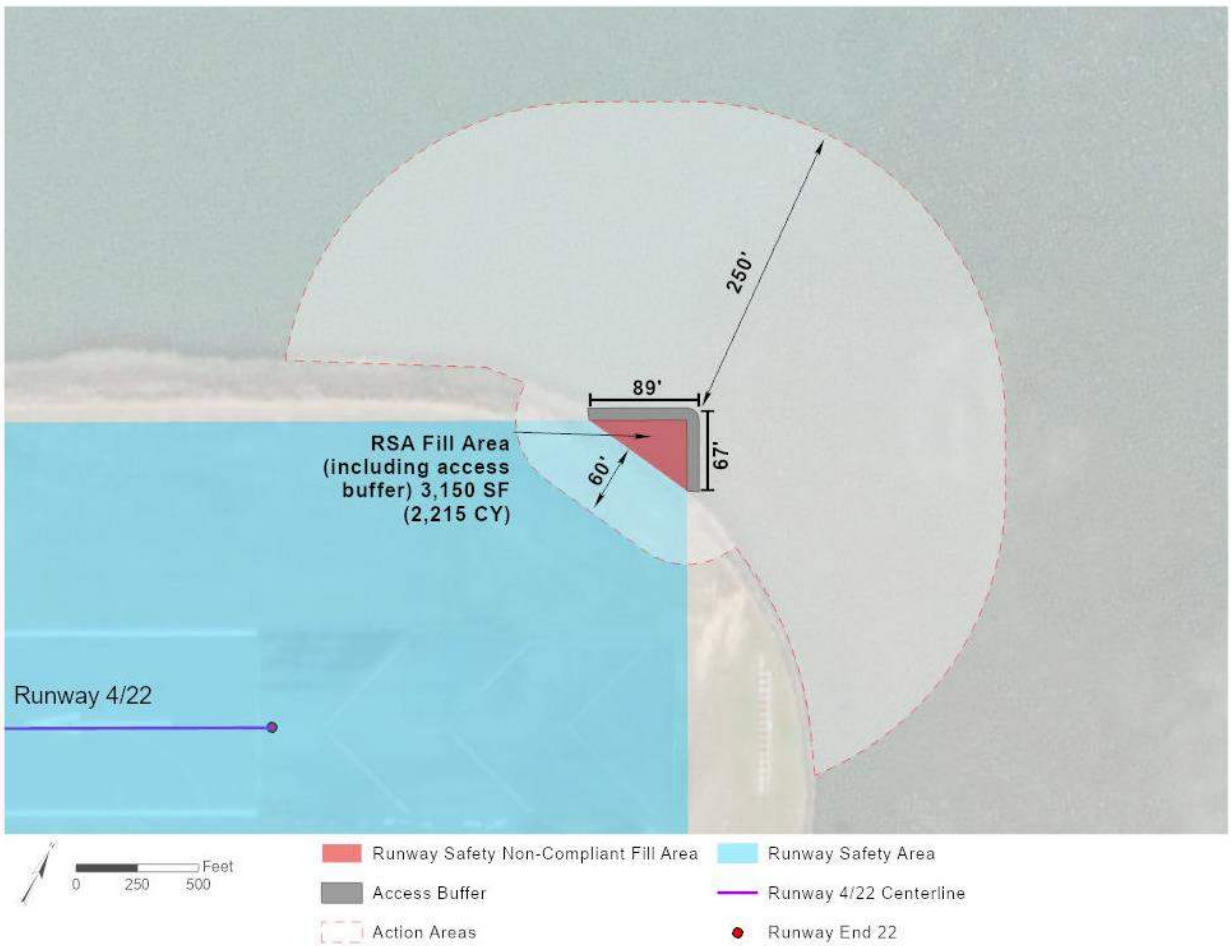
The Port is proposing to fill a 2,215-cubic-yard bulkhead to comply with FAA runway safety requirements (**Figure 3: RSA Fill Area**). All work conducted below the highest measured tide (HMT) of the Coos River will occur between October 1 and February 15 in compliance with the Oregon Department of Fish and Wildlife (ODFW) preferred in-water work window (IWWW) for Coos River.

Construction crews and equipment will access the project site via existing Airport roadways, embankments, and floating barges. Fill activities will be conducted using an excavator and/or hydraulic suction dredge operated from a floating barge, in accordance with Oregon Fill-Removal Law (ORS 196.795-990).

2.1 Action Areas

For the purposes of this analysis, the project action area includes all areas of the Airport and the Coos Bay estuary directly or indirectly affected by the proposed project (**Figure 2: Action Areas Overview**). The action area is not limited to the project footprint exclusively; it includes all areas that could experience temporary effects, for example downstream water quality due to construction turbidity. As such, based on the proposed project activities, conservation measures, and existing site conditions, the project action area includes an in-water construction buffer of 250 feet for proposed fill work on a 89-foot by 67-foot triangular fill area, comprised of the mandatory RSA (red) and a 10-foot road buffer (grey) for emergency vehicle access (see **Figure 3: RSA Fill Area**). There is an additional 60-foot action area on land for vehicle support and construction staging.

Figure 3: RSA Fill Area



The in-water extent of the action area beyond the project footprint is based on the potential for minor, temporary increased downstream turbidity and sedimentation. Due to the relative size of the Coos River and proposed timing of in-water work (October 1 – February 15), it is expected that any concentration of turbidity will not result in adverse effects. Initial in-water work (coffer dam installation) will be timed with the outflow of tides, to minimize possible impacts on adjacent eelgrass beds. Dewatering of the construction site will be conducted through an outflow sediment filter.

Within the OTH property there are five action areas, each with different construction methods and potential impacts. For analysis under the ESA, the action areas are defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 Code of Federal Regulations [CFR] § 402.02). This includes all areas to be affected due to impacts from fill, construction and staging areas, and related haul roads. The five action areas and their buffers (MALSR-25 feet, Glide Slope-100 feet, Apron/Connectors/ARFF-100 feet, RSA-250 feet) total approximately 32 acres and are summarized below in **Table 1**.

Table 1: Action Areas and Impacts Summary

Project	Direct impact type	Quantity	Indirect impact type	Action Area
MALSR catwalk	None	None	None	1.62 acres[1]
Glide Slope System	None	None	Stormwater Re-design	2.98 acres
Runway Safety Area	Fill into Coos Bay	2,215 cubic yards	Critical Habitat adverse modification	0.07 acres
Apron/Connectors	None	None	None	22.5 acres
ARRF Facility	None	None	New impervious surfaces	0.3 acres

[1]*MALSR* unit maintenance improvements are above water, on catwalk. No proposed in-water work.

2.2 Conservation Measures

Appropriate conservation measures have been incorporated into the proposed project design to minimize and avoid adverse effects to ESA-listed species, their designated Critical Habitat elements, and EFH. These measures will include the following:

- All work conducted below the HMT of the Coos River will occur during the permitted period for the Coos River estuary (October 1 – February 15). During this time ESA-listed species are less likely to be present within the project action area.
- All heavy equipment (i.e., cranes) will access the project site via existing roadways and/or floating barges.
- In-water work will be timed so that tides will be flowing out of Pony Slough, reducing the potential for sedimentation on adjacent eelgrass beds.
- A Pollution Control Plan (PCP) that includes the following will be prepared by the Contractor and carried out commensurate with the scope of the project:
    - Best management practices to confine, remove, and dispose of construction waste.
    - Procedures to contain and control a spill of any hazardous material.
- All conditions of Oregon Department of Environmental Quality’s (ODEQ) 401 Water Quality Certification will be followed.
- All equipment will be inspected daily for fluid leaks; any leaks detected will be repaired before operation resumes.
- Stationary power equipment operated within 150 feet of the Coos River will be diapered to prevent leaks.

3. NATURAL HISTORY AND SPECIES OCCURRENCE

3.1 Habitat Summary

OTH is a triangular-shaped property that is surrounded on multiple sides by marine aquatic resources. The northwest side of the property is surrounded predominantly by open water of the Coos Bay estuary; intertidal estuarine wetlands run along the shoreline at the western extent of Runway 4. The east boundary of OTH is defined by Pony Slough and its estuarine intertidal wetland system. The southern boundary of the property is developed and dominated by airport related facilities and infrastructure. The habitat types surrounding OTH are described and discussed in the following paragraphs.

Within the 619 acres of OTH, wildlife habitat in general is minimized due to the danger that air strikes of wildlife pose to airport operations. There are extensive areas of impervious surfaces, structures, infrastructure, and closely cropped/mowed grass monocultures and other vegetation. OTH is surrounded by fences maintained for the purposes of wildlife exclusion. While passerine birds may seasonally nest in Ornamental trees and shrubs, no long-term wildlife habitat occurs or is sustained within the property.

3.2 The Coos Bay Estuary

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. It ranges from 0.5 miles to 1.5 miles wide by 15 miles long and has approximately 30 tributaries. Coos River is the major tributary flowing into Coos Bay and the river is also an important shipping channel. The Port of Coos Bay is a major deep-draft coastal harbor with a 15-mile navigation channel that is adjacent to OTH.

Much of the shoreline and subtidal habitat of Coos Bay consists of unvegetated mud and sand that is mixed with areas of various algae species. Clams and shrimp are also found here with varied abundance and diversity (SEACOR Holdings Inc., 2008). Salinity and other water quality characteristics vary with proximity to the estuary mouth and with the volume of freshwater entering sloughs.

Pony Slough borders the eastern side of the property. It is identified as an estuarine intertidal wetland system (E2USN) by the USFWS National Wetland Inventory (NWI). Freshwater is supplied into the slough by Pony Creek, a perennial stream.

4. ENVIRONMENTAL BASELINE

4.1 Coos Bay

OTH is located along the lower Coos estuary navigation channel. In general, the environmental baseline within the action area has been impacted by urbanization, past industrialization, development, and human activity. The predominant substrate in the basin is mud or sand/mud mixture. This is a high energy area of the river with strong lateral currents and steep banks that limit near-shore shallow habitat suitable for juvenile fish rearing and provide very little habitat complexity. The riverbank at this location is armored with riprap and concrete and contains minimal riparian vegetation. OTH is south of the flowing channel, armored by riprap shorelines, MALSR pilings, and concrete vessel boat launches to the east. River flows in the Coos estuary are subject to twice-daily tidal fluctuations.

The project region is developed land with small areas of coniferous regeneration. An on-site investigation performed in October 2018 found five distinct wetland subclasses within the basin: subtidal channel and basin, intertidal mudflats, low salt marsh (*Carex* dominated), intertidal high salt marsh

(*Juncus/Salicornia/Carex* dominated), and intertidal high brackish marsh (Scirpus dominated). A band of low salt marsh runs around the edge of the subtidal channel. It is dominated by *Carex lyngbyei* (Lyngbye's sedge). There is an area of high intertidal salt marsh in the southeastern comer of the wetland basin. It is dominated by *Juncus balticus* (Baltic rush), with patches of Lyngbye's sedge and *Scirpus maritimus* (seacoast bulrush). Lesser amounts of *Potentilla pacifica* (Pacific silverweed), *Deschampsia cespitosa* (tufted hairgrass), *Plantago maritima* (seaside plantain), and *Grindelia integrifolia* (gumweed) are found in this plant community. Cover by macrophytes in this community is about 80%, the remainder being bare mud substrate. High intertidal sltmarsh also extends in a fringe around the wetland basin in some places. The western side of the basin is characterized as a high brackish marsh dominated by a dense (100% cover) stand of *Scirpus validus* (soft-stem bulrush).

The steeply sloping upland fringe of the basin is dominated by *Salix hookerana* (Hooker willow), *Rubus procerus* (Himalayan blackberry), *Cytisus scoparius* (Scotch broom), *Ceanothus thyrsiflorus* (blueblossom), and *Lonicera involucrata* (twinberry). To the west, there is a densely wooded area dominated by the same species, and in addition some *Pinus contorta* (shore pine) and *Alnus rubra* (red alder). The small channel to the west is overhung by shore pine, Hooker willow, Himalayan blackberry, and *Rubus spectabilis* (salmoriberry). The herbaceous layer is dominated by *Phalaris arundinacea* (reed canarygrass), creating a fringe of wetland along the channel.

Roye (1979) identified much of Pony Slough as habitat for soft-shell clam. *Macoma* spp. clam beds were also mapped as present in Pony Slough, including the project area. However, other important invertebrates, such as gaper clams (*Tresus capax*), cockles (*Clinocardium nuttallii*), butter clams (*Saxidomus giganteus*), and littlenecks (*Protothaca staminea*) were not identified in Pony Slough. Pony Slough tideflats are used by *Corophium spinicorne*, a crustacean important as a prey species for salmonids and other fishes.

4.2 Baseline conditions within the Action area

4.2.1 Essential Fish Habitat (EFH) - Eelgrass

EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Seagrass species found on the west coast of the US include eelgrass species (*Zostera spp*.), widgeongrass (*Ruppia maritima*), and surfgrasses (*Phyllospadix spp*.). These grasses are vascular plants, not seaweeds, forming dense beds of leafy shoots year-round in the lower intertidal and subtidal areas. Given the significance and diversity of the functions and services provided by seagrass, Costanza et al. (1997) determined seagrass ecosystems to be one of Earth's most valuable.

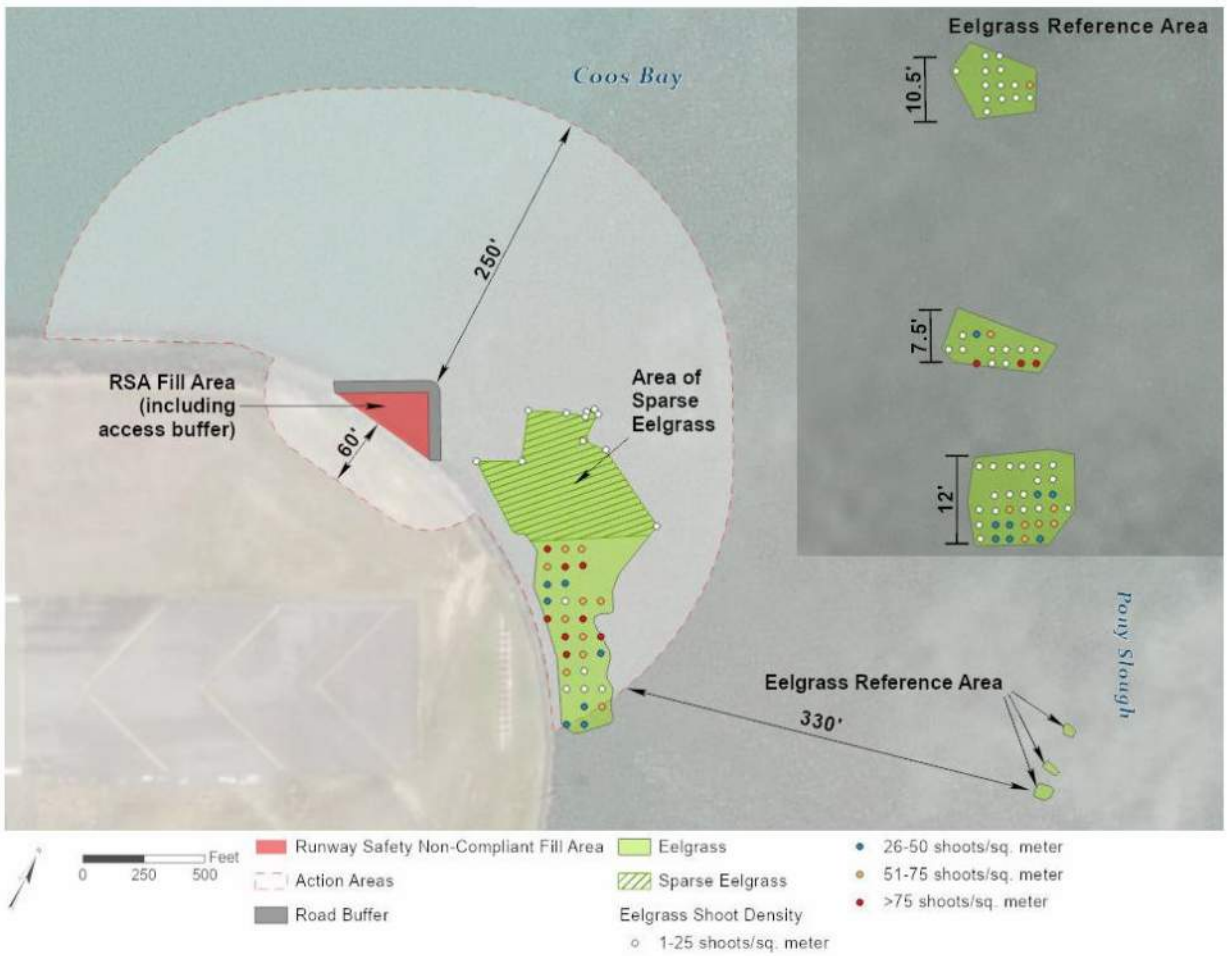
Seagrass beds known as eelgrass (*Zostera* spp.) are a major habitat component of Coos Bay and Pony Slough. Vegetated shallows that support eelgrass are considered special aquatic sites under the 404(b)(1) guidelines of the CWA (40 CFR § 230.43). Two eelgrass species are known to be present in this ecoregion, the native *Z. marina* and the non-native *Z. japonica*. *Z. japonica* was first reported in 1957 in Willapa Bay, Washington, and is thought to have been introduced in the early twentieth century along with oyster stock imported from Japan (Shafer, Kaldy, and Gaeckle 2014).

Both eelgrass species contribute to ecosystem functions at multiple levels: as primary and secondary producers, as habitat structuring elements, as a substrate for epiphytes and epifauna, and as sediment stabilizers and nutrient cycling facilitators. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish such as the Pacific herring. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help ameliorate the effects of ocean acidification.

Eelgrass is an EFH and a Habitat Area of Particular Concern (HAPC). A HAPC is a subset of EFH that is rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts.

Baseline surveys were conducted in June 2019 to delineate and characterize eelgrass beds in the vicinity of the proposed Action Area **(Figure 4: Eelgrass Survey Data).** June 3 and 4, 2019 were identified as appropriate sampling dates for the survey based on a strong minus morning low tide to maximize dewatering of the bay and resultant exposure of *Z. marina.* The survey team identified and delineated the boundaries and spatial distribution of the eelgrass beds in accordance with the protocols outlined in the document US Army Corps of Engineers Seattle District (2018), using the eelgrass bed edge definition described in NOAA Fisheries Western Region (2014).

Figure 4: Eelgrass Survey Data

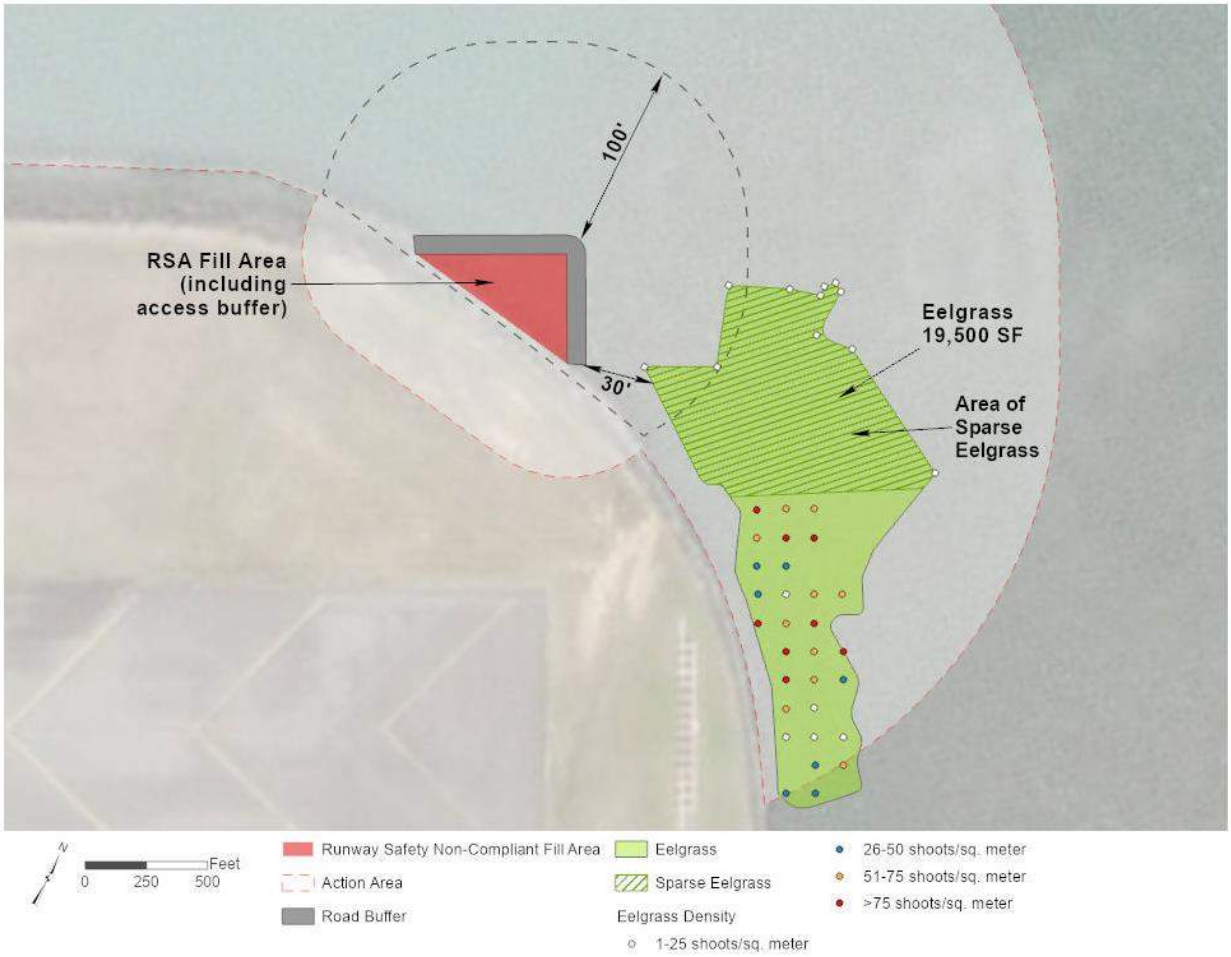


For the purpose of this survey, eelgrass beds were considered continuous if any eelgrass was within a one square meter quadrat and within 1 meter of another shoot. In areas where there are too few native eelgrass shoots to meet the bed thresholds described above, the survey map should indicate that widely scattered or sparse eelgrass shoots are present in the area, with no discernable beds. Within each bed, eelgrass shoot density was measured using a series of ¼ meter² plots arranged in a regularly spaced grid. The positions of the survey points are shown in (**Figure 4: Eelgrass Survey Data**). Data values

were converted to numbers of eelgrass shoots per square meter. Baseline surveys were also conducted in a reference area for use in interpreting the results of subsequent eelgrass monitoring surveys.

The survey results indicated the presence of approximately 19,500-square feet of eelgrass occurring within the 250-foot radius of the project footprint perimeter. The closest eelgrass bed edge was located approximately 30 feet from the proposed bulkhead. (**Figure 5: Eelgrass Presence in RSA Action Area**) The average eelgrass shoot density in the project area was 54 ± 27 shoots/square meter (± = standard deviation, n = 30), with a range of 8 to 112 shoots/square meter. The average eelgrass shoot density in the reference area was 37 ± 30 shoots/square meter (± = standard deviation, n = 39), with a range of 4 to 132 shoots per square meter.

Figure 5: Eelgrass Presence in RSA Action Area



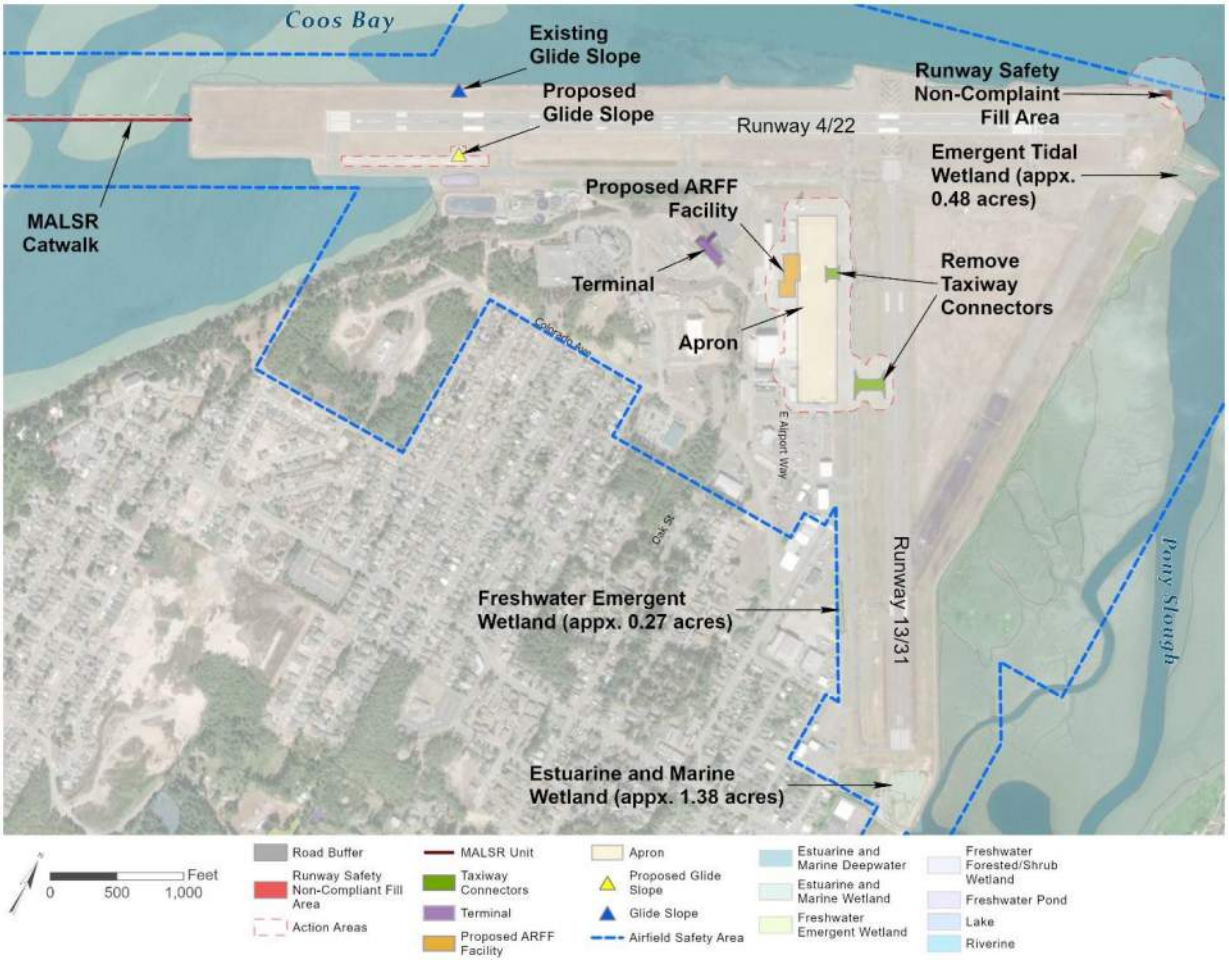
4.2.2 Wetlands

OTH includes an enclosed wetland basin, with a small channel that enters the basin from the west and a small area of tidal marsh and mudflats in the southwestern corner of Pony Slough. The basin, channel, and associated wetlands total approximately 3.88 acres. There are five distinct wetland subclasses within the basin; these subclasses include the subtidal channel and basin, intertidal mudflats, low salt marsh (*Carex* dominated), intertidal high salt marsh (*Juncus/ Salicornia/ Carex* dominated), and intertidal high brackish marsh (*Scirpus* dominated). In addition, a tidally influenced stream channel extends to the west of the basin (**Figure 6: Preferred Alternative - Wetlands**).

According to the USFWS NWI, prior wetland delineations, and a wetland field survey conducted in 2018, there are three non-coastal wetlands located on Airport property, which include:

- One freshwater emergent wetland located between Taxiways A and H (approximately 0.27 acres).
- One estuarine and marine wetland (approximately 1.38 acres) located south of the Runway 31 threshold.
- An emergent tidal wetland (0.48 acres) was identified beyond the southeast portion of the Runway Safety Non-Compliant Fill Action Area. The wetland is located within a sloping alcove, formerly a boat ramp.

Figure 6: Preferred Alternative – Wetlands



4.3 Protected Species

4.3.1 Species/Critical Habitat Considered Threatened and Endangered Species

The following list (**Table 2**) of federally protected (threatened and endangered) species reflects species whose range or Critical Habitat overlap with the project study areas. Information regarding state protected species was generated by the ODFW and was updated on June 11, 2018, and Information, Planning, and Consultation System (IPaC) and Oregon Biodiversity Information Center (OBIC) database searches were performed. **Table 2** includes six threatened and one endangered species, of which only the fish species (Coho Salmon, Eulachon, Green Sturgeon) are potentially present in the RSA Fill Action Area. The bald

eagle (*Haliaeetus leucocephalus*) is no longer protected under the ESA but is afforded protection through the Bald and Golden Eagle Protection Act (BGEPA) of 1940. Species addressed in this section include those on the Federally Listed and Proposed Endangered and Threatened Species, Candidate Species, and Species of Concern list provided by the USFWS. A data search was conducted by the Oregon Natural Heritage Program and the NMFS. Presence potential was determined through contact with ODFW biologists familiar with the area, and field visits.

Federally protected species and their respective habitats are briefly described in the sections that follow.

Table 2: Protected Species That May Occur Within the Study Area

Species	Population	Federal Status	Closest Designated Critical Habitat*	Potential Site Use
Bird Species				
Marbled Murrelet *Brachyramphus marmoratus*	Pacific North West (CA, OR, WA)	Threatened	Coos Bay	Migration and rearing
Northern Spotted Owl *Strix occidentalis caurina*	Coastal Ranges (CA, OR, WA)	Threatened	Coos Bay	Foraging and migrating
Western Snowy Plover *Charadrius nivosus nivosus*	Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico(within 50 miles of Pacific Coast)	Threatened	Coos Bay	Foraging and migrating
Fish Species				
Coho Salmon (Oregon Coast)* *Oncorhynchus kisutch*	Oregon Coast ESU	Threatened	Coos Bay	Migration and rearing
Eulachon *Thaleichthys pacificus*	Southern DPS	Threatened	Umpqua River	Spawning
Green sturgeon* *Acipenser medirostris*	Southern DPS	Threatened	Coos Bay	Spawning
Plant Species				
Western Lily *Lilium occidentale*	Coos Bay	Endangered	Coos Bay	-

* Species is under the jurisdiction of the NMFS

Sources: NMFS 2019; OBIC 2018; USFWS IPaC 2019

4.4 Bird

4.4.1 Bald eagle (*Haliaeetus leucocephalus*) – Bald and Golden Eagle Protection Act

While foraging habitat for the Bald Eagle occurs in and along the bay, no suitable nesting habitat exists in any of the action areas. No nests are known to occur in or near the multiple project areas. No further analysis will be conducted for this species.

4.4.2 Marbled murrelet (*Brachyramphus marmoratus*) – Federally Threatened

The marbled murrelet is a small, brown diving shorebird with a short bill and tail and narrow wings. It spends most of its life in near-shore ocean waters feeding on fish and invertebrates. This species comes inland up to 50 miles to nest in large unfragmented stands of old growth Douglas fir or redwoods. Historically and currently, this species range includes Alaska, California, Oregon, and Washington within the US.

Critical habitat determination was finalized in August 2016 and confirmed on the effective and revised date of November 4, 2011. The current designation includes over 3 million acres of critical habitat in Washington, Oregon, and California. Suitable nesting habitat for this marine bird includes inland mature coniferous forests with trees that have specific branch structure, trunk diameter, and height. The physical characteristics of these northwestern trees and forests typically require 200 to 250 years to attain the attributes necessary to support marbled murrelet nesting (Federal Register 81 FR 51348).

Marbled murrelets typically forage within 3 miles of the ocean shore and in estuarine areas at the mouths of rivers and creeks. Marbled murrelets are known to forage at the mouth of the Coos River; however, known densities are fairly low (less than one bird per square kilometer (Falxa et al. 2008). Given the project location (15 river miles inland) and proposed timing of construction activities (outside the nesting season for marbled murrelets [April 1 – September 15]), it is unlikely that marbled murrelets will be foraging within the action area during proposed in-water work activities. In addition, based on an initial desktop assessment of potential nesting habitat within the vicinity of the proposed project, it was determined that marbled murrelet nesting habitat does not occur within 0.25 mile of proposed construction activities (the farthest distance at which construction activities could potentially disturb nesting murrelets). The nearest marbled murrelet Critical Habitat is approximately 9 miles away. Given that proposed project activities will occur outside of the murrelet nesting season and will not remove nesting habitat, the proposed project will have no effect on this species and further analysis of impact was deemed unnecessary.

For additional information on the general habitat requirement, life history, and limiting factors for recovery of the marbled murrelet, see the Federal Register Notices published on September 28, 1992 (57 FR 45328), and October 5, 2011 (76 FR 61599).

4.4.3 Northern spotted owl (*Strix occidentalis caurina*) - Federally Threatened

The northern spotted owl is a nocturnal, medium-sized, chocolate brown owl with dark eyes set in prominent facial disks, a barred tail, and white spots on the head and breast. The owl inhabits structurally complex forests from southwestern British Columbia through Washington and Oregon to northern California. These forests are characterized as mature (greater than 150 years old) and by multi-layered and dense canopy closure, abundant logs, standing snags, and live trees with broken tops.

The owl was listed as threatened in June 1990, and critical habitat determination was updated in December 2012. In Oregon, approximately 4,557,852 acres of federal lands are designated as critical habitat. The nearest northern spotted owl Critical Habitat is located approximately 10 miles away.

A recovery plan for the owl was issued in 2008 and revised in 2011. Current forest management practices on federal lands stress limited harvesting in old-growth forests and suggest alternate locations for harvest that are not preferred by the northern spotted owl. Barred owl management and removal are also tools being used to assist with recovery of the owl.

Given that proposed project activities will occur outside of the spotted owl nesting season (March 9 – August 19) and will not remove or affect nesting or foraging habitat, the proposed project will have no effect on this species and further analysis of impact was deemed unnecessary.

4.4.4 Western snowy plover (Charadrius nivosus nivosus) - Federally Threatened

The western snowy plover is a small shorebird with pale brown upper parts, dark patches on either side of the upper chest, and dark gray legs. Habitat for the plover includes coastal areas along the west coast from Washington to Mexico on sandy or salty areas without much vegetation. The Pacific coast population is defined as those individuals that nest within 50 miles of the Pacific Ocean on the mainland

coast, peninsulas, offshore islands, bays, estuaries, or rivers of the United States and Baja California, Mexico (58 FR 12864, USFWS 1993).

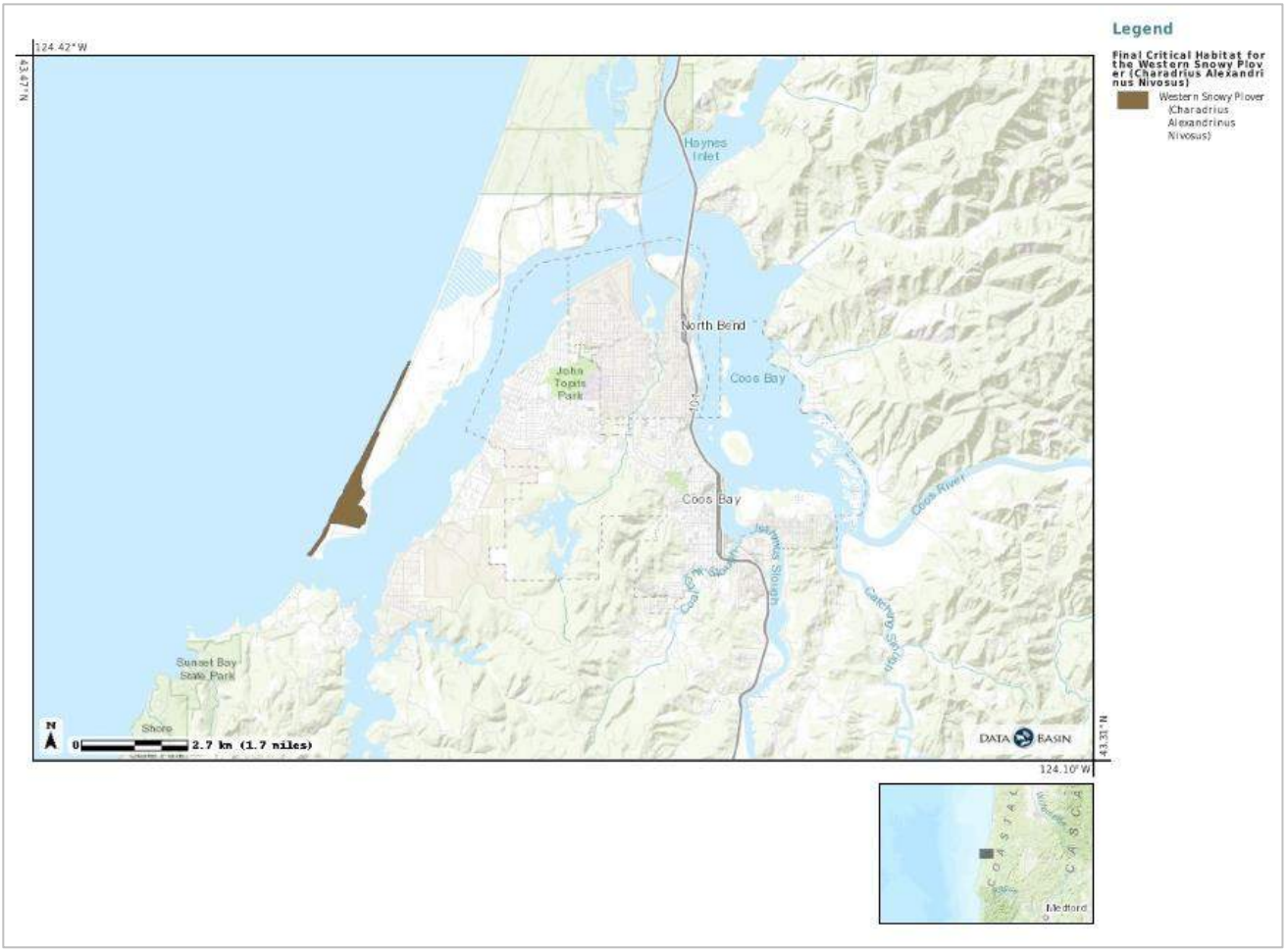
On March 5, 1993, the Pacific coast population of the western snowy plover (*Charadrius nivosus nivosus*) was listed as threatened under provisions of the ESA of 1973, as amended (16 U.S. Code 1531 et seq.). The western snowy plover's threatened status was reaffirmed in 1989 under the Oregon ESA and again in 1993 and 1998 by the Oregon Fish and Wildlife Commission as part of its periodic review process. Critical habitat for this shorebird was designated in June 2012 and includes areas of coastline in California, Oregon, and Washington (77 FR 36728, FWS 2012).

The Pacific coast population of the western snowy plover breeds primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. On the Oregon coast, nesting may begin as early as mid-March, but most nests are initiated from mid-April through mid-July (Wilson-Jacobs and Meslow 1984); peak nest initiation occurs from mid-May to early July (Stern et al. 1990).

The project area includes portions of tidal mudflats, areas of riprap on slopes, and lacks appropriate beach habitat suitable for nesting for this species. There is no proposed modification of beach habitat within the Action Areas, and the nearest possible beach is 0.25 miles away to the East, on the opposite bank of the Pony Slough entrance.

While foraging habitat may be present in Pony Slough and throughout Coos Bay, no nests are known to occur in or near the action areas for this project. No sightings of snowy plovers were documented in Fall and Spring surveys at OTH. The nearest western snowy plover critical habitat is approximately 3.5 miles west of the Airport at the Coos Bay North Spit unit presented in **Figure 7**.

Figure 7: Western Snowy Plover



4.5 Fish

Three federally listed anadromous fish species spend a portion of their life cycle within the estuarine environment of Coos Bay. Oregon Coast Coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) green sturgeon (*Acipenser medirostris*), and southern DPS Pacific eulachon (*Thaleichthys pacificus*), were each federally listed as threatened under the ESA. Use of the Coos Bay system by eulachon and green sturgeon is sporadic (Wagoner et. Al 1990). Migrating habitat exists for Coho salmon in the RSA Fill Action Area and Coos Bay is considered Critical Habitat for Coho salmon.

4.5.1 Coho salmon (*Oncorhynchus kisutch*) – Federally Threatened

The Coho salmon is commonly referred to as the silver salmon due to its dark metallic blue or greenish back with silver sides and a whitish underside. The Coho salmon is an anadromous fish, which spends juvenile development stages (approximately 18 months) in freshwater rivers and streams, spends most of its adult life in the ocean, and then returns to freshwater rivers and streams to spawn. In February 2008, the naturally spawning populations within the evolutionary significant unit (ESU) of Oregon Coast Coho salmon was listed as a federal threatened species under the ESA (73 FR 35755). Critical habitat for Coho salmon encompasses 13 subbasins in Oregon and includes all coastal river and stream reaches accessible to Coho salmon, including adjacent riparian zones. Coos Bay is included as Critical Habitat as part of the Coos Bay watershed.

The Biological Assessment considered the effects of west coast ocean salmon fisheries on listed populations of Coho salmon, including the Oregon Coast ESU (Supplemental Biological Opinion and Incidental Take Statement for the Pacific Coast Salmon Recovery Plan, 1999). The long-term decline in Oregon Coast Coho salmon productivity reflects deteriorating conditions in freshwater habitat as well as extensive loss of access to habitats in estuaries and tidal freshwater. Changes in the watersheds due to land use practices have weakened natural watershed processes and functions, including loss of connectivity to historical floodplains, wetlands, and side channels; reduced riparian area functions (stream temperature regulation, wood recruitment, sediment and nutrient retention); and altered flow and sediment regimes (NMFS 2016b, Recovery Plan for Oregon Coast Coho Salmon ESU).

The essential physical or biological features of freshwater migration corridors associated with spawning and incubation sites include water flow, quality, and temperature conditions supporting larval and adult mobility, abundant prey items supporting larval feeding after yolk sac depletion, and free passage (no obstructions) for adults and juveniles.

Distribution of juvenile Coho salmon within the action area is unknown; however, research in the Coos River observed that juvenile Coho salmon were in greater abundance away from the shoreline areas, often in deep water during their outmigration. Carson et al. (2001) found that in the Coos River, less than 20 percent of all fish were found along the shore and were about evenly split between the channel and channel margins.

For additional information on the general habitat requirements, life history, and limiting factors for recovery of the Oregon Coast Coho salmon ESU see the Federal Register Notice published on June 28, 2005 (70 FR 37160).

4.5.2 Southern Eulachon - Federal Threatened, Southern DPS

Eulachon (*Thaleichthys pacificus*) is a small, anadromous fish from the eastern Pacific Ocean. In North America they range from northern California into the southeastern Bering Sea. On March 18, 2010, NMFS listed the southern DPS of eulachon as threatened under the ESA, followed by designating Critical Habitat for the southern DPS on October 20, 2011. In determining Critical Habitat, the physical or biological features identified by NMFS as essential for eulachon migration and spawning within the Coos River include unobstructed migratory pathways, spring freshet flow regime, pollutant free waters, relatively low water temperatures (generally below 10° Celsius during spawning), suitable spawning substrates (pea gravel and coarse sand are preferred), and abundant prey items (copepod larvae) (76 FR 65324).

Eulachon presence within the Coos River is generally limited to the duration of the yearly spawning run (December – June) (see **Table 2** and 76 FR 65324). Adult eulachon typically begin their spawning migration into the Coos River in December and have emigrated by late March. Egg incubation and larval outmigration in the Coos River begins as early as January and can continue through June (76 FR 65324). When present, eulachon may utilize both shallow and deep-water habitats within the estuary as they migrate to spawning grounds. It is possible that adult and larval eulachon may be present within the action area during proposed in-water activities. The nearest Critical Habitat for eulachon is the Umpqua River, located 17 miles north of OTH.

For additional information on the general habitat requirement, life history, and limiting factors for recovery of the Southern eulachon DPS see the FR Notice published on March 18, 2010 (75 FR 13012), and October 20, 2011 (76 FR 65324). NMFS is currently in the process of evaluating protective regulations for the Southern DPS of eulachon pursuant to Section 4(d) of the ESA. As such, “take” allocations for Southern eulachon have not yet been issued.

4.5.3 Green Sturgeon - Federal Threatened, Southern DPS

Green sturgeon *(Acipenser medirostris)* are long-lived, slow-growing fish that are the most marine-oriented of the sturgeon species. The Southern green sturgeon DPS was listed as threatened on April 7, 2006 (71 FR 17757). The Southern DPS includes all naturally spawned populations originating from coastal watersheds south of the Eel River in California, with the only known spawning population in the Sacramento River.

Critical Habitat for the Southern green sturgeon DPS was designated on October 9, 2009 and includes the Coos River within the action area (NOAA Fisheries, 2018). The primary constituent elements (PCE) associated with Southern green sturgeon Critical Habitat within the action area include freshwater riverine systems and estuarine areas. The physical and biological features identified by NMFS as essential for Southern green sturgeon include available food resources, migratory corridors, sediment quality, substrate type, water depth, water flow, and water quality (NOAA Fisheries, 2018).

Green sturgeon are present in the Coos River from June through October; however, they mainly concentrate in the lower reaches of the estuary below river mile 37 (NOAA Fisheries, 2018). As such, given the proposed timing of in-water work (October 1 – February 15), the presence of adult and juvenile Southern green sturgeon may overlap within the action area during the early stages of proposed in-water activities.

For additional information on the general habitat requirement, life history, and limiting factors for recovery of the Southern green sturgeon DPS see the Federal Register Notice published on April 7, 2006 (71 FR 17757).

4.6 Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act. The project is located within the statewide Pacific Flyway path for migratory birds. The Southern Oregon coast provides wintering and migratory habitat for birds, and Coos Bay is one of several important areas for shorebirds between San Francisco Bay and British Columbia. The Migratory Bird Treaty Act of 1918, as amended, provides federal protection for migratory birds and their nests, eggs, and body parts from harm, sale, or other injurious actions.

No clearing of trees, shrubs, and brush will occur as a result of this project.

Potential migratory birds that may be present within the project area, and their breeding seasons are listed below in **Table 3**.

Table 3: Possible Migratory Birds at OTH

Common Name	Scientific Name	Breeding Season
Allen's hummingbird	*Selasphorus sasin*	February 1 to July 15
Black oystercatcher	*Haematopus bachmani*	April 15 to October 31
Black turnstone	*Arenaria melanocephala*	Breeds elsewhere
Clark's grebe	*Aechmophorus clarkii*	January 1 to December 31
Great blue heron	*Ardea herodias fannini*	March 15 to August 15
Lesser yellowlegs	*Tringa flavipes*	Breeds elsewhere
Long-billed curlew	*Numenius americanus*	Breeds elsewhere
Marbled godwit	*Limosa fedoa*	Breeds elsewhere
Olive-sided flycatcher	*Contopus cooperi*	May 20 to August 31
Red-throated loon	*Gavia stellata*	Breeds elsewhere
Rufous hummingbird	*Selasphorus rufus*	April 15 to July 15
Semipalmated sandpiper	*Calidris pusilla*	Breeds elsewhere
Short-billed dowitcher	*Limnodromus griseus*	Breeds elsewhere
Whimbrel	*Numenius phaeopus*	Breeds elsewhere
Willet	*Tringa semipalmata*	Breeds elsewhere

Source: IPaC Resource List, December 13, 2018.

5. EVALUATION METHODS

Some activities associated with the proposed project, or "action areas," will occur below the HMT of the Coos River. The proposed project activities have the potential to affect designated Critical Habitat for ESA-listed fish species and Pacific Salmon EFH. Each of these ESA-listed species has the potential to occur within the action areas. Further discussion of the natural history and potential occurrence of ESA-listed species within the project action areas is provided in this section.

Factors considered in evaluating the project impacts include:

- The species' dependence on specific habitat components that will be removed or modified.
- The abundance and distribution of those habitat components in the project vicinity.
- The distribution and population levels of the species (if known).
- The possibility of direct and/or indirect effects to the species and their habitats.
- The potential to mitigate adverse effects.

These factors are relevant both for the survival of individuals of the species and recovery prospects of the populations.

The method of analysis used in this BA includes determining the environmental baseline for the action areas, discussing how the proposed action will affect the environmental baseline, and then using that information to arrive at a determination of effect.

For analysis of potential project impacts to salmon species, this BA utilizes methods outlined in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). The information presented in this BA is based on a review of existing database information, site visits, and discussions with the project design team and resource agency staff. Research on species' presence within and near the project area was conducted through a review of species lists and database information from the Information for Planning and Consultation (IPaC), and StreamNet in 2019.

The USFWS' IPaC was accessed on December 13, 2018, for information on threatened and endangered (T&E) species habitat. A request for known occurrences of State sensitive species within a 2-mile radius of the study area was made to the OBIC.

Mead and Hunt, Inc. Environmental Scientist Aaron Killgore conducted field surveys of the site on November 12, 2018, and April 8, 2019. Additional surveys for eelgrass were conducted on June 4-5, and July 2-3, 2019 to determine adjacent eelgrass boundaries and densities and to establish a control plot for eelgrass density for monitoring. Areas identified as likely habitat for T&E species were treated as habitat and surveyed by land-based pedestrian transects using the following methods:

- Visual or auditory encounters with the species
- Confirmed species nesting sites
- Evidence of diseased species
- Other diagnostic indicators of species presence

Prior Environmental Assessments in the area were referenced and interviews were conducted with Federal and State agency personnel, employees of the South Slough National Estuarine Research Reserve, Oregon State University professors, and experts in eelgrass habitat and mitigation.

This section addresses direct, indirect, and cumulative effects on ESA-listed species and their designated Critical Habitat that may result from proposed project actions given the proposed avoidance and minimization measures. Factors considered in this analysis include the following:

- Proximity of the action
- Distribution, timing, and nature of the effect
- Duration
- Disturbance frequency
- Intensity
- Severity

The Sustainable Fisheries Act of 1996 (Public Law 104-267) amended the MSA to establish new requirements designed to identify, conserve, and enhance EFH for those species regulated under a federal Fisheries Management Plan. The MSA requires federal agencies to consult with NMFS on all actions or proposed actions that are authorized, funded, or undertaken by the agency that may adversely affect EFH (MSA §305(b)(2)). Adverse effect means any impact that reduces quality and/or quantity of EFH and may include direct, indirect, site-specific, or habitat-wide impacts including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Any reasonable attempt to encourage the conservation of EFH must also take into account actions that occur outside EFH, such as upstream and upslope activities that may result in adverse effects.

5.1 Direct Effects

Direct effects include all immediate impacts (adverse and beneficial) resulting from project-related actions. Potential direct effects to ESA-listed species associated with the proposed project may include entrainment during dredging activities, temporarily degraded water quality, and minor alteration of substrates associated with dredging and disposal. Following detailed discussion, these effects are summarized in **Table 6** below.

5.1.1 Water Quality

5.1.1.1 Sediment/Turbidity

Short-term, localized increases in adjacent turbidity levels within the RSA Fill Action Area will likely occur as a result of proposed fill activities below the HMT. In the short-term, increases in turbidity can reduce forage quantity for salmonids and disrupt behavioral patterns such as feeding and sheltering. Exposure duration is a critical determinant of physical or behavioral turbidity effects. Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such seasonal high pulse exposures.

Light is one of the most important factors affecting eelgrass depth distribution, abundance, growth and survival. Therefore, any activity which generates turbidity in the water column has the potential to negatively affect eelgrass.

The in-water extent of the Action Area beyond the project footprint is based on the potential for a temporary increase in turbidity and sedimentation. Installation and removal of the coffer dam would result in the highest level of turbidity during the project. This work will be timed with the outflow of tides to reduce the potential for sedimentation near the adjacent eelgrass. Dewatering in the construction area will be done through sedimentation outflow filters. The water will drain into Coos Bay on the westside of the coffer dam/RSA fill area to reduce turbidity and sedimentation within Pony Slough and the adjacent eelgrass to the greatest extent possible.

Given the proposed project conservation measures and fill techniques, it is anticipated that any project related increases in background turbidity will be relatively localized. As such, short-term increases in background turbidity resulting from temporary work below the HMT are not expected to result in any long-term adverse effects to ESA-listed fish species or significant net change in function of the in-stream habitat.

5.1.1.2 Chemical Contamination

Equipment operating near and over the river channel within the action area represent potential sources of chemical contamination. Accidental spills of construction materials or petroleum products would adversely affect water quality and potentially impact ESA-listed species. Development and implementation of a PCP that will include containment measures and spill response for construction-related chemical hazards will significantly reduce the likelihood for chemical releases within the action area.

5.1.1.3 Impervious Surfaces and Water Treatment

The design of the ARFF facility is currently under development. The stormwater runoff associated with the water quality storm event will receive treatment prior to discharge to the Waters of the United States to the maximum extent feasible and will meet SLOPES V standards. A stormwater report associated with the ARFF facility project will detail the associated water quality control design and analysis and is expected to be completed with the final design in March 2020. The stormwater report can be provided upon request once available.

The ARFF facility project will result in a net decrease of 10,163 square feet of impervious surface within the Outfall #2 drainage basin; therefore, there will be an improvement to the stormwater conveyance system capacity and water quality at the existing drainage outfall. The disturbance of underlying soils trigger water treatment requirement.

The water resources report prepared by Mead & Hunt, Inc., dated February 7, 2020, includes the design codes and references, regulatory considerations, surface waters and wetlands, floodplains, drainage infrastructure related to the existing conditions, and potential impacts as a result of the proposed actions.

5.1.2 Alteration of Substrates

As discussed above, the proposed project will result in the fill of up to 2,215 cubic yards of accumulated sediment from within the Coos Bay Estuary (**Figure 3: RSA Fill Area**). In general, the environmental baseline within the action area has been degraded by urbanization, past industrialization, development, and human activity. This is a high energy area of the river with strong lateral currents and steep banks that limit near-shore shallow habitat suitable for juvenile fish rearing and provide very little habitat complexity. As such, given the existing baseline conditions within the bay, and proposed fill of sediments only (consisting primarily of sand and silt) after the bulkhead construction, utilization of silt fencing, and lack of suitable spawning habitat in the action area, it is reasonably certain that the proposed alteration of existing substrates will not result in adverse direct effects to ESA-listed fish species.

5.2 Indirect Effects

Indirect effects of a proposed action are those impacts that are reasonably certain to occur later in time (after construction of the project is complete). As discussed above, short-term increases in turbidity can reduce forage quantity for salmonids and disrupt behavioral patterns such as feeding and sheltering. Forage quantity for juvenile fish may be temporarily reduced within the immediate in-water work area as benthic organisms become disturbed by bulkhead installation; however, recolonization of benthic organisms will likely occur within a month following project completion (NMFS 2009). As such, it is reasonably certain that any potential indirect effects of the proposed project on ESA-listed fish species will be insignificant and discountable.

All project construction and excavation would occur in an estuarine environment. This limits potential impacts to salmonid spawning habitat, eggs, or fry, which all occur in freshwater. Similarly, this proposed project would not affect salmonid smolt migration because Coos Bay in water work periods have been designed and implemented to avoid sensitive and critical life history stages of these fish.

Impacts potentially could be both short- and/or long-term in nature. Short-term risks could include temporary increases in turbidity, threat of construction-related hazardous materials entering a waterbody, and/or disturbance from a variety of construction related activities. Potential long-term impacts might result from an increase in potential predators aggregating in the vicinity of the riprap preying on migrating salmonids. Estuarine shoreline development can have adverse effects on out-migrating juvenile salmon. Smolts can become disoriented and their downstream progress restricted, possibly exposing them to additional predation from fish, birds, or mammals.

The proposed project is not expected to create turbidity levels detrimental to crustaceans or annelids found in Coos Bay. Mobile species, such as fish, generally avoid areas of high turbidity and are able to move out of the area before conditions become detrimental.

5.3 Interrelated and Interdependent Effects

Interrelated actions include actions that are a part of a larger action and depend on the larger action for justification. Interdependent actions are defined as actions with no independent utility apart from the proposed action. As discussed above, the purpose of the proposed project is to address FAA safety regulations for continued operations at OTH. No interrelated or interdependent effects are anticipated as a result of the proposed project.

5.4 Cumulative Effects

Cumulative effects address activities "that are reasonably certain to occur within the action area subject to consultation." Historically, Coastal and southern Oregon has been affected by human activity for thousands of years and the existing environmental conditions in the action area reflect significant changes to natural resources brought about by past human activities. Associated transportation and commercial development within the Coos River basin in the vicinity of the action area are anticipated as population growth continues. **Table 4** lists large-scale projects that could impact water resources in the Coos River estuary as an additional environmental baseline for the impacted watershed. For the purposes of this EA, the geographical extent of future cumulative effects analysis will be limited from the mouth of the Coos River Estuary to Pony Slough.

Table 4: Past, Present, or Reasonably Foreseeable Actions that May Cumulatively Affect Resources in Coos County

Location	Actions
US Army Corps of Engineers	Permits and Mitigation (Coos Fourth-Field Watershed) Various
US Army Corps of Engineers	Coos Bay Federal Navigation Channel Maintenance Dredging
Jordan Cove	Project Impact Mitigation
Jordan Cove	Maintenance Dredging
Port of Coos Bay	Coos Bay Railroad Bridge Rehabilitation
Port of Coos Bay	Maintenance Dredging
Port of Coos Bay	Coos Bay Rail Line Tunnel Rehabilitation
US Army Corps of Engineers	Coos Bay Jetties Rehabilitation Project
Confederated Tribes of Coos, Lower Umpqua Suislaw Indians	Coos Head Area Master Plan, Hollering Place
City of North Bend	Department of Human Services Building Relocation
Port of Coos Bay	Coos Bay Section 408/204(f) Channel Modification b
Tioga	Sports Park
Bureau of Land Management	Catching Creek Conversion Timber Sale
Bureau of Land Management	Other Commercial Thinning Timber Sales

5.4.1 Jordan Cove

The Jordan Cove Liquefied Natural Gas (LNG) Project has released a November 2019 Final Environmental Impact Statement (EIS) requesting authorization to liquefy at a terminal in Coos Bay, Oregon up to 1.04 billion cubic feet of natural gas per day for export for to overseas markets. The 200-acre LNG terminal site would include significant development of the Coos Estuary and coastline on the opposite side from OTH. This development would include:

- An access channel from the existing Coos Bay Federal Navigation Channel to the LNG terminal
- Modifications to the existing Federal Navigation Channel

- A marine slip containing two berths (one Production Loading Berth and one Emergency Lay Berth), a dock for tug and escort boats, and a material offloading facility (MOF)
- LNG loading platform and transfer line
- Two full-containment LNG storage tanks and associated equipment
- Five natural gas liquefaction trains
- Multiple industrial facilities

The extent of this development will affect eelgrass in the estuary; an eelgrass mitigation site has been selected adjacent to OTH, 1000 feet southwest of the MALSR unit, which precludes OTH from selecting a mitigation near to that area, if mitigation is necessary. More detail about the extent of possible impact of this project is found at https://www.energy.gov/nepa/eis-0489-jordan-cove-liquefaction-project-coos-county-or-and-pacific-connector-pipeline-project.

5.4.2 Bay Dredging Plan

The Oregon International Port of Coos Bay is proposing modifications to the lower Coos Bay Federal Navigation Channel to deepen, widen, and lengthen the channel and alter other related federal navigation components. The Port's project is made up of several proposed actions to improve navigation efficiency, to reduce shipping transportation costs, and to facilitate the shipping industry's transition to larger, more efficient vessels.

The Port of Coos Bay is currently in the engineering and design phase of the project and is coordinating with the USACE which is involved with the long-term maintenance of the Coos Bay Channel. This modification project will expand the channel from -37 feet deep and 300 feet wide to -45 feet deep and 450 feet wide from the channel entrance to river mile 8.2. The channel was last deepened from -35 feet to -37 feet beginning in 1996 and completed in 1998. More information about this project can be found on the Port of Coos Bay website at https://www.portofcoosbay.com/channel-deepening.

6. FINDING OF EFFECT

6.1 Analysis of Effects

The potential effects of the proposed action on the environmental baseline conditions are summarized below (**Table 5**). All pathways and indicators are expected to be maintained throughout this project, with the exception of short-term, localized increases in turbidity during the work window and minor alteration of in-water substrates. Given the proposed conservation measures, it is reasonably certain that there is minimal risk of injury, harm, or harassment (i.e., "take") of ESA-listed fish species resulting from the proposed fill activities. It is anticipated that fish will avoid the fill area during construction during the ODFW approved in-water work window.

Table 5: Checklist for documenting environmental baseline and effects of proposed actions on relevant indicators for ESA-listed salmonid species within the action area.

Pathways/Indicators	Baseline	Effects of Proposed Action
Water Quality		
Temperature	Not Properly Functioning	**Maintain**
Sediment/Turbidity	Not Properly Functioning	**Maintain (-):** short-term, localized increases in turbidity
Chemical Contamination	Not Properly Functioning	**Maintain**
Habitat Access		
Physical Barriers	At Risk	**Maintain**
Habitat Elements		
Substrate	Not Properly Functioning	**Maintain (-):** minor alteration of in-water substrates
Large Wood	Not Properly Functioning	**Maintain**
Pool Frequency	N/A	**Maintain**
Pool Quality	N/A	**Maintain**
Off-Channel Habitat	Not Properly Functioning	**Maintain**
Refugia	Not Properly Functioning	**Maintain**
Channel Conditions and Dynamics		
Width/Depth Ratio	Not Properly Functioning	**Maintain**
Streambank Condition	At Risk	**Maintain**
Floodplain Connectivity	Not Properly Functioning	**Maintain**
Flow/Hydrology		
Peak/Base Flows	At Risk	**Maintain**
Drainage Network Increase	Not Properly Functioning	**Maintain**
Watershed Conditions		
Road Density/Location	Not Properly Functioning	**Maintain**
Disturbance History	Not Properly Functioning	**Maintain**
Riparian Reserves	Not Properly Functioning	**Maintain**

Maintain = no localized, temporary, or system-wide effect
Maintain (-) = localized, temporary effect, no system-wide effect

Table 6 provides a summary of the potential effects of the proposed action on Critical Habitat PCE located within the action area. Short-term, localized increases in background turbidity and minor alteration of substrates in estuarine and migration corridors are anticipated. There will be a loss of 2,215 cubic yards of potential migration or refugial critical habitat for Coho salmon and Green sturgeon with the proposed action.

Table 6: Summary of Effects to Critical Habitat Primary Constituent Elements (PCE) within the Action Area

Species	PCEs within the Action Area	Essential Physical and Biological Features	Effects of the Proposed Action
Coho salmon	Freshwater rearing sites	Floodplain connectivity Available forage/ cover Water quality/quantity	None
	Freshwater migration corridors	Free of obstruction Natural cover Water quality/quantity	None
	Juvenile rearing areas	Water quality/quantity Cover/shelter/food Riparian vegetation	None
	Juvenile/adult migration corridors	Substrate Water quality/quantity/ Cover/shelter/food Riparian vegetation Space and safe passage	3,150-sqft adverse modification of critical habitat. Short-term, localized increases in background turbidity and minor alteration of substrates
Southern eulachon	Freshwater spawning and incubation	Flow Water quality/temperature Substrate	None
	Freshwater migration	Migratory corridor Flow Water quality/temperature Food	None
Southern green sturgeon	Freshwater riverine system	Food resources Migratory corridor Sediment quality Substrate Water depth/flow/quality	None
	Estuarine areas	Food resources Migratory corridor Sediment quality Water depth/flow/quality	3,150-sqft adverse modification of critical habitat. Short-term, localized increases in background turbidity and minor alteration of substrates

7. SUMMARY OF EFFECTS

The finding of effect is the conclusion reached on the project's likelihood of affecting a proposed or listed species or its Critical Habitat. The actual finding of effect may be made only by the Federal action agency. The conclusions presented in this report are recommendations. The Federal action agency must give concurrence with the conclusions of the BA for its findings to be valid.

In a letter dated March 5, 2019, the USFWS responded to Mead & Hunt's request for technical assistance on November 9, 2018, and additional project description and maps submitted on December 27, 2018. After review of the IPaC, results for the project area, and of the provided maps, the USFWS believes that no federally listed species under the jurisdiction of the USFWS are present in the action area. The USFWS also recommended coordination with the NOAA for species under their jurisdiction and a review of migratory birds.

Based on the lack of suitable habitat and seasonal avoidance, there will be no effect on the marbled murrelet, western snowy plover, northern spotted owl, or western lily.

7.1.1 Coho Salmon and Southern green sturgeon

The smallest area that must be filled for RSA compliance is 2,215 cubic yards, an adverse modification of critical habitat for Oregon Coast Coho salmon and Southern green sturgeon. The proposed project will result in short-term increases in background turbidity and the minor alteration of in-water substrates within designated critical habitat. However, it is reasonably certain that these actions will not result in long-term adverse effects to substrates, water quality, migratory habitat, food base, or other PCEs within the action area. Turbidity would be controlled by proposed conservation measures (Section 2.2), minimizing potential impacts. The proposed project actions are not expected to result in any net change in function of the in-stream habitat.

Due to permanent adverse modification of critical habitat, this project is likely to adversely affect Oregon Coast Coho salmon and Southern green sturgeon.

7.1.2 Southern Eulachon

The proposed project will result in short-term increases in background turbidity and the minor alteration of in-water substrates within designated critical habitat. However, it is reasonably certain that these actions will not result in long-term adverse effects to substrates, water quality, migratory habitat, food base, or other PCEs within the action area given the proposed conservation measures discussed above. The proposed project actions are not expected to result in any net change in function of the in-stream habitat.

The project may affect, but is not likely to adversely affect, the Southern eulachon. The project construction has the potential to affect migration and rearing habitat for fish species present near and downstream from the project area. Any effects are likely to be immeasurable and insignificant.

7.1.3 Essential Fish Habitat - Eelgrass

Given the proximity of eelgrass to the proposed project area (30 feet), there is the potential for adverse indirect impacts to eelgrass resources. The likelihood of adverse effects are minimized by timing of the construction operations outside the eelgrass peak growing season (October 1 - May 30), and use of a coffer dam and other conservation measures outlines in **Section 2.2** during excavation, fill, and construction.

Due to the avoidance and minimization measures described previously, this project is not likely to adversely affect Essential Fish Habitat (eelgrass). However, a two-year monitoring plan will be

implemented in order to assess the potential for indirect effects to eelgrass as a result of project construction. To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent monitoring surveys will be conducted at a similar time during the growing season (e.g. June - early July) and using the same methodology as the baseline surveys conducted in June 2019. Analysis of the monitoring data will focus on detecting changes in the location of the eelgrass bed boundary, total areal coverage of eelgrass within a 250-foot radius of the project footprint, and changes in eelgrass shoot density.

Data collected in the reference area will be used to assess the possibility of negative effects to eelgrass due to local or regional eelgrass stressors unrelated to the project construction. If there is an observed decline of eelgrass shoot density in both the project area and the reference area, the average decrease in eelgrass shoot density within the reference area will be subtracted from the average decrease in eelgrass shoot density within the project area. The eelgrass survey data will be available for review by agency staff. In the event that the first monitoring survey indicates no detectable impact to eelgrass beds (i.e. no decrease in eelgrass shoot density, and no retraction of the eelgrass bed boundary nearest the project footprint, then no second monitoring effort will be conducted.

The attached (**Attachment A**) permittee-responsible mitigation plan addresses the impacts for Coho salmon and Southern green sturgeon in the Coos River as a result of proposed construction. The impacts on the environmental baseline conditions (habitat Primary Constituent Elements) within the construction area include: 1) the 3,150 square foot permanent adverse modification of critical habitat for ESA-listed fish, and 2) short-term, localized increases in background turbidity and minor alteration of substrates.

There are two primary objectives of the mitigation plan:

1) to restore functional losses of aquatic critical habitat for ESA-listed fish, and
2) to enhance the project area shoreline to improve habitat for benthic organisms.

The restoration of 8,000 square feet of adjacent critical habitat and Essential Fish Habitat (EFH) eelgrass beds represents over a 2:1 ratio compared to the area of critical habitat permanently adversely modified due to the bulkhead construction. Restoration will be accomplished by removing creosote piles and remnant dock structures in Pony Slough. The removal of these items will return the substrate to natural conditions and remove impediments to fish migration and foraging habitat within Pony Slough.

Permittee-Responsible Mitigation Plan

Environmental Assessment

Runway Safety Area Improvements (Runway 4/22)

Southwest Oregon Regional Airport

Report Prepared By

Mead & Hunt

www.meadhunt.com

June 29, 2020

Mead & Hunt Project No. 1417700-171679.01

1. Project Information

Project Name: Southwest Oregon Regional Airport (OTH) Runway Safety Area Bulkhead

NWP Permit No.:

Project Location: 43° 25' 18.4794"N, -124° 14' 18.6432"W (43.421800°, -124.238512°)

Mitigation Site Location(s) (if different): 43°25'18.02"N, -124°14'17.24"W (43.421672°, -124.238122°) (1000ft SE of project site)

Watershed(s): Coos Bay, HUC 171003040405

County or Counties: Coos County

1.1 Plan Overview

This permittee-responsible mitigation plan addresses the permanent adverse modification of critical habitat for Coho salmon and Southern green sturgeon in the Coos River as a result of proposed construction of a triangular bulkhead adjacent to the Southwest Oregon Regional Airport (OTH) in North Bend, Oregon. The Federal Aviation Administration (FAA) requires[1] that the Runway Safety Area (RSA) have a 500-foot width and extend 1,000 feet beyond the ends of the runway. Currently, the northeast portion of Runway 4/22 is approximately 60 feet short of compliance.

Work will take place at the northeastern corner of the Airport property adjacent to and within Coos Bay. The project Action Area includes all areas of OTH, and the Coos Bay estuary directly or indirectly affected by the proposed project (**Figure 1, Runway Safety Area Fill and Construction Buffer**). The Action Area includes an in-water construction buffer of 250 feet for proposed fill activities within the 89-foot by 67-foot triangular fill area, the mandatory RSA, and a 10-foot road buffer for emergency vehicle access. An additional 60-foot Action Area on land is provided for vehicle support and construction staging. Construction crews and equipment will utilize haul routes to the project site via existing Airport roadways and paved areas.

2. Avoidance and Minimization

2.1 Avoidance

An alternatives analysis to meet FAA RSA compliance was conducted during the Master Plan update (2013).[2] These alternatives were further analyzed in the OTH RSA Environmental Assessment, which discusses the impacts to natural resources of each alternative to meet RSA compliance.[3] A triangular

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[1] [1]FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, provides required airport safety area guidance and defines the RSA as a surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway.

[2] Southwest Oregon Regional Airport Master Plan Update, 2013. https://cooscountyairportdistrict.com/coos-county-aiport-district-master-plan/

[3] Mead & Hunt, Environmental Assessment for Southwest Regional Airport Runway Safety Area Improvements (Runway 4/22), May 2020, Chapter 2.4: Build Alternatives.

bulkhead at the northeast end of Runway 4/22 was identified as the preferred alternative because it had the smallest footprint and the least impact to critical habitat of Endangered Species Act (ESA) listed species in Coos Bay. Construction haul routes and staging areas were designed to use existing impervious surfaces when possible and avoid adjacent wetlands.

2.2 Minimization

Appropriate and practical measures have been identified to minimize impacts to the aquatic ecosystem that cannot reasonably be avoided. Work will be performed during the Oregon Department of Environmental Quality (OR DEQ) in-water work window of October 1 to February 15 and will be timed with the outflow of the tides to avoid sedimentation impacts to adjacent eelgrass beds.

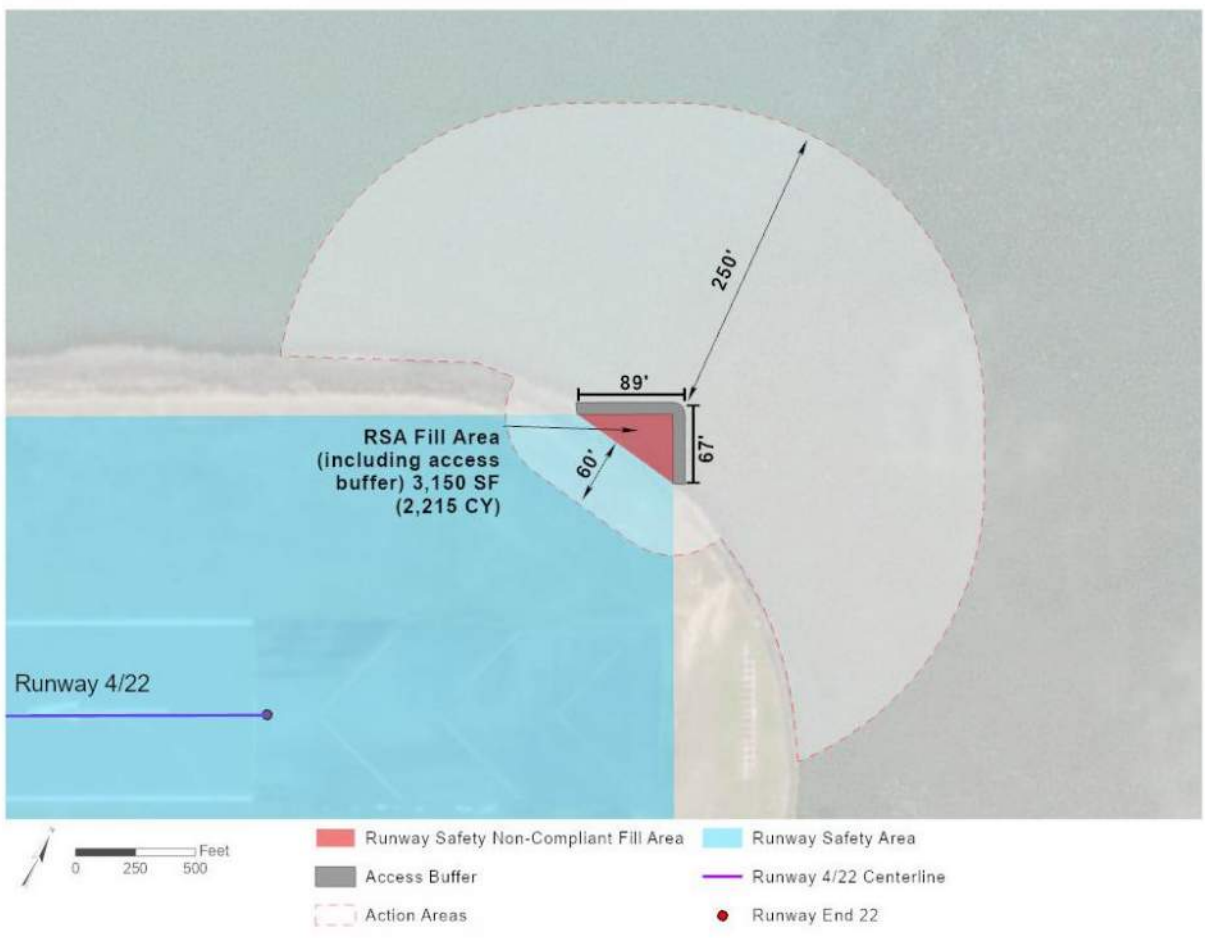

Figure 1: Runway Safety Area Fill and Construction Buffer

A 3,150 square-foot pre-cast concrete block bulkhead will be constructed to form a 0.07-acre (89-foot by 67-foot) triangular surface area at the northeastern corner of Runway 4/22. The bulkhead will be created by using a Mechanically Stabilized Earth (MSE) retaining wall constructed with pre-cast concrete blocks, which was determined to have the smallest construction footprint and have the least environmental

impact on Coos Bay and Pony Slough. The foundation of the bulkhead will be stabilized with sand and 3 inches of rock topped with native slough soils.

Existing riprap cobbles within the construction area will be salvaged and reused for the final structure as armoring stone along the toe of the bulkhead. The armoring would extend slough-ward by approximately 8 feet to dissipate wave energy erosion, decrease scouring and undercutting of the bulkhead structure, and increase structural stability of the bulkhead. To prepare for construction, a temporary single-face sheet pile cofferdam will be installed 12 feet from the exposed slough-ward bulkhead wall for dewatering and excavation of the foundation.

Dewatering of the construction site will be conducted through outflow sediment filters on the west side of the coffer dam to further reduce sedimentation within Pony Slough. Installation and removal of the coffer dam would result in the highest level of turbidity during the course of the project. Work associated with both will be timed with the outflow of tides to reduce the potential for sedimentation on adjacent eelgrass beds. Due to the relative size of the Coos River and proposed timing of in-water work, it is expected that any increase in turbidity would not result in adverse effects.

A 60-foot Action Area on land will be used for vehicle support and construction staging. Construction crews and equipment will access the project site via existing Airport access routes, embankments within the construction area, and floating barges for the installation of the temporary coffer dam. The contractor staging and laydown area will be on land immediately adjacent to the identified construction area.

3. Compensatory Mitigation

3.1 Goals and Objectives

Compensatory mitigation (CM) involves activities conducted by a permittee or third party to create, restore, enhance, or preserve the functions and values of the waters of the state to compensate for the removal/fill-related adverse impacts of project development to waters of the state.

3.2 Ecological Goals

The principal goal of this mitigation plan is to replace the function for the waters of the US that will be lost for the RSA bulkhead construction. The bulkhead site functions as critical habitat for Coho salmon and Southern green sturgeon in the Coos River estuary (Table 1). According to the 2019 Biological Assessment, the impacts on the environmental baseline conditions (habitat Primary Constituent Elements) within the construction area include: 1) the 3,150- square foot permanent adverse modification of critical habitat for

ESA-listed fish, and 2) short-term, localized increases in background turbidity and minor alteration of substrates.[4]

Table 1. ESA-Listed Species with The Potential to Occur within the Project Area

Species	Population (ESU/DPS)	Federal Status	Closest Designated Critical Habitat	Potential Site Use
Coho salmon *Oncorhynchus kisutch*	Oregon Coast ESU	Threatened (76 FR 35755)	Coos Bay	Rearing and migration
Green Sturgeon *Acipenser medirostris*	Southern DPS	Threatened (71 FR 17757)	Coos Bay	Foraging
Eulachon *Thalichthys pacificus*	Southern DPS	Threatened (75 FR 13012)	Approximately 17 miles north of project area at Umpqua River	Rearing and migration

Sources: NMFS (National Marine Fisheries). 2018. Northwest Regional Office, ESA Salmon Listings. http://www.westcoast.fisheries.noaa.gov/index.html.
StreamNet. 2018. Data Query and Critical Habitat Mapper. http://www.streamnet.org/.
USFWS (U.S. Fish and Wildlife Service). 2018. Critical Habitat Mapper. https://ecos.fws.gov/ecp/report/table/critical-habitat.html

3.3 Ecological Objectives

There are two primary objectives of this mitigation plan:

1) to restore functional losses of aquatic critical habitat for ESA-listed fish, and

2) to enhance the project area shoreline to improve habitat for benthic organisms.

The restoration of 8,000 square feet of adjacent critical habitat and Essential Fish Habitat (EFH) eelgrass beds represents a 2:1 ratio over the area of critical habitat permanently adversely modified due to the bulkhead. Restoration will be accomplished by removing creosote piles and remnant dock structures in Pony Slough. The removal of these items will return the substrate to natural conditions and remove impediments to fish migration and foraging habitat within Pony Slough. Improvements in the slough bottom can induce the spread of eelgrass into the area, improving cover from predation and increasing the availability of feeder species. The surrounding Pony Slough estuary includes eelgrass beds that provide complex habitat and are an important foraging area for multiple species, including ESA-listed fish.

In the last phase of construction of the RSA bulkhead, the toe of the eco-block wall will be armored with rip-rap to structurally stabilize the wall, and provide habitat for marine organisms. This new rip-rap toe, as well as adjacent existing rip-rap within 500 feet, will be seeded with crushed oyster shells. This

[4] Mead & Hunt. Biological Assessment for the Southwest Oregon Regional Airport Runway Safety Area Improvements, October 2019. Chapter 4: Environmental Baseline, p.8.

enhancement hopes to provide a fully functioning, three-dimensional bed system that provides associated ecosystem services and biological functions, such as marine biodiversity, shoreline protection, sediment trapping, water quality improvement, and recreational fishing opportunities. If successfully established, the oyster beds will also protect and enhance the adjacent sea grass beds and mitigate for substrate alteration and rip-rap removal during bulkhead construction. [5]

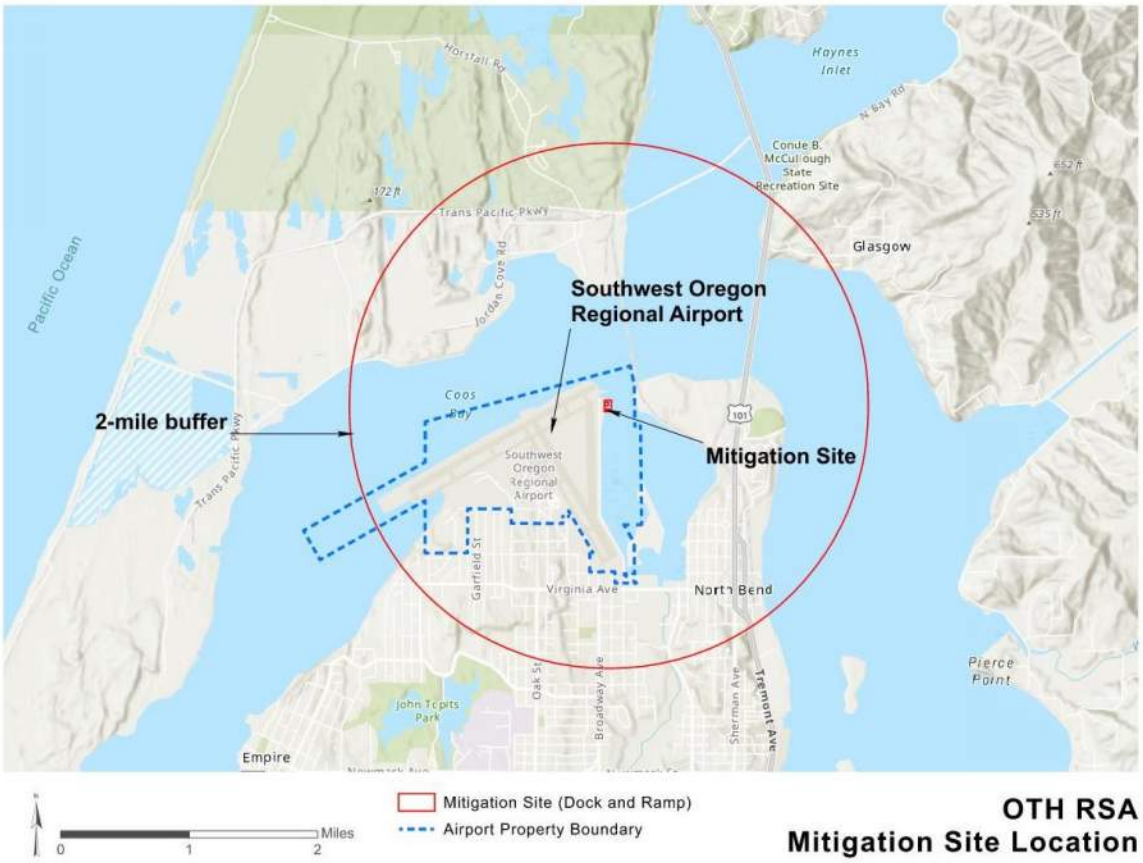

Figure 2: OTH RSA Mitigation Site Location

To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent annual monitoring surveys will be conducted at a similar time during the growing season (e.g. June to early July) using the methodology utilized in baseline surveys conducted in June 2019. Detailed survey methodology is included in **Section 11. Performance Standards/Monitoring Requirements**.

4. Site Selection

Selection of the site was driven primarily by the goal of restoring ecosystem function and providing high-quality habitat for fish. Proximity to project area was also given consideration. The selected sites were

[5] *"NOAA Habitat Conservation | Restoration Center | Restoration Techniques and Monitoring | Oyster Restoration". Habitat.noaa.gov.*

determined to be ecologically suitable for providing the desired compensatory mitigation and are adjacent to existing aquatic resources.

The proposed mitigation sites are located 1,000 feet southeast of the RSA fill bulkhead, east of Runway 4/22 (**Figure 2**). This area is the former location of Ponypoint Park, a City of North Bend facility that accommodated five recreational vehicle camp sites and included a walking trail, a boat ramp, and parking lot. The 3.5-acre mitigation site includes the creosote piles of a boat launch and dock structure within Pony Slough to the east of the paved parking area.

A visual survey of the site identified the structural remnants of an approximate 4,000 square-foot boat dock consisting of at least 68 piles, and an approximate 4,000 square-foot boat ramp with 50 piles and wood planks (**Figure 3**). Exposed piles were found to be creosote coated with metal fasteners.

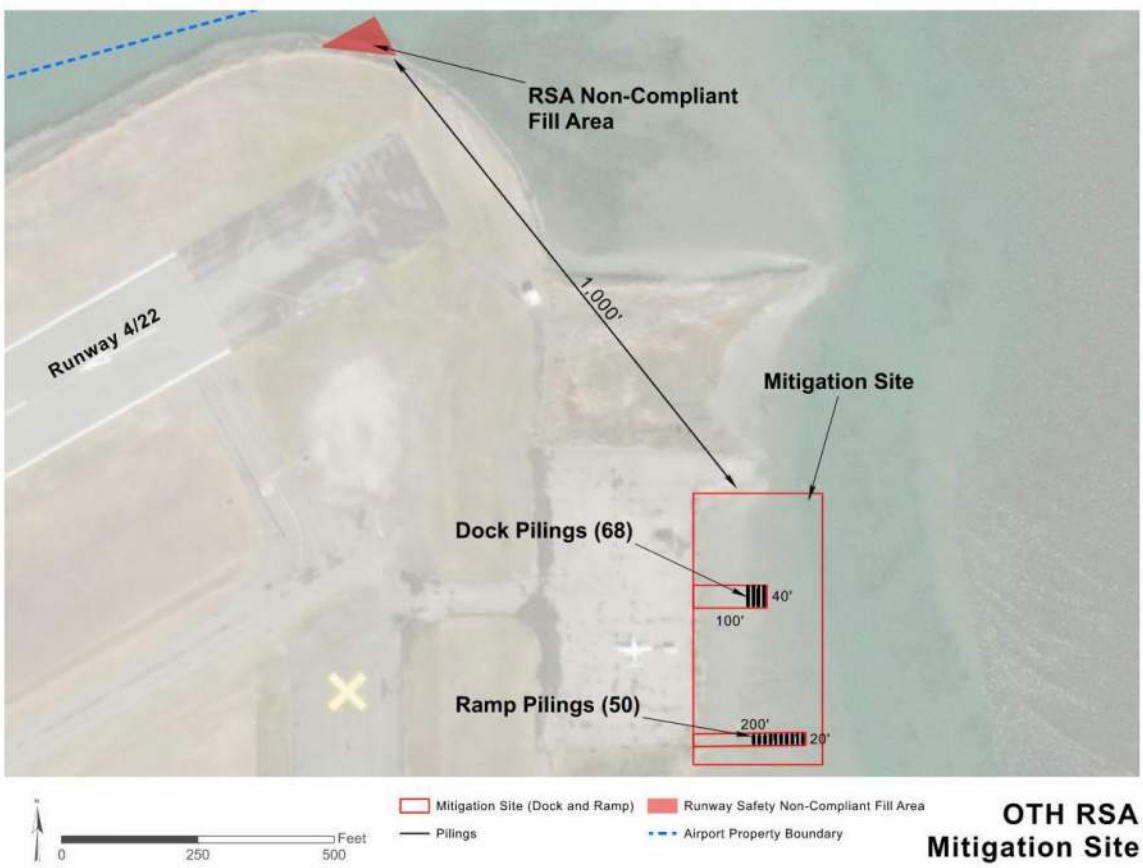

Figure 3: OTH RSA Mitigation Site

Eelgrass beds are located 100 feet from the RSA Fill Action Area and have been designated as EFH, while dispersed eelgrass exists within 30 feet of the construction site. No direct impact to eelgrass is anticipated due to the construction of a coffer dam; however, any in-water work has the potential to increase

sedimentation and turbidity in the surrounding area. Monitoring any potential long-term impacts to eelgrass bed growth will be based on comparing existing and future eelgrass density with an adjacent designated control plot.

Given the existing baseline conditions within the project area and net of in-water/overwater structures, it is reasonably certain that the proposed project will not result in any adverse change to the instream or downstream functions (i.e., hydrologic, geomorphic, biological, or chemical/nutrient) of the Coos River. Potential direct effects of the proposed project on ESA-listed species and their habitats (i.e., hydroacoustic impacts, temporary degraded water quality, and minor alteration of substrates) will be consistent with those addressed under the SLOPES V In-water/Overwater Structures Programmatic Agreement.

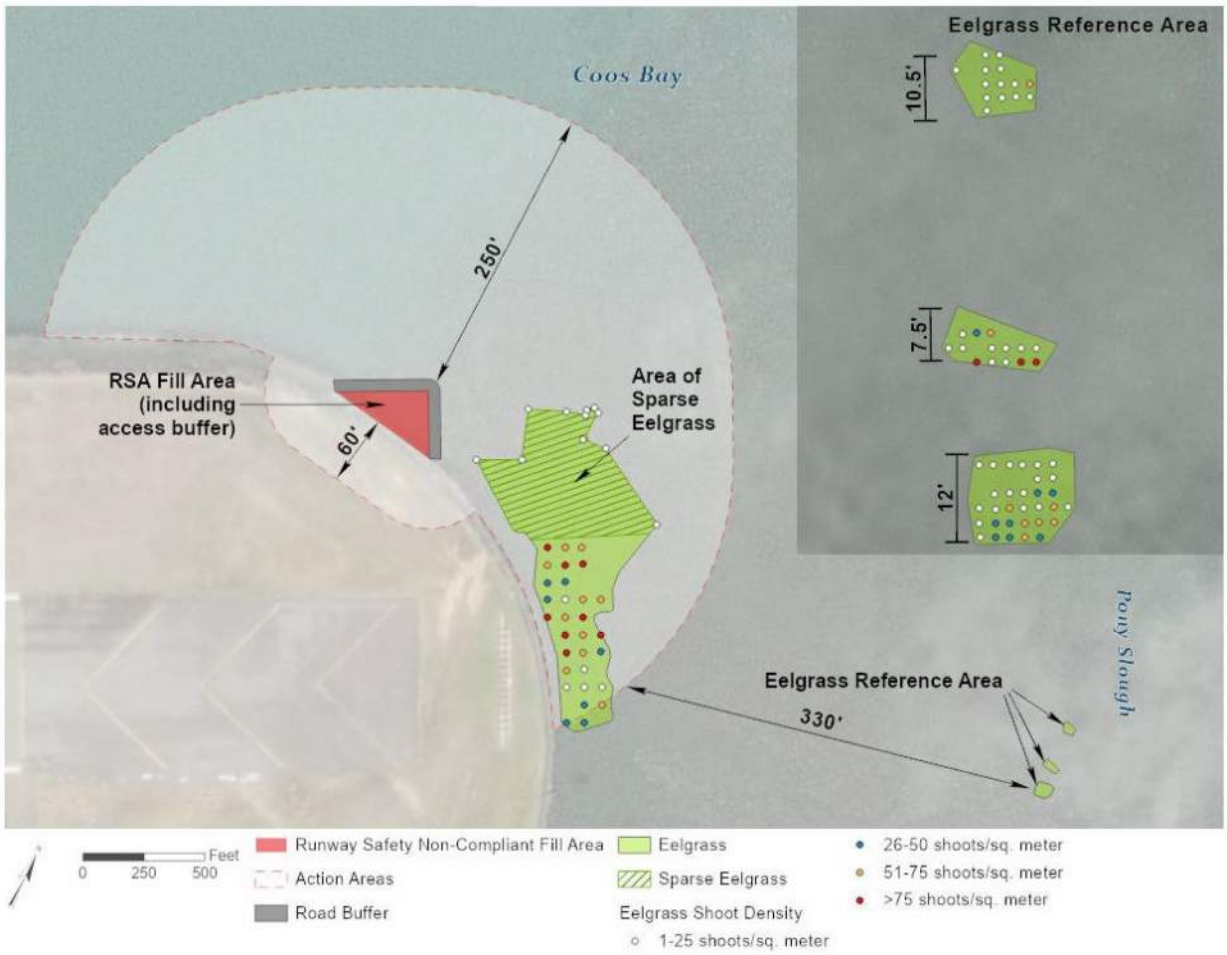

Figure 4: Eelgrass Density Adjacent to RSA Fill Area

5. Easements or Encumbrances

No easements or encumbrances are known to exist. The project site is within tidal water and managed by the Oregon Department of State Lands.

6. Baseline Information

OTH is a triangular-shaped property that is surrounded on multiple sides by the Coos Bay Estuary. The northwest side of the property is surrounded predominantly by the open water of the Coos Bay estuary. The east boundary of OTH is defined by Pony Slough and its estuarine intertidal wetland system.

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. It ranges from 0.5 mile to 1.5 miles wide, is 15 miles long, and has approximately 30 tributaries. The Coos River is the major tributary flowing into Coos Bay and is an important shipping channel. Pony Slough is identified as an estuarine intertidal wetland system (E2USN) by the USFWS National Wetland Inventory (NWI). Freshwater is supplied into the slough by Pony Creek, a perennial stream.

Three federally listed anadromous fish species spend a portion of their lifecycle within the estuarine environment of Coos Bay. Oregon Coast Coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) Green sturgeon (*Acipenser medirostris*), and southern DPS Pacific eulachon (*Thaleichthys pacificus*), were each federally listed as threatened under the Endangered Species Act (ESA). Use of the Coos Bay system by Pacific eulachon and Green sturgeon is sporadic; however, migrating habitat exists for Coho salmon in the RSA Fill Action Area and Coos Bay is considered Critical Habitat for Coho salmon.

Pony Slough has been designated EFH and a Habitat Area of Particular Concern (HAPC) for Coho salmon. EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." A HAPC is a subset of EFH that is rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts.

Estuarine areas are crucial for juvenile salmonids given their multiple functions as areas for rearing/feeding, freshwater-saltwater acclimation, and migration. Nearshore areas also provide important habitat for rearing/feeding and migrating salmonids.[6] Eelgrass supports aquatic organisms, including salmon, by providing food, refuge from predation, and nursery areas. The integrity of nearshore ecosystems where juvenile salmon reside and the capacity of these habitats to provide prey can thus influence overall salmon returns.[7]

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[6] Final Assessment of NOAA Fisheries' Critical Habitat Analytical Review Team (CHART) for the Oregon Coast Coho Salmon Evolutionarily Significant Unit. Accessed February 2020

[7] Eelgrass as Valuable Nearshore Foraging Habitat for Juvenile Pacific Salmon in the Early Marine Period. Accessed February 2020. (https://afspubs.onlinelibrary.wiley.com/doi/pdf/10.1002/mcf2.10018)

Oyster reefs create important habitat for hundreds of other marine species and filter and clean the surrounding water. Species like mussels, barnacles, and sea anemones settle on them, creating abundant food sources for commercially valuable fish species. Oyster reefs provide habitat to forage fish, invertebrates, and other shellfish. Approximately 1 mile away from the project site at the western portion of the airport, significant cockle, shrimp, and bivalve habitat exists in Coos Bay.[8]

Seagrass beds known as eelgrass (*Zostera spp.*) are a major habitat component of Coos Bay and Pony Slough. Vegetated shallows that support eelgrass are considered special aquatic sites under the 404(b)(1) guidelines of the CWA (40 CFR § 230.43). Two eelgrass species are known to be present in this ecoregion, the native *Z. marina* and the non-native *Z. japonica. Z. japonica* was first reported in 1957 in Willapa Bay, Washington, and is thought to have been introduced in the early twentieth century along with oyster stock imported from Japan (Shafer, Kaldy, and Gaeckle 2014).

Both eelgrass species contribute to ecosystem functions at multiple levels: as primary and secondary producers, as habitat structuring elements, as a substrate for epiphytes and epifauna, and as sediment stabilizers and nutrient cycling facilitators. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish such as the Pacific herring. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help ameliorate the effects of ocean acidification.

Creosote has been used as a wood preservative for more than a century to treat telephone poles, railroad ties, piers, docks and floats. Thousands of derelict creosote pilings remain in Oregon coastal waters. Many eventually break up and distribute tons of debris onto beaches throughout the Sound. Creosote comprises more than 300 chemicals that, together, are very effective at achieving their intended purpose of preventing decay or insect infestation.

But chemicals in treated wood—such as those on beaches or old dock pilings—can be harmful and even toxic to marine species. Polycyclic aromatic hydrocarbons (PAHs) are the chemicals of most concern. When exposed to ultraviolet light or sunshine, the chemicals in creosote become more toxic and are more likely to leach from the wood. A piling that contains creosote can leach throughout its lifetime. Studies show that herring eggs exposed to creosote have a high mortality rate. PAHs are known to increase disease and alter growth and reproductive function in English sole. These chemicals affect juvenile salmonids that migrate through contaminated estuaries by reducing their growth and altering immune function.[9]

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[8] https://www.dfw.state.or.us/mrp/shellfish/docs/SEACOR%20environmental%20all.pdf

[9] Washington Department of Natural Resources Derelict Creosote Piling Removal Best Management Practices For Pile Removal & Disposal

7. Mitigation Work Plan

All work will take place during the OR DEQ designated in-water work window (IWWW) of October 1 – February 15, the period during which ESA-listed species are least likely to be present within the vicinity of the project area. The proposed project will require approximately four to eight weeks of in-water/overwater work. Construction crews and equipment will access the project site from the shoreline and from a floating barge. The existing dock and pier (approximately 8,000 square feet total) and 118 pilings will be removed with a crane and/or excavator operating from a floating barge. Removal of any sections of sunken dock and/or pier will occur at low tide so workers can locate and remove the debris without causing turbidity. The 118 existing pilings will be dislodged with a vibratory hammer and slowly lifted from the sediment and placed into a contained area for appropriate upland disposal. No dredging or excavation will be required.

Piling and other structure removal includes untreated and chemically treated wood pilings, piers, boat docks and potentially other structures comprised of plastic, concrete, and other materials. Piling and other structure removal from waterways will improve water quality by eliminating chronic sources of toxic contamination and associated impacts to riparian dependent species. Pilings and other structures occur in estuaries, lakes, and rivers and are typically used in association with boat docks and other facilities. Equipment such as boats, barges, excavators, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

When removing an intact pile:

- Install a floating surface boom to capture floating surface debris.
- To the extent possible, keep all equipment (e.g., bucket, steel cable, vibratory hammer) out of the water, grip piles above the waterline, and complete all work during low water and low current conditions.
- Dislodge the piling with a vibratory hammer, whenever feasible. Never intentionally break a pile by twisting or bending.
- Slowly lift piles from the sediment and through the water column.
- Place chemically treated piles in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment. A containment basin for the removed piles and any adhering sediment may be constructed of durable plastic sheeting with sidewalls supported by hay bales or another support structure to contain all sediment.
- Fill the holes left by each piling with clean, native sediments located from the project area.

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https://www.dnr.wa.gov/publications/aqr_rest_creosote_bmps_pilings.pdf?w8th9

- Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.

When removing a broken pile:

- If a pile breaks above the surface of uncontaminated sediment, or less than 2 feet below the surface, every attempt short of excavation will be made to remove it entirely. If the pile cannot be removed without excavation, excavate sediments and saw the stump off at least 3 feet below the surface of the sediment.
- If a pile breaks above contaminated sediment, saw the stump off at the sediment line: if a pile breaks within contaminated sediment, make no further effort to remove it and cover the hole with a cap of clean substrate appropriate for the site.
- If dredging is likely in the area of piling removal, use a global positioning device (GPS) to note the location of all broken piles for future use in site debris characterization.[10]

Measures to Minimize Impacts: The following conservation measures have been incorporated into the proposed project design and construction methods to minimize and avoid potential adverse effects to ESA- listed fish species, their designated Critical Habitat elements, and Essential Fish Habitat:

- All work conducted below the Highest Median Tide (HMT) will occur during the OR DEQ-preferred IWWW for the Coos River estuary (October 1 – February 15), a period when ESA-listed species are less likely to be present within the vicinity of the project area.
- All heavy equipment (i.e., crane) will access the project site via existing piers and/or floating barges.
- All pilings will be removed with a vibratory hammer. During piling removal, the following criteria will be implemented to minimize creosote release, sediment disturbance and sediment resuspension:
  - Install a floating surface boom to capture floating surface debris.
  - Consider the best tidal condition for piling removal, try to remove in-the-dry.
  - Keep all equipment (e.g., bucket, cable, vibratory hammer) out of the water, grip piles above the waterline, and complete work during low water and low current conditions.
  - Dislodge piling with a vibratory hammer, when possible; never intentionally break a pile.
  - "Wake" the piling by vibrating to break the friction bond between the piling and sediment.
  - Slowly lift the pile from the sediment and through the water column.
  - Place the pile in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment.
  - Fill the holes left by each piling with clean, native sediments immediately upon removal.

[10] Removal of Creosote-Treated Pilings and Structures from San Francisco Bay-Environmental Assessment https://www.sfei.org/sites/default/files/biblio_files/ReportNo605_Creosote_Dec2010_finalJan13.pdf

  - Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.
- When a pile breaks or is intractable during removal, removal will continue as follows:
  - Every attempt short of excavation will be made to remove each piling, if a pile in uncontaminated sediment is intractable, breaks above the surface, or breaks below the surface, cut the pile or stump off at least 3 feet below the surface of the sediment.
- The following conditions will apply when removing preservative-treated wood:
  - To the extent possible, ensure no wood debris falls into the water. If wood debris does fall into the water, remove it immediately.
  - Wood debris will be placed in an appropriate dry storage site until removed from the site.
  - Wood construction debris will not be left in the water or stacked on the bank or below HMT.
  - Wood debris removed during the project will be evaluated to ensure proper disposal.
- The contractor will initiate daily "soft-start" procedures to provide a warning and/or give species near piling removal and installation activities a chance to leave the area prior to a vibratory hammer or impact driver operating at full capacity; thereby, exposing fewer species to loud underwater and airborne sounds.
  - A soft start procedure will be used at the beginning of in-water piling removal and installation, or any time piling removal/installation has ceased for more than 30 minutes.
  - For vibratory hammer operation, the contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.
  - For impact pile driving (if necessary), the contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets. (The reduced energy of an individual hammer cannot be quantified given the variations between individual drivers. In addition, the number of strikes will vary at reduced energy given that raising the hammer at less than full power and then releasing it results in the hammer bouncing as it strikes the pile, resulting in multiple strikes).
- A Pollution Control Plan (PCP) will be prepared by the contractor and carried out commensurate with the scope of the project that includes the following:
  - Best management practices to confine, remove, and dispose of construction waste.
  - Procedures to contain and control a spill of any hazardous material.
- All conditions of Oregon Department of Environmental Quality's (ODEQ's) 401 Water Quality Certification will be followed.
- All equipment will be inspected daily for fluid leaks. Any leaks detected will be repaired before operation is resumed. Stationary power equipment (i.e., cranes) operated within 150 feet of the river will be diapered to prevent leaks.
- All new pilings will be fitted with devices to prevent perching by piscivorous birds.

- All floatation material will be permanently encapsulated to prevent dispersal into the water.
- Replacement overwater piers and floats will be grated to allow for 50 percent light penetration.
- The proposed project will result in a net reduction of approximately 7 square feet of existing overwater area and will result in a net reduction of in-water pilings.

8. Determination of Credits

The construction of the RSA bulkhead is unavoidable and presents the lowest possible impact to EFH and ESA-listed critical habitat. Mitigation of the creosote contamination in Pony Slough proposes a 2:1 ratio. The project has a high likelihood of success and provides a much higher functioning estuarine habitat in Pony Slough than the impact site. Since the likelihood of success is greater and the impacts to potentially valuable migration corridors are reduced during construction, aquatic resource restoration is the best option for permittee-responsible mitigation.

9. Monitoring Plan

Based on the potential for in-water impacts to EFH adjacent to Runway 4/22 during construction, additional BMPs will be put in place to monitor water quality. The construction schedule will be timed to adhere to OR DEQ in-water work windows for the Coos River (October 1 – February 15) and tidal outflows. Sediment outflow filters will be utilized during dewatering to minimize turbidity in Coos Bay.

A 2-year post-construction monitoring plan for eelgrass presence/absence (within 100 feet in deeper habitat) and density (>100 feet in shallow habitat) will be compared with an adjacent control site to monitor potential impacts of the project on EFH. See the attached Biological Assessment for more details/

10. Site Protection Instrument

The project site is within tidal waters and managed by the Oregon Department of State Lands.

11. Performance Standards / Monitoring Requirements

Due to the avoidance and minimization measures described previously, this project is not likely to adversely affect EFH (eelgrass). However, a 2-year monitoring plan will be implemented in order to assess the potential for indirect effects to eelgrass as a result of project construction. To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent monitoring surveys will be conducted at a similar time during the growing season (e.g. June - early July) and using the same methodology as the baseline surveys conducted in June 2019. Analysis of the monitoring data will focus on detecting changes in the location of the eelgrass bed boundary, total areal coverage of eelgrass within a 250-foot radius of the project footprint, and changes in eelgrass shoot density.

Baseline surveys were conducted in June 2019 to delineate and characterize eelgrass beds in the vicinity of the proposed Action Area. June 3 and 4, 2019 were identified as appropriate sampling dates for the survey based on a strong minus morning low tide to maximize dewatering of the bay and resultant exposure of Z. marina. The survey team identified and delineated the boundaries and spatial distribution of the eelgrass beds in accordance with the protocols outlined in the document US Army Corps of Engineers Seattle District (2018), using the eelgrass bed edge definition described in NOAA Fisheries Western Region (2014).

To remain consistent with the 2019 baseline survey, monitoring surveys will consider eelgrass beds continuous if any eelgrass is within a one square meter quadrat and within one meter of another shoot. In areas where there are too few native eelgrass shoots to meet the bed thresholds described above, the survey map will indicate that widely scattered or sparse eelgrass shoots are present in the area, with no discernable beds. Within each bed, eelgrass shoot density will be measured using a series of ¼ square meter plots arranged in a regularly spaced grid. The positions of the survey points will be shown on GIS mapping. Data values will be converted to numbers of eelgrass shoots per square meter. Baseline surveys were also conducted in a reference area for use in interpreting the results of subsequent eelgrass monitoring surveys.

12. Maintenance/Long-term/Adaptive Management Plan

Creosote removal has proven to have such a high success rate for water quality restoration that the Washington Department of Natural Resources has removed 21,300 tons from the Puget Sound area in the last 15 years. Once conditions improve, eelgrass will naturally colonize the site and ongoing maintenance will not be necessary. Similarly, oyster seeding only requires an initial application, with no maintenance necessary. The proposed mitigation will not require maintenance nor long-term planning.

13. Financial Assurances

As a small primary, reliever, and general aviation airport, FAA Airport Improvement Project (AIP) grants cover a range of 90-95 percent of eligible costs, based on statutory requirements. The funding for this project is currently part of the 2021 AIP funding cycle, which includes mitigation as part of the construction of the RSA fill bulkhead.

Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Western Region Eugene Office
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Eugene, OR 97401
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BY: RO

November 3, 2011

Theresa Cook
Coos County Airport District
PO Box F
North Bend, OR 97459-0022

Site Name: Southwest Regional Airport
DEQ File Number: 107274
Coos County

Receiving Waters: Coos Bay
SIC code: 4582

RE: Renewal of NPDES Industrial Stormwater General Permit No. 1200-Z

Dear Theresa Cook,

On October 1, 2011, the Department of Environmental Quality (DEQ) issued revisions to the Industrial Stormwater General Permit No. 1200-Z (permit). The enclosed chart summarizes the key changes to the permit. For more information, you can also view the new requirements on DEQ's web page at: http://www.deq.state.or.us/wq/stormwater/industrial.htm.

Your coverage under the permit is scheduled to expire on June 30, 2011. In order to maintain coverage under the permit, please submit the following to DEQ's Eugene office at 165 E. 7th Ave. Suite 100, Eugene, OR 97401 by **March 31, 2012**.

- Renewal application form (enclosed)
- Updated Stormwater Pollution Control Plan (plan)- one paper copy and one electronic PDF version (preferably on a CD).
- Plan checklist (enclosed)

Renewal Application

The receiving waters and SIC code that DEQ has on record for your facility are provided above. Please confirm on the enclosed renewal application form that this information is correct. If your site has additional SIC codes, please include this information on the renewal application form. These SIC codes may differ from company-wide SIC Codes or those used for other programs such as worker's compensation insurance.

Plan

Please review your plan and amend it as necessary to ensure it is up to date, reflects current conditions at your site and meets the new permit requirements. Most of the plan requirements in the new permit did not change (see Schedule A, conditions 6 and 7). However, the following revisions to your plan are necessary:

- The new permit contains mandatory BMPs, called narrative effluent limits, (see Schedule A, condition 1) and sector specific requirements for certain industries (Schedule E). Include in your plan, the site specific BMPs that you will implement to meet these requirements. Include any additional sector specific information in the plan that is required in Schedule E.

- If your plan contains monitoring information such as benchmarks or monitoring frequencies, please update it to reflect the requirements in the new permit.

Please use the enclosed checklist to ensure your plan meets the new permit requirements and submit it with your plan. For additional technical assistance on updating your plan, please see DEQ's website, located at http://www.deq.state.or.us/wq/stormwater/industrial.htm.

Before renewing your coverage under the new permit, the public will have 30 calendar days to review your renewal application and updated plan. DEQ will post a notification on its web site that these materials can be reviewed at DEQ's regional office.

During the application process, your existing permit coverage will not expire until DEQ has taken final action on your renewal application. You will receive notification from DEQ that coverage under the new permit has been granted or denied. The new permit requirements will not become effective until this occurs.

If you do not submit a renewal application or request for termination, DEQ will terminate your permit coverage upon expiration of the existing 1200-Z permit (June 30, 2012). If you still need a permit at that time, you will be required to submit a new application, plan and permit fee of $1,586. *Please be aware that operating without a permit is a violation and subject to enforcement action including civil penalties.*

DEQ will hold the following training sessions throughout the western side of the state on the new requirements:

Time: Thursday, December 1, 8 to 10:00 am, 2nd (repeat) session from 10:30 am to 12:30 pm **Place:** City of Portland BES Water Pollution Control Laboratory, 6543 N. Burlington Ave., **Portland**
Time: Wednesday, December 7, 8 to 10:00 am, 2nd (repeat) session from 10:30 am to 12:30 pm **Place:** Clean Water Services Durham Facility, 16060 S.W. 85th Ave., **Tigard**
Time: Thursday, December 8, 2 to 4 pm **Place: Jackson County Library Medford Branch,** 205 South Central Ave., **Medford**
Time: Friday, December 9, 1 to 3 pm **Place: DEQ Regional Office, 165 East 7th Ave., Eugene**

If you no longer conduct activities regulated by the 1200-Z permit or are no longer in business, please request that your permit coverage be terminated. The termination form is located on DEQ's website, at http://www.deq.state.or.us/wq/wqpermit/docs/forms/terminationazcols.pdf.

If you have any questions, or need to request an extension for more time to update your plan, please contact Mindi English at (541)686-7763 or by email at english.mindi@deq.state.or.us.

Sincerely,

Zach Loboy
Manager, Watersheds and Stormwater

Enclosures: Renewal Application Form
Summary of Changes to Permit
SWPCP Checklist

SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE:

A legally authorized representative must sign the application. The following are authorized to sign the document:

- **Corporation** — President, secretary, treasurer, vice-president, or any person who performs principal business functions; or a manager of one or more facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million that is authorized in accordance to corporate procedure to sign such documents
- **Partnership** — General partner *[list of general partners, their addresses and telephone numbers]*
- **Sole Proprietorship** — Owner(s) *[each owner must sign the application]*
- **City, County, State, Federal, or other Public Facility** — Principal executive officer or ranking elected official
- **Limited Liability Company** — Member
- **Trusts** — Acting trustee *[list of trustees, their addresses and telephone numbers]*

APPLICATION SUBMITTAL:

The following application materials must be completed and submitted by **March 31, 2012** to the DEQ regional office below: **Signed Application Form; Stormwater Pollution Control Plan (SWPCP), and SWPCP Checklist**. No fees are required with this application.

DEQ Regional Offices		
DEQ Northwest Region 2020 SW 4th Ave., Suite 400 Portland, OR 97201-4987 (503) 229-5263 or 1-800-452-4011	DEQ Western Region 165 East 7th Avenue, Ste. 100 Eugene, OR 97401-3049 (541)-687-7326 or 1-800-844-8467	DEQ Eastern Region 700 SE Emigrant, Suite 330 Pendleton, OR 97801 (541) 276-4063 or 1-800-452-4011

NORTHWEST REGION (county)		WESTERN REGION (county)			
Clackamas	Multnomah	Benton	Douglas	Lane	Marion
Clatsop	Tillamook	Coos	Jackson	Lincoln	Polk
Columbia	Washington	Curry	Josephine	Linn	Yamhill

EASTERN REGION (county)					
Baker	Gilliam	Hood River	Lake	Sherman	Wallowa
Crook	Grant	Jefferson	Malheur	Umatilla	Wasco
Deschutes	Harney	Klamath	Morrow	Union	Wheeler

State of Oregon Department of Environmental Quality

New 1200-Z Permit Requirements

Category	Old 1200-Z	New 1200-Z
Best Management Practices	Implement best management practices (BMPs) that are appropriate for the site and describe the BMPs in a Storm Water Pollution Control Plan (SWPCP).	Meet mandatory BMP requirements (for example, "erosion and sediment control" and "spill prevention and response"). These requirements are narrative technology based effluent limits in the permit. Describe specific details of BMPs used at the site to meet these requirements in the SWPCP.
Water Quality Based Effluent Limits	Do not cause a violation of in-stream water quality standards.	Do not cause or contribute to a violation of in-stream water quality standards. Facilities discharging to impaired waters that do not meet the state's water quality standards must meet additional monitoring requirements.
Benchmarks	Meet statewide stormwater discharge concentration benchmarks for copper, lead and zinc, total suspended solids, pH and oil and grease; also E. coli (for certain landfill and sewage treatment plants).	Meet lower metals benchmarks for copper, lead and zinc and meet EPA's sector-specific benchmarks for certain industrial sectors (for example, pulp mills and automobile salvage yards).
Other Pollutants	None	Monitor for a broader suite of metals (cadmium, chromium and nickel) to determine if they are present in industrial stormwater.
Benchmark Exceedances	Within 30 days of receiving water quality sample results that exceed a benchmark concentration, submit Action Plan that contains (1) results of review, (2) a corrective action, (3) and an implementation schedule.	Complete Tier I corrective actions are required when stormwater sample results exceed benchmark or impairment reference concentrations. Tier I requirements are similar to responses in the current permit, except only submit to DEQ or Agent changes made to SWPCP based on investigation. Retain Tier I corrective action report on site and submit to DEQ or Agent upon request. Tier II corrective actions are required if a second-year geometric mean concentration exceeds a benchmark. Must implement treatment BMPs within two years. Professional engineer or certified engineering geologist must design and stamp the portion of the SWPCP addressing the treatment measures.
Sampling	Sample 4 times per year. Samples must be collected at least 14 days apart.	Added requirement to monitor during first 12 hours of a stormwater discharge event.
Monitoring Waiver	Monitoring waiver can be obtained for individual parameters after four consecutive samples collected are at or below the benchmark or exceedance due to background or natural conditions.	Monitoring waiver can be obtained for individual parameters after four consecutive samples are at or below the benchmarks based on geometric mean evaluation or due to background natural conditions.
Inspections	Monthly inspections of areas where potential spills of significant materials or industrial activities occur, and where stormwater control measures, structures, catch basins, and treatment facilities are located.	Continued inspection of items listed at left and broadened what needs to be inspected. Clarified that visual observations of stormwater discharge can occur during the monthly inspection. Require facilities to document inspection results.
Documentation	Maintain and submit to DEQ or Agent all records of inspection, maintenance and repair, education activities, and any spills.	Identified priority reports that must be submitted to DEQ or Agent and reports that are retained on site (and only submitted upon request), such as: • Continue to submit Discharge Monitoring Reports to DEQ or Agent on an annual basis; • Retain/submit only if requested routine benchmark exceedance reports (Tier I corrective action) and monthly inspection reports.

DEQ Industrial Stormwater Permits
Stormwater Pollution Control Plan (SWPCP) Check List

Instructions: Complete this form and submit with SWPCP. Fill in the appropriate page number(s) indicating the location of information in the SWPCP. New requirements are highlighted and italicized.

Site Name: **File No.:**

Permit Schedule		Requirement	Page #	Comments (For official use only)
SIC codes	Sch. E	*Provide primary and any additional SIC Codes (in renewal application or in cover letter if already submitted application)*		
Signature	A.6.b	Signed and certified in accordance with 40 CFR 122.22		
Title Page	A.7.a	Site Name		
		Site Owner or Operator		
		Name(s) of the person(s) who prepared the plan		
		DEQ Permit File (not ORR #)		
		Contact Person Name and Telephone Number		
		Site Physical Address, including County		
		Site Mailing Address (if different)		
		Plan Date		
Site Description*	A.7.b.iii	Industrial activities conducted on-site (description of processes, products made, services provided, etc.)		
		Significant materials (include methods of storage, usage, treatment, and disposal)		
General Location Map	A.7.b.i	Site in relation to surrounding properties, transportation routes, surface waters, and other relevant features.		
Site Map* (please identify clearly)	A.7.b.ii	Drainage Patterns		
		Drainage and Discharge Structures (piping, ditches, etc.)		
		Drainage Area Outline for each Stormwater Outfall		
		Paved Areas, Equipment, Tanks, Buildings in each drainage area		
		Areas of Outdoor Manufacturing, Treatment, Storage or Disposal of Significant Materials		
		Stormwater Structural Control Measures		
		Stormwater features to reduce flow or minimize impervious surfaces		
		Material Loading and Access Areas		
		Used Oil, Hazardous Waste Treatment, Storage and Disposal Facilities		
		Location of Wells (including waste injection wells, seepage pits, and drywells)		
		Location of Springs, Wetlands and Surface Waterbodies (both on-site and adjacent to the site)		
		Location of Non-Stormwater Discharges		
		Location of Sampling Points and Outfalls		
		Location of Spill Prevention and Cleanup Materials	AP-1 PH 2	

Permit Schedule		Requirement	Page #	Comments (For official use only)
Potential Pollutants*	A.7.b.iv	Identify potential pollutants that could be present in stormwater for each drainage basin		
Impervious Area	A.7.b.vi	Estimates, by individual stormwater outfall, of impervious area including paved areas and building roofs.		
Receiving Waters	A.7.b.vii	Name(s) of the receiving water(s). If to a municipal storm sewer system include ultimate receiving waters and name of municipality.		
Monitoring Locations*	A.7.b.viii	Identify discharge outfall(s) and sampling point(s) where stormwater monitoring will occur.		
		If all outfalls are not monitored, include description of outfalls, data, and analysis supporting outfalls are representative according to Schedule B.2.c.		
Site Controls*	A.7.b.v	*Identify **Best Management Practices** to meet technology based requirements (Sch. A.1) and any applicable sector specific requirements (Sch.E):* • *Minimize Exposure,* • *Oil and Grease,* • *Waste Chemicals and Material Disposal,* • *Erosion and Sediment Control,* • *Debris Control,* • *Dust Generation and Vehicle Tracking,* • *Housekeeping,* • *Spill Prevention and Response,* • *Preventative Maintenance,* • *Employee Education, and* • *Non-Stormwater Discharges*	App # 4 P. 3-4	
Procedures and Schedules*	A.7.c	**Spill Prevention and Response Procedures.** Include methods to prevent spills along with clean-up and notification procedures. Spill prevention plans may be substituted if stormwater is adequately addressed.		
		Preventative Maintenance Procedures. Include procedures for inspection, maintenance and repairs, and schedule for regular pick up and disposal of waste materials, and inspection for leaks and condition of drums, tanks and containers		
		Employee Education Schedule. Orientation w/in 30 days, education annually.		
Monitoring Info from Previous Permit*	A.7.d	*Remove or update monitoring information if plan contains monitoring information from previous permit.*		

* Some facilities must meet sector specific requirements (Schedule E) and include additional information in SWPCP, including the site map. If applicable, ensure that the SWPCP includes the sector specific information.

For Official Use Only

Date received:_____ **Plan Accepted: N/Y**

Southwest Regional Airport

North Bend/Coos County, Oregon

1200-Z Permit Submittal
Storm Water Pollution Control Plan

Prepared for:

Coos County Airport District
Contact – Bob Hood
P.O. Box "F" 1100 Airport Lane
North Bend, OR 97459
Phone – (541) 756-8531

Prepared by:

WHPacific
9755 SW Barnes Road, Suite 300
Portland, Oregon 97225

Project Engineer:
Carl Chase
Engineer, PE

Project Manager:
Rainse Anderson
Manager, PE

DEQ File #	TBD 107274
WHPacific Project No:	34214
Original:	01/27/09
Revision:	-

1200Z Permit Application
Southwest Oregon Regional Airport

WHPacific

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APPENDICIES

APPENDIX 1

- Figure 1 - Basin Map & Discharge Locations
- Figure 2 – Aerial Photo & Vicinity Map

APPENDIX 2

- Storm Report for Southwest Oregon Regional Airport; November, 2006

APPENDIX 3

- Record Keeping & Internal Reporting Procedures

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Rainse Anderson

1/24/09

1200Z Permit Application
Southwest Oregon Regional Airport

WHPacific

Schedule A

1. SITE DESCRIPTION

The airport's current configuration was established in 1935, when the city council acquired permits and funds to construct a three runway airport. The NE-SW runway (4-22) was to be 3,400 feet long, the SE-NW runway (16-34) was to be 3,900 feet long, and the E-W runway (13-31) was to be 3,450 feet long. Before that time, the airport consisted of a grassy landing strip with a few small hangar structures. In 1944, the United States Navy assumed ownership for use as a training station and coastal surveillance base. In late 1947, the government released their control and the airport was returned to the City of North Bend. By 1967 a triangular section of land totaling approximately 10.5 acres was conveyed to the U.S. Coast Guard for a heliport and base. A new terminal structure was built in 1963 and the fire and rescue station was constructed in 1964. Lighting was added to runways 4-22 and 13-31 in 1967 and 1968, respectively. Hughes Airwest provided air service from the mid-1970's to 1979. Air Oregon provided service from 1978 to 1981, at which time they were purchased by Horizon Air. Runway 4-22 was lengthened by approximately 1000 feet in 1988. In early 2006, construction began on the new terminal for Southwest Oregon Regional Airport, which included a new aircraft apron and air traffic control tower. The terminal and apron were completed in July 2008 and the tower is expected to be completed by October 2008. The Fuel Farm project located near the Hanger building was completed in 2008, providing a fuel transfer and storage station. The relocation of Taxiway C is currently under construction, and is due to be completed in December 2008. Runway 16-34 will be shut down for airplanes and used as a helicopter approach after October 2008.

The industrial activities conducted at the North Bend airport are primarily associated with Coos Aviation, Ocean Air, The Coast Guard, the Airport itself, and the new fuel farm. Contaminants related to the site result from the takeoff, landing, loading/unloading, refueling, maintenance, de-icing and taxiing of commercial as well as private airplanes and helicopters.

The commercial airline keeps a 55 gallon barrel of de-icer, as required by their company policy. However, the use of the chemicals is minimal due to the climate at the site location. A containment plan exists for the terminal area where de-icing can occur and is discussed in the 'Site Controls' section.

The maintenance and repair shop has a tank for the storage of used oil which is disposed of, on request, by a local commercial environmental service. The recently completed fuel farm, which contains 12,000 gallon fuel storage tanks (approx. 84,000 gallons of storage in total) also has a containment plan which is discussed in the 'Site Controls' section.

2. SITE CONTROLS

The purpose of the following site controls is to eliminate or minimize the exposure of pollutants to stormwater and to remove pollutants from stormwater before it discharges to surface water. In developing a control strategy, the Southwest Oregon Regional Airport will develop, implement, and maintain the following four (4) types of controls in the SWPCP as listed below:

i) *Stormwater Best Management Practices* - The Southwest Oregon Regional Airport will employ the following types of best management practices that are appropriate for the site. A schedule for implementation of these practices is currently in place as part of the existing 1200Z permit for the site and an updated schedule is contained in the 'Schedule B' section of the SWPCP. The following BMP's are designated for the site:

(1) Containment – Two areas exist on-site with the potential to experience spills. These two areas are the fuel farm, where refueling occurs, and the terminal area, where de-icing can potentially occur. The fuel farm contains a two valve system, which operates in the closed state to automatically contain any oil spill if one should occur. All drainage from the fuel farm is conveyed from sumped catch basins to a coalescing oil & water separating vault. From this point, the maintenance staff can choose to have the drainage pumped out and properly disposed of by an outside source, or, if no oil is present, the valve can be opened and the discharge conveyed through a series of water quality swales to its eventual discharge into Coos Bay via Outfall #2.

The terminal area operates with a similar containment system. Discharge from the sumped catch basins in the area is conveyed to a collection manhole which then routes discharge to a storage vault during situations where de-icing is likely to occur or to a bypass during the situations where de-icing does not occur. The discharge routed to the storage vault will be pumped out and properly disposed of by a local environmental service. Discharge which passes through the bypass will then be conveyed through a series of water quality swales before discharging into Coos Bay via Outfall #1.

The topography of the site in these two areas is flat, with slopes typically less than 2.0%. The paving material in the noted areas is concrete, which will act as a barrier, not allowing any potential contaminate to infiltrate.

(2) Oil and Grease – As noted, a coalescing oil & water separator is contained at the fuel farm site to contain oil, grease, and solids. All newly constructed catch basins are sumped to provide some oil and grease separation as well as containment.

(3) Waste Chemicals and Material Disposal – The on-site maintenance shop contains a storage tank for the containment of used oils and is emptied periodically by a local environmental service. As noted, contaminated de-icer and oil discharge will be removed from their respective storage areas by a local environmental service. Trash enclosures are in sheltered locations and the discharge is conveyed to the sanitary sewer system for treatment. These

storage tanks/vaults are single cast/mold objects, with negligible leakage potentials.

(4) Erosion and Sediment Control – A 1200-C permit was obtained with BMP's implemented during construction such as sediment fencing, inlet protection, and re-vegetating. Many of these items are still in place.

(5) Debris Control – All recently installed catch basins are sumped, lynch style catch basins in order to achieve some initial settlement of particulate as well as contain floatable particles and oils. The storm system associated with terminal building, parking area, and the approach road flows through a series of water quality swales before discharging from Outfall #1 into Coos Bay at the southwest section of the runway.

(6) Stormwater Diversion – Drainage and stormwater is diverted from fueling, storage, and disposal areas on-site by locating the said areas at relative high points within basins to minimize the amount of runoff that can come into contact with these areas.

(7) Covering Activities – Temporary measures, such as tarps, can be implemented to cover storage and/or work areas where pollutants may be exposed to stormwater, thereby reducing the chance of pollutants entering the containment mechanisms.

(8) Housekeeping - Sweeping, litter pick-up, prompt clean up of spills and leaks, and proper maintenance of vehicles will occur as noted on the maintenance schedule. Additional maintenance will be employed to eliminate or minimize exposure of stormwater to pollutants as needed.

ii) *Spill Prevention and Response Procedure* – As noted in the 'Containment' section, spill responses are designed to isolate any and all containments. Employees working in close proximity to potential spill or contaminant areas will be educated about the most effective means of spill prevention and how to respond in the event that a spill occurs (noted in section iv). The required clean-up material will be on-site or readily available and the location of materials shown on the site drawings.

iii) *Preventative Maintenance* – In order to ensure the effective operation of all stormwater best management practices, the following preventative maintenance is proposed:

(1) Monthly inspections of areas where potential spills of significant materials or industrial activities could impact stormwater runoff. This includes, but is not limited to, areas in and around the fuel farm, the de-icer storage tank, and the terminal loading areas.
(2) Monthly inspections of stormwater control measures, structures, catch basins, treatment facilities, and the coalescing plate oil/water separator.
(3) Cleaning, maintenance or repair of all materials handling, storage areas, and all stormwater control measures, structures, catch basins, and treatment facilities on an as needed basis and upon discovery of any contaminant. Cleaning,

maintenance, and repair of these systems will be performed in such a manner as to prevent the discharge of pollution.

iv) *Employee Education* - An employee orientation and education program to inform personnel of the components and goals of the SWPCP will be conducted by the maintenance staff. The program will also address spill response procedures and the necessity of good housekeeping practices. The education and training will occur within 30 calendar days of hiring an employee who works in areas where stormwater is exposed to industrial activities or conducts duties related to the implementation of the SWPCP, and annually thereafter. A schedule will be documented by the maintenance staff of the time, location, and employee(s) attending the educational program for recording purposes.

Record Keeping and Internal Reporting Procedures – The maintenance staff will record and maintain on-site the following information, which does not need to be submitted to the department, agent or other government agencies, unless it is requested.

i) Inspection, maintenance, repair and education activities as required by the SWPCP and stated in the sample frequency table below.
ii) Spills or leaks of significant materials that impacted or had the potential to impact stormwater or surface waters will be noted. Corrective actions to clean up the spill or leak as well as measures to prevent future problems of the same nature will be noted on the Discharge Monitoring Report.

Outfall Structures – The airport has been constructed through a variety of small additions and improvements over the past 75 years. Consequently, several outfall locations exist with established drainage patterns. The site consists of the following outfall structures as depicted on 'Figure 1 – Basin Map':

Outfall #1 – Consists of two 36" pipes which collects water from both runway & taxiway areas, the terminal building, and the new parking area. The basin associated with this outfall drains approximately 145.6 acres (33.0 acres pervious, 112.6 acres impervious). After flowing through a series of swales, the runoff discharges into Coos Bay from the outfall with a double tide gate at the discharge point to prevent tidal inflows.

Outfall #2 – Consists of a 24" pipe which collects water from the renovated fuel farm. The discharge from this area is consistently monitored, with discharge not being allowed to pass from the coalescing plate oil/water separator until the maintenance staff has visually ensured no oil is present, at which time the valve opened from its normal closed state to allow for the treated runoff to be conveyed to the said outfall. Outfall #2 drains approximately 6.0 acres (0.5 acres pervious, 5.5 acres impervious) and has a double tide gate at the discharge point to prevent tidal inflows from its discharge point into Coos Bay.

Outfall #3 – Drains the northeastern portion of the airport, consisting of approximately 88.0 acres (59.7 acres pervious, 28.3 acres impervious). The outfall consists of two 24" pipes with double tide gates at the discharge point into Coos Bay.

Outfalls #4-#8 – Each outfall consists of a 10" storm drain pipe which collects approximately 1.0 acres of runway in the southeastern corner of the site. These outfalls

have remained unchanged, other than routine maintenance, for approximately 20 years. Each outfall discharges into the Pony Slough, which connects to Coos Bay.

Outfall #9 – Consists of a 60" public storm drainage line which collects water from developed areas south and west of the airport. A 24" storm drainage pipe connects to this system approximately 380 feet from the discharge point. The connection pipe drains approximately 15.2 acres (6.2 acres pervious, 9.0 acres impervious) from the airport. The discharge point of this public system into the Pony Slough is through a tide gate to prevent tidal inflows and is maintained by the City of North Bend.

4. **Non-Stormwater Discharges**

a) The following non-stormwater discharges are authorized by this permit:

i) Discharges from fire-fighting activities.
ii) Fire hydrant flushings.
iii) Potable water, including water line flushings.
iv) Uncontaminated air conditioning condensate.
v) Irrigation drainage.
vi) Landscape watering, provided that all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions.
vii) Pavement wash waters where no detergents or hot water are used, no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed), and surfaces are swept before washing.
viii) Routine external building washdown that does not use detergents or hot water.
ix) Uncontaminated ground water or spring water.
x) Foundation or footing drains where flows are not contaminated with process materials.
xi) Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).

b) Piping and drainage systems for interior floor drains and process wastewater discharge points must be separated from the storm drainage system to prevent inadvertent discharge of pollutants to waters of the state. Discharge from floor drains to the stormwater drainage system is a violation of this permit.

c) Any other wastewater discharge or disposal, including stormwater mixed with wastewater, must be permitted in a separate permit, unless the wastewater is reused or recycled without discharge or disposal, or discharged to the sanitary sewer with approval from the local sanitary authority.

5. **Water Quality Standards**

a) The Southwest Oregon Regional Airport must not cause a violation of instream water quality standards as established in OAR 340-041.
b) If the Southwest Oregon Regional Airport develops, implements, and revises its SWPCP in compliance with Schedule A of this permit, the department presumes that the discharges authorized by this permit will comply with instream water quality standards unless the department obtains evidence to the contrary. Coincident samples of the discharge and at upstream and downstream locations in the receiving waterbody at

outfall #1, outfall #2, outfall #3, and outfall #9 must be collected to establish a violation of an instream water quality standard is caused by the discharge.

c) In instances where the department determines that the permit registrant's stormwater discharges are not complying with instream water quality standards, the department may take enforcement action for violations of the permit and will require the permit registrant to do one or more of the following:

i) Develop and implement an Action Plan that describes additional effective BMPs to address the parameters of concern and their locations at the site;

ii) Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is meeting water quality standards; or

iii) Curtail stormwater pollutant discharges to the extent possible and submit an individual permit application.

6. **Discharges to Impaired Waterbodies** - If a Total Maximum Daily Load (TMDL) Order (see condition D.3, Definitions) is established and the discharge from a permitted source is assigned a waste load allocation or is required to meet other conditions in the TMDL Order, then an application for an individual or different general permit or other appropriate tools may be required to address the allocation or other requirements.

STORMWATER DISCHARGE BENCHMARKS

7. **Benchmarks** - Benchmarks are guideline concentrations, not limitations. They are designed to assist the permit registrant in determining whether their SWPCP is effectively reducing pollutant concentrations in stormwater discharged from the site. For facilities that are subject to federal limitations, benchmarks apply to only those pollutants that are not limited by the federal regulations.

The following benchmarks apply to each point source discharge of stormwater associated with industrial activity:

Parameter	Benchmark
Total Copper	0.1 mg/l
Total Lead	0.4 mg/l
Total Zinc	0.6 mg/l
pH*	5.5 – 9.0 SU
Total Suspended Solids*	130 mg/l
Total Oil & Grease*	10 mg/l
Floating Solids (associated with industrial activities)	No Visible Discharge
Oil & Grease Sheen	No Visible Sheen

* See condition A.7 for list of facilities subject to federal limitations.

SCHEDULE B
MONITORING AND REPORTING REQUIREMENTS

1. **Monitoring Schedule** – The following stormwater monitoring is proposed for the outfalls #1-#3 & #9 of the site:

GRAB SAMPLES OF STORMWATER*	
Parameter	Frequency**
Total Lead	Four times per Year
Total Copper	Four times per Year
Total Zinc	Four times per Year
pH	Four times per Year
Total Suspended Solids	Four times per Year
Total Oil & Grease	Four times per Year

* For each outfall monitored, the permit registrant may collect a single grab sample or a series of equal volume grab samples. Samples must be collected from the same storm event.
** The permit registrant is allowed to collect more samples than the minimum frequency requires and must report this data.

VISUAL MONITORING OF STORMWATER	
Parameter	Frequency
Floating Solids (associated with industrial activities)	Once per Month (when discharging)
Oil & Grease Sheen	Once per Month (when discharging)

2. **Grab Sampling and Visual Monitoring Procedures and Locations** - The following requirements apply to monitoring conducted in compliance with condition B.1 above.

a) **Grab Sampling and Visual Monitoring Methodology** - The monitoring period is from July 1 to June 30th. Grab samples must be representative of the discharge and must be taken at least 14 calendar days apart. Two samples must be collected before December 31, and two samples must be collected after January 1. Time or flow-weighted compositing of samples may be used as an alternative to grab samples, except when monitoring for pH, oil and grease, and E. coli. Visual monitoring must occur at outfall(s) or discharge point(s) identified in the SWPCP as outfall(s) or point(s) where stormwater monitoring will occur.

b) **Multiple Point Source Discharges** - Each stormwater outfall must be monitored unless:

i) The outfall serves an area with no exposure of stormwater to industrial activities; or

ii) The outfall has effluent that is substantially similar to the effluent(s) of a monitored outfall and the same BMPs are implemented and maintained at the similar outfalls or drainage areas that lead to the outfalls. Substantially similar effluent(s) are discharges from drainage areas serving comparable activities where the discharges are expected to be similar in composition. The determination of substantial similarity or effluent(s) must be based on past monitoring or an analysis of industrial activities and site characteristics. The data or analysis supporting that the outfalls are representative must be included in the SWPCP as described in A.3.b.vii.

iii) If sampling points are modified, permit registrants must notify the department or agent and submit an Action Plan as described in condition A.2.c. Only outfalls #1 & #2 have been modified, but contaminants *could* be collected by the

drainage areas associated with outfalls #3 & #9. Outfalls #4-#8 are **not** being tested due to their unmodified condition, small drainage areas, and their location away from potential contaminants.

c) **Monitoring Location** - All samples must be taken at monitoring points specified in the SWPCP before the stormwater joins or is diluted by any other waste stream, body of water or substance, unless otherwise approved in writing by the department.

d) **Sampling Variance**

i) Permit registrants may request a sampling variance for missed samples if one of the following criteria is met:

a) State or federal authorities declared the year a drought year.

b) Demonstrate that rainfall in the area where the permit registrant's facility is located was 20% or more below the three-year average rainfall for that area.

c) Demonstrate to the department or agent's satisfaction that samples were unable to be collected due to the infrequency of storm events of sufficient magnitude to produce run-off. Supporting data and analysis must be submitted to the department or agent.

ii) Permit registrants must submit to the department or agent a written request for a sampling variance by July 31st of the monitoring year in which the missed sampling occurred.

3. **Monitoring Waiver**

a) **Visual Observations** - There is no reduction allowed of the required visual observations.

b) **Grab Samples** - If at least four consecutive sampling results meet the benchmarks specified in condition A.8, the permit registrant is not required to collect grab samples for the remainder of the permit term. Where the permit registrant demonstrates to the department or agent's satisfaction that a benchmark exceedance resulted from background or natural conditions as described in condition A.9, the department or agent will consider these samples as meeting the benchmark(s) for the purposes of granting a monitoring waiver. There is no reduction in monitoring allowed for facilities subject to CFR limitations as described in condition A.7.

i) Results from sampling events cannot be averaged to meet the benchmarks.

ii) Monitoring waivers may be allowed for individual parameters.

iii) The permit registrant must submit to the department or agent a request to exercise the monitoring waiver that includes the analytical results from the four sampling events. If the department or agent does not comment within 30 calendar days, the monitoring waiver is deemed approved.

c) **Revocation of Monitoring Waiver**

i) The permit registrant must conduct monitoring as specified in condition B.1 if:

a) The department or agent determines that prior monitoring efforts used to establish the monitoring waiver were improper or sampling results were incorrect;

b) The department, agent or permit registrant determines that changes to site conditions are likely to affect stormwater discharge characteristics, or

c) The department, agent or permit registrant conducts additional monitoring and the sampling results exceed benchmark(s).

ii) The department or agent will notify the permit registrant in writing if the monitoring waiver is revoked.

4. **Monitoring Reporting Requirements** - The permit registrant must submit the following to the appropriate DEQ regional office or agent:

a) **Monitoring Data -** The permit registrant must submit by July 31st of each year grab sampling and visual monitoring results for the previous monitoring period (July 1- June 30). The permit registrant must also report the minimum detection levels and analytical methods for the parameters analyzed. Non-detections must be reported as "ND" with the detection limit in mg/L parentheses, e.g., ND (0.005 mg/L). In calculating the geometric mean as described in condition A.10, one-half of the detection limits must be used for non-detections.

b) **Report Forms -** The permit registrant must use a department-approved Discharge Monitoring Report (DMR) form for both visual and analytical monitoring results

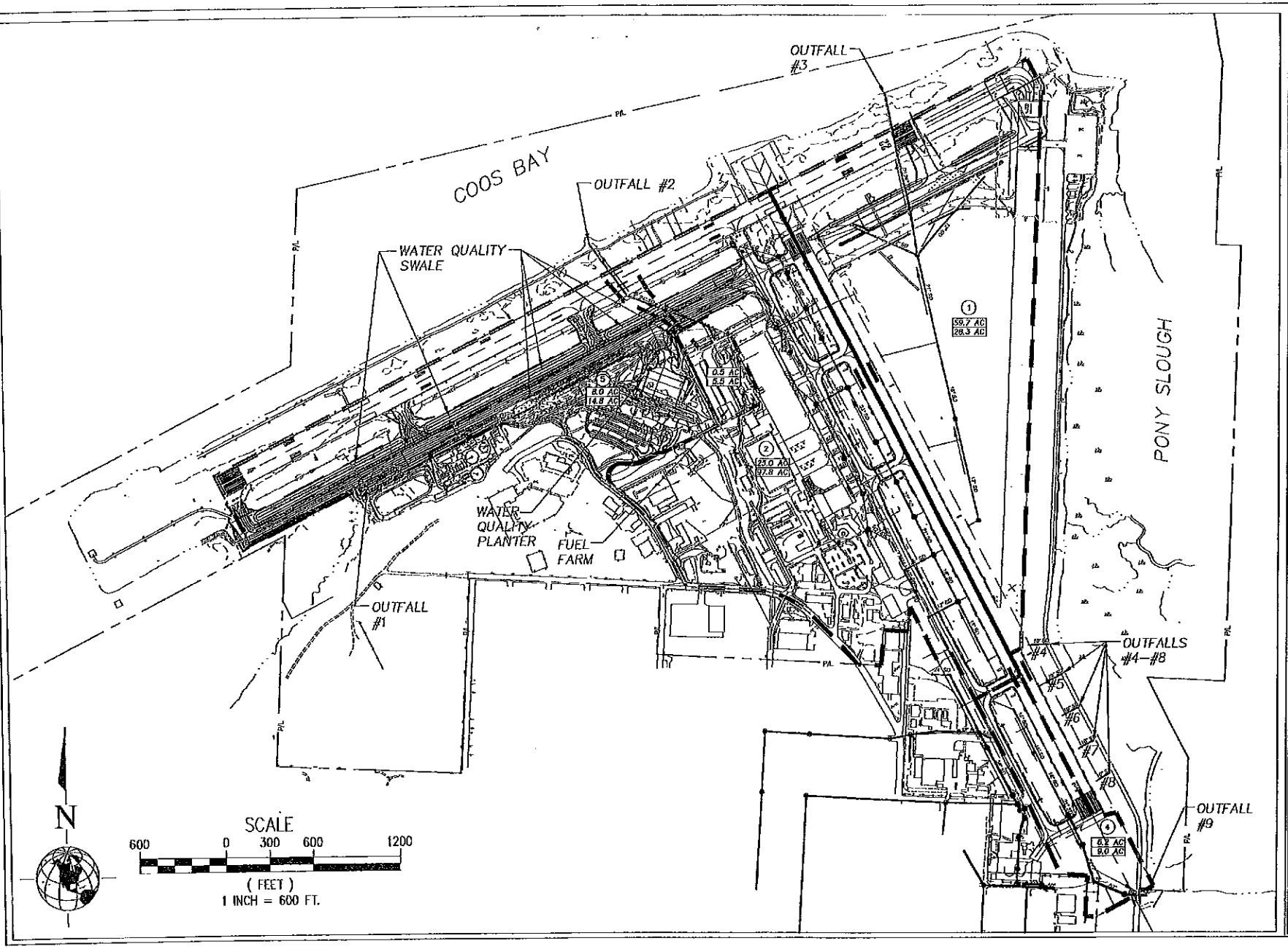
1200Z Permit Application
Southwest Oregon Regional Airport

WHPacific

APPENDIX 1

- Figure 1 - Basin Map & Discharge Locations
- Figure 2 – Aerial Photo & Vicinity Map

XRF INDEX



WHPacific
8705 SW Barnes Rd, Suite 230
Portland, OR 97225
503-626-0455 Fax 503-626-0775
www.whpacific.com

REVISIONS			
NO.	BY	DATE	REMARKS

SHEET INFO	
PREPARED	RHV
DRAWN	GRM
CHECKED	GCD
APPROVED	PRE
LAST EDIT	12/05/2009
PLOT DATE	12/05/2009
SUBMITTAL	

EXHIBIT A
BASIN MAP
COOS COUNTY AIRPORT DISTRICT

SHEET NUMBER 1

PROJECT NUMBER D54214 | DRAWING FILE NAME DRAWING2 | SCALE 1"=600'

Attachment F

P:\Coos County Airport District\D54214\Develop\Drawings\Civil\1209-3\Drawing2.dwg, 11x17, 12/5/2009 11:23:40 AM, grancy, \\pdxserv\Plots\Civil, 11x17, 1:1

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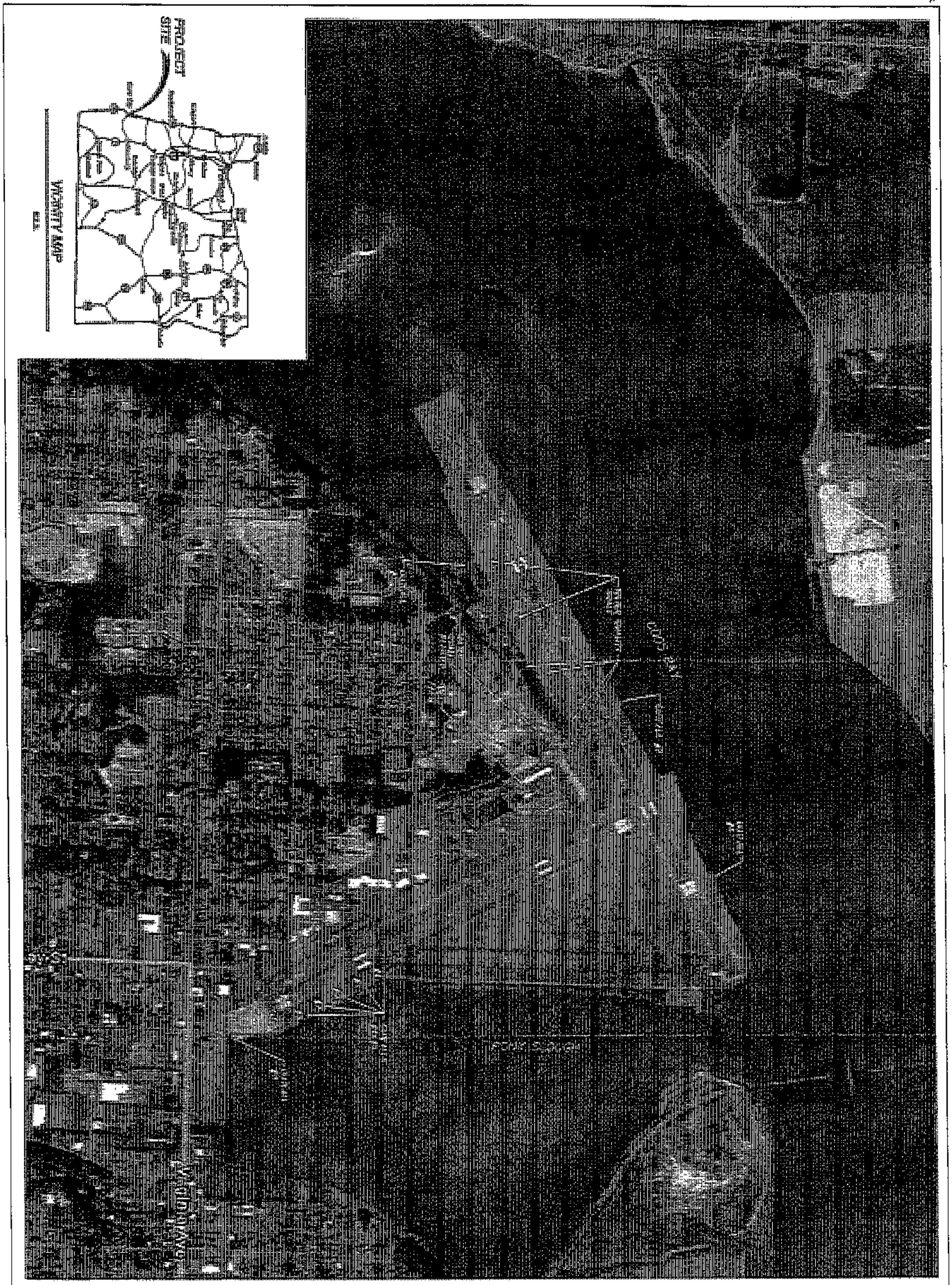


SHEET NUMBER 2	EXHIBIT B AERIAL PHOTO COOS COUNTY AIRPORT DISTRICT	SHEET INFO		REVISIONS			
		[illegible]	[illegible]	NO.	BY	DATE	REMARKS
		DRAWN	SRM				
		CHECKED	CCT				
		APPROVED	[illegible]				
		LAST EDIT	1/26/2009				
		PLOT DATE	1/26/2009				
PROJECT NUMBER 34056	DRAWING FILE NAME DRAWING2 — SCALE 1" = 1000'	SUBMITTAL					

WHPacific
9755 SW Barnes Rd, Suite 300
Portland, OR 97225
503-626-0455 Fax 503-526-0775
www.whpacific.com

Attachment F

APPENDIX 2

- Storm Report for Southwest Oregon Regional Airport; November, 2006

APPENDIX VI

Discharge Monitoring Report Form for 1200-Z Permit

Industrial Stormwater Discharge Monitoring Report - 1200-Z Permit

Permittee Legal Name:	*ODEQ File No./Facility ID:*
Facility Common Name:	*Reporting Period:* July 1, to June 30,
Facility Location:	*Laboratory Name:*
County:	*Laboratory ORELAP #:*

DEQ State of Oregon Department of Environmental Quality

Monitor for the following pollutants at the monitoring points specified in your SWPCP. Add more sheets if necessary. You MUST also attach a copy of the laboratory results sheet(s) and associated QA/QC information to this form.

Outfall Name or Number	Sample Date	pH **	Suspended Solids, Total **	Oil and Grease, Total **	Copper, Total	Lead, Total	Zinc, Total	E. coli *
		s.u.	mg/L	mg/L	mg/L	mg/L	mg/L	counts/100 ml
Permit Benchmark		6.5 - 9.0	100	10	0.04	0.04	0.16	406
4th Year Geometric Mean (Note 4)								

** Only applies to landfills accepting septage/biosolids and sewage treatment plants.*

*** Effluent limits for these parameters apply to some industries - see permit, Schedule A.7.*

Note 1: Submit this report to the appropriate DEQ regional and agent offices (see below) annually by July 31st. The report must contain the results of all stormwater monitoring conducted during the year.

Note 2: Non-detects must be reported as "ND" along with the applicable method detection limit in parentheses - e.g. ND (0.001)

Note 3: If a stormwater sampling result exceeds any of the benchmark values, the permit registrant must, within 30 calendar days of receiving the sampling results, investigate the cause of the benchmark exceedance(s), review the SWPCP and submit an Action Plan for department or agent approval.

Note 4: By June 30th of the 4th year of permit coverage, determine whether the geometric mean of the last 4 samples collected for each parameter, from each outfall, exceeds benchmark(s). Under each parameter, report the geometric mean value. If there is more than 1 outfall, report the highest geometric mean value of all the outfalls and circle or highlight the sampling data from that outfall.

Name/Title Principal Executive Officer or Authorized Delegate

(Please Print)

Telephone: *Email:*

I certify, under penalty of law, that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sign here: Date

See reverse side for additional visual monitoring requirements

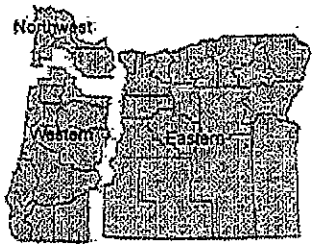
Monthly Visual Observations

	Record Visual Observations for Oil and Grease Sheen and Floating Solids	
	Oil and Grease Sheen – No visible sheen allowed. Monthly observation when discharging. For months when no discharge occurs, please write: "No Discharge" for that month.	Floating Solids (associated with industrial activities) – No visible discharge allowed. Monthly observation when discharge occurs. For months when no discharge occurs, please write: "No Discharge" for that month.
	Date	Observations (please note the outfall name or #)
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		
May		
June		

For facilities located within the following local jurisdictions, please submit one (1) copy of this report and laboratory results sheet(s) and QA/QC documentation to the local jurisdiction annually by July 31st:

Clean Water Services Industrial Stormwater 2550 SW Hillsboro Hwy. Hillsboro, OR 97123	City of Portland Industrial Stormwater Section, Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland OR 97203-5452	City of Eugene Industrial Source Control 410 River Avenue Eugene, Oregon 97404

For all other locations, please submit one (1) copy of this report and laboratory results sheet(s) and the QA/QC documentation to the appropriate DEQ regional office annually by July 31st:



DEQ Northwest Region Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
Phone: (503) 229-5263
Hours: 8 a.m. - 5 p.m.

DEQ Western Region Office
750 Front St NE, #120
Salem, OR 97301-1039
Phone: (503) 378-8240
Hours: Mon - Thurs: 8 a.m. - 5 p.m.
Fri: 8 a.m. - 12 p.m., 1 p.m. - 5 p.m.

DEQ Eastern Region Office
2146 NE 4th
Bend OR 97701
Phone: (541) 388-6146
Hours: 8 a.m. - 5 p.m.

Attachment F

APPENDIX IX

DEQ Industrial Stormwater Permits
Action Plan Form

Instructions: Fill out this form if you make routine changes to the Stormwater Pollution Control Plan or if stormwater sampling results show an exceedance of benchmark(s). If you need additional space to answer the questions below, please attach additional sheet(s).

1. Permit Registration Information

Date: _____

Facility Name: _____

Prepared By: _____

Phone Number: _____ E-mail Address: _____

2. If you are making routine changes to SWPCP, describe the proposed changes below:

_____
_____
_____
_____
_____
_____
_____
_____
_____

3. If you are filling out this form in response to a benchmark(s) exceedance, please provide the following information:
(A) Describe the nature of the benchmark(s) exceedence and whether the SWPCP is being followed properly:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

NEW TERMINAL BUILDING SOUTHWEST OREGON REGIONAL AIRPORT

North Bend, Oregon

Permit Submittal
Drainage Report

Prepared for:

Coos County Airport District
North Bend, Oregon

Prepared by:

W&H Pacific
9755 SW Barnes Road, Suite 300
Portland, Oregon 97225

Project Manager:
Brady Berry, P.E.

REGISTERED PROFESSIONAL ENGINEER
14,919
1/8/07
OREGON
JULY 26, 1990
BRADY L. BERRY
BLB 12/21/07

Original: November 29, 2006

TABLE OF CONTENTS

Project Location

This approximate 95-acre site (see Appendix 1, Existing Conditions Plan) is located in the City of North Bend, south of the Southwest Oregon Regional Airport runway. It is bordered by Airport Lane to the east and Colorado Street to the south.

Purpose

The purpose of this report is to analyze the drainage requirements and impacts for development of the new terminal building for Southwest Oregon Regional Airport. This document quantifies the storm water management plan for the site. It also provides documentation of the drainage facility criteria.

Regulatory Design Criteria

The project is within the jurisdiction of the City of North Bend. For water quality standards, the city refers to the Department of Environmental Quality (DEQ) for enforcement.

The evaluation contained in this summary is based on the Clean Water Services Design and Construction Standards (dated March 2004), which effectively meets or exceeds DEQ requirements. Accordingly, all conveyance calculations included in this report are based on a 25 year frequency design storm event and a minimum time of concentration of five minutes as defined by CWS standards.

Existing Condition Hydrology

The majority of the existing site topography in the area of the proposed development consists of slopes ranging from 0 to 10 percent, with a majority of the site draining to the north. The remaining portions of the development site are relatively steep (grades greater than 20 percent) to the north and east.

A majority of the existing storm water run-off sheet flows across the site and collects in an existing wetland area, which is located northeast of Maxwell Road.

According to the Natural Resources Conservation Service (NRCS), the majority of the site is made up of Waldport fine sand, which is classified as a SCS hydrologic soil group A (see Appendix 4). These soils have a low runoff potential and high infiltration rates even when thoroughly saturated.

Proposed Site Conditions & Hydrology

The proposed development includes a new three story terminal building for the Southwest Oregon Regional Airport, an aircraft apron, three parking lots, roadway access, and site features such as sidewalks and landscape areas.

The proposed development has seventeen drainage sub-basins.

Basin #	Impervious Area (ac)	Pervious Area (ac)
1	0.16	0.39
2	0.15	0.19
3	0.17	0.55
4	0.10	0.17
5	0.15	0.20
6	0.07	0.42
7	0.06	0.05
8	0.21	0.34
9	0.13	0.12
10	0.22	0.13
11	0.19	0.26
12	0.23	0.21
13	0.18	0.16
14	0.15	0.00
15	0.15	0.00
16	0.05	0.00
17	0.14	0.00

See Appendix 2 for calculations.

The proposed drainage sub-basins consist of impervious and pervious areas. Therefore a weighted runoff curve number was computed. The resulting curve number and calculated time of concentration are utilized by hydrographs to determine the proposed storm runoff.

Basin #	CN / Time of Concentration (min)	2-Year Peak Flow	25-Year Peak Flow	100-Year Peak Flow
1	79 / 5	0.19	0.44	0.57
2	83 / 5	0.15	0.31	0.39
3	77 / 5	0.22	0.53	0.70
4	81 / 5	0.11	0.23	0.30
5	83 / 5	0.15	0.32	0.41
6	75 / 5	0.13	0.33	0.44
7	86/ 5	0.06	0.11	0.14
8	81 / 5	0.22	0.47	0.60
9	85 / 5	0.12	0.24	0.31

See Appendix 2 for calculations.

Basin #	CN / Time of Concentration (min)	2-Year Peak Flow	25-Year Peak Flow	100-Year Peak Flow
10	88 / 5	0.20	0.37	0.46
11	82 / 5	0.19	0.40	0.51
12	85 / 5	0.22	0.43	0.54
13	85 / 5	0.17	0.33	0.42
14	98 / 5	0.12	0.19	0.23
15	98 / 5	0.12	0.19	0.23
16	98 / 5	0.04	0.06	0.08
17	98 / 5	0.11	0.18	0.22

See Appendix 2 for calculations.

Conveyance Methodology

The Santa Barbara Urban Hydrograph method with a 25 year storm event was used to determine proposed peak storm water flows. "Hydraflow" software was used to generate the hydrographs. These flow quantities were used in conjunction with Manning's equation to insure adequate capacity and flow velocities at a minimum of 3 feet per second through the new conveyance storm water system. The design storm distribution was taken from the U.S. Department of Agricultural isopluvial charts for Oregon, and a minimum time of concentration of five minutes was used.

Design Storm Event	24-Hour Precipitation
2-Yr	3.5"
25-Yr	5.5"
100-Yr	6.5"

(See Appendix 2 for conveyance calculations).

Water Quantity and Quality Design

Water quality swales were utilized for treatment of all site runoff and were designed to meet the requirements outlined in Section 2 of the Clean Water Services Design and Construction Standards Manual.

The swales were sized appropriately for the water quality design storm with a total precipitation of 0.36 inches falling in four hours with a storm return period of 96 hours.

Water Quality Volume (cf) = {0.36in. x Area (sf)}/{12 (in/ft)}
Water Quality Flow (cfs) = {Water Quality Volume (cf)}/{14,400 (sec)}

Swale #	Treatment Area (sf)	Water Quality Flow (cfs)
1	106,150	0.22

The criteria used to design the water quality swales were:

Design Flow: Water Quality Flow
Minimum Hydraulic Residence Time: 9 minutes
Maximum Water Design Depth: 0.5 feet
Minimum Freeboard: 1 foot
Manning's "n" value: 0.24
Maximum Velocity: 2 fps based on 25 year flow
Minimum Length: 100 feet
Minimum Slope: 0.5 percent
Minimum Bottom Width: 2 feet
Maximum Side Slope In Treatment Area: 4H:1V
Maximum Side Slope Above Treatment Area: 2.5H:1V

Swale #	Bottom Width	Flow Depth	Velocity	Length
1	2'	3.84"	0.23 ft/s	150'

Please see Appendix 3 for swale design calculations.

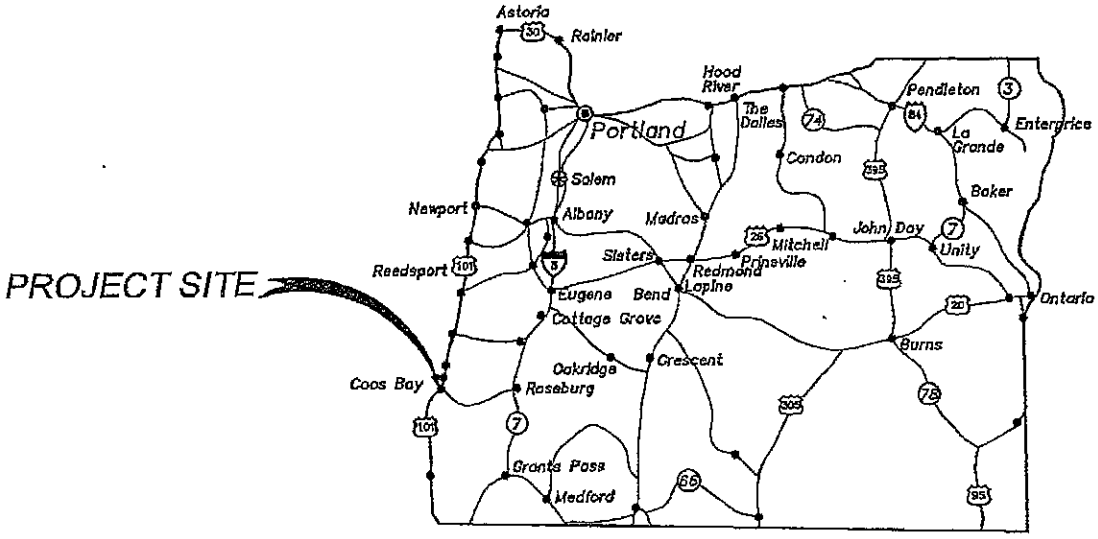
Maintenance: Water Quality Swales shall be maintained per Detail No. 530 "Water Quality Swale Construction & Maintenance Notes" of the Clean Water Services Design and Construction Standards.

Conclusions

This proposed development provides both water quality and water quantity based on the Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management Manual. .

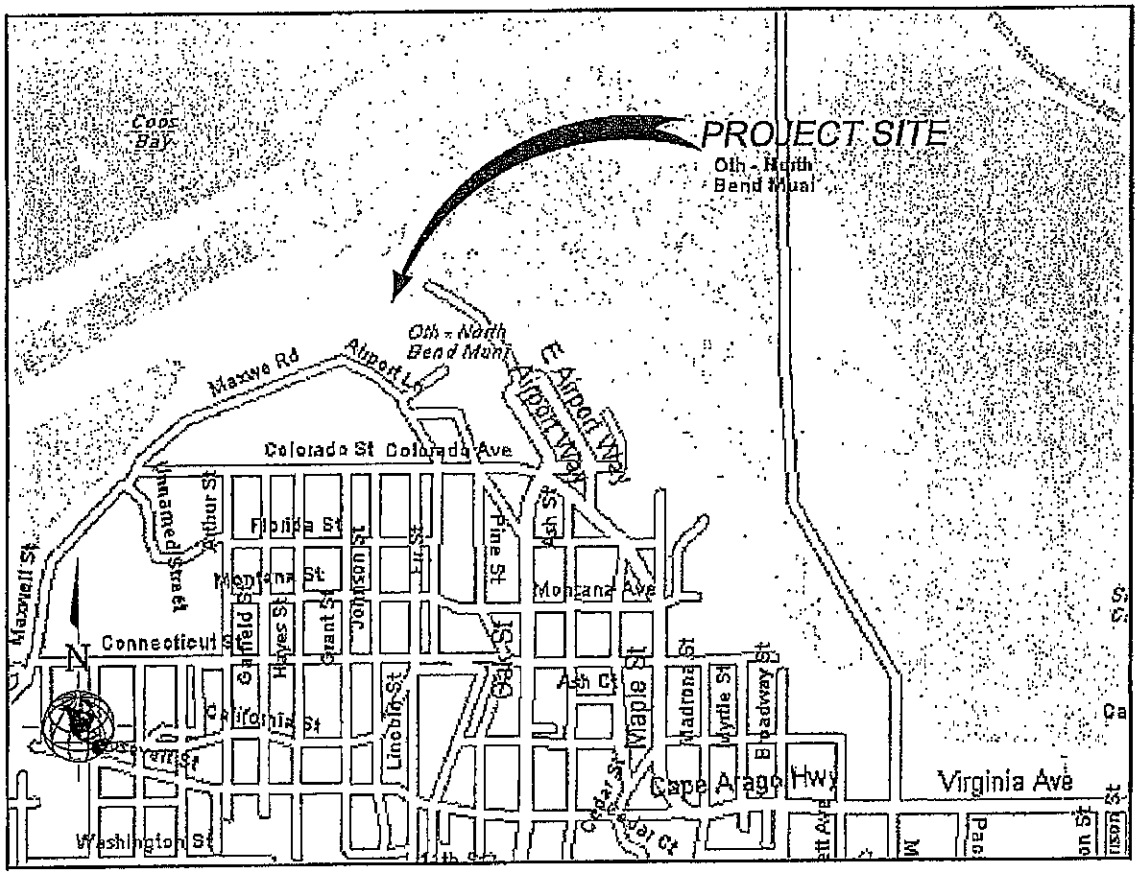
Sources of Information and Relevant References

- Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management Manual dated March 2004.
- King County Surface Water Design Manual dated November 1992
- Soil Conservation Service Soil Survey for Coos County dated December 2005



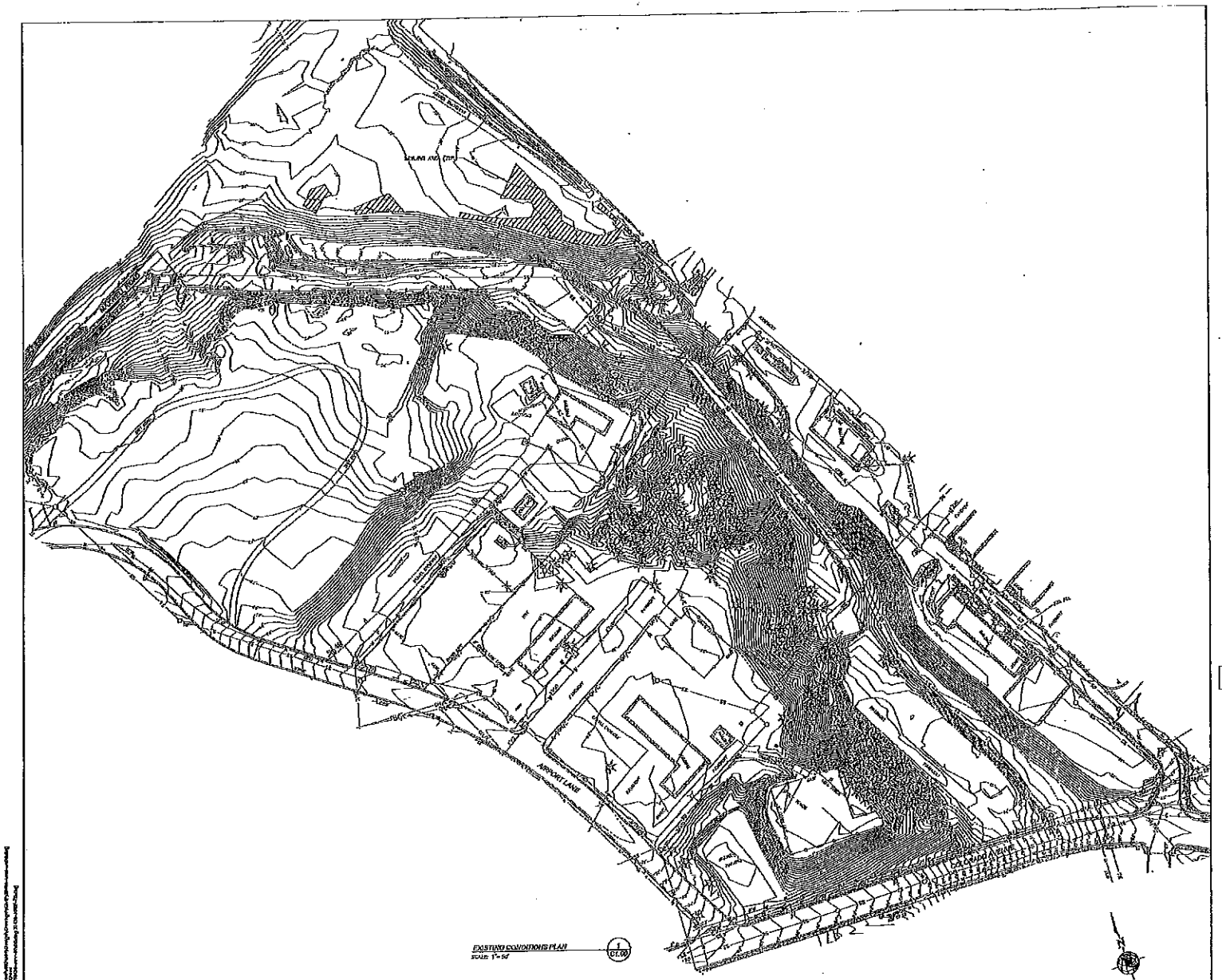
VICINITY MAP

N.T.S.



PROJECT LOCATION

N.T.S.



ZIMMER GUNSUL FRASCA PARTNERSHIP

ZGF ARCHITECTS

Architecture / Planning / Interiors
Portland / Los Angeles / Washington, D.C.

133 S.W. Oak Street, Suite 300
Portland, Oregon 97204
503 223 3050
FAX 503 223 1002

Consultants

STRUCTURAL ENGINEER
KPFF CONSULTING ENGINEERS
333 SW 5TH AVE SUITE 200
PORTLAND, OR 97204

MECHANICAL ENGINEER
PAE CONSULTING ENGINEERS
888 SW 5TH AVE SUITE 300
PORTLAND, OR 97204

ELECTRICAL ENGINEER
PAE CONSULTING ENGINEERS
888 SW 5TH AVE SUITE 300
PORTLAND, OR 97204

CIVIL ENGINEER
WEST HAYES
3737 SW EVERGREEN BLVD SUITE 300
PORTLAND, OR 97239

LANDSCAPE ARCHITECT
LANDWORKS
319 SW WASHINGTON, SUITE 820
PORTLAND, OR 97204

GEOTECHNICAL
SOLTAN TOMS ENGINEERS
330 SW COLORADO AVE
CORVALLIS, OR 97330

CONTROL TOWER DESIGN
THE HOLT COMPANY
600 SW 10TH AVE, SUITE 600
PORTLAND, OR 97205

LIGHTING DESIGN
ULMA LIGHTING DESIGN
830 SW 10TH AVENUE, SUITE 100
PORTLAND, OR 97205

Revisions

Portland International Airport

NEW TERMINAL BUILDING

3118 COLORADO AVE
NORTH BEND, OR

Drawing Title

EXISTING CONDITIONS PLAN

Date SEPT. 11, 2001
Job No. P 200101
Drawn By: DK
Checked By: RB

Drawing No.

C1.00

GMP SET

Attachment F

NRCS Natural Resources Conservation Service

Web Soil Survey

Contact Us | Download Soils Data | Preferences | Logout | Help

Area of Interest | Soil Map | Soil Data Explorer

Create Printable Document

Map Unit Legend Summary

Coos County, Oregon

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
59D	Waldport fine sand, 0 to 30 percent slopes	27.2	100.0

Soil Map

Scale (not to scale)

Attachment F

Water Features

Coos County, Oregon

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
59D:										
Waldport	A	—	Jan-Dec			—	—	None	—	None

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

"Hydrologic soil groups" are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

"Surface runoff" refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The "months" in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

"Water table" refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top ("upper limit") and base ("lower limit") of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

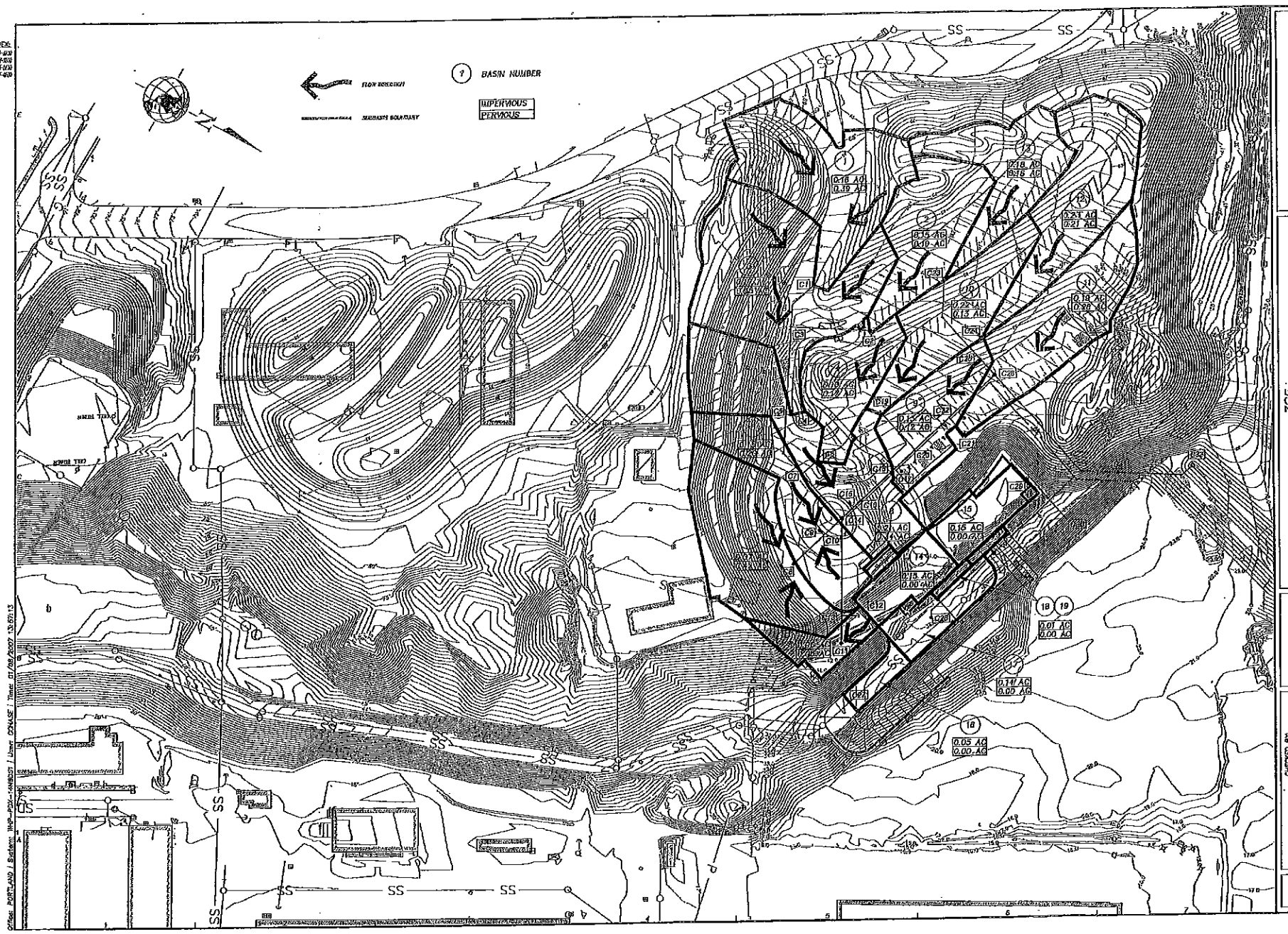
"Ponding" is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates "surface water depth" and the "duration" and "frequency" of ponding. Duration is expressed as "very brief" if less than 2 days, "brief" if 2 to 7 days, "long" if 7 to 30 days, and "very long" if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. "None" means that ponding is not probable; "rare" that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); "occasional" that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and "frequent" that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

"Flooding" is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

"Duration" and "frequency" are estimated. Duration is expressed as "extremely brief" if 0.1 hour to 4 hours, "very brief" if 4 hours to 2 days, "brief" if 2 to 7 days, "long" if 7 to 30 days, and "very long" if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. "None" means that flooding is not probable; "very rare" that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); "rare" that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); "occasional" that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); "frequent" that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and "very frequent" that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.



Attachment F

25 YEAR EVENT - SANTA BARBARA URBAN HYDROGRAPH (SBUH)

Project: Coos County Airport Terminal Building
Client: ZGF
Job No.: 32436
Design: D. Peppmeier

IMPERVIOUS CN = 98
PERVIOUS CN = 71

STORM 25-YR. 24-HR.
DEFAULT n = 0.013

Orig: 21-Nov-2006
Rev: 08-Jan-2007

SBUH Hydrology											Pipe Sizing (via Manning's equation, full flow)										
Pipe	Upstream Node	Downstream Node	Initial Subarea Tc (min)	Total Tc (min)	I in/hr (in/hr)	A IMPERV. (acre)	A PERV. (acre)	C*A Incr. (acre)	Total C*A (acre)	Q CIA (cfs)	Upstream Elevation (ft)	Downstream Elevation (ft)	Len. (ft)	Slope %	Dia. in (in)	n	Q Cap. (cfs)	V (fps)	Flow Time (min)	This Reach's Tc at Downstream Node (min)	
1	C1	C3								0.44	54.48	51.02	58.94	5.87	6	0.013	1.36	6.92	0.14	0.14	OK
2	C2	C3								0.31	53.37	51.02	93.85	2.50	6	0.013	0.89	4.52	0.35	0.35	OK
3	C3	C5								0.75	51.02	45.93	101.88	5.00	6	0.013	1.25	6.39	0.27	0.27	OK
4	C4	C5								0.53	46.55	45.93	6.51	9.52	6	0.013	1.73	8.81	0.01	0.01	OK
5	C5	C7								1.28	45.85	40.21	77.81	7.25	8	0.013	3.25	9.32	0.14	0.14	OK
6	C6	C7								0.23	44.00	40.29	21.84	16.97	6	0.013	2.31	11.77	0.03	0.03	OK
7	C7	C14								1.51	40.12	39.71	69.40	0.60	10	0.013	1.70	3.11	0.37	0.37	OK
8	C8	C10								0.33	41.94	41.42	47.51	1.10	6	0.013	0.59	3.00	0.26	0.26	OK
9	C9	C10								0.32	41.86	41.42	7.80	5.64	6	0.013	1.33	6.78	0.02	0.02	OK
10	C10	C14								0.65	41.42	40.04	27.93	4.95	6	0.013	1.25	6.36	0.07	0.07	OK
11	C11	C13								0.11	43.50	42.74	31.65	2.40	6	0.013	0.87	4.43	0.12	0.12	OK
12	C12	C13								0.19	44.00	42.74	20.92	6.02	6	0.013	1.38	7.01	0.05	0.05	OK
13	C13	C14								0.30	42.74	40.04	112.44	2.40	6	0.013	0.87	4.43	0.42	0.42	OK
14	C14	C16								2.46	39.54	39.40	19.01	0.75	12	0.013	3.08	3.93	0.08	0.08	OK
15	C15	C16								0.47	41.86	39.65	6.74	32.79	6	0.013	3.21	16.36	0.01	0.01	OK
16	C16	C18								2.93	39.40	38.97	57.56	0.75	12	0.013	3.08	3.93	0.24	0.24	OK
17	C17	C18								0.24	42.65	39.22	6.74	50.89	6	0.013	4.00	20.38	0.01	0.01	OK

Attachment F

25 YEAR EVENT - SANTA BARBARA URBAN HYDROGRAPH (SBUH)

Project: Coos County Airport Terminal Building
Client: ZGF
Job No.: 32436
Design: D. Peppmeier

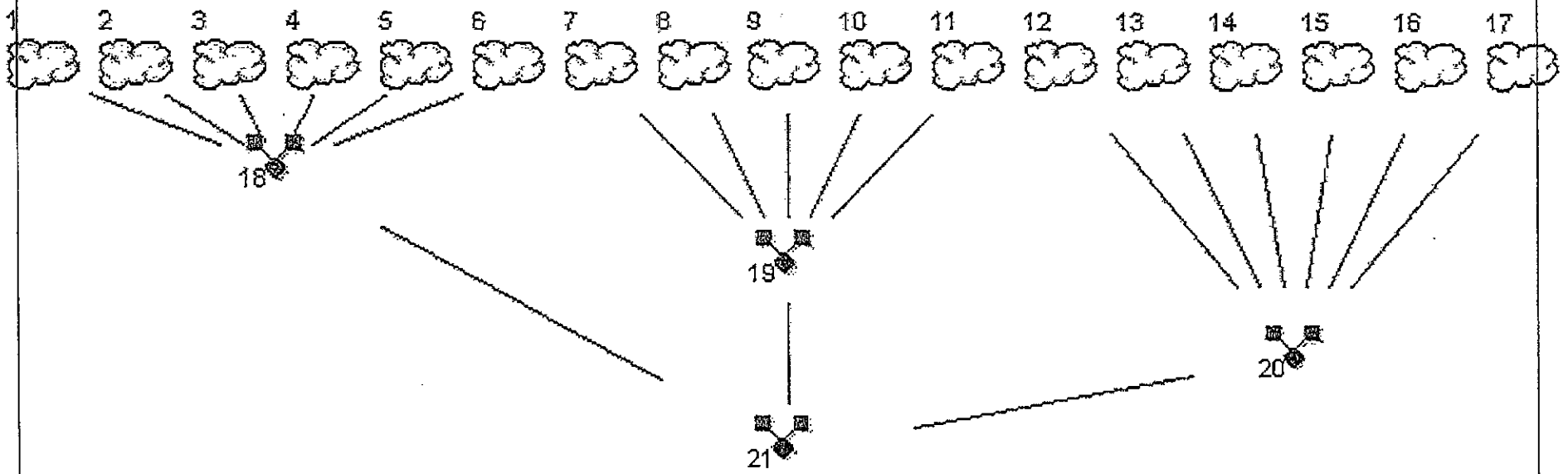
IMPERVIOUS CN = 98
PERVIOUS CN = 71

STORM 25-YR. 24-HR.
DEFAULT n = 0.013

Orig: 21-Nov-2006
Rev: 08-Jan-2007

SBUH Hydrology											Pipe Sizing (via Manning's equation, full flow)										
Pipe	Upstream Node	Downstream Node	Initial Subarea Tc (min)	Total Tc (min)	I in/hr (in/hr)	A IMPERV. (acre)	A PERV. (acre)	C*A Incr. (acre)	Total C*A (acre)	Q CIA (cfs)	Upstream Elevation (ft)	Downstream Elevation (ft)	Len. (ft)	Slope %	Dia. in (in)	n	Q Cap. (cfs)	V (fps)	Flow Time (min)	This Reach's Tc at Downstream Node (min)	
18	C18	C20								3.17	38.97	38.43	39.84	1.35	12	0.013	4.14	5.27	0.13	0.13	OK
19	C19	C20								0.37	46.66	38.68	59.26	13.30	6	0.013	2.05	10.42	0.09	0.09	OK
20	C20	C22								3.54	38.43	37.69	54.63	1.35	12	0.013	4.14	5.27	0.17	0.17	OK
21	C21	C22								0.40	44.13	37.94	26.87	23.04	6	0.013	2.69	13.71	0.03	0.03	OK
22	C22	C26								3.94	37.69	36.71	72.57	1.35	12	0.013	4.14	5.27	0.23	0.23	OK
23	C23	C25								0.33	57.22	49.54	92.69	8.29	6	0.013	1.61	8.23	0.19	0.19	OK
24	C24	C25								0.43	51.90	49.54	17.38	13.56	6	0.013	2.07	10.52	0.03	0.03	OK
25	C25	C26								0.76	49.54	37.21	43.54	28.32	6	0.013	2.98	15.20	0.05	0.05	OK
26	C26	C31								4.70	36.51	24.19	195.87	6.29	12	0.013	8.93	11.37	0.29	0.29	OK
27	C27	C28								0.06	28.95	27.29	150.51	1.10	6	0.013	0.59	3.00	0.84	0.84	OK
28	C28	C30								0.24	27.29	25.33	178.70	1.10	6	0.013	0.59	3.00	0.99	0.99	OK
29	C29	C30								0.19	29.00	25.33	71.20	5.15	6	0.013	1.27	6.48	0.18	0.18	OK
30	C30	C31								0.43	25.33	24.44	80.97	1.10	6	0.013	0.59	3.00	0.45	0.45	OK
31	C31	C32								5.13	24.19	21.99	91.76	2.40	12	0.013	5.52	7.03	0.22	0.22	OK

Attachment F



Legend

Hyd.	Origin	Description
1	SBUH Runoff	Post-development sub-basin 1
2	SBUH Runoff	Post-development sub-basin 2
3	SBUH Runoff	Post-development sub-basin 3
4	SBUH Runoff	Post-development sub-basin 4
5	SBUH Runoff	Post-development sub-basin 5
6	SBUH Runoff	Post-development sub-basin 6
7	SBUH Runoff	Post-development sub-basin 7
8	SBUH Runoff	Post-development sub-basin 8
9	SBUH Runoff	Post-development sub-basin 9
10	SBUH Runoff	Post-development sub-basin 10
11	SBUH Runoff	Post-development sub-basin 11
12	SBUH Runoff	Post-development sub-basin 12
13	SBUH Runoff	Post-development sub-basin 13
14	SBUH Runoff	Post-development sub-basin 14
15	SBUH Runoff	Post-development sub-basin 15
16	SBUH Runoff	Post-development sub-basin 16
17	SBUH Runoff	Post-development sub-basin 17
18	Combine	Combined Flow - Portion 1
19	Combine	Combined Flow Portion 2
20	Combine	Combined Flow Portion 3
21	Combine	Combined Flow Portion 4

Hydraflow Hydrographs Model	Project: 32436-SBUH-Swale-Design.gpw	Monday, Jan 8 2007, 2:33 PM

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SBUH Runoff	------	------	0.19	------	------	------	0.44	------	0.57	Post-development sub-basin 1
2	SBUH Runoff	------	------	0.15	------	------	------	0.31	------	0.39	Post-development sub-basin 2
3	SBUH Runoff	------	------	0.22	------	------	------	0.53	------	0.70	Post-development sub-basin 3
4	SBUH Runoff	------	------	0.11	------	------	------	0.23	------	0.30	Post-development sub-basin 4
5	SBUH Runoff	------	------	0.15	------	------	------	0.32	------	0.41	Post-development sub-basin 5
6	SBUH Runoff	------	------	0.13	------	------	------	0.33	------	0.44	Post-development sub-basin 6
7	SBUH Runoff	------	------	0.06	------	------	------	0.11	------	0.14	Post-development sub-basin 7
8	SBUH Runoff	------	------	0.22	------	------	------	0.47	------	0.60	Post-development sub-basin 8
9	SBUH Runoff	------	------	0.12	------	------	------	0.24	------	0.31	Post-development sub-basin 9
10	SBUH Runoff	------	------	0.20	------	------	------	0.37	------	0.46	Post-development sub-basin 10
11	SBUH Runoff	------	------	0.19	------	------	------	0.40	------	0.51	Post-development sub-basin 11
12	SBUH Runoff	------	------	0.22	------	------	------	0.43	------	0.54	Post-development sub-basin 12
13	SBUH Runoff	------	------	0.17	------	------	------	0.33	------	0.42	Post-development sub-basin 13
14	SBUH Runoff	------	------	0.12	------	------	------	0.19	------	0.23	Post-development sub-basin 14
15	SBUH Runoff	------	------	0.12	------	------	------	0.19	------	0.23	Post-development sub-basin 15
16	SBUH Runoff	------	------	0.04	------	------	------	0.06	------	0.08	Post-development sub-basin 16
17	SBUH Runoff	------	------	0.11	------	------	------	0.18	------	0.22	Post-development sub-basin 17
18	Combine	1, 2, 3, 4, 5, 6,	------	0.95	------	------	------	2.16	------	2.80	Combined Flow - Portion 1
19	Combine	7, 8, 9, 10, 11,	------	0.92	------	------	------	1.82	------	2.28	Combined Flow Portion 2
20	Combine	12, 13, 14, 15, 16, 17,	------	0.78	------	------	------	1.39	------	1.71	Combined Flow Portion 3
21	Combine	18, 19, 20	------	2.64	------	------	------	5.36	------	6.78	Combined Flow Portion 4

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SBUH Runoff	0.19	6	480	3,126	---	------	------	Post-development sub-basin 1
2	SBUH Runoff	0.15	6	480	2,294	---	------	------	Post-development sub-basin 2
3	SBUH Runoff	0.22	6	480	3,739	---	------	------	Post-development sub-basin 3
4	SBUH Runoff	0.11	6	480	1,675	---	------	------	Post-development sub-basin 4
5	SBUH Runoff	0.15	6	480	2,361	---	------	------	Post-development sub-basin 5
6	SBUH Runoff	0.13	6	480	2,316	---	------	------	Post-development sub-basin 6
7	SBUH Runoff	0.06	6	480	838	---	------	------	Post-development sub-basin 7
8	SBUH Runoff	0.22	6	480	3,411	---	------	------	Post-development sub-basin 8
9	SBUH Runoff	0.12	6	480	1,830	---	------	------	Post-development sub-basin 9
10	SBUH Runoff	0.20	6	480	2,882	---	------	------	Post-development sub-basin 10
11	SBUH Runoff	0.19	6	480	2,912	---	------	------	Post-development sub-basin 11
12	SBUH Runoff	0.22	6	480	3,221	---	------	------	Post-development sub-basin 12
13	SBUH Runoff	0.17	6	480	2,489	---	------	------	Post-development sub-basin 13
14	SBUH Runoff	0.12	6	474	1,779	---	------	------	Post-development sub-basin 14
15	SBUH Runoff	0.12	6	474	1,779	---	------	------	Post-development sub-basin 15
16	SBUH Runoff	0.04	6	474	593	---	------	------	Post-development sub-basin 16
17	SBUH Runoff	0.11	6	474	1,660	---	------	------	Post-development sub-basin 17
18	Combine	0.95	6	480	15,458	1, 2, 3, 4, 5, 6,	------	------	Combined Flow - Portion 1
19	Combine	0.92	6	480	13,659	7, 8, 9, 10, 11,	------	------	Combined Flow Portion 2
20	Combine	0.78	6	480	11,519	12, 13, 14, 15, 16, 17,		------	Combined Flow Portion 3
21	Combine	2.64	6	480	40,636	18, 19, 20	------	------	Combined Flow Portion 4

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SBUH Runoff	0.44	6	480	6,462	---	------	------	Post-development sub-basin 1
2	SBUH Runoff	0.31	6	480	4,480	---	------	------	Post-development sub-basin 2
3	SBUH Runoff	0.53	6	480	7,962	---	------	------	Post-development sub-basin 3
4	SBUH Runoff	0.23	6	480	3,363	---	------	------	Post-development sub-basin 4
5	SBUH Runoff	0.32	6	480	4,612	---	------	------	Post-development sub-basin 5
6	SBUH Runoff	0.33	6	480	5,088	---	------	------	Post-development sub-basin 6
7	SBUH Runoff	0.11	6	480	1,572	---	------	------	Post-development sub-basin 7
8	SBUH Runoff	0.47	6	480	6,850	---	------	------	Post-development sub-basin 8
9	SBUH Runoff	0.24	6	480	3,478	---	------	------	Post-development sub-basin 9
10	SBUH Runoff	0.37	6	480	5,267	---	------	------	Post-development sub-basin 10
11	SBUH Runoff	0.40	6	480	5,766	---	------	------	Post-development sub-basin 11
12	SBUH Runoff	0.43	6	480	6,122	---	------	------	Post-development sub-basin 12
13	SBUH Runoff	0.33	6	480	4,731	---	------	------	Post-development sub-basin 13
14	SBUH Runoff	0.19	6	474	2,865	---	------	------	Post-development sub-basin 14
15	SBUH Runoff	0.19	6	474	2,865	---	------	------	Post-development sub-basin 15
16	SBUH Runoff	0.06	6	474	955	---	------	------	Post-development sub-basin 16
17	SBUH Runoff	0.18	6	474	2,674	---	------	------	Post-development sub-basin 17
18	Combine	2.16	6	480	31,944	1, 2, 3, 4, 5, 6,	------	------	Combined Flow - Portion 1
19	Combine	1.82	6	480	25,962	7, 8, 9, 10, 11,	------	------	Combined Flow Portion 2
20	Combine	1.39	6	474	20,213	12, 13, 14, 15, 16, 17,		------	Combined Flow Portion 3
21	Combine	5.36	6	480	78,118	18, 19, 20	------	------	Combined Flow Portion 4

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SBUH Runoff	0.57	6	480	8,244	---	------	------	Post-development sub-basin 1
2	SBUH Runoff	0.39	6	480	5,625	---	------	------	Post-development sub-basin 2
3	SBUH Runoff	0.70	6	480	10,243	---	------	------	Post-development sub-basin 3
4	SBUH Runoff	0.30	6	480	4,256	---	------	------	Post-development sub-basin 4
5	SBUH Runoff	0.41	6	480	5,790	---	------	------	Post-development sub-basin 5
6	SBUH Runoff	0.44	6	480	6,603	---	------	------	Post-development sub-basin 6
7	SBUH Runoff	0.14	6	480	1,951	---	------	------	Post-development sub-basin 7
8	SBUH Runoff	0.60	6	480	8,669	---	------	------	Post-development sub-basin 8
9	SBUH Runoff	0.31	6	480	4,334	---	------	------	Post-development sub-basin 9
10	SBUH Runoff	0.46	6	474	6,490	---	------	------	Post-development sub-basin 10
11	SBUH Runoff	0.51	6	480	7,268	---	------	------	Post-development sub-basin 11
12	SBUH Runoff	0.54	6	480	7,628	---	------	------	Post-development sub-basin 12
13	SBUH Runoff	0.42	6	480	5,895	---	------	------	Post-development sub-basin 13
14	SBUH Runoff	0.23	6	474	3,409	---	------	------	Post-development sub-basin 14
15	SBUH Runoff	0.23	6	474	3,409	---	------	------	Post-development sub-basin 15
16	SBUH Runoff	0.08	6	474	1,136	---	------	------	Post-development sub-basin 16
17	SBUH Runoff	0.22	6	474	3,182	---	------	------	Post-development sub-basin 17
18	Combine	2.80	6	480	40,760	1, 2, 3, 4, 5, 6,	------	------	Combined Flow - Portion 1
19	Combine	2.28	6	480	32,353	7, 8, 9, 10, 11,	------	------	Combined Flow Portion 2
20	Combine	1.71	6	474	24,660	12, 13, 14, 15, 16, 17,		------	Combined Flow Portion 3
21	Combine	6.78	6	480	97,773	18, 19, 20	------	------	Combined Flow Portion 4

32436-SBUH-Swale-Design.gpw	Return Period: 100 Year	Monday, Jan 8 2007, 2:22 PM

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

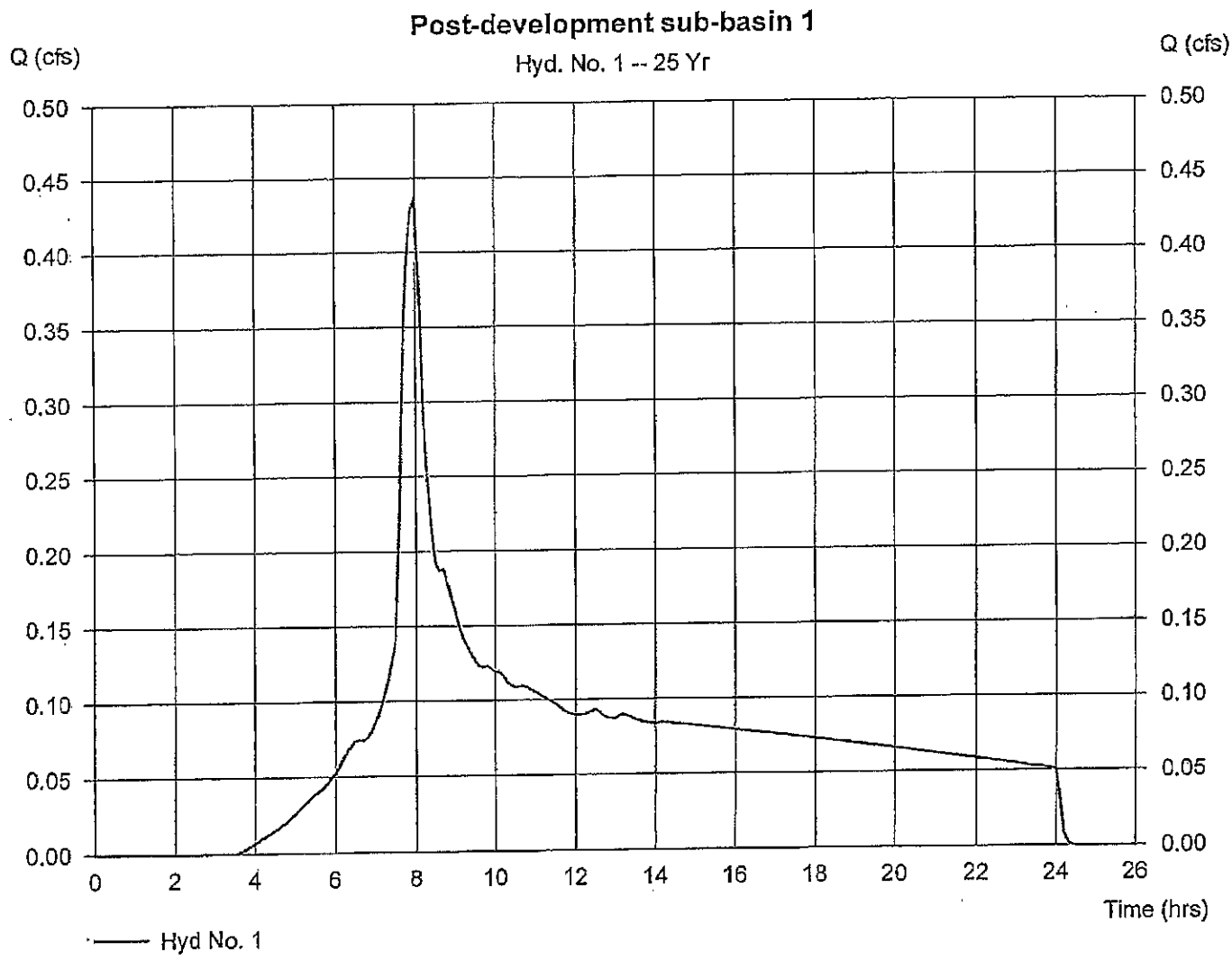
Monday, Jan 8 2007, 2:22 PM

Hyd. No. 1

Post-development sub-basin 1

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.44 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 0.55 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 5 min
Total precip.	= 5.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= N/A

Hydrograph Volume = 6,462 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 8 2007, 2:22 PM

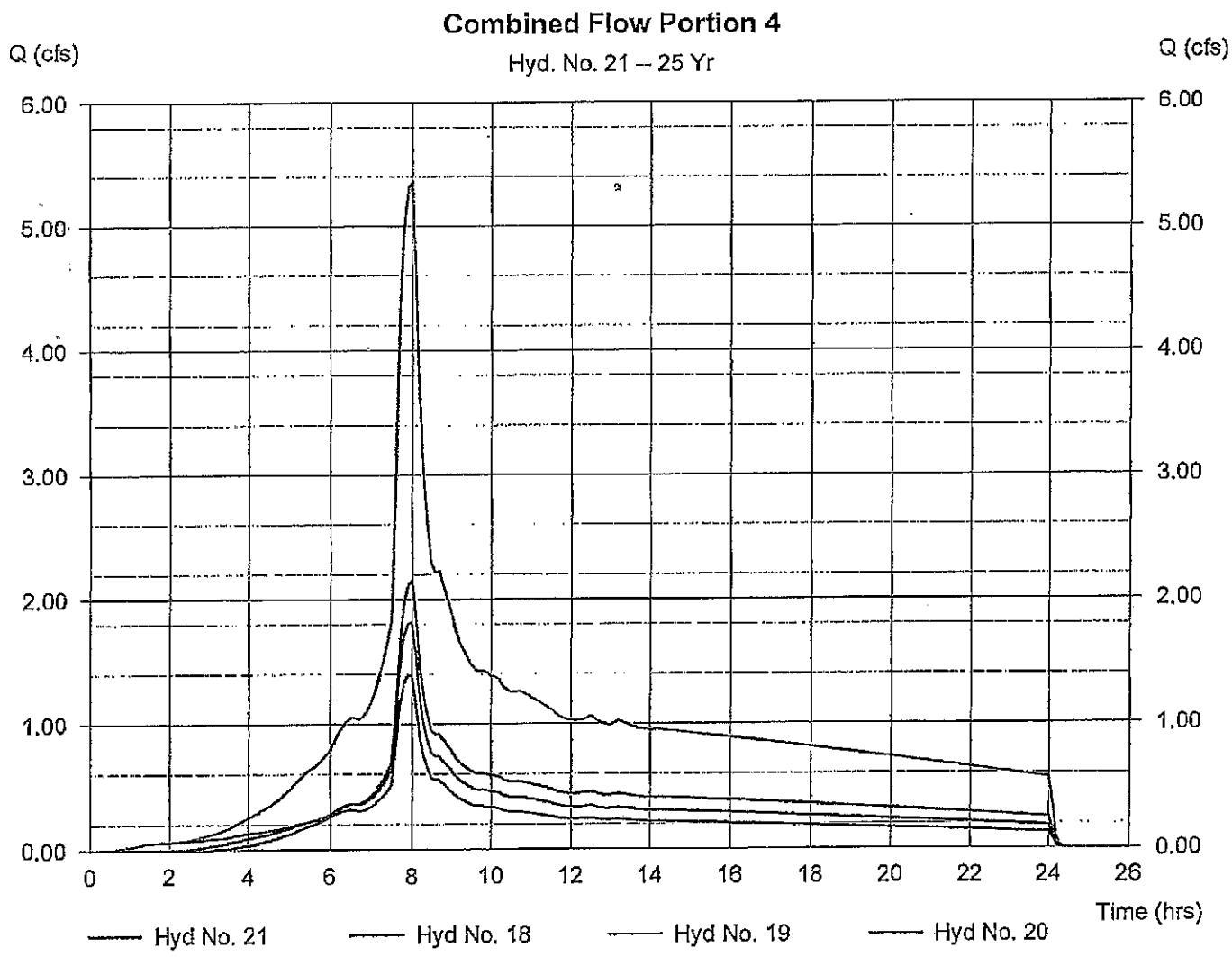
Hyd. No. 21

Combined Flow Portion 4

Hydrograph type = Combine
Storm frequency = 25 yrs
Inflow hyds. = 18, 19, 20

Peak discharge = 5.36 cfs
Time interval = 6 min

Hydrograph Volume = 78,118 cuft



W&H PACIFIC
AN AECOM COMPANY

planners
surveyors
engineers
landscape architects

CWS DESIGN:

Water Quality flow $Q\,(cfs) = \dfrac{0.36(in) \times Area(SF)}{12 \times 4 \times 60 \times 60}$

$= \dfrac{0.36 \times 106{,}150}{12 \times 4 \times 60 \times 60}$

$= 0.22\ cfs$

Project _____ Subject _____ Sheet No. ____ of ____

Job No. _____ Prepared by _____ Date _____ Checked by _____ Date _____

Coos County Airport Terminal Bldg
Worksheet for Trapezoidal Channel

Project Description	
Project File	i:\transfer\jtruong\fmw\project2.fm2
Worksheet	Coos County Airport Terminal Bldg Swale
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.250	
Channel Slope	0.010000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	2.00	ft
Discharge	0.22	ft^3/s

Results		
Depth	0.32	ft
Flow Area	0.96	ft^2
Wetted Perimeter	4.05	ft
Top Width	3.95	ft
Critical Depth	0.07	ft
Critical Slope	2.309630	ft/ft
Velocity	0.23	ft/s
Velocity Head	0.81e-3	ft
Specific Energy	0.33	ft
Froude Number	0.08	
Flow is subcritical.		

$$\text{RESIDENCE TIME} = \frac{\text{SWALE LENGTH}}{\text{VELOCITY}}$$

$$= \frac{150\ FT}{0.23\ \frac{FT}{S} \times \frac{60\ S}{MIN}} = 10.87\ min$$

> 9 min. $\therefore$ OK.

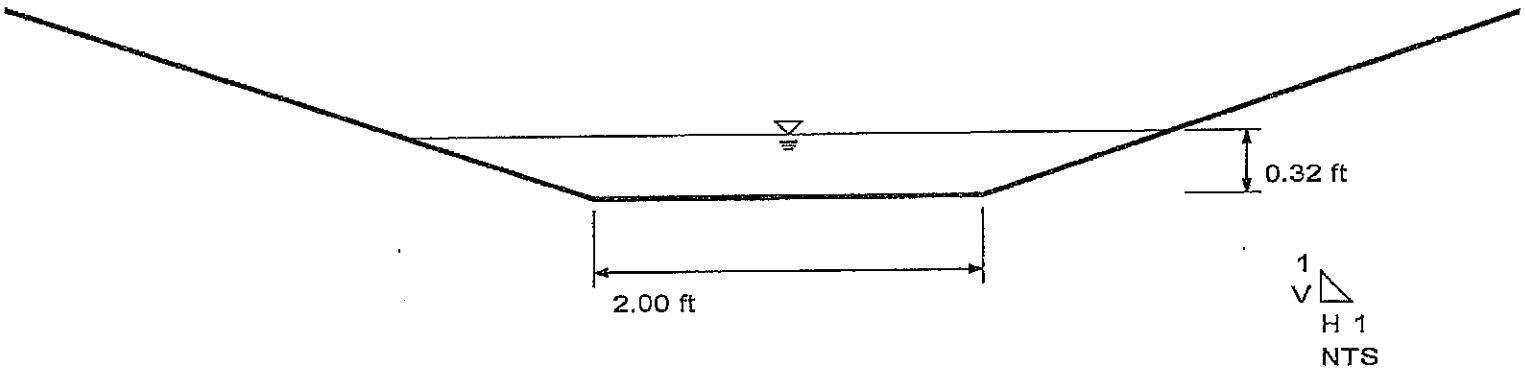
$$\text{Depth} = 0.32\ ft \times \frac{12\ in}{ft} = 3.84\ in < 6''$$

$\therefore$ OK.

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Project File	i:\transfer\jtruong\fmw\project2.fm2
Worksheet	Coos County Airport Terminal Bldg Swale
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

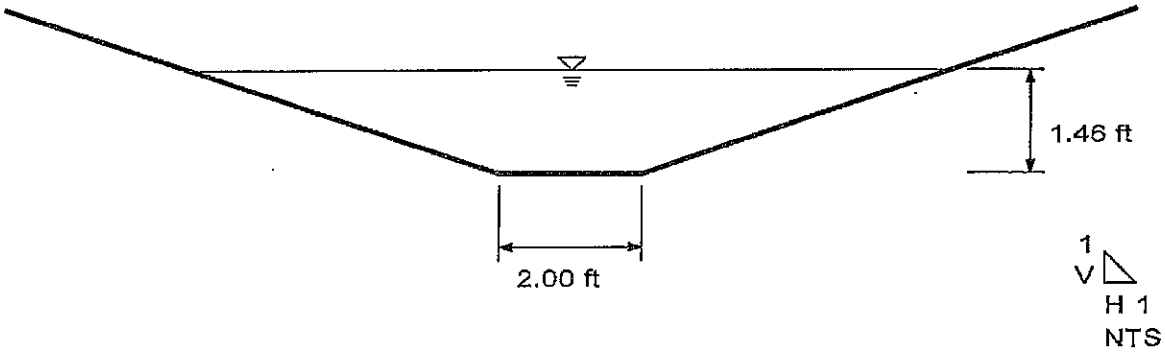
Section Data		
Mannings Coefficient	0.250	
Channel Slope	0.010000	ft/ft
Depth	0.32	ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	2.00	ft
Discharge	0.22	ft^3/s



Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Project File	i:\transfer\jtruong\fmw\project2.fm2
Worksheet	Coos County Airport Terminal Bldg Swale
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.250	
Channel Slope	0.010000	ft/ft
Depth	1.46	ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	2.00	ft
Discharge	4.90	ft^3/s



Coos County Airport Terminal Bldg
Worksheet for Trapezoidal Channel

Project Description	
Project File	i:\transfer\jtruong\fmw\project2.fm2
Worksheet	Coos County Airport Terminal Bldg Swale
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.250	
Channel Slope	0.010000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	2.00	ft
Discharge	4.90	ft^3/s

Results		
Depth	1.46	ft
Flow Area	9.33	ft^2
Wetted Perimeter	11.25	ft
Top Width	10.77	ft
Critical Depth	0.45	ft
Critical Slope	1.383516	ft/ft
Velocity	0.52	ft/s
Velocity Head	0.43e-2	ft
Specific Energy	1.47	ft
Froude Number	0.10	
Flow is subcritical.		

APPENDIX 4

STORMWATER QUALITY TREATMENT FACILITIES OPERATION AND MAINTENANCE PLAN

For:
Coos County Airport District
North Bend, Oregon

September 25, 2006

ASSUMPTIONS AND EXPECTATIONS

This storm drainage maintenance plan describes the operation and maintenance for storm drainage facilities proposed for the New Terminal Building for Southwest Oregon Regional Airport project, owned by Coos County Airport District.

This approximate 95-acre site is located in the City of North Bend, south of the Southwest Oregon Regional Airport runway. It is bordered by Airport Lane to the east and Colorado Street to the south.

The purpose of the plan is to prevent impacts of polluted storm water on the local groundwater. The plan is to include: system assessment, system controls, spill prevention and response, maintenance, employee and public education, and evaluation of effectiveness of the storm water management plan.

DESIGN/MAINTENANCE ASSUMPTIONS

The intent of this system is to achieve groundwater protection by treating the impervious area through the use of a water quality swale. Additional control measures include landscape depressions and sumped catch basins configured to minimize the potential of both accidental and illicit spills of contaminants that could impact groundwater.

To maintain healthy plant life and provide filtration of pollutants, the water quality swale will be regularly maintained. Dead plants will be removed and replaced as needed. Vegetation should be trimmed back periodically and the trimmings removed as determined by monitoring so that the pollutants that have been taken into the vegetation are not released back to the water quality swale at levels that would preclude new capture of pollutants. Use of pesticides and fertilizers will be minimized to protect groundwater and applied in minimal rates (follow manufacturer's specifications). Mulch and other debris should be kept clear of the water quality swale.

Assumptions of general site maintenance include periodic dry street sweeping of the parking lot, landscape and lawn mowing, and litter/debris removal. All landscape and maintenance personnel shall be trained to contain spills.

SPILL PREVENTION AND RESPONSE

Spill prevention is an important factor in the successful operation of a storm water management system. All employees will be trained to this plan so that they are certain of the location of any hazardous materials, who to notify in case of a spill, and how to initially contain the spill. Employees shall never dispose of materials into the storm water system. Employees will be observant of other potential contamination occurrences. All employees will review the following page regarding detailed spill response steps.

This data will be posted in an accessible area.

1. **The spill kit is located in the maintenance room.**

2. **Get the spill kit (and kit instructions when provided)**

   -If possible, determine visually what type of fluids has been spilled.
   -Put on gloves and glasses or any other necessary Personal Protective Equipment (PPE).
   -Get the absorbent material provided in the kit and drain block covers.
   -Place the absorbent materials in the path of the spill.
   -Remove any debris from the vicinity of the inlets.
   -Place the catch basin or area drain cover snugly over the inlet.
   -Verify that the cover has full contact with the rim of the inlet.
   -Use snakes, pillow, or pigs to completely contain the area

3. **Notify the following personnel immediately:**

   - City of North Bend Fire and Emergency Services 911 ("hazardous material spill")
   - Coos County Airport District Maintenance, Bob Hood 541.756.8531
   - Department of Environmental Quality 503.229.5263 (ask for "duty officer")
   - Oregon Emergency Management 1.800.452.0311 or 503.378.6377

   Owner: Coos County Airport District
   North Bend, OR

NOTE: Only dry cleanup methods will be employed to clean up spills (i.e., no use of water to wash spilled materials from pavement will be conducted).

MAINTENANCE PLAN

The owner must insure that the storm water systems efficiently perform their function. The following guidelines will be used for general maintenance of the storm water system:

1. Dry sweeping of the parking lot and dumpster area to reduce accumulation of sediments and debris in the depressions and water quality swale will be conducted regularly. Treatment areas clogged with sediment will fail.
2. Quarterly visual inspection of the swales and inlets for debris, discoloration, dead vegetation, obstructions, smell or ponding of stagnant water (of concern for mosquito breeding).
3. The vegetation within the swales will be maintained. Grasses will be trimmed no shorter than 3 inches from the ground surface.
4. Visual inspection of the entire storm water system after major storms for evidence of system problems.
5. Annual inspection of the spill kit to ensure all supplies are available and have not deteriorated or expired.
6. Annual inspection of the catch basin cover to ensure it's in the proper location and is in good working condition. (Check for cracks)
7. Biannual or quarterly cleaning of the ditch inlet. Sediments need to be removed along with any oils before the deposits reach one foot in depth and before the inlet/outlet is obstructed. Debris disposal needs to be done in accordance with applicable state law, and records of debris disposal will need to be kept on file for review by regulating agencies.
8. Attached are the manufacturer's inspection and maintenance instructions and a maintenance log. The log is to be kept available for inspection by the city/county and DEQ upon request.

Month _____ Year _____ Initial & date	Inlets, Area Drains, Swales, Drainage System (quarterly)	Cleaning of the inlet & system (quarterly)	Spill kit (annual)	Catch Basin Cover (annual)
JANUARY				
FEBRUARY				
MARCH				
APRIL				
MAY				
JUNE				
JULY				
AUGUST				
SEPTEMBER				
OCTOBER				
NOVEMBER				
DECEMBER				

Public education includes posted signage and personal observed inspection. Hands-on training may occur if owner or employees see public not following the rules. Signage to include wording such as (but not limited to): "Never dump waste materials into the catch basins."

EMPLOYEE TRAINING RECORD

All employees should complete the following training with a supervisor

Employees will be trained upon hiring and thereafter annually or when any new requirements are published, or when there are any changes to the system or equipment. Employee training will include;

- Reading this Storm Water Management Plan
- Familiarity of all contents and locations for materials indicated in the plan
- Spill response and Personal Protective Equipment (PPE)
- Documentation requirements

	EMPLOYEE NAME (Print)	Employee Signature	Job Title	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

EVALUATION OF EFFECTIVENESS OF STORM WATER MANAGEMENT PLAN

The storm water management plan is to be evaluated every five years or immediately after any documented spill incidents; this will allow for any necessary changes, additions or improvements to be incorporated. Any data collected during the year, or other reports, will be used for making improvements.

APPENDIX 3

- Record Keeping & Internal Reporting Procedures

Attachment F

Oregon

Theodore Kulongoski, Governor

Department of Environmental Quality
Western Region Eugene Office
165 E. 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
TTY (541) 687-5603

COPY

November 25, 2009

RECEIVED
APR 08 2010

Robert Hood/Gary LeTellier
Coos County Airport District
PO Box F
North Bend, OR 97459-0022

Re: NPDES 1200-Z Industrial Stormwater Discharge Permit Coverage
File No.: 107274 / EPA No. ORR80-1006
Site Loc. Southwest Regional Airport, Municipal Airport off Colorado Ave, North Bend
Coos County

Dear Mr. Hood and Mr. LeTellier:

In August 2006, the Oregon Environmental Quality Commission adopted a newly revised National Pollutant Discharge Elimination System Industrial Stormwater Discharge Permit No. 1200-Z. The purpose of the permit is to ensure that registrants assigned permit coverage are implementing adequate Best Management Practices to minimize adverse impacts to the environment from stormwater runoff and prevent violations of the state's instream water quality standards.

The Oregon Department of Environmental Quality (DEQ) has received and reviewed your application to renew your coverage under this permit, and DEQ is approving your registration under the new permit. *The permit will expire on* ***June 30, 2012***. The following information highlights some of the key permit requirements as well as guidance to assist you with permit compliance.

Permit Provisions

Please review your copy of the permit carefully as there are new conditions and requirements, some of which are summarized below:

- Each monitored outfall must be sampled at least ***four times during each monitoring period***, and each sample per outfall must be collected ***at least fourteen calendar days apart.*** The annual monitoring period runs from July 1st through June 30th. For the first half of the annual monitoring period (i.e. July 1st to December 31st), you must take two separate samples of your stormwater discharge – at least 14 days apart – at each monitored outfall as required by the permit. Additionally, you must take another two samples – at least 14 days apart – during the second half of the monitoring period (i.e. January 1st to June 30th). Furthermore, you must conduct ***visual monitoring*** of your outfalls ***once a month*** during periods of stormwater discharge.

- As required in the new permit, you must use the Department's Discharge Monitoring Report (DMR) form to report your stormwater sampling and visual monitoring results to the DEQ by July 31st each year. ***No other monitoring report forms will be accepted.***

  A copy of this form is attached to the permit. If additional copies are needed, please download the DMR form from the following Oregon Department of Environmental Quality's (DEQ) website:

  http://www.deq.state.or.us/wq/stormwater/industrial.htm#frms

DEQ-DC1

ok to file per BOD 4/8/10

- If a stormwater sampling result exceeds any of the benchmark values listed in the permit, you must, **within 30 days** of receiving the sampling results, investigate the cause of the elevated pollutant levels, review the Storm Water Pollution Control Plan, and ***submit an Action Plan for approval by the DEQ.*** See Section A.9 of the permit for additional information about Action Plans. The action plan form is also available at the website listed above.

- **By June 30, 2011**, you must evaluate the last four samples collected from each outfall monitored and **determine if the geometric mean** of the samples exceeds benchmark levels listed in the permit. This requirement is not applicable if you have a monitoring waiver as described in condition B.3 of the permit. Additionally, this information must be reported on the Department's DMR form and submitted to the DEQ by July 31, 2011. If the geometric mean of these sampling results exceeds any of the benchmark parameters, your permit coverage will be revoked and DEQ will require that you apply for an individual NPDES Permit.

DEQ has recently developed **guidance** that will assist with implementing some of these new permit requirements. This guidance includes general information about permit requirements, permit forms (including the DMR Form and the Action Plan form), as well as instructions for calculating the geometric mean. The guidance document, as well as other information such as technical assistance on best management practices, can be found on the following website:

http://www.deq.state.or.us/wq/stormwater/industrial.htm

Please be aware that you will be assessed an annual fee for each year of permit coverage.

If you have any questions about this permit, please contact Mindi English at (541) 686-7763 or Kristy Sewell at (541) 686-7858. Please send all written correspondence, including submittal of DMRs and any Action Plans, to: Industrial Stormwater Program, Oregon Department of Environmental Quality, Western Region - Eugene, 165 E. 7th Avenue, Suite 100, Eugene, OR 97401, attn: Mindi English or at English.Mindi@deq.state.or.us .

Sincerely,

Kathy Jacobsen
Water Quality Permit Coordinator
Western Region – Eugene Office
jacobsen.kathy.r@deq.state.or.us
(541) 687-7326

Enclosures: Permit, NEC, DMR, Comparison Sheet, pH Letter and Guidelines
cc: Source File/DEQ – Coos Bay
Mindi English, DEQ - Eugene

Attachment F

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Western Region - Eugene Office
165 E. 7th Avenue, Suite 100
Eugene, OR 97401-3049
(541) 686-7838
FAX (541) 686-7551
OTRS 1-800-735-2900

November 25, 2009

COPY

Robert Hood/Gary LeTellier
Coos County Airport District
PO Box F
North Bend OR 97459-0022

RECEIVED
APR 08 2010

Re: **Permit Action Letter**
Additional pH test method
File Number: 107274
Facility: Southwest Regional Airport, Municipal Airport off Colorado Ave, North Bend
Coos County

The Department has recently become aware of difficulties associated with pH monitoring for stormwater and adhering to the holding times for samples specified in 40 CFR 136. Monitoring of pH is required by your NPDES 1200-Z permit, and pH must be tested within fifteen minutes after collecting your stormwater sample to be valid and in compliance with the 1200-Z permit.

To assist you in meeting this requirement, the Department will allow the use of fresh pH paper that provides a sensitivity of at least three-tenths (0.3) standard units (i.e., accurate color matches for every 0.3 pH unit) or a properly calibrated portable pH meter to make a field measurement of pH.

If you intend to use pH paper, the Department recommends that you have pH paper available to cover the range of 1 to 14 standard units. This may require that you purchase several different series of pH paper to more accurately determine the pH of your stormwater discharge (e.g., pH paper with the range of 1.2 to 3.6, pH paper with the range of 2.8 to 5.2 etc.). As part of your quality assurance program, the Department also recommends that you record the expiration date, manufacturer, and lot number for the pH paper used when documenting your pH results.

This "Permit Action Letter" is an administrative modification to your NPDES 1200-Z permit. Please attach it to your permit. If you have any questions, please contact Mindi English at 541-686-7763 or Kristy Sewell at 541-686-7858.

Sincerely,

Mike Wolf
Water Quality Manager
Western Region

MW:rln

ok to file per Bang 4/8/10

Performing Your Own Test of pH in Your Stormwater Samples

Suggestions for Data Sheets & Quality Assurance/Control Procedures

If you choose to analyze the pH of your stormwater discharge, you must develop a data sheet to document your results and record key information as well as the measures you have taken to evaluate the quality of your testing using pH paper. Submit your data sheets and quality assurance procedures along with the summary of your monitoring results that are submitted on the Discharge Monitoring Report form for a NPDES 1200-Z permit at the end of the monitoring year. This information will be used to evaluate the quality of your test results as well as your compliance with monitoring requirements.

The following information provides some suggestions for you to consider if you choose to do your own pH testing using either a pH meter or pH paper. If you are unfamiliar with developing a quality assurance (QA) plan for laboratory tests, seek the services of a consultant who can assist you with establishing a QA plan for your test procedures. The information below references guidelines for quality assurance and provides some suggestions on developing data sheets and quality assurance procedures for pH paper.

1) For an overview on a QA plan for test procedures, refer to documentation requirements in sections 1 – 5 of DEQ's *Quality Assurance Guidelines for NPDES and WPCF Self-Monitoring Laboratories.*
   a) For a copy of these guidelines, go to DEQ Laboratory and Environmental Assessment Division's Quality Assurance Webpage: http://www.deq.state.or.us/lab/techrpts/technicaldocs.htm
   b) For guidelines on using a pH meter, refer to Section 8 of the document noted above.
   c) For guidelines on using pH paper, refer to the information below.

2) Prepare a data sheet to record the following information:
   a) The **date** and **time** the sample *was collected.*
   b) The **name** and **signature** of the person who collected the sample.
   c) The **name** and **signature** of the person who performed the analysis and associated *quality assurance evaluation.*
   d) The **time** the sample *was analyzed* using pH paper.
      Note: the maximum allowable *holding time* before a sample is tested is *15 minutes*
   e) Information about the pH paper used to analyze the pH of your stormwater sample:
      i) Manufacturer's name for the pH paper.
      ii) Product name for the pH paper.
      iii) Lot number for the pH paper.
      iv) Expiration date for the pH paper that you are using.
      v) pH ranges for the pH paper that you use to analyze your stormwater sample.
         (1) Use only fresh pH paper that provides a sensitivity of at least three-tenths (0.3) standard units (i.e., accurate color matches for every 0.3 pH unit).
         (2) Obtain pH paper(s) that covers the range of 1 to 14 standard units
            Note: This may require the purchase of several different series of pH paper to more accurately determine the pH of your stormwater discharge (e.g., pH paper with the range of 1.2 to 3.6, pH paper with the range of 2.8 to 5.2 etc.)

3) Document the quality assurance procedures used to evaluate the *precision* of the analysis using pH paper – *precision* is how close the measured values are to each other.
   a) For example, indicate on your data sheet if you performed a **duplicate** analysis of your stormwater sample and *record the result* for this duplicate.
      Note: a duplicate analysis is performed when you split, for instance, your stormwater sample and run a second analysis using the same batch of pH paper used to perform the analysis on the other half of your stormwater sample.

b) When you perform a duplicate analysis, you should **average (M)** the result of your duplicate samples and, then, determine the ***relative percent difference (RPD)*** of your two results and report the RPD with the average for your pH result.

i) Average (**M**) = (pH of sample A + pH of sample B) ÷ 2

ii) Percent Difference:

(1) If the pH of sample A is greater than the pH of sample B, then the **RPD** = (pH sample A – pH of sample B) ÷ **M** x 100 = _____%

OR

(2) If the pH of sample B is greater than the pH of sample A, then the **RPD** = (pH sample B – pH of sample A) ÷ **M** x 100 = _____%

c) Record the **date** and **time** the duplicate analysis was performed.
Note: the duplicate analysis should be performed alongside the other half of the split sample.

d) Record the **name** and **signature** of the individual who performed the duplicate analysis and determined the relative percent difference.

e) Perform one duplicate of a stormwater sample each time you collect stormwater samples from your outfalls.

4) Document the quality assurance procedures you use to evaluate the *accuracy* of your analysis using pH paper - *accuracy* is the degree of closeness of a measured or calculated quantity to its actual (true) value.

a) For example, indicate on your data sheet if you are using **standards** of known pH to evaluate whether the pH paper that you are using provides accurate results and record the following information:

i) Indicate the range of standards that were used to evaluate the accuracy of the pH papers that will be used to analyze your stormwater sample.

ii) Record the **date** and **time** the analysis of the standards was performed.
Note: the analysis the standards should be performed preferably on the day you collect your stormwater sample but before you actually collect and test the samples.

iii) Record the **name** and **signature** of the individual who performed the analysis of the standard.

b) If you use buffered solutions of known pH as standards to evaluate the accuracy of your pH paper, document the manufacturer's name, product name, lot number, and expiration date for these standards.

5) Document the quality assurance procedures you use to evaluate **blank samples** – *blank samples* are used to determine if your samples were contaminated by the receptacles used to collect the stormwater sample or by some other factor during field sampling and testing.

a) For example, indicate on your data sheet if you used a **blank sample** to evaluate your test method for pH.

i) Record the **date** and **time** the blank analysis was performed.
Note: the analysis of the blank sample should be performed with all the other stormwater samples collected during that day's sampling event.

ii) Record the **name** and **signature** of the individual who performed the analysis of the blank sample.

b) Use one blank each time you collect stormwater samples for your outfalls.

c) Indicate, for instance, if you use distilled water for your blank sample and document the manufacturer's name, product name, lot number, expiration date, and date the distilled water was opened.

Industrial Stormwater Discharge Monitoring Report - 1200-Z Permit

Permittee Legal Name:	Coos County Airport District	*ODEQ FILE NO.:*	107274
Facility Common Name:	Southwest Regional Airport	Reporting Period:	July 1, to June 30,
Facility Location:	Municipal Airport off Colorado Ave, North Bend	Laboratory Name:	
County:	COOS	Laboratory ORELAP #:	

DEQ State of Oregon Department of Environmental Quality

Monitor for the following pollutants at sampling point(s) specified in your SWPCP. Add more sheets if necessary (e.g., if more than 4 samples are collected per pollutant or facility has more than 4 sampling points). You MUST also attach a copy of laboratory results sheet(s) and associated QA/QC information to this form.

Name or Number of Sampling Point(s) (group data per sampling point)	Sample Date	pH **	Suspended Solids, Total **	Oil and Grease, Total **	Copper, Total	Lead, Total	Zinc, Total	E. coli *
		s.u.	mg/L	mg/L	mg/L	mg/L	mg/L	counts/100 ml
Geometric Mean (Note 4)								
Geometric Mean (Note 4)								
Geometric Mean (Note 4)								
Geometric Mean (Note 4)								
Permit Benchmark		5.5 - 9.0	130	10	0.1	0.4	0.6	406

* Only applies to landfills accepting septage/biosolids and sewage treatment plants.

** Effluent limits for these parameters apply to some industries - see permit, Schedule A.7.

Note 1: Submit this report to the appropriate DEQ regional or agent offices (see below) annually by July 31st. The report must contain the results of all stormwater monitoring conducted during the year. If you have a monitoring waiver for one or more of the pollutant(s), please report "M" in the column(s)-see permit-Schedule B.3.

Note 2: Non-detects must be reported as "ND" along with the applicable method detection limit in parentheses - e.g. ND (0.001).

Note 3: If a stormwater sampling result exceeds any of the benchmark values, the permit registrant must, within 30 calendar days of receiving the sampling results, investigate the cause of the benchmark exceedance(s), review the SWPCP and submit an Action Plan for department or agent approval.

Note 4: For the 4th year of coverage under the permit that became effective on July 1, 2007, report the geometric mean value of the last 4 samples collected for each pollutant parameter, from each sampling point. The geometric mean value is automatically calculated if using the Excel version of the DMR form.

Note 5: If a sampling event is missed or a sampling parameter is not analyzed or sampled, enter "NS" in each applicable column for that row. - The spreadsheet will recalculate and use the benchmark for that event in the calculation of the Geometric Means.

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APR 08 2010

Name/Title Principal Executive Officer or Authorized Delegate

(Please Print)

Telephone: *Email:*

I certify, under penalty of law, that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sign here: Date

Attachment F

See reverse side for additional visual monitoring requirements

Monthly Visual Observations

	Record Visual Observations for Oil and Grease Sheen and Floating Solids:	
	Oil and Grease Sheen - No visible sheen allowed. Monthly observation when discharging. For months when no discharges occur, please write in "No Discharge" for that month.	**Floating Solids** (associated with industrial activities) - No visible discharge allowed. Monthly observation when discharging. For months when no discharges occur, please write in "No Discharge" for that month.
	Date	Observations (please note the sampling point(s) name or number)
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		
May		
June		

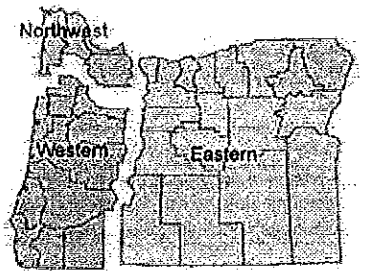
For facilities located within the following local jurisdictions, please submit one (1) copy of this report and laboratory results sheet(s) and QA/QC documentation to the local jursisdiction annually by July 31st:

Clean Water Services
Industrial Stormwater
2550 SW Hillsboro Hwy.
Hillsboro, OR 97123

City of Portland
Industrial Stormwater Section
Water Pollution Control Lab
6543 N Burlington Ave.
Portland, OR 97203-

City of Eugene
Industrial Source Control
410 River Ave.
Eugene, OR 97404

For all other locations, please submit one (1) copy of this report and laboratory results sheet(s) and the QA/QC documentation to the appropriate DEQ regional office annually by July 31st:



DEQ Northwest Region Office
2020 SW 4th Ave. Suite 400
Portland, OR 97201
Phone: (503) 229-5263
Hours: 8 am - 5 pm

DEQ Eastern Region Office
475 NE Bellevue, Suite 110
Bend, OR 97701
Phone: (541) 388-6146
Hours: 8 am - 5 pm

DEQ Western Region Office
(Benton, Lincoln, Marion, Polk, and Yamhill counties)
750 Front St NE, #120
Salem, OR 97301-1039
Phone: (503) 378-8240
Hours: Mon - Thurs: 8 am - 5 pm
Fri: 8 am - noon, 1 - 5 pm

DEQ Western Region Office
(Lane and Linn counties)
1102 Lincoln St. Suite 210
Eugene, OR 97401
Phone: (541) 686-7838
Hours: 8 am - 5 pm

DEQ Western Region Office
(Coos, Curry, Douglas, Jackson, and Josephine counties)
221 Stewart Ave. Suite 201
Medford, OR 97501
Phone: (541) 776-6010
Hours: 8 am – noon, 1 - 5 pm

Attachment F

APR 0 8 2010

Department of Environmental Quality

NO EXPOSURE CERTIFICATION
For Exclusion from NPDES Storm Water Permitting

Submission of this *No Exposure Certification* is required to notify DEQ that the entity identified in Section A does not require permit coverage for its storm water discharges associated with industrial activity under DEQ's NPDES industrial storm water general permit(s) due to a condition of no exposure. **Please review the criteria for qualifying for the no exposure conditional exclusion, described in the Instructions section on page 3 of this form, prior to completing the form.**

A *No Exposure Certification* must be provided for each facility qualifying for the no exposure exclusion. In addition, the exclusion from NPDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the no exposure exclusion. Under penalty of the law by signing and submitting this *No Exposure Certification* form, the person signing for the entity in Section A is certifying that a condition of no exposure exists at its facility or site, and is obligated to comply with the terms and conditions of 40 CFR §122.26(g).

ALL INFORMATION MUST BE PROVIDED ON THIS FORM. **Detailed instructions for completing this form and obtaining the no exposure exclusion are provided on page 3 and 4.**

A. Facility Operator Information

1. Legal Name:_____
2. Phone:_____ 3. Email Address:_____
4 Mailing Address:_____

   Street:_____

   City:_____ State:_____ Zip Code:_____

B. Facility/Site Location Information

1. Facility Name:_____
2. Street Address:_____

   City:_____ State:_____ Zip Code:_____ County:_____
3. Legal Status of Applicant: ☐ Federal ☐ State ☐ Public ☐ Private ☐ Other, specify:
4. Was the facility or site previously covered under an NPDES storm water permit? ☐Yes ☐ No

   If yes, enter NPDES permit type and file number:_____
5. Primary SIC Code:_____ Secondary SIC code (if applicable):_____
6. Total size of site in acres associated with industrial activity:_____
7. Have you paved or roofed over a formerly exposed, pervious area in order to qualify for the no exposure exclusion?

   ☐ Yes ☐ No If yes, please indicate approximately how much area was paved or roofed over. Completing this question does not disqualify you for the no exposure exclusion. However, DEQ may use this information in considering whether storm water discharges from your site are likely to have an adverse impact on water quality, in which case you could be required to obtain permit coverage.

   ☐ Less than one acre ☐ One to five acres ☐ More than five acres
8. Please indicate if any of the following activities occur at your facility (DEQ may use this information in assessing which facilities to inspect to verify the no exposure condition exists):

   ☐ Vehicle washing

   ☐ Fueling of vehicles or equipment

   ☐ Vehicle repair and/or maintenance

CONTINUED ON NEXT PAGE

Old to File per BOB

NO EXPOSURE CERTIFICATION
For Exclusion from NPDES Storm Water Permitting

C. Exposure Checklist

Are any of the following materials or activities exposed to precipitation, now or in the foreseeable future? (Please check "Yes" or "No".) **IF YOU ANSWER "YES" TO ANY OF THESE QUESTIONS, THE FACILITY IS NOT ELIGIBLE FOR THE NO EXPOSURE EXCLUSION.**

		Yes	No
1.	Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning Industrial machinery or equipment remain and are exposed to storm water	☐	☐
2.	Materials or residuals on the ground or in storm water inlets from spills/leaks	☐	☐
3.	Materials or products from past industrial activity	☐	☐
4.	Material handling equipment (except adequately maintained vehicles)	☐	☐
5.	Materials or products during loading/unloading or transporting activities	☐	☐
6.	Materials or products stored outdoors (except final products intended for outside use [e.g., new cars] where exposure to storm water does not result in the discharge of pollutants)	☐	☐
7.	Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers	☐	☐
8.	Materials or products handled/stored on roads or railways owned or maintained by the discharger	☐	☐
9.	Waste material (except waste in covered, non-leaking containers [e.g., dumpsters])	☐	☐
10.	Application or disposal of process wastewater (unless otherwise permitted)	☐	☐
11.	Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the storm water outflow	☐	☐
12.	Storm resistant shelters with unsealed zinc or copper roofing materials	☐	☐

D. Certification Statement

I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of "no exposure" and obtaining an exclusion from NPDES storm water permitting.

I certify under penalty of law that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility or site identified in this document (except as allowed under 40 CFR §122.26(g)(2)).

I understand that I am obligated to submit a no exposure certification form once every five years to DEQ and, if requested, to the operator of the local municipal separate storm sewer system (MS4) into which the facility discharges (where applicable). I understand that I must allow the NPDES permitting authority, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under an NPDES permit prior to any point source discharge of storm water from the facility.

Additionally, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision In accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information, Including the possibility of fine and imprisonment for knowing violations.

Print Name:_____ Print Title:_____

Signature:_____ Date:_____

DEQ USE ONLY	
Date Approved:	By:
Date Facility Notified:	By:
Comments:	

Instructions for the NO EXPOSURE CERTIFICATION For Exclusion from NPDES Storm Water Permitting

Who May File a No Exposure Certification?

Federal law prohibits point source discharges of storm water associated with industrial activity to surface waters without a National Pollutant Discharge Elimination System (NPDES) permit (40 CFR §122.26). However, NPDES permit coverage is not required for discharges of storm water associated with industrial activities identified at 40 CFR §122.26(b)(14)(i) - (ix) and (xi) if the discharger can certify that a condition of "no exposure" exists at the industrial facility or site.

Storm water discharges from construction activities identified in 40 CFR §122.26(b)(14)(x) and (b)(15) are not eligible for the no exposure exclusion.

Criteria for Qualifying for No Exposure Certification

A condition of no exposure exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to precipitation including but not limited to rain, snow, sleet, hale or thawing precipitation (e.g., snowmelt). Measures must be in place to prevent storm water run-off from entering the storm resistant shelter. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. Practices must prevent tracking of materials outside storm resistant shelters. A storm resistant shelter is conditionally not required for the following industrial materials and activities:

- Drums, barrels, buckets, pales, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. Precipitation must not contact product or residue thereof on the exterior of the container or tank. Precipitation collected in secondary containment devices or structures must be properly managed.
- Solid waste dumpsters that are completely closed and not leaking.
- Adequately maintained vehicles used in material handling, transportation, and fleets.
- Final products, other than products that would be mobilized in storm water discharges (e.g., wood chips, rock salt, etc.).

Obtaining and Maintaining the No Exposure Exclusion

This form is used to certify that a condition of no exposure exists at the industrial facility or site described herein. This certification must be re-submitted at least once every five years.

The industrial facility operator must maintain a condition of no exposure at its facility or site in order for the no exposure exclusion to remain applicable. If conditions change resulting in the exposure of materials and activities to storm water, the facility operator must obtain coverage under an NPDES storm water permit immediately.

Where to File This Form

Mail the original form to the appropriate DEQ regional office. See attached map and address list for the office in your area.

In addition, upon request, a copy of this form must be sent to the operator (i.e., local municipality) of the municipal separate storm sewer system if storm water run-off from your facility is discharged to such a system.

Completing the Form

One form must be completed for each facility or site for which you are seeking to certify a condition of no exposure. Additional guidance on completing this form can be accessed through EPA's web site at http://cfpub.epa.gov/npdes/stormwater/exposure.cfm. Please make sure you have addressed all applicable questions and have made a photocopy for your records before sending the completed form to the address above.

Section A. Facility Operator Information

1. Provide the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this certification. The name of the operator may or may not be the same as the name of the facility. The operator is the legal entity that controls the facility's operation, rather than the plant or site manager.

2. Provide the telephone number of the facility operator.

3. Provide the e-mail address of the facility operator

4. Provide the mailing address of the operator (P.O. Box numbers may be used). Include the city, state, and zip code. All correspondence will be sent to this address.

Section B. Facility/Site Location Information

1. Enter the official or legal name of the facility or site.

2. Enter the complete street address (if no street address exists, provide a geographic description [e.g., Intersection of Routes 9 and 55]), city, county; state, and zip code. Do not use a P.O. Box number.

3. Indicate whether the industrial facility is operated by a department or agency of the Federal Government (see also Section 313 of the Clean Water Act).

Instructions for the NO EXPOSURE CERTIFICATION
continued

4. Indicate whether the facility was previously covered under an NPDES storm water permit. If so, include the permit number.

5. Enter the 4-digit SIC code that identifies the facility's primary activity, and, if applicable, second 4-digit SIC code identifying the facility's secondary activity. SIC codes can be obtained from the *Standard Industrial Classification Manual, 1987* or from http://www.osha.gov/cgi-bin/sic/sicser5.

6. Enter the total size of the site associated with industrial activity in acres. Acreage may be determined by dividing square footage by 43,560, as demonstrated in the following example.
   Example: Convert 54,450 ft^2 to acres
   Divide 54,450 ft^2 by 43,560 square feet per acre:
   54,450 $ft^2 \div$ 43,560 ft^2/acre = 1.25 acres.

7. Check "Yes" or "No" as appropriate to indicate whether you have paved or roofed over a formerly exposed, pervious area (i.e., lawn, meadow, dirt or gravel mad/parking lot) in order to qualify for no exposure. If yes, also indicate approximately how much area was paved or roofed over and is now impervious area.

8. Indicate which vehicle-related activities occur at your facility. Check all of the boxes that apply.

Section C. Exposure Checklist
Check "Yes" or "No" as appropriate to describe the exposure conditions at your facility. *If you answer "Yes" to ANY of the questions (1) through (11) in this section, a potential for exposure exists at your site and you cannot certify to a condition of no exposure.* You must obtain (or already have) coverage under an NPDES storm water permit. After obtaining permit coverage, you can institute modifications to eliminate the potential for a discharge of storm water exposed to industrial activity, and then certify to a condition of no exposure.

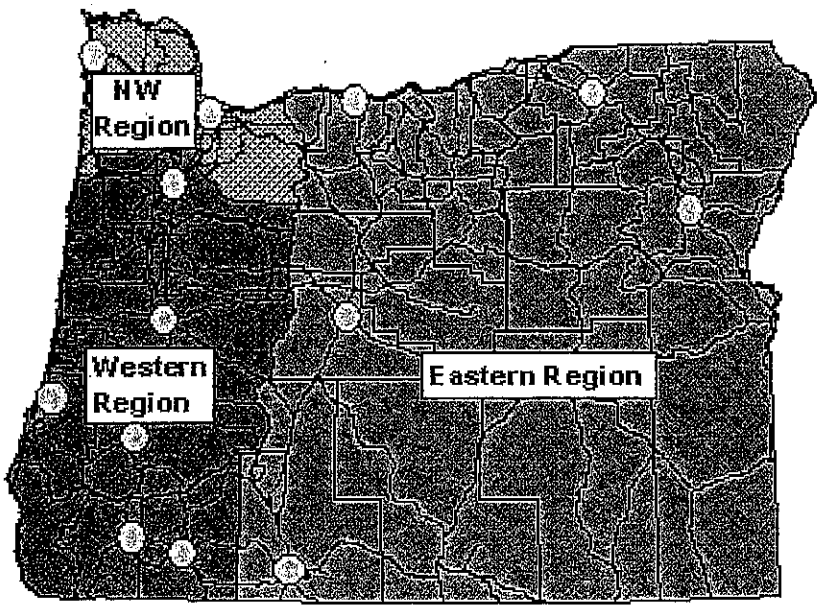
Section D. Certification Statement
Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means:
(i) president, secretary treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or

(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipal, State, Federal, or other public facility: by either a principal executive or ranking elected official.



Northwest Region

Northwest Region - 503-229-5263
FAX - 503-229-6945
2020 SW 4th Ave., #400
Portland OR 97201

Western Region

Western Region - 541-686-7838
1102 Lincoln St., Suite 210
Eugene, OR 97401

Medford Office 541-776-6010
201 W. Main St., #2-D
Medford, OR 97501

Salem Office 503-378-8240
750 Front St. NE, #120
Salem, OR 97310

Coos Bay Branch Office 541-269-2721
340 N. Front
Coos Bay, OR 97420

Grants Pass Branch Office 541-471-2850
510 NW 4th, Rm. 76
Grants Pass, OR 97526

Eastern Region

Eastern Region - 541/388-6146
2146 NE 4th
Bend OR 97701

Pendleton Office 541-276-4063
700 SE Emigrant, #330
Pendleton, OR 97801

Baker City Branch Office 541-523-7998
2034 Auburn St.
Baker City, OR 97814

Columbia Gorge Branch Office 541-298-7255
Columbia Gorge Community College
400 E. Scenic Dr. Bldg. 2
The Dalles, OR 97058

Hermiston Office 541-567-8297
256 East Hurlburt, Suite 117
Hermiston, OR 97838

Klamath Falls Office 541-883-5603
PO Box 333
700 Main Street, Suite 202
Klamath Falls, OR 97601

Comparison of Old and New 1200-Z Permit Requirements

Category	Old 1200-Z (expired 6/30/2007)	New 1200-Z (Effective 7/1/2007)
Benchmark Exceedances	Review and update the Storm Water Pollution Control Plan (SWPCP).	Within 30 days of receiving the results of a benchmark exceedance, submit Action Plan that contains (1) results of review, (2) a corrective action, (3) and an implementation schedule.
Sampling	Sampling 2 times per year.	Sampling 4 times per year
	Collected samples must be at least 60 days apart.	Collected samples must be at least 14 days apart.
Time or flow-weighted composite samples	No allowance for time or flow-weighted composite sampling for grab samples.	Time or flow-weighted composite samples can be used except for pH, oil & grease, and e.coli as an alternative to grab samples.
Monitoring Period	One sample collected between October 1st and December 31st and one sample collected between January 1st and April 30th.	Two samples collected between July 1st and December 31st and two samples collected between January 1st and June 30th.
Employee Training	Develop an employee education program. Inform employees on the elements of the SWPCP, including spill response and good housekeeping.	Hold training within 30 days of hiring new employee who will conduct duties related to implementing the SWPCP or working in areas where stormwater is exposed to industrial activities. Conduct education program annually.
Monthly Inspections	Monthly inspections of areas where potential spills of significant materials or industrial activities occur. May occur during any weather.	Same.
	Monthly inspections of stormwater control measures, structures, catch basins, and treatment facilities.	Same.
Visual Monitoring	**Monthly** visual monitoring for (1) oil and grease, and (2) floating solids at all outfall(s) or discharge point(s) where stormwater monitoring will occur. Must occur while discharging stormwater, i.e. when it is raining.	Same.
Documentation	Records of inspection, maintenance and repair, education activities, and any spills.	Same.
Monitoring Waiver	Monitoring waiver can be obtained for individual parameters after four consecutive samples collected are at or below the benchmark	Limited to one permit term. Re-sample designated sampling points to establish the waiver.
	ALL outfalls must be sampled unless (1) outfall serves area with no exposure to industrial activity or (2) outfall has similar effluents as other monitored outfalls. Data or analysis must be provided to support this determination.	**ALL** outfalls must be sampled unless (1) outfall serves an area with no exposure to industrial activity or (2) outfall has similar effluents and *same BMPs* as other monitored outfalls. Data or analysis must be provided to support this determination.
	No monitoring waiver for visual observations	Same.
Data Submittal	Submit annual reports and laboratory results sheets to the DEQ by July 15th.	Submit Discharge Monitoring Report form (DMR) along with laboratory results sheets to DEQ or Agent by July 31st.
		In the 4th year only, report in DMR the highest geometric mean of last four monitoring results for each benchmark parameter at each outfall.
Authorization of Non-Stormwater	No authorization for non-stormwater discharges in permit	Authorization for certain discharges such as fire-fighting activities, fire hydrants, potable water, irrigation drainage, landscape watering.

Attachment F

COPY

RECEIVED

APR 08 2010

GENERAL PERMIT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORM WATER DISCHARGE PERMIT
Department of Environmental Quality
811 S.W. Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5630 or 1-800-452-4011 toll free in Oregon
Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO: 107274

Coos County Airport District
PO Box F
North Bend, OR 97459-0022

Date Issued: 11/24/2009
Coos County
EPA No: ORR80-1006
RM: 7.9000000000000004
LLID: 1243397433543

Site Location: Southwest Regional Airport, Municipal Airport off Colorado Ave, North Bend

SOURCES THAT ARE REQUIRED TO OBTAIN COVERAGE UNDER THIS PERMIT

Pursuant to 40 Code of Federal Regulation (CFR) § 122.26(b)(14)(i - ix, xi) and OAR 340-045-0033(5), facilities identified in *Table 1: Sources Covered* on p. 3 below that may discharge stormwater from a point source to surface waters or to conveyance systems that discharge to surface waters. These facilities must complete the application and registration procedures to obtain coverage under the permit; see *Permit Coverage and Exclusion from Coverage* on p. 5 below.

Note:
1) Facilities may apply for conditional exclusion from the requirement to register for coverage under this permit if there is no exposure of industrial activities and materials to stormwater pursuant to 40 CFR § 122.26(g); see *Permit Coverage and Exclusion from Coverage* on p. 5 below.

2) Sources meeting the description above, but that are excluded from this permit include: (i) Construction activities, asphalt mix batch plants, concrete batch plants and Standard Industrial Classification code 14, *Mining and Quarrying of Nonmetallic Minerals, Except Fuels.* These activities are regulated under separate general permits; and (ii) any source that has obtained a individual NPDES permit for the discharge.

Date: August 23, 2006

Lauri Aunan , Administrator
Water Quality Division

PERMITTED ACTIVITIES
Until this permit expires or is modified or revoked, the permit registrant is authorized to construct, install, modify, or operate stormwater treatment or control facilities, and to discharge stormwater to public waters in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

Unless specifically authorized by this permit, by regulation issued by EPA, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited, including discharges to an underground injection control system.

Schedule F contains General Conditions that are included in all general permits issued by DEQ. Should conflicts arise between Schedule F and any other schedule of the permit, the requirements in Schedule F will not apply.

TABLE 1: SOURCES COVERED Types of Industrial Sources required to obtain coverage under this permit
Facilities with the following primary Standard Industrial Classification (SIC) codes: 10 Metal Mining 12 Coal Mining 13 Oil and Gas Extraction 20 Food and Kindred Products 21 Tobacco Products 22 Textile Mill Products 23 Apparel and Other Finished Products Made From Fabrics and Similar Material 24 Lumber and Wood Products, Except Furniture and 2491 Wood Preserving. (Activities with SIC 2411 Logging that are defined in 40 CFR §122.27 as silvicultural point source discharges are covered by this permit.) 25 Furniture and Fixtures 26 Paper and Allied Products 27 Printing, Publishing and Allied Industries 28 Chemicals and Allied Products (excluding 2874 Phosphate Fertilizer Manufacturing) 29 Petroleum Refining and Related Industries 30 Rubber and Miscellaneous Plastics Products 31 Leather and Leather Products 32 Stone, Clay, Glass, and Concrete Products 33 Primary Metal Industries 34 Fabricated Metal Products, Except Machinery and Transportation Equipment 35 Industrial and Commercial Machinery and Computer Equipment 36 Electronic and Other Electrical Equipment and Components, Except Computer Equipment 37 Transportation Equipment 38 Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks 39 Miscellaneous Manufacturing Industries 4221 Farm Product Warehousing and Storage 4222 Refrigerated Warehousing and Storage 4225 General Warehousing and Storage 5015 Motor Vehicle Parts, Used 5093 Scrap and Waste Materials
Facilities with the following primary SIC codes that have vehicle maintenance shops (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations: 40 Railroad Transportation 41 Local and Suburban Transit and Interurban Highway Passenger Transportation 42 Motor Freight Transportation and Warehousing (excluding 4221 Farm Product Warehousing and Storage, 4222 Refrigerated Warehousing and Storage, and 4225 General Warehousing and Storage) 43 United States Postal Service 44 Water Transportation 45 Transportation by Air 5171 Petroleum Bulk Stations and Terminals, except as provided in Note 1 below.
Facilities storing, transferring, formulating, or packaging bulk petroleum products or vegetable oils, except as provided in Note 1 below.
Steam Electric Power Generation including coal handling sites
Landfills, land application sites and open dumps (excluding landfills regulated by 40 CFR §445 that discharge "contaminated stormwater" (as defined by 40 CFR §445.2) to waters of the U.S.)
Hazardous Waste Treatment, Storage and Disposal Facilities [excluding hazardous waste landfills regulated by 40 CFR §445 that discharge "contaminated stormwater" (as defined by 40 CFR §445.2) to waters of the U.S.]

TABLE 1: SOURCES COVERED Types of Industrial Sources required to obtain coverage under this permit.
Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, recycling, and reclamation of municipal or domestic sewage (including land dedicated to the disposal of sewage sludge that are located within the confines of the facility) with the design flow capacity of 1.0 mgd or more, or required to have a pretreatment program under 40 CFR §403.

Note 1:
Permit registration is not required for a facility covered in Table 1 if discharges are only from:

a) Stormwater that contacts oil-filled electrical equipment in transformer substations that are equipped with properly functioning oil spill prevention measures such as containment areas or oil/water separators.
b) Stormwater that contacts petroleum product receiving or dispensing areas or product dispensing equipment from which product is dispensed to final users, whether or not the stormwater is treated by an oil/water separator.
c) Stormwater that collects in a secondary containment area at a petroleum product dispensing site, where the secondary containment area is associated with storage tanks from which product is dispensed only to final users, and the discharge from the containment area is treated by an oil/water separator.
d) Stormwater that collects in a secondary containment area at a bulk petroleum product storage site, where the total storage capacity at the site does not exceed 150,000 gallons, and the discharge from the containment area is treated by an oil/water separator. A site with multiple containment areas is considered a single site for determining total storage capacity.

PERMIT COVERAGE AND EXCLUSION FROM COVERAGE

1) **New Application for Permit Coverage**
   a) An owner or operator of a new facility or existing facility that is required to be covered under this permit must:
      i) *New facility* - Submit a complete application, which includes a department-approved application form; a Stormwater Pollution Control Plan (SWPCP); and applicable permit fees, to the department or agent at least 60 calendar days before the planned activity that requires permit coverage, unless otherwise approved by the department or agent (see Schedule D for description of agent). If an agent is receiving the application materials, submit two copies of the SWPCP.
      ii) *Existing facility operating without coverage under the permit* - Submit a complete application, which includes a department-approved application form; a SWPCP; and applicable permit fees, to the department or agent immediately. If an agent is receiving the application materials, submit two copies of the SWPCP.
      iii) *Existing facility operating under permit coverage that intends to change industrial processes* - Submit a complete application, which includes a department-approved application form; a SWPCP; and applicable permit fees, to the department or agent at least 60 calendar days before the planned change, unless otherwise approved by the department or agent. If an agent is receiving the application materials, submit two copies of the SWPCP.
   b) Public Review Period on new application and SWPCP*
      i) The application form and SWPCP are subject to a 14-calendar day public review period before permit registration is granted by the department.
      ii) The public review period will not begin if the application form or SWPCP are incomplete.
   c) Registration
      i) The department or agent will notify the applicant in writing if registration is approved or denied. Permit coverage does not begin until the applicant receives written notice from the department or agent that the registration is approved.
      ii) If registration is denied or the applicant does not wish to be regulated by this permit, the applicant may apply for an individual permit in accordance with OAR 340-045-0030.

2) **Renewal Application for Permit Coverage**
   a) An owner or operator of a facility registered under the 1200-Z permit that expires on June 30, 2007 must submit a complete renewal application, which includes a department-approved renewal application form; an updated SWPCP, if revisions to the SWPCP are necessary to address changed conditions or meet new permit requirements of this permit; and applicable permit fees, to the department or agent by January 30, 2007 to ensure uninterrupted permit coverage for industrial stormwater discharges. If an updated SWPCP is not submitted, the department will use the existing SWPCP for public notice purposes.
   b) Public Review Period on renewal application and SWPCP*
      i) The renewal application and SWPCP are subject to a 14-calendar day public review period before permit coverage may be renewed by the department or agent.
      ii) The public review period will not begin if the renewal application or SWPCP are incomplete.
   c) Registration
      i) The department or agent will notify the applicant in writing if registration is approved or denied.

ii) If registration is denied or the applicant does not wish to be regulated by this permit, the applicant may apply for an individual permit in accordance with OAR 340-045-0030.

* The public review period described in conditions 1.b and 2.b above do not apply to registration applications and accompanying SWPCPs for new or existing facilities that were subject to public notice and comment requirements prior to July 1, 2007.

3. **Name Change or Transfer of Permit Coverage**
   a) For a name change or transfer of permit coverage between legal entities with no industrial process changes at the site, the owner or operator must submit a complete copy of the department-approved Name Change or Permit Transfer application form; an updated SWPCP, if revisions are necessary to address changed conditions, and applicable fees to the department or agent within 30 calendar days of the name change or planned transfer. If submittal is made to the agent, two copies of the SWPCP are required.
   b) The department or agent will notify the applicant in writing if the transfer is approved or denied. The department will transfer coverage under the permit after the department approves the application.
   c) For a name change or transfer of permit coverage between legal entities that intend to change industrial processes, the owner or operator must submit a new application for coverage under this permit as required in condition 1.a.iii above.

4) **"No Exposure" Conditional Exclusion from Permit Coverage**
   a) An owner or operator that applies for a "no exposure" conditional exclusion from coverage under this permit must:
      i) Provide a storm resistant shelter to protect industrial materials and activities from exposure to rain, snow, snow melt, and runoff, except as provided in the Environmental Protection Agency (EPA) *Guidance Manual for Conditional Exclusion from Stormwater Permitting Based on "No Exposure" of Industrial Activities to Stormwater* (EPA 833-B-00-001, June 2000). Storm resistant shelters with unsealed zinc or copper roofing materials are not eligible for the "no exposure" conditional exclusion.
      ii) Ensure that contaminated soil or materials from previous operations is not exposed.
      iii) Complete and sign a certification, on a form approved by the department, that there is no stormwater exposure to industrial materials and activities from the entire facility, except as provided in 40 CFR §122.26(g)(2). The EPA *Guidance Manual* (EPA 833-B-00-001) may be used to determine whether the no exposure criteria are met.
      iv) Submit the signed certification to the department or agent once every five years. If the department or agent does not comment on the "no exposure" certification within 30 days, the "no exposure" conditional exclusion is deemed approved. The department or agent may notify the applicant in writing or by email of its approval. The owner or operator must keep a copy of the certification on site and any notification of approval on site.
      v) Allow the department or agent to inspect the facility to determine compliance with the "no exposure" conditions, and allow the department or agent to make any "no exposure" inspection reports available to the public upon request.
      vi) Submit a copy of the "no exposure" certification to the municipal separate storm sewer system (MS4) operator (i.e., local municipality, district), upon their request, if facility discharges through an MS4; and allow inspection and public reporting by the MS4 operator.
   b) Limitations for obtaining or maintaining the exclusion:
      i) This exclusion is available on a facility-wide basis only, not for individual outfalls.

ii) If industrial materials or activities become exposed to rain, snow, snow melt, or runoff, the conditions for this exclusion no longer apply. In such cases, the discharge becomes subject to enforcement for un-permitted discharge. Any conditionally exempt discharger who anticipates changes in circumstances must apply for and obtain permit coverage before the change of circumstances.

iii) The department or agent retains the authority to make a determination that the "no exposure" conditional exclusion no longer applies and require the owner or operator to obtain permit coverage.

5. **Revocation of Permit Coverage** - The department may revoke a permit registrant's coverage under the permit pursuant to OAR 340-045-033(10).

SCHEDULE A
STORMWATER POLLUTION CONTROL PLAN

1. **Preparation and Implementation of Stormwater Pollution Control Plan (SWPCP)**
   a) The permit registrant must ensure that the SWPCP contains the applicable information described in condition A.3.
   b) The SWPCP must be prepared by a person knowledgeable in stormwater management and familiar with the facility.
   c) The name of the person(s) preparing the SWPCP must be included in the plan.
   d) The SWPCP must be signed and certified in accordance with 40 CFR §122.22.
   e) The SWPCP must be implemented according to conditions A.3.c and Schedule C. Failure to implement any portion of the SWPCP constitutes a violation of the permit.
   f) The SWPCP must be kept current and updated as necessary to reflect any changes in facility operation.
   g) A copy of the SWPCP must be kept at the facility and made available upon request to government agencies responsible for stormwater management in the permit registrant's area.

2. **SWPCP Revisions and Actions Plans**
   a) After the permit registration is approved, if the permit registrant proposes to revise its SWPCP or the department or agent require revisions to the SWPCP, the permit registrant must clearly describe these revisions in an Action Plan.
   b) The Action Plan is considered an addendum to the SWPCP and must be prepared in compliance with condition A.1 above.
   c) Within 30 calendar days of making SWPCP revisions, permit registrant must submit an Action Plan to the department or agent for approval. If the department or agent does not comment within 10 business days of receiving the Action Plan, it is deemed approved. Failure to implement any portion of the Action Plan constitutes a violation of the permit.

3. **Required SWPCP Elements**
   a) **Title Page** - The title page of the SWPCP must contain the following information:
      i) Name of the site.
      ii) Name of the site operator or owner.
      iii) Site or file number as indicated on the permit.
      iv) Contact person's name and telephone number.
      v) Physical address, including county, and mailing address if different.

   b) **Site Description** - The SWPCP must contain the following information:
      i) A description of the industrial activities conducted at the site. Include a description of the significant materials (see condition D.3, Definitions) that are stored, used, treated or disposed of in a manner that allows exposure to stormwater. Also describe the methods of storage, usage, treatment or disposal.
      ii) A general location map showing the location of the site in relation to surrounding properties, transportation routes, surface waters and other relevant features.
      iii) A site map including the following:
         (1) drainage patterns;
         (2) drainage and discharge structures (piping, ditches, etc.);
         (3) outline of the drainage area for each stormwater outfall;
         (4) paved areas and buildings within each drainage area;

(5) areas used for outdoor manufacturing, treatment, storage, or disposal of significant materials;
(6) existing structural control measures for reducing pollutants in stormwater runoff;
(7) material loading and access areas;
(8) hazardous waste treatment, storage and disposal facilities;
(9) location of wells including waste injection wells, seepage pits, drywells, etc., and
(10) location of springs, wetlands and other surface waterbodies both on site and adjacent to the site.

iv) Estimates of the amount of impervious surface area (including paved areas and building roofs) relative to the total area drained by each stormwater outfall.

v) For each area of the site where a reasonable potential exists for contributing pollutants to stormwater runoff, identify the potential pollutants that could be present in stormwater discharges.

vi) The name(s) of the receiving water(s) for stormwater drainage. If drainage is to a municipal storm sewer system, the name(s) of the ultimate receiving waters and the name of the municipality.

vii) Identification of the discharge outfall(s) and the point(s) where stormwater monitoring will occur as required by Schedule B. If multiple discharge outfalls exist but will not all be monitored, include a description of the outfalls and data or analysis supporting that the outfalls are representative as described in condition B.2.b.

c) **Site Controls** - The permit registrant must develop, implement, and maintain the controls that are appropriate for the site. The purpose of these controls is to eliminate or minimize the exposure of pollutants to stormwater or to remove pollutants from stormwater before it discharges to surface waters. In developing a control strategy, the permit registrant must include the following four (4) types of controls in the SWPCP and describe the specific components of each control:

i) *Stormwater Best Management Practices* - The permit registrant must employ the following types of best management practices that are appropriate for the site. A schedule for implementation of these practices must be included in the SWPCP if the practice has not already been accomplished. This schedule must be consistent with the requirements for implementing the SWPCP in Schedule C of this permit.

(1) Containment - All hazardous substances (see condition D.3, Definitions) must be stored within berms or other secondary containment devices to prevent leaks and spills from contaminating stormwater. If the use of berms or secondary containment devices is not possible, then hazardous substances must be stored in areas that do not drain to the storm sewer system.

(2) Oil and Grease - Oil/water separators, booms, skimmers or other methods must be employed to eliminate or minimize oil and grease contamination of stormwater discharges.

(3) Waste Chemicals and Material Disposal - Wastes must be recycled or properly disposed of in a manner to eliminate or minimize exposure of pollutants to stormwater. All waste contained in bins or dumpsters where there is a potential for drainage of stormwater through the waste must be covered to prevent exposure of stormwater to these pollutants. Acceptable covers include, but are not limited to, storage of bins or dumpsters under roofed areas and use of lids or temporary covers such as tarps.

(4) Erosion and Sediment Control - Erosion control methods such as vegetating exposed areas, graveling or paving must be employed to minimize erosion of soil at the site.

Sediment control methods such as detention facilities, vegetated filter strips, bioswales, or other permanent erosion or sediment controls must be employed to minimize sediment loads in stormwater discharges. For activities that involve land disturbance, the permit registrant must contact the local municipality to determine if there are other applicable requirements.

(5) Debris Control - Screens, booms, settling ponds, or other methods must be employed to eliminate or minimize debris in stormwater discharges.

(6) Stormwater Diversion - Stormwater must be diverted away from fueling, manufacturing, treatment, storage, and disposal areas to prevent exposure of uncontaminated stormwater to potential pollutants.

(7) Covering Activities – Fixed fueling, manufacturing, treatment, storage, and disposal areas must be covered to prevent exposure of stormwater to potential pollutants. Acceptable covers include, but are not limited to, permanent structures such as roofs or buildings and temporary covers such as tarps.

(8) Housekeeping - Areas that may contribute pollutants to stormwater must be kept clean. Sweeping, litter pick-up, prompt clean up of spills and leaks, and proper maintenance of vehicles must be employed to eliminate or minimize exposure of stormwater to pollutants.

ii) *Spill Prevention and Response Procedure* - Permit registrant must include in the SWPCP methods to prevent spills along with clean-up and notification procedures. These methods and procedures must be made available to appropriate personnel. The required clean-up material must be on-site or readily available and the location of materials must either be shown on the site drawings or indicated in the text of the SWPCP. Spills prevention plans required by other regulations may be substituted for this provision providing that stormwater management concerns are adequately addressed.

iii) *Preventative Maintenance* - Permit registrant must include in the SWPCP a preventative maintenance program to ensure the effective operation of all stormwater best management practices. At a minimum the program must include:

(1) Monthly inspections of areas where potential spills of significant materials or industrial activities could impact stormwater runoff.

(2) Monthly inspections of stormwater control measures, structures, catch basins, and treatment facilities.

(3) Cleaning, maintenance or repair of all materials handling and storage areas and all stormwater control measures, structures, catch basins, and treatment facilities as needed upon discovery. Cleaning, maintenance, and repair of such systems must be performed in such a manner as to prevent the discharge of pollution.

iv) *Employee Education* - Permit registrant must develop and maintain an employee orientation and education program to inform personnel of the components and goals of the SWPCP. The program must also address spill response procedures and the necessity of good housekeeping practices. A schedule for employee education must be included in the SWPCP. The education and training must occur within 30 calendar days of hiring an employee who works in areas where stormwater is exposed to industrial activities or conducts duties related to the implementation of the SWPCP, and annually thereafter.

d) **Record Keeping and Internal Reporting Procedures** - Permit registrant must record and maintain at the facility the following information, which does not need to be submitted to the department, agent or other government agencies, unless it is requested.
   i) Inspection, maintenance, repair and education activities as required by the SWPCP.
   ii) Spills or leaks of significant materials (See condition D.3, Definitions) that impacted or had the potential to impact stormwater or surface waters. Include the corrective actions to clean up the spill or leak as well as measures to prevent future problems of the same nature.

ADDITIONAL REQUIREMENTS

4. **Non-Stormwater Discharges**
   a) The following non-stormwater discharges are authorized by this permit:
      i) Discharges from fire-fighting activities.
      ii) Fire hydrant flushings.
      iii) Potable water, including water line flushings.
      iv) Uncontaminated air conditioning condensate.
      v) Irrigation drainage.
      vi) Landscape watering, provided that all pesticides, herbicides, and fertilizer have been applied in accordance with manufacturer's instructions.
      vii) Pavement wash waters where no detergents or hot water are used, no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed), and surfaces are swept before washing.
      viii) Routine external building washdown that does not use detergents or hot water.
      ix) Uncontaminated ground water or spring water.
      x) Foundation or footing drains where flows are not contaminated with process materials.
      xi) Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains).
   b) Piping and drainage systems for interior floor drains and process wastewater discharge points must be separated from the storm drainage system to prevent inadvertent discharge of pollutants to waters of the state. Discharge from floor drains to the stormwater drainage system is a violation of this permit.
   c) Any other wastewater discharge or disposal, including stormwater mixed with wastewater, must be permitted in a separate permit, unless the wastewater is reused or recycled without discharge or disposal, or discharged to the sanitary sewer with approval from the local sanitary authority.

5. **Water Quality Standards**
   a) The permit registrant must not cause a violation of instream water quality standards as established in OAR 340-041.
   b) If the permit registrant develops, implements, and revises its SWPCP in compliance with Schedule A of this permit, the department presumes that the discharges authorized by this permit will comply with instream water quality standards unless the department obtains evidence to the contrary. Coincident samples of the discharge and at upstream and downstream locations in the receiving waterbody must be collected to establish a violation of an instream water quality standard is caused by the discharge.
   c) In instances where the department determines that the permit registrant's stormwater discharges are not complying with instream water quality standards, the department may take

enforcement action for violations of the permit and will require the permit registrant to do one or more of the following:

i) Develop and implement an Action Plan that describes additional effective BMPs to address the parameters of concern and their locations at the site;

ii) Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is meeting water quality standards; or

iii) Curtail stormwater pollutant discharges to the extent possible and submit an individual permit application.

6. **Discharges to Impaired Waterbodies** - If a Total Maximum Daily Load (TMDL) Order (see condition D.3, Definitions) is established and the discharge from a permitted source is assigned a waste load allocation or is required to meet other conditions in the TMDL Order, then an application for an individual or different general permit or other appropriate tools may be required to address the allocation or other requirements.

CODE OF FEDERAL REGULATION STORMWATER DISCHARGE LIMITATIONS

7. **Effluent Limitations** - The permit registrant with the following activities must comply with the applicable limitations:

CFR Industry		Parameter	Limitation	
Category	Subcategory			
Cement manufacturing (40 CFR §411)	Materials storage piles runoff	pH	6.0 - 9.0 SU	
		Total Suspended Solids (TSS)	50 mg/l	
Steam powered electric power generating (40 CFR §423)	Coal pile runoff	TSS	50 mg/l, Daily Maximum	
Paving and roofing materials (tars and asphalt) (40 CFR §443)	Runoff from manufacturing of asphalt paving or roofing emulsion	Oil & Grease	15 mg/l, Daily Maximum	10 mg/l, 30 Day Average
		pH	6.0 - 9.0 SU	

STORMWATER DISCHARGE BENCHMARKS

8. **Benchmarks** - Benchmarks are guideline concentrations, not limitations. They are designed to assist the permit registrant in determining whether their SWPCP is effectively reducing pollutant concentrations in stormwater discharged from the site. For facilities that are subject to federal limitations, benchmarks apply to only those pollutants that are not limited by the federal regulations. See condition A.7 for a list of facilities subject to federal limitations.

   The following benchmarks apply to each point source discharge of stormwater associated with industrial activity:

Parameter	Benchmark
Total Copper	0.1 mg/l
Total Lead	0.4 mg/l
Total Zinc	0.6 mg/l
pH*	5.5 – 9.0 SU
Total Suspended Solids*	130 mg/l
Total Oil & Grease*	10 mg/l
E. coli**	406 counts/100 ml
Floating Solids (associated with industrial activities)	No Visible Discharge
Oil & Grease Sheen	No Visible Sheen

* See condition A.7 for list of facilities subject to federal limitations.

**The benchmark for E. coli applies only to landfills, if septage and sewage biosolids are disposed at the site, and sewage treatment plants.

9. **Response to a Benchmark Exceedance**
   a) If a stormwater sampling result exceeds any of the benchmark values, the permit registrant must, within 30 calendar days of receiving the sampling results, investigate the cause of the elevated pollutant levels, review the SWPCP and submit an Action Plan for department or agent approval.
   b) The purpose of this review is to determine if:
      i) The SWPCP is being followed;
      ii) There are alternative methods for implementing the existing site controls identified in the SWPCP;
      iii) The benchmark exceedance resulted from background or natural conditions not associated with industrial activities at the site; and
      iv) Additional effective site controls are needed to address the parameters of concern.
   c) The Action Plan must contain the following, unless condition A.9.d applies:
      i) The results of the review;
      ii) The corrective actions the permit registrant will take to address the benchmark exceedance; and
      iii) An implementation schedule including alternative methods for implementing existing site controls or methods for implementing additional effective site controls, if the site controls have not already been implemented.

d) If the permit registrant believes that the benchmark exceedance resulted from natural or background conditions, the Action Plan must propose a sampling plan and methodology for demonstrating that the elevated pollutant levels are due to background or natural conditions.
e) If the department or agent does not comment on the Action Plan within 10 business days of its receipt, it is deemed approved. The department or agent's approval of the Action Plan does not constitute compliance with this permit.
f) Upon approval, the permit registrant must implement the corrective actions identified in the Action Plan within 60 calendar days, unless otherwise approved by the department or agent.
g) If the department or agent affirms the assertion that background or natural conditions contributed to the benchmark exceedance, the permit registrant is not required to make this demonstration again during the term of this permit.

10. **Benchmark Compliance Evaluation**
a) By June 30th of the 4th year of permit coverage, the permit registrant must evaluate the last four samples collected from each outfall monitored and determine whether the geometric mean of the samples exceeds benchmark(s). This condition is not applicable to a permit registrant with a monitoring waiver as described in condition B.3.
b) The permit registrant must report this information in a Discharge Monitoring Report (DMR) and submit the DMR to the department or agent by July 31st of the 4th year of permit coverage as described in condition B.4.a.
c) If the geometric mean of the samples exceeds benchmark(s), the department will revoke the permit registrant's coverage under this permit and will require the permit registrant to apply for an individual permit pursuant to OAR 340-045-0033(10) and OAR 340-045-0060.

SCHEDULE B
MONITORING AND REPORTING REQUIREMENTS

1. **Minimum Monitoring Requirements** - All permit registrants must monitor stormwater associated with industrial activity for the following:

GRAB SAMPLES OF STORMWATER*	
Parameter	**Frequency** **
Total Copper	Four times per Year
Total Lead	Four times per Year
Total Zinc	Four times per Year
pH	Four times per Year
Total Suspended Solids	Four times per Year
Total Oil & Grease	Four times per Year
E. coli***	Four times per Year

* For each outfall monitored, the permit registrant may collect a single grab sample or a series of equal volume grab samples. Samples must be collected from the same storm event.

** The permit registrant is allowed to collect more samples than the minimum frequency requires and must report this data.

***The monitoring for E. coli applies only to landfills, if septage and sewage biosolids are disposed at the site, and sewage treatment plants.

VISUAL MONITORING OF STORMWATER	
Parameter	**Frequency**
Floating Solids (associated with industrial activities)	Once per Month (when discharging)
Oil & Grease Sheen	Once per Month (when discharging)

2. **Grab Sampling and Visual Monitoring Procedures and Locations** - The following requirements apply to monitoring conducted in compliance with condition B.1 above.

   a) **Grab Sampling and Visual Monitoring Methodology** - The monitoring period is from July 1 to June 30th. Grab samples must be representative of the discharge and must be taken at least 14 calendar days apart. Two samples must be collected before December 31, and two samples must be collected after January 1. Time or flow-weighted compositing of samples may be used as an alternative to grab samples, except when monitoring for pH, oil and grease, and E. coli. Visual monitoring must occur at outfall(s) or discharge point(s) identified in the SWPCP as outfall(s) or point(s) where stormwater monitoring will occur.

   b) **Multiple Point Source Discharges** - Each stormwater outfall must be monitored unless:
      i) The outfall serves an area with no exposure of stormwater to industrial activities; or
      ii) The outfall has effluent that is substantially similar to the effluent(s) of a monitored outfall and the same BMPs are implemented and maintained at the similar outfalls or drainage areas that lead to the outfalls. Substantially similar effluent(s) are discharges from drainage areas serving comparable activities where the discharges are expected to be similar in composition. The determination of substantial similarity or effluent(s)

must be based on past monitoring or an analysis of industrial activities and site characteristics. The data or analysis supporting that the outfalls are representative must be included in the SWPCP as described in A.3.b.vii.

iii) If sampling points are modified, permit registrants must notify the department or agent and submit an Action Plan as described in condition A.2.c.

c) **Monitoring Location** - All samples must be taken at monitoring points specified in the SWPCP before the stormwater joins or is diluted by any other wastestream, body of water or substance, unless otherwise approved in writing by the department.

d) **Sampling Variance**

i) Permit registrants may request a sampling variance for missed samples if one of the following criteria is met:

a) State or federal authorities declared the year a drought year.

b) Demonstrate that rainfall in the area where the permit registrant's facility is located was 20% or more below the three-year average rainfall for that area.

c) Demonstrate to the department or agent's satisfaction that samples were unable to be collected due to the infrequency of storm events of sufficient magnitude to produce run-off. Supporting data and analysis must be submitted to the department or agent.

ii) Permit registrants must submit to the department or agent a written request for a sampling variance by July 31st of the monitoring year in which the missed sampling occurred.

3. **Monitoring Waiver**

a) **Visual Observations** - There is no reduction allowed of the required visual observations.

b) **Grab Samples** - If at least four consecutive sampling results meet the benchmarks specified in condition A.8, the permit registrant is not required to collect grab samples for the remainder of the permit term. Where the permit registrant demonstrates to the department or agent's satisfaction that a benchmark exceedance resulted from background or natural conditions as described in condition A.9, the department or agent will consider these samples as meeting the benchmark(s) for the purposes of granting a monitoring waiver. There is no reduction in monitoring allowed for facilities subject to CFR limitations as described in condition A.7.

i) Results from sampling events cannot be averaged to meet the benchmarks.

ii) Monitoring waivers may be allowed for individual parameters.

iii) The permit registrant must submit to the department or agent a request to exercise the monitoring waiver that includes the analytical results from the four sampling events. If the department or agent does not comment within 30 calendar days, the monitoring waiver is deemed approved.

c) **Revocation of Monitoring Waiver**

i) The permit registrant must conduct monitoring as specified in condition B.1 if:

a) The department or agent determines that prior monitoring efforts used to establish the monitoring waiver were improper or sampling results were incorrect;

b) The department, agent or permit registrant determines that changes to site conditions are likely to affect stormwater discharge characteristics, or

c) The department, agent or permit registrant conducts additional monitoring and the sampling results exceed benchmark(s).

ii) The department or agent will notify the permit registrant in writing if the monitoring waiver is revoked.

4. **Monitoring Reporting Requirements** - The permit registrant must submit the following to the appropriate DEQ regional office or agent:

   a) **Monitoring Data** - The permit registrant must submit by July 31st of each year grab sampling and visual monitoring results for the previous monitoring period (July 1- June 30). The permit registrant must also report the minimum detection levels and analytical methods for the parameters analyzed. Non-detections must be reported as "ND" with the detection limit in mg/L parentheses, e.g., ND (0.005 mg/L). In calculating the geometric mean as described in condition A.10, one-half of the detection limits must be used for non-detections.

   b) **Report Forms** - The permit registrant must use a department-approved Discharge Monitoring Report (DMR) form for both visual and analytical monitoring results.

SCHEDULE C
COMPLIANCE CONDITIONS AND SCHEDULES

1. **An Existing Permit Registrant** that is either renewing or transferring coverage under the permit where there are no changes to operation or industrial type (for a facility operating under an NPDES stormwater discharge permit prior to July 1, 2007):

   a) Not later than 90 calendar days after renewing or transferring coverage under the permit, permit registrant must implement new site controls identified in the SWPCP to meet new permit requirements.

   b) Site controls that are developed to meet new permit requirements that require capital improvements (see Schedule D.3, Definitions) must be completed in accordance with the schedule set forth in the SWPCP, but must be completed within two years of renewing or transferring coverage under this permit.

2. **A New Permit Registrant with an Existing Facility** (for a facility operating before July 1, 2007, without an NPDES stormwater discharge permit):

   a) Not later than 90 calendar days after obtaining permit coverage, the permit registrant must implement site controls identified in the SWPCP to meet the new permit requirements.

   b) Site controls that are developed to meet new permit requirements that require capital improvements (see Schedule D.3, Definitions) must be completed in accordance with the schedule set forth in the SWPCP, but must be completed within two years of obtaining permit coverage.

3. **A New Permit Registrant with a New Facility** (for a facility beginning operation after July 1, 2007 without an NPDES stormwater discharge permit):

   a) A permit registrant must begin implementation of the SWPCP before starting operations. Not later than 90 calendar days after obtaining permit coverage, the permit registrant must fully implement site controls identified in the SWPCP.

   b) Site controls that require capital improvements (see Schedule D.3, Definitions), must be completed in accordance with the schedule set forth in the SWPCP, but must be completed within two years of obtaining permit coverage.

4. **A New Permit Registrant Discharging to Clackamas River, McKenzie River above Hayden Bridge (River Mile 15) or North Santiam River** (For potential or existing dischargers that did not have a permit prior to January 28, 1994, and existing dischargers that have a NPDES stormwater discharge permit but request an increased load limitation.)

   a) Not later than 180 calendar days after obtaining permit coverage, permit registrant must submit to the department a monitoring and water quality evaluation program. This program must be effective in evaluating the in-stream impacts of the discharge as required by OAR 340-041-0470.

b) Within 30 calendar days of department approval, the permit registrant must implement the monitoring and water quality evaluation program.

SCHEDULE D
SPECIAL CONDITIONS

1. **Releases in Excess of Reportable Quantities.** This permit does not relieve the permit registrant of the reporting requirements of 40 CFR §117 Determination of Reportable Quantities for Hazardous Substances and 40 CFR §302 Designation, Reportable Quantities, and Notification.

2. **Availability of SWPCP and Monitoring Data.** The Stormwater Pollution Control Plan (SWPCP) or stormwater monitoring data must be made available to government agencies responsible for stormwater management in the permit registrant's area.

3. **Definitions**

   a) *Action Plan* means an addendum to the SWPCP developed in response to modification to the SWPCP or in response to a benchmark exceedance.

   b) *Capital Improvements* means the following improvements that require capital expenditures:
      i) Treatment best management practices including but not limited to settling basins, oil/water separation equipment, catch basins, grassy swales, detention/retention basins, and media filtration devices.
      ii) Manufacturing modifications that incur capital expenditures, including process changes for reduction of pollutants or wastes at the source.
      iii) Concrete pads, dikes and conveyance or pumping systems utilized for collection and transfer of stormwater to treatment systems.
      iv) Roofs and appropriate covers for manufacturing areas.

   c) *Hazardous Substances* as defined in 40 CFR §302 Designation, Reportable Quantities, and Notification.

   d) *Material Handling Activities* include the storage, loading and unloading, transportation or conveyance of raw material, intermediate product, finished product, by-product or waste product.

   e) *Point Source Discharge* means a discharge from any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, or conduit.

   f) *Significant Materials* includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical that a facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ash, slag, and sludge that have the potential to be released with stormwater discharges.

   g) *Site Controls* is analogous to Best Management Practices.

   h) *Stormwater Associated With Industrial Activity* includes, but is not limited to, stormwater discharges from the following:
      - Industrial plant yards

- Immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility
- Material handling sites (Material handling activities include the storage, loading and unloading, transportation or conveyance of raw material, intermediate product, finished product, by-product or waste product.)
- Refuse sites
- Sites used for the application or disposal of process waste waters (as defined in 40 CFR § 401)
- Sites used for storage or maintenance of material handling equipment
- Sites used for residual treatment, storage, or disposal; shipping and receiving areas
- Manufacturing buildings
- Storage areas (including tank farms) for raw materials, and intermediate and finished products
- Areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical that a facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ash, slag, and sludge that have the potential to be released with stormwater discharges.

i) *Stormwater Conveyance* means a sewer, ditch, or swale that is designed to carry stormwater; a stormwater conveyance may also be referred to as a storm drain or storm sewer.

j) *Total Maximum Daily Load (TMDL)* is the sum of the individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources and background. If a receiving water body has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

4. **Local Public Agencies Acting as the Department's Agent**

The department authorizes local public agencies to act as its agent in implementing this permit if they entered into a Memorandum of Agreement (MOA). The agent may be authorized to conduct the following activities, including but not limited to: application review and approval, inspections, monitoring data review, stormwater and wastewater monitoring, SWPCP review, and verification and approval of no-exposure certifications. Where the department has entered into such an agreement, the department or its agent must notify the permit registrant of where to submit no-exposure certifications, and other notifications or correspondence associated with this permit. Annual discharge monitoring reports, including analytical monitoring data and visual monitoring results, SWPCPs and Actions Plans must be submitted to both the department and the agent.

SCHEDULE F
NPDES GENERAL CONDITIONS – INDUSTRIAL FACILITIES

SECTION A. STANDARD CONDITIONS

1. Duty to Comply
The permit registrant must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468B.025 and 40 CFR 122.41(a) and is grounds for enforcement action; for permit termination, revocation, reissuance, or modification; or for denial of a permit renewal application.

2. Penalties for Water Pollution and Permit Condition Violations
ORS 468.140 allows the department to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit. Additionally, 40 CFR 122.41, modified by 40 CFR 19.4, provides that any person who violates any permit condition, term, or requirement may be subject to a federal civil penalty not to exceed $32,500 per day of each violation.

Under ORS 468.943 and 40 CFR 122.41, modified by 40 CFR 19.4, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to $32,500 or by imprisonment for not more than one year, or by both. Each day on which a violation occurs or continues is a separately punishable offense.

Under ORS 468.946, a person who knowingly discharges, places or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state, is subject to a Class B felony punishable by a fine not to exceed $200,000 and up to 10 years in prison. Additionally, under 40 CFR §122.41(a) any person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a federal civil penalty not to exceed $100,000, and up to 6 years in prison.

3. Duty to Mitigate
The permit registrant must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permit registrant must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

4. Duty to Reapply
If the permit registrant wishes to continue an activity regulated by this permit after the expiration date of this permit, the permit registrant must apply to have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions
This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute;
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts;
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;
d. The permit registrant is identified as a Designated Management Agency or allocated a wasteload under a Total Maximum Daily Load (TMDL);
e. New information or regulations;
f. Modification of compliance schedules;
g. Requirements of permit re-opener conditions;
h. Correction of technical mistakes made in determining permit conditions;
i. Determination that the permitted activity endangers human health or the environment, or
j. Other causes as specified in 40 CFR §§122.62, 122.64, and 124.5.

The filing of a request by the permit registrant for a permit modification or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants
The permit registrant must comply with any applicable effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

7. Property Rights
The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

8. Permit References
Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance
The permit registrant must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permit registrant to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permit registrant only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Duty to Halt or Reduce Activity
For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permit registrant must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permit registrant in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities
   a. Definitions
      (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple units or processes of a treatment works when the nonuse is insignificant to the quality or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.
      (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

   b. Prohibition of bypass.
      (1) Bypass is prohibited unless:
         (a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;
         (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
         (c) The permit registrant submitted notices and requests as required under General Condition B.3.c.

(2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Director determines that it will meet the three conditions listed above in General Condition B.3.b.(1).

c. Notice and request for bypass.
   (1) Anticipated bypass. If the permit registrant knows in advance of the need for a bypass, it must submit prior written notice, if possible at least ten days before the date of the bypass.
   (2) Unanticipated bypass. The permit registrant must submit notice of an unanticipated bypass as required in General Condition D.5.

4. Upset
   a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permit registrant. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

   b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of General Condition B.4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

   c. Conditions necessary for a demonstration of upset. A permit registrant who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      (1) An upset occurred and that the permit registrant can identify the causes(s) of the upset;
      (2) The permitted facility was at the time being properly operated;
      (3) The permit registrant submitted notice of the upset as required in General Condition D.5, hereof (24-hour notice); and
      (4) The permit registrant complied with any remedial measures required under General Condition A.3 hereof.

   d. Burden of proof. In any enforcement proceeding the permit registrant seeking to establish the occurrence of an upset has the burden of proof.

5. Treatment of Single Operational Event
   For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter must be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations
   a. Definitions
      (1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.
      (2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.
      (3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

   b. Prohibition of overflows. Overflows are prohibited unless:
      (1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;
      (2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and

(3) The overflows are the result of an upset as defined in General Condition B.4. and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permit registrant becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5.

7. Public Notification of Effluent Violation or Overflow
If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permit registrant must take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Removed Substances
Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling
Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit and must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of the Director.

2. Flow Measurements
Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures
Monitoring must be conducted according to test procedures approved under 40 CFR §136, unless other test procedures have been specified in this permit.

4. Penalties of Tampering
The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years or both.

5. Reporting of Monitoring Results
Monitoring results must be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permit registrant
If the permit registrant monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR §136 or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data

submitted in the Discharge Monitoring Report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value must be recorded unless otherwise specified in this permit.

7. Averaging of Measurements
Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

8. Retention of Records
Except for records of monitoring information required by this permit related to the permit registrant's sewage sludge use and disposal activities, which must be retained for a period of at least five years (or longer as required by 40 CFR §503), the permit registrant must retain records of all monitoring information, including all calibration and maintenance records of all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

9. Records Contents
Records of monitoring information must include:
   a. The date, exact place, time and methods of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

10. Inspection and Entry
The permit registrant must allow the Director, or an authorized representative upon the presentation of credentials to:
   a. Enter upon the permit registrant's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and
   d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes
The permit registrant must comply with Oregon Administrative Rules (OAR) 340, Division 052, "Review of Plans and Specifications". Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers must be commenced until the plans and specifications are submitted to and approved by the Department. The permit registrant must give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

2. Anticipated Noncompliance
The permit registrant must give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers
This permit may be transferred to a new permit registrant provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit must be transferred to a third party without prior written approval from the Director. The permit registrant must notify the Department when a transfer of property interest takes place.

4. Compliance Schedule
Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting
The permit registrant must report any noncompliance which may endanger health or the environment. Any information must be provided orally (by telephone) within 24 hours, unless otherwise specified in this permit, from the time the permit registrant becomes aware of the circumstances. During normal business hours, the Department's Regional office must be called. Outside of normal business hours, the Department must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

A written submission must also be provided within 5 days of the time the permit registrant becomes aware of the circumstances. If the permit registrant is establishing an affirmative defense of upset or bypass to any offense under ORS 468.922 to 468.946, and in which case if the original reporting notice was oral, delivered written notice must be made to the Department or other agency with regulatory jurisdiction within 4 (four) calendar days. The written submission must contain:
a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected;
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
e. Public notification steps taken, pursuant to General Condition B.7.

The following must be included as information which must be reported within 24 hours under this paragraph:
a. Any unanticipated bypass which exceeds any effluent limitation in this permit.
b. Any upset which exceeds any effluent limitation in this permit.
c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in this permit.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. Other Noncompliance
The permit registrant must report all instances of noncompliance not reported under General Condition D.4 or D.5, at the time monitoring reports are submitted. The reports must contain:
a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected; and
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information
The permit registrant must furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permit registrant must also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permit registrant becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it must promptly submit such facts or information.

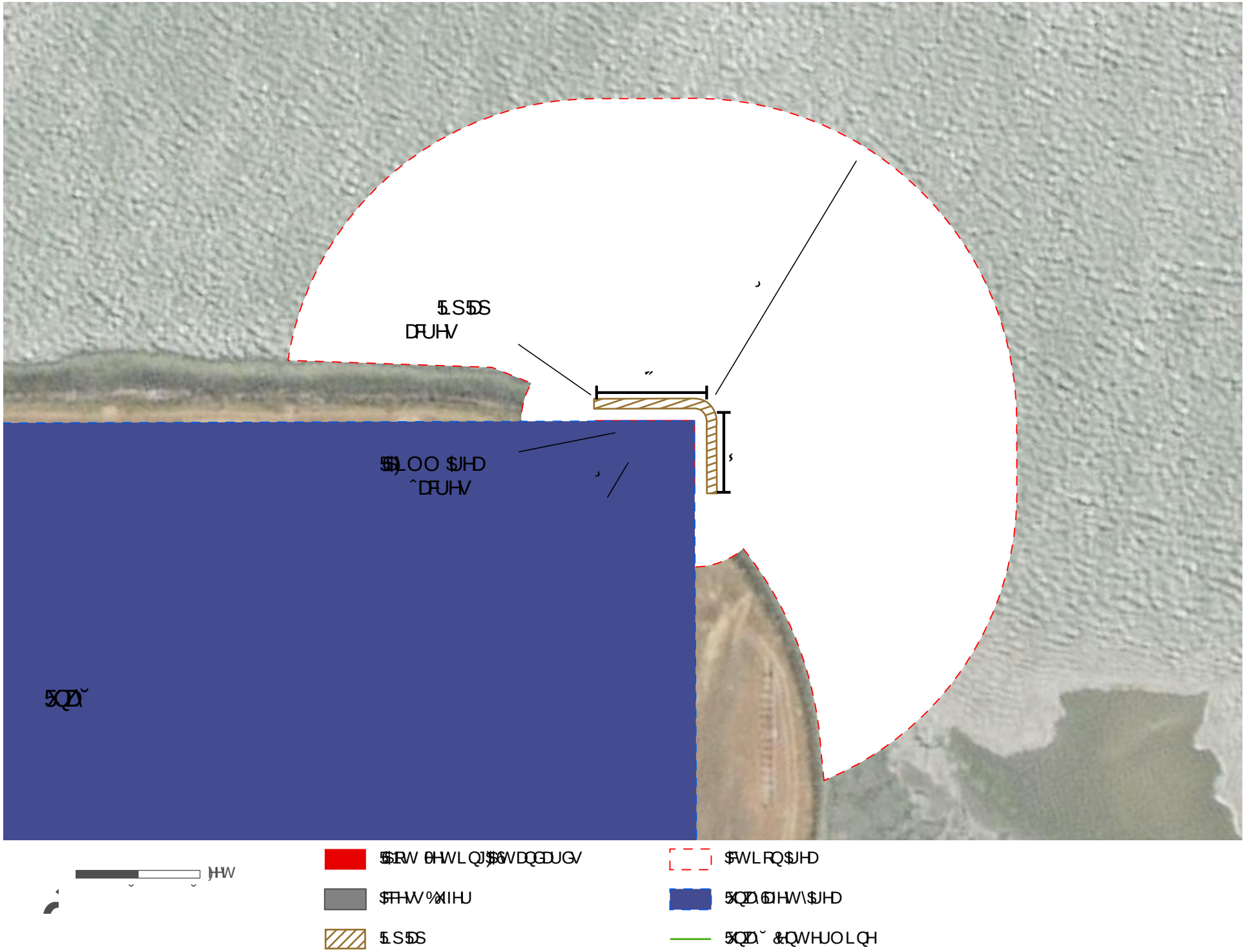
8. Signatory Requirements
All applications, reports or information submitted to the Department must be signed and certified in accordance with 40 CFR §122.22.

9. Falsification of Reports
Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $100,000 per violation and up to 5 years in prison.

SECTION E. DEFINITIONS

1. BOD means five-day biochemical oxygen demand.
2. TSS means total suspended solids.
3. mg/l means milligrams per liter.
4. kg means kilograms.
5. m^3/d means cubic meters per day.
6. MGD means million gallons per day.
7. Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.
8. FC means fecal coliform bacteria.
9. Technology based permit effluent limitations means technology-based treatment requirements as defined in 40 CFR §125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.
10. CBOD means five day carbonaceous biochemical oxygen demand.
11. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.
12. Quarter means January through March, April through June, July through September, or October through December.
13. Month means calendar month.
14. Week means a calendar week of Sunday through Saturday.
15. Total residual chlorine means combined chlorine forms plus free residual chlorine.
16. The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and E. coli bacteria.
17. POTW means a publicly owned treatment works.

Attachment G



Water Resources Report

Southwest Oregon Regional Airport

Environmental Assessment

Runway Safety Area Improvements (Runway 4/22)

Report prepared by

Mead & Hunt

www.meadhunt.com

February 7, 2020

Mead & Hunt Project No. 1417700-171679.01

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1 PROJECT SCOPE

1.1 Project Description

The Southwest Oregon Regional Airport (OTH, Airport, or Sponsor) is a commercial service airport located on the southern coast of Oregon within the City of North Bend. The location of the Airport is displayed in **Figure 1 – Vicinity Map**. The Airport's primary runway (Runway 4/22) is 5,980 feet long and 150 feet wide. Currently, the Runway Safety Area (RSA) for Runway 4-22 does not meet the design standards for C-III aircraft as established by the FAA. FAA Advisory Circular 150/5300-13A, *Airport Design*, provides required airport safety area guidance and defines an RSA as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway."

At OTH, the FAA requires the RSA to be 500 feet wide, centered on the runway centerline, and to extend 1,000 feet beyond each end of the runway. The existing Runway 22 RSA does not meet these requirements. The Airport completed an Airport Master Plan in 2013 that identified the need to correct the RSA for Runway 4/22. The FAA's Seattle Airport District Office (ADO) concurred with the findings of the Master Plan and directed OTH to complete an Environmental Assessment (EA).

The Airport is also contemplating several additional projects that will be included in the EA for the purposes of evaluation of airport-wide impacts: elimination of direct taxiway connections from the apron to the runway, rehabilitation of general aviation apron pavement, and replacement of the Aircraft Rescue and Fire Fighting (ARFF) building.

The Sponsor's proposed action to be evaluated in the EA includes:

- Correct Runway 4/22 RSA to meet design standards for C-III aircraft
- Remove taxiway connectors to enhance safety
- Rehabilitate main general aviation apron
- Demolish and reconstruct the ARFF building
- Install maintenance improvements to the Medium Intensity Approach Lighting System (MALSR); and
- Relocate the glide slope instrumentation 150-feet from Centerline 4/22.

The proposed projects are displayed in **Figure 2 – Proposed Project.**

1.2 Purpose of Report

OTH is surrounded by the open waters of Coos Bay, and the Airport's stormwater infrastructure discharges directly to this waterway. The existing drainage at the Airport is displayed in **Figure 3 – Existing Drainage**. This report summarizes the Water Resources considerations associated with the EA proposed actions. These projects are in varying stages of development and the purpose of this report is to summarize the potential impacts associated with the preferred design alternative for each action. Detailed design and analysis will be advanced with each individual project as applicable. This report includes a description of the design codes and references; regulatory considerations; surface waters and wetlands, floodplains, and drainage infrastructure related to the existing conditions; and potential impacts as a result of the proposed actions.

1.3 Design Codes and References

The following design codes and references have been considered for this project.

- Federal Aviation Administration (FAA), AC 150/5300-13A*, Airport Design, Change 1*, 02/26/2014
- FAA, AC 150/5320-5D, *Surface Drainage Design*, 8/15/2013
- FAA, AC 150/5200-33B, Hazardous Wildlife Attractants On Or Near Airports, 8/28/2007
- Code of Federal Regulations (CFR), Title 44: Emergency Management and Assistance, § 60.3 - *Flood Plain Management Criteria for Flood-Prone Areas*, Revised October 26, 1976
- Code of Federal Regulations (CFR), Title 44: Emergency Management and Assistance, § 60.6 – *Variances and Exceptions*, Revised August 22, 2016
- Code of Federal Regulations (CFR), Title 14: Aeronautics and Space, § 139.319 - *Aircraft rescue and firefighting: Operational requirements*, June 4, 2004
- Oregon Revised Statutes, ORS 196.795-990, *Oregon's Removal-Fill Law*, 2017
- Oregon Department of Environmental Quality (DEQ), *1200-C Construction Stormwater General Permit*, December 15, 2015
- Oregon Department of Environmental Quality (DEQ), *1200-Z Industrial Stormwater General Permit*, August 1, 2017
- Oregon Department of Environmental Quality (DEQ), *Section 401 Water Quality Certification - Post-Construction Stormwater Management Plan Submission Guidelines,* March 2018
- Washington State Department of Transportation (WSDOT), Aviation Stormwater Design Manual: Managing Wildlife Hazards Near Airports, December 2008.
- City of North Bend Ordinance No. 2027, Issued November 27, 2018
- City of North Bend Ordinance No. 2028, Issued November 19, 2018
- City of North Bend, Title 18 Zoning, Revised October 2007
- Southwest Regional Airport, 1200-Z Permit Submittal, *Storm Water Pollution Control Plan*, January 27, 2009
- PBS, Wetland Delineation Report – SW Oregon Regional Airport Safety Improvements, February 15, 2019

1.4 Regulatory Considerations

1.4.1 Surface Water and Wetlands

The Clean Water Act (CWA) has been established to protect streams, lakes, rivers, wetlands, or other waters that qualify as "Waters of the United States" and are regulated by the U.S. Army Corps of Engineers (USACE). Wetlands and waterways have been defined by the USACE and the U.S. Environmental Protection Agency (EPA), pursuant to Section 404 of the CWA. Wetlands are also defined by Executive Order 11990: *Protection of Wetlands*. Wetlands are a subset of Waters of the United States and receive protection under Section 404 of the CWA. Surface waters and wetlands within Oregon are further regulated by Oregon's Removal-Fill Law administered by the Oregon Department of State Lands (DSL). The USACE and DSL use a joint permit application for proposed removal-fill activities; however, each agency independently reviews the application and issues its own permit. Stormwater discharges to surface waters are regulated by the DEQ General Permits, which are further described below.

1.4.2 FEMA Floodplains and Local Floodplain Ordinance

According to Executive Order 11988 (Floodplains), Executive Order 13690 (Federal Flood Risk Management), and the US Department of Transportation Order 5650.2 (Floodplain Management and Protection), development actions must avoid the floodplain if a practical alternative exists. If no practical alternative exists, actions in the floodplain should be designed to minimize adverse impacts to the floodplain's natural and beneficial values. Improvements should also minimize the potential risks for flood-related property loss and impacts on human safety, health, and welfare.

44 CFR § 60.3, c. states the following applicable regulatory requirements for construction projects in flood-prone areas where the Administrator has provided a notice of final flood elevations for one or more special flood hazard areas on the community's Flood Insurance Rate Map (FIRM) but has not identified a regulatory floodway or a costal high hazard area:

- Notify adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse;
- Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained; and
- Demonstrate that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood by more than one (1) foot.

The City of North Bend has issued Ordinance No. 2027, which repeals and replaces the text of North Bend City Code Title 18, Chapter 18.48. In Ordinance No. 2027, Section 18.48.140 states that it must be demonstrated that the cumulative effect of proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood by more than one foot.

For Pony Slough, in both the case of 44 CFR § 60.3, c. and Ordinance No. 2027, the base flood is the One-Percent Annual Chance Event.

1.4.3 Tsunami Hazard Area

The City of North Bend has issued Ordinance No. 2028. The ordinance concerns the Tsunami Hazard Overlay Zone, which was established to increase the resilience of communities to a local source Cascadia Subduction Zone (CSZ) tsunami by establishing standards and requirements that apply to land use and development. The ordinance prohibits certain types of facilities within the Tsunami Hazard Overlay Zone but also establishes exceptions.

1.4.4 Firefighting Response Time

14 CFR § 139.319, h. states that within three (3) minutes from the time of alarm, at least one (1) aircraft rescue and firefighting vehicle must reach the midpoint of the farthest runway serving aircraft from the vehicle's assigned post and begin application of extinguishing agent.

1.4.5 Drainage Infrastructure

The stormwater infrastructure associated with the Airport development actions will be subject to the federal regulations for surface drainage design (FAA 2013) and hazardous wildlife attractants

(Section 2-3.b., FAA 2007). On airfields, the objective of storm drainage design is to provide for safe passage of vehicles or operation of the facility during the design storm event.

"The design of appropriate discharge facilities for storm water collection and conveyance systems includes consideration of storm water quantity and quality. Local, state, and/or Federal regulations often control the allowable quantity and quality of storm water discharges. To meet these regulatory requirements, storm drainage systems will usually require detention or retention basins, and/or other best management practices (BMPs) for the control of discharge quantity and quality" (Section 1-5.3.4, FAA 2013).

Local regulations that govern the project area are dictated by the City of North Bend. The City of North Bend adheres to the Oregon Drainage Law for stormwater management. Lands upstream and downstream of the Airport's existing drainage infrastructure are primarily within the airport property boundaries. The City of North Bend does not have specific standards for water quantity and water quality associated with developments and defers to DEQ guidelines (DEQ 2018).

The requirements for conveyance, water quantity, and water quality control are defined as follows:

1.4.5.1 *Conveyance*

The design and installation of a functioning stormwater conveyance system is a crucial part of maintaining the safety of an airfield. A combination of surface drainage and storm drains should be used to create an efficient stormwater network. Pipes with watertight joints that meet the cover requirements should be used. Storm drains shall be designed to maintain a full-flow pipe velocity of 3ft/s or greater. Sub-drains will be used to drain the base material, lower the water table, or drain perched water tables. It is recommended that storm drains be sized based on gravity flow criteria at flowing full or near full; however, pressure flow may be justified in certain instances.

Conveyance systems on an airfield must be designed to convey a 5-year storm event with no runoff encroachment onto taxiways, runway pavements, or other surfaces. Conveyance systems in areas other than airfields must be designed to convey a 10-year storm event. Sag locations must be designed to accommodate a 50-year storm event. A design check of a 100-year storm event to evaluate the system performance is required (FAA 2013).

1.4.5.2 *Water Quantity Control*

Water quantity control may be provided by above- or below ground detention; collection and conveyance facilities; underground tanks; and on-site facilities such as parking lots, pavements, and basins. Water quantity control facilities need to address timing, safety, and maintenance. Timing design shall evaluate the cumulative hydrograph with and without detention. For safety, design shall include elements to protect public safety and prevent wildlife attractants. For maintenance, design shall include appropriate access for proper long-term maintenance. Specifically, detention ponds need to be linear-shaped dry detention ponds with a maximum of a 48-hour detention period for the design storm (Section 2-3.b., FAA 2007). As the Airport outfalls to a large waterbody (Coos Bay), quantity control is not required.

1.4.5.3 *Water Quality Control*

Development or redevelopment projects that disturb underlying gravel and soil and result in the additional or replacement of impervious surfaces trigger stormwater quality control requirements. Water quality control requires stormwater runoff associated with the water quality storm event receive treatment prior to discharge to the Waters of the United States unless site constraints make this infeasible (DEQ 2018). Best Management Practice (BMP) selection needs to take into consideration the watershed area served, physical conditions of the site, and the water quality objectives. Particular attention is required in the selection of appropriate BMPs to meet the requirements for controlling runoff associated with aircraft and airfield pavement deicing activities, which are required to maintain safe aircraft operating conditions during the winter months. (FAA 2013). The WSDOT, *Aviation Stormwater Design Manual: Managing Wildlife Hazards Near Airports*, provides a selection of BMPs that are applicable to the site-specific conditions at this Airport (WDOT 2008).

The Airport is a permitted industrial facility under the 1200-Z Industrial Stormwater General Permit (1200-Z) administered by the DEQ. Runoff from industrial areas may contain heavy metals, sediments, and petroleum hydrocarbons. The Airport is required to develop, maintain, and implement a Storm Water Pollution Control Plan (SWPCP) describing industrial activities, significant materials storage, runoff patterns, drainage infrastructure, source control measures, and stormwater treatment systems. The SWPCP must be kept current when changes are made to the facility and will need to be updated and submitted to DEQ within 30 days after the modification. New drainage areas and discharge points may require establishment of new stormwater monitoring points under the 1200-Z. A substantial modification to the characteristic of an existing discharge point may invalidate existing monitoring waivers.

The clearing, grading, and excavating activities associated with the proposed project, if in excess of one (1) acre, will require a 1200-C Construction Stormwater General Permit (1200-C) administered by the DEQ. The 1200-C is typically obtained during final design, and application must be submitted at least 30 days prior to construction. The 1200-C application must include a set of design drawings for erosion control (i.e., Erosion and Sediment Control Plan).

2 EXISTING CONDITIONS

2.1 Location and Climate

The Airport is located on the southern coast of Oregon within the City of North Bend. The climate in the Airport vicinity is humid, with little temperature variation throughout the year. Based on records from the Western Regional Climate Center, the Airport's average annual rainfall is 62.8 inches, and the average snowfall is only 0.8 inch. The average number of days per year with measurable precipitation is 162. The warmest month is August, with an average temperature of 59.9 degrees Fahrenheit, and the coldest month is January, with an average temperature of 45.8 degrees Fahrenheit. The average annual temperature is 52.6 degrees Fahrenheit.

Table 1 below displays 24-hour duration rainfall depths, in inches, for multiple return interval events at the Airport. The rainfall depths are from the National Oceanic and Atmospheric Administration (NOAA) Atlas 2 Precipitation Frequency Estimates. Return intervals are based on the probability that the given event will

be equaled or exceeded in a given year. For example, there is a 1 in 5 chance (20 percent chance) that a 5-year return interval event will happen in a given year.

Table 1: Rainfall Values

Return Interval	Duration	Rainfall, inches	Design Parameter
2 year	24-hour	3.5	Water quality*; Flow control
5 year	24-hour	4.5	Pavement encroachment check
10 year	24-hour	5.0	Flow control; Conveyance
25 year	24-hour	5.5	Flow control
50 year	24-hour	6.0	Sag check
100 year	24-hour	6.5	Flow control; Conveyance check

* The water quality design storm event factor is 50% (DEQ 2018).

2.2 Soils and Terrain

The National Resource Conservation Service (NRCS) Soils Survey found only Udorthents within the study area. The soil description is limited and states that the soil is poorly drained, and that the parent material is alluvium, dredging spoil, dune sand, and wood chips. The topography in the area surrounding the Airport is mildly sloped. Soils within the airfield safety area are displayed in **Figure 4 – Soils**.

2.3 Regulated Wetlands and Waterways

The Airport is surrounded by the open waters of Coos Bay to the north and southwest and by the open waters of Pony Slough to the east. A wetlands and waterway delineation conducted in November 2018 was documented in the *Wetland Delineation Report* (PBS, 2019). A single emergent tidal wetland was delineated within the project area on the northeast side of the Airport (Study Area B). The jurisdictional elevations of the surface waters (Coos Bay and Pony Slough) for the project area were established in Table 2 and mapped on Figure 6B of the *Wetland Delineation Report* (PBS, 2019).

Coos Bay and Pony Slough are listed as 303(d) Impaired Waterbodies due to Fecal Coliform. The Airport activities associated with the proposed project do not contribute to this constituent of concern. The City of North Bend owns and maintains a wastewater treatment plant located on Airport property, which is south of Runway 4/22 near Taxiway C. Treated wastewater effluent from this plant is discharged into the Coos Bay Channel as permitted by the DEQ. Airport activities associated with the proposed project do not impact this facility.

2.4 FEMA Floodplains

The Airport is covered by Flood Insurance Rate Map (FIRM) No. 41011C0186E and FIRM No. 41011C0167. There are effective Zone AE floodplains adjacent to the Airport and on Airport property (see **Figure 5 – FEMA Floodplains**). There are defined Base Flood Elevations (BFEs) but no defined floodway.

2.5 Tsunami Hazard Area

The Airport is covered by Tsunami Inundation Map Coos-05. The Airport is in the “SM” earthquake size zone, and thus is subject to the requirements of the City of North Bend’s Ordinance No. 2028. The existing ARFF building is classified as an Essential Facility according to section 18.50.020(1)(b-d).

2.6 Existing Drainage Conditions.

Multiple drainage paths exist at the Airport. Existing drainage at the Airport is displayed in **Figure 3 – Existing Drainage**. The primary runway, Runway 4/22, is oriented in a southwest-to-northeast direction. Runway 4/22 mostly drains from the northeast to the southwest. Water on Runway 4/22 is intercepted by existing drainage infrastructure and conveyed to Outfalls #1, #2, or #3. Outfall #1 is at the southwest end of the runway and is on the south side of the runway. Outfall #2 is halfway along the runway and is on the north side of the runway. Outfall #3 is near the northeast end of the runway and is on the north side of the runway. With the drainage basins draining to Outfalls #1 and #2, there are water quality swales that provide stormwater treatment prior to discharge at the outfalls. These are located between Taxiway C and Runway 4/22.

The secondary runway, Runway 13/31, is oriented from the southeast to the northwest and primarily drains in that direction. Multiple inlets along the northern two-thirds of the runway intercept stormwater and convey it to Outfalls #2 and #3. The southern one-third of the runway drains to multiple outfalls (#4-#9) with most of the area discharging to Outfall #9 in the southeast corner of the Airport.

2.7 Existing Industrial Activities

The industrial activities at the Airport consist of storing and loading/unloading of significant materials (primarily fuel), fueling, maintenance, and minor amounts of deicing. The fuel farm has a containment area and an oil water separator prior to discharge to Outfall #2 on the north side of the Airport. The terminal area has a similar containment area and flows through a series of water quality swales prior to discharging to Outfall #1 at the southwest end of the Airport. Outfall #1 and #2, along with two other outfalls to the north (Outfall #3) and southeast (Outfall #9), are regularly monitored and outflow samples are collected and tested for pollutants of concern in accordance with the Airport's 1200-Z Permit.

3 PROJECT IMPACTS

3.1 Proposed Improvements

The EA covers the following proposed actions on the Airport:

- Correct Runway 4-22 RSA to meet design standards for C-III aircraft
- Remove direct access taxiway connectors to enhance safety
- Rehabilitate main general aviation apron pavement
- Demolish and reconstruct the ARFF building
- Install maintenance improvements to the MALSR
- Relocate the FAA glide slope instrumentation.

The proposed projects are displayed in **Figure 2 – Proposed Project.**

These projects are in varying stages of development and the purpose of this report is to summarize the preferred design alternative, potential impacts associated with the preferred design alternative, and the regulatory actions. Detailed design and analysis will be advanced with each individual project as applicable and as further discussed below.

3.2 Water Resources Impacts

The impact to the water resources, including regulated wetlands and waterways, floodplains and drainage infrastructure associated with each of these improvements preferred alternative, is discussed below. Their regulatory actions are described in the following section.

3.2.1 Runway 4/22 RSA

The FAA requires a safety buffer surrounding Runway 4/22. To meet these standards, OTH proposes a one-time fill at the northeast end of the runway where Coos Bay intersects with Pony Slough (see **Figure 2 – Proposed Project**). The fill would be level with the elevation of the existing runway edge, and the fill would consist of mixed material (sand, silt, rock, riprap). Two possible options for the bank stabilization are as follows:

1. Riprap border approximately 15 feet wide with a 15-degree slope terminating into the bay/slough.
2. Eco-block or sheet pile installed at the edge of the fill.

Based on the biological assessment, Option 2, the eco-block or sheet pile is the preferred alternative and is therefore evaluated in this report. The preferred alternative would result in approximate 2,215 cubic yards of fill above the mean high water. For more details on the fill calculations, see the technical memorandum included in **Appendix B**.

The improvement area is outside the outfall drainage basins area (see **Figure 3 – Existing Drainage**). These improvements will result in a disturbance to underlying soils and upon construction completion, a negligible addition of impervious area. Because the fill is at the edge of the Airport, adjacent to and draining into the bay/slough, upon construction completion, there will be no impact to the existing drainage system conveyance or water quality. The fill will occur in a mapped Zone AE floodplain impacting regulated floodplains and waterways within this study area. Water quality protection measures will be required during construction.

3.2.2 Taxiway Connectors

The FAA recommends the elimination of direct access (without turns) from apron or gate areas to a runway. There are two taxiway connectors at the Airport that provide direct access to Runway 13/31 from the main General Aviation ramp (see **Figure 2 – Proposed Project**). Sections of these two taxiway connectors will be removed to eliminate direct access to the runway to meet FAA safety guidelines.

These taxiway connectors are located within the Outfall #2 drainage basin (see **Figure 6 – Outfall #2 Drainage Basin Improvements**). These improvements will result in a disturbance to underlying soils and upon construction completion, no new impervious area and a decrease of 30,137 square feet (0.69 acres) in impervious surface area within this basin. Therefore, upon construction completion, there will be an improvement to the stormwater conveyance system capacity and water quality at the existing drainage outfall. There are no regulated floodplains, wetlands, or waterways within this study area. Water quality protection measures will be required during construction.

3.2.3 General Aviation Apron

The main General Aviation apron is located west of Taxiway A, adjacent to the northern one-third of Runway 13/31 (see **Figure 2 – Proposed Project**). The apron is approximately 36,110 square yards. It was

constructed during World War II and was resurfaced in 2001. The pavement condition has deteriorated, and pavement rehabilitation will be required.

The General Aviation apron is located within the Outfall #2 drainage basin (see **Figure 6 – Outfall #2 Drainage Basin Improvements**). These improvements are not expected to disturb the underlying soils and upon construction completion, there will be no change in impervious area; therefore, there will be no impact to the stormwater conveyance system capacity and water quality at the existing drainage outfall. There are no regulated floodplains, wetlands, or waterways within this study area. Water quality protection measures will be required during construction.

3.2.4 ARFF Building

The ARFF building is centrally located immediately south of the main hangar on the southwest side of the main apron. The existing 4,670 square foot (0.1 acre) ARFF building was constructed in 1960 and is in poor condition. The existing building will be demolished, and a new 12,431 square foot ARFF building will be constructed immediately north of the main hangar (see **Figure 2 – Proposed Project**). The site of the new ARFF facility is primarily covered in impervious surfaces. The impervious surface will be removed for the construction of the building and associated site improvements.

The existing and new ARFF buildings are located within the Outfall #2 drainage basin (see **Figure 6 – Outfall #2 Drainage Basin Improvements**). These improvements will result in a disturbance to underlying soils and upon construction completion, new impervious area but a net decrease of impervious area as summarized in **Table 2**.

Table 2: ARFF Building

Improvement	Area (Square Feet)	Area (Acres)
Remove ARFF	4,670	0.1
New ARFF Site, Existing Impervious	39,073	0.9
New ARFF Site, Post-construction Impervious	33,580	0.77
Total change in impervious	**-10,163**	**-0.23**

The net result of the ARFF building removal and the new ARFF building and site improvements will be a net decrease of 0.23 acres of impervious area within the Outfall #2 drainage basin; therefore, there will be an improvement to the stormwater conveyance system capacity and water quality at the existing drainage outfall. However, the disturbance of the underlying soils trigger water treatment requirements. There are no regulated floodplains, wetlands, or waterways within this study area.

3.2.5 MALSR Maintenance Improvements

The MALSR consists of a threshold light bar and seven five-light bars located on the extended runway centerline (see **Figure 2 – Proposed Project**). The first bar is located 200 feet from the runway threshold, and the remaining bars are located at 200-foot intervals out to 1,400 feet from the threshold. Maintenance of the MALSR units normally require replacement of instrumentation and electrical fittings.

The maintenance improvements would occur on the existing catwalk, with no in-water work. Therefore, there will be no impact on the existing drainage system, regulated floodplains, wetlands, or waterways within this study area.

3.2.6 Glide Slope Antenna

The existing glide slope antenna for Runway 4/22 does not meet the minimum 150-foot required distance from the center of runway. The existing antenna is on the north side of Runway 4/22 (see **Figure 2 – Proposed Project**).

The following alternatives are being considered:

- Relocation of the glide slope 30 feet towards the edge of Coos Bay and beyond the existing footprint of OTH, requiring a fill embankment.
- Relocation to the opposite side (south) of the runway center, between Taxiway C and runway 4/22. Associated equipment shelter and access way will be located approximately 150 feet south of the Runway 4/22 centerline. This location may require excavation for utilities.

A preferred alternative is not being put forth within the context of this EA and is only being discussed with regard to general impacts of each alternative for future consideration.

The first alternative would require a fill embankment, similar to the Runway 4/22 RSA fill, and would have no impact on the existing drainage system. The fill would occur in a mapped Zone AE floodplain impacting regulated floodplains and waterways within this study area.

The second alternative would require filling in an existing water quality swale to create a level surface for the functionality of the glide slope. This impact to the existing drainage system would need to be mitigated with water quality improvements. Due to the existing drainage network configuration and proximity to the outfall, the new water quality treatment mechanism would need to located within the airfield operating area. The *Aviation Stormwater Design Manual: Managing Wildlife Hazards Near Airports*, Chapter 6 modifies stormwater best management practices (BMPs) for airport usage (WSDOT 2008). There are no regulated floodplains, wetlands, or waterways within this study area.

3.3 Regulatory Actions

The Runway 4/22 RSA fill activity would likely exceed the threshold to qualify for a General Authorization or General Permit under the USACE and DSL regulations and is likely to require an Individual Permit for fill activities. A pre-application meeting on July 17, 2019 addressed the fill activity and proposed impacts to advance the regulatory process with the agencies.

The Runway 4/22 RSA fill alternative, would place fill in a mapped Zone AE floodplain. To satisfy FEMA requirements and the City of North Bend's Ordinance No. 2027, a hydraulic model was prepared to show that the fill would not increase the water surface elevations. For more details on the hydraulic model, see the technical memorandum included in **Appendix A**. If the first alternative for the Glide Slope Antenna relocation is preferred, a similar analysis will need to be completed.

Because the proposed ARFF building is within the Tsunami Hazard Zone, construction is regulated under section 18.50.050(2)(a-c) of the City of North Bend's Ordinance No. 2028. However, section 18.50.060,

which covers use exceptions, states that structures may be permitted upon authorization of a use exception if:

1. There is a need for a strategic location for a fire station (section 18.50.060(2), or
2. There are no reasonable, lower-risk alternative sites available for the proposed use (section 18.50.060(3)(a).

Because the ARFF building's purpose is to prevent the spread of fire and rapidly respond to rescue situations at the Airport, the location near main runways is critical, and mandated by FAA (14 CFR § 139.319, h.). Relocating the structure to an alternative site outside of the Tsunami Hazard Zone would significantly increase response time, increasing the probability of loss of life and property in the case of an emergency. In a July 2019 consultation with Coos County planning office, an administrative waiver for the ARFF facility was granted.

Since the ARFF facility is disturbing underlying soils at the new facility site, the ARFF facility project will require water quality control associated with the water quality storm event prior to discharge to the Waters of the United States unless site constraints make this infeasible. This project is currently under design and includes design development of water treatment. A stormwater management plan associated with the site development will outline the design compliance. It is expected that the stormwater management plan and final design report will completed in March 2020.

For any construction activities exceeding one (1) acre of land disturbing activity will be required to obtain coverage under the 1200-C Construction Storm Water General Permit, including an Erosion and Sediment Control Plan. In water work will be performed within regulatory in water work windows and include contract provisions for turbidity control during construction.

Any modifications to the facility drainage, including changes to site impervious areas, must be updated in the Airport's SWPCP.

FIGURES

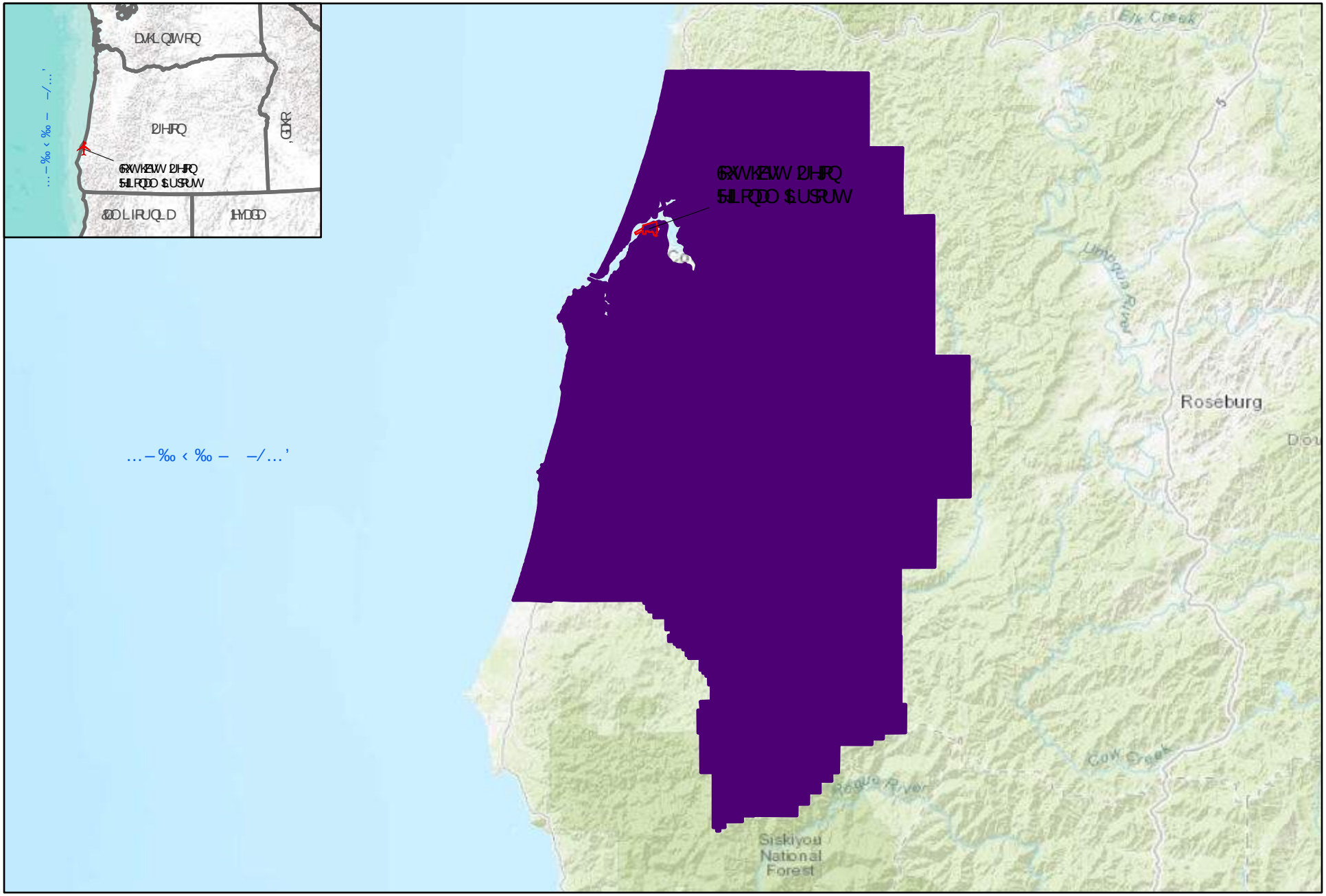


Fig. 1. Vicinity Map

Southwest Oregon Regional Airport

N

0 750 1,500 Feet

Aerial Imagery Source: Esri

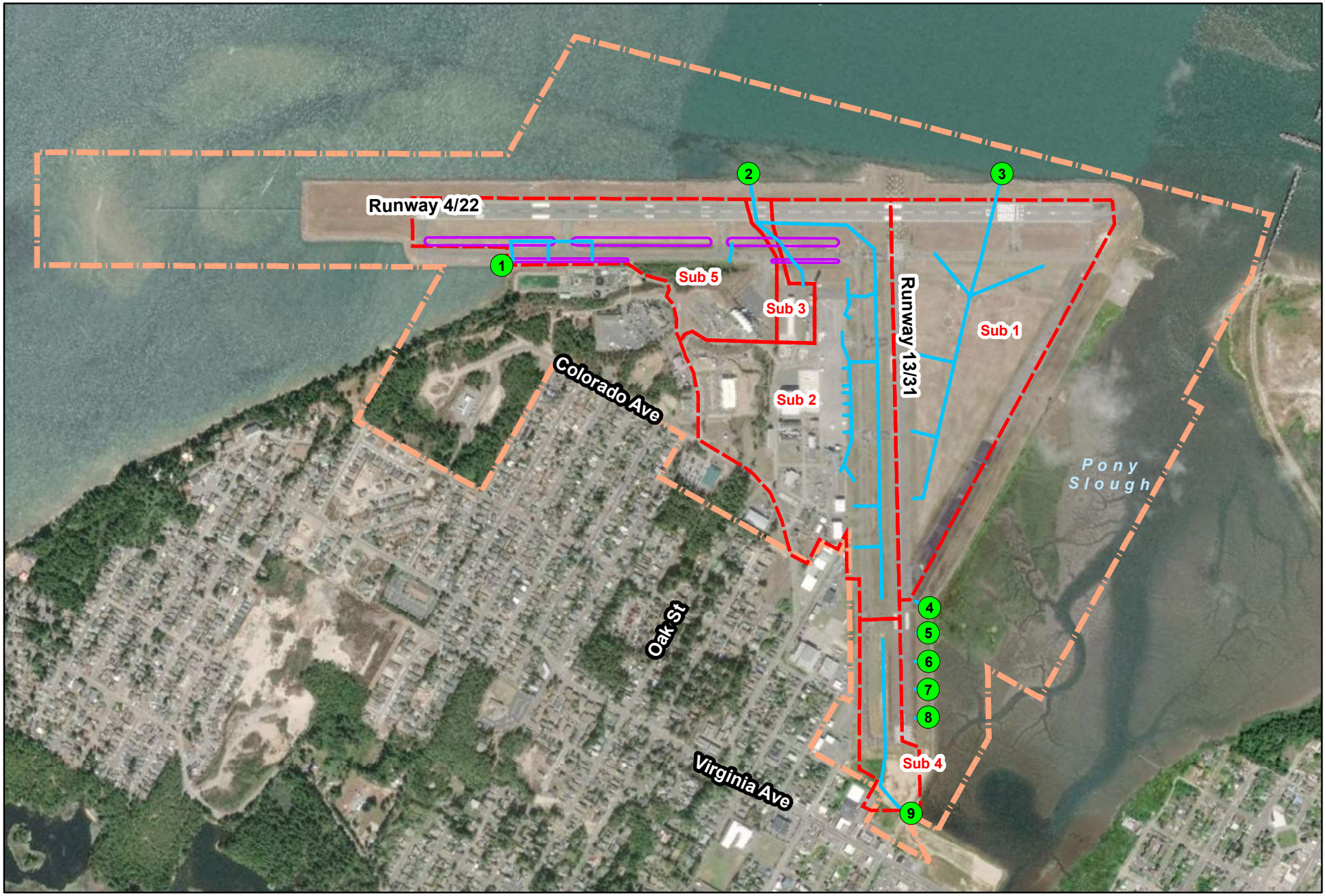
Legend

- Existing Glide Slope
- Proposed Glide Slope
- Existing Glide Slope Critical Area
- Proposed Glide Slope Critical Area
- MALSR
- Remove ARFF
- Proposed ARFF
- Remove Taxiway Connector
- RSA Fill Area
- Apron
- Study Area
- Airfield and Safety Area

Fig. 2. Proposed Project

OTH North Bend Oregon

Southwest Oregon Regional Airport



N

0 750 1,500 Feet

Legend

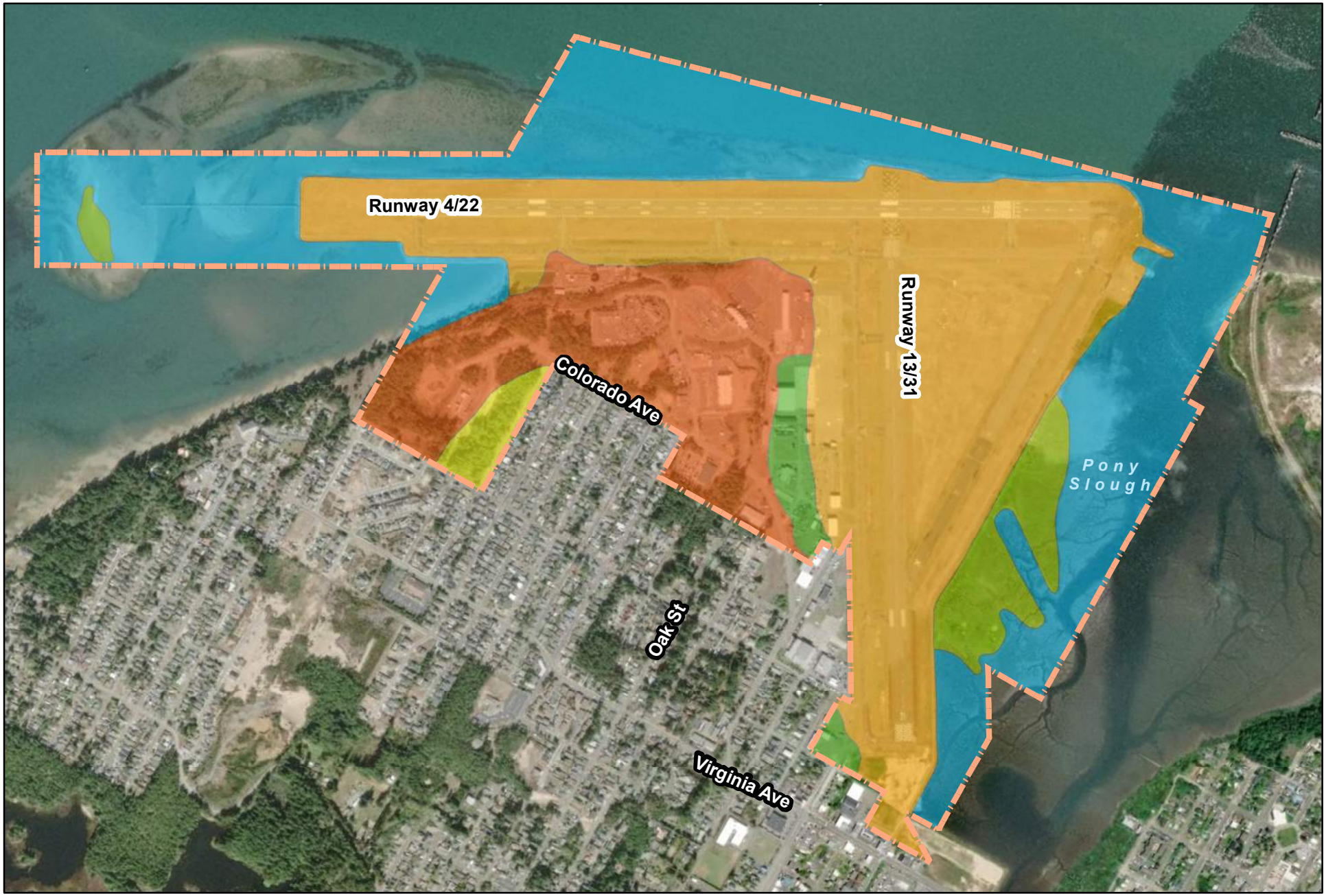
- Outfalls
- Storm Sewer
- Water Quality Swales
- Airfield and Safety Area
- Drainage Basins

Aerial Imagery Source: Esri

Fig. 3. Existing Drainage

OTH North Bend Oregon

Southwest Oregon Regional Airport



Feet
0 750 1,500

Legend

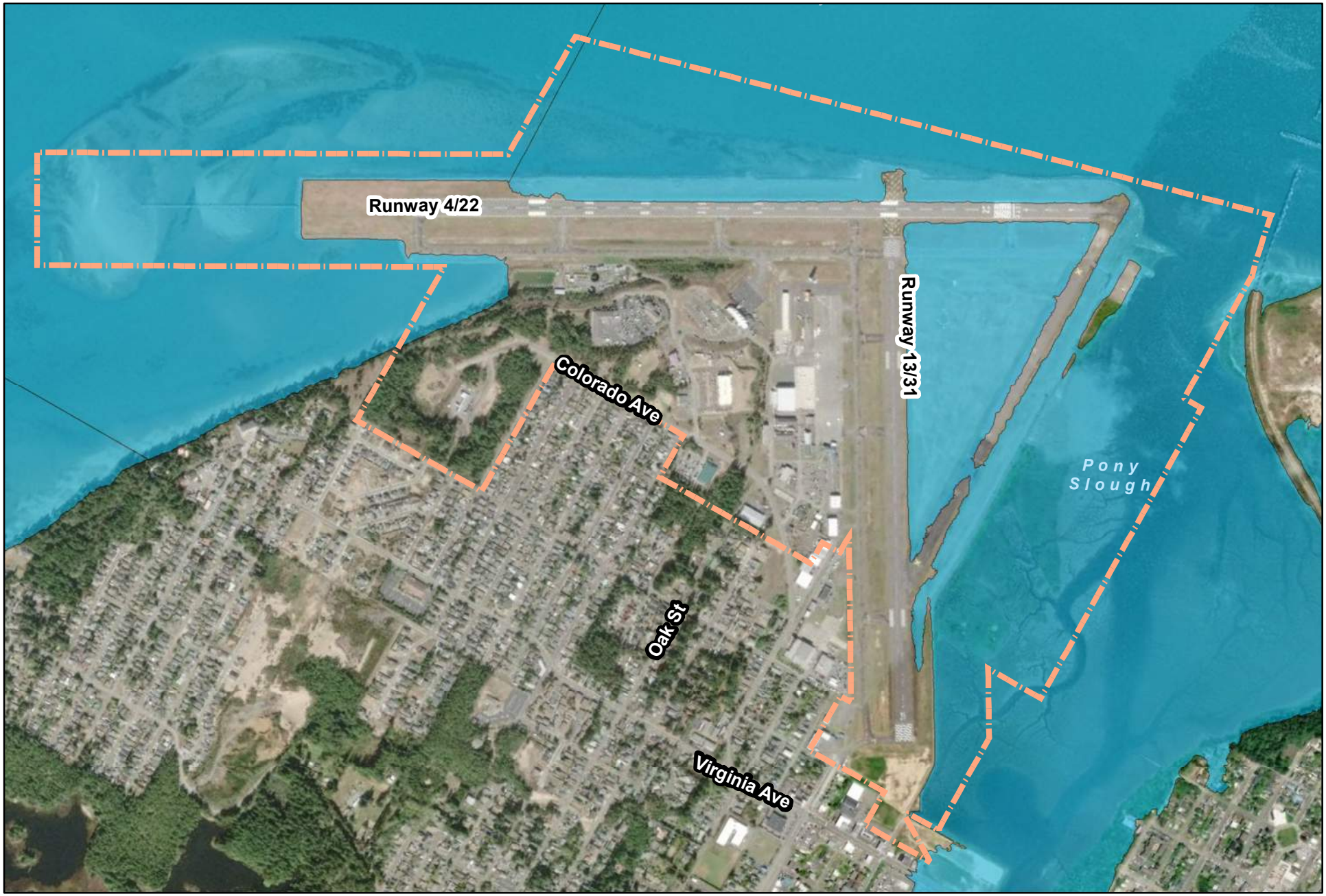
- Existing Airfield and Safety Area
- Bullards sandy loam, 0 to 7 percent slopes
- Dune land
- Fluvaquents-Histosols complex
- Netarts loamy fine sand, 2 to 30 percent slopes
- Udorthents, level
- Waldport fine sand, 0 to 30 percent slopes
- Water

Aerial Imagery Source: Esri

Fig. 4. Soils

OTH North Bend Oregon

Southwest Oregon Regional Airport



Feet
0 750 1,500

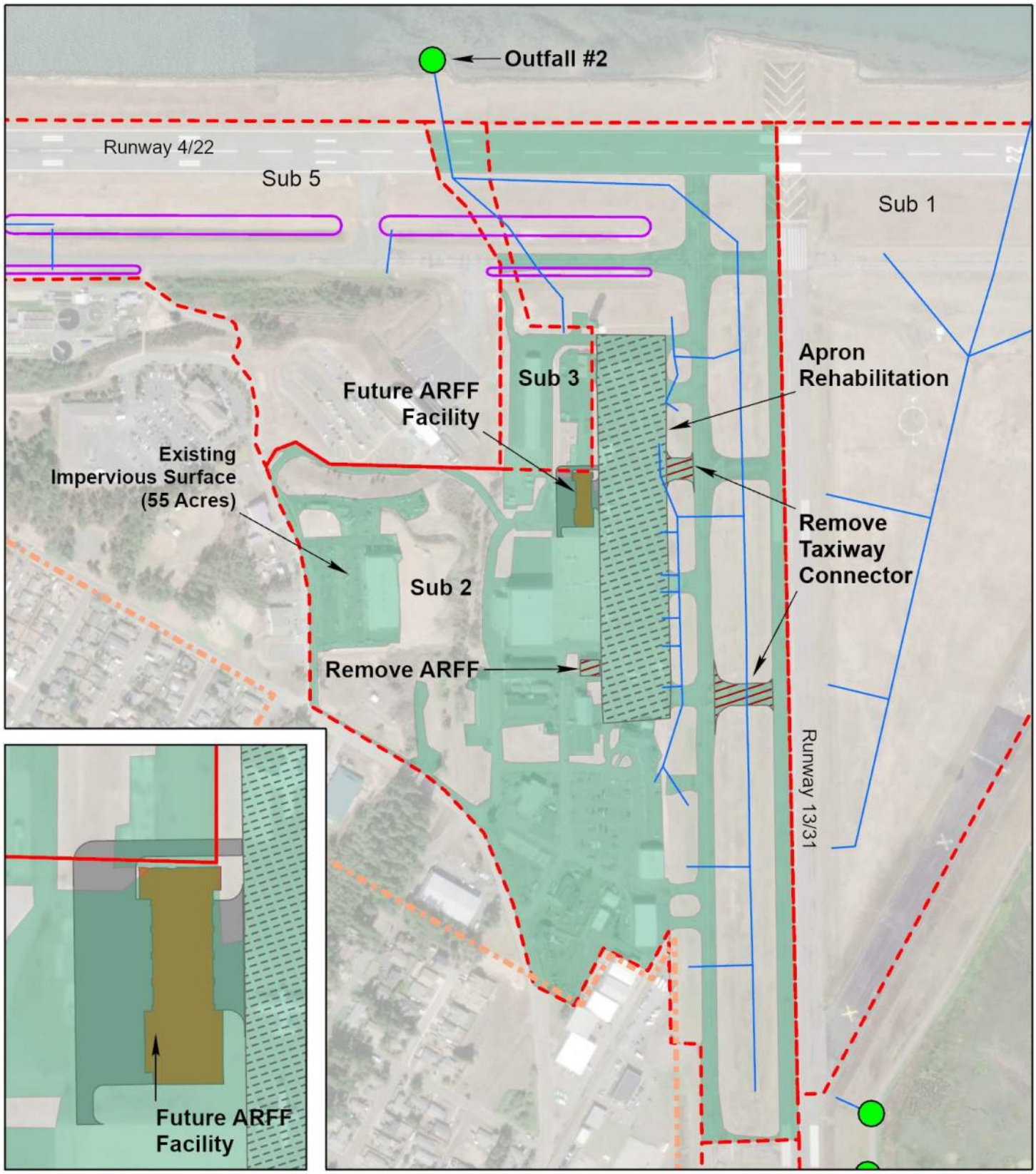
FEMA floodplain data is from FIRM Map No. 41011C0186E and No. 41011C0167E, both revised March 17, 2014.
Aerial Imagery Source: Esri

Legend

- Existing Airfield and Safety Area
- Special Flood Hazard Area Zone AE

Fig. 5. FEMA Floodplains

OTH North Bend Oregon
Southwest Oregon Regional Airport



Feet
0 250 500

Legend
- Future ARFF Building
- Future ARFF Pavement
- Existing Impervious Surface
- Storm Sewer
- Water Quality Swales
- Drainage Basins
- Outfalls
- Apron Rehabilitation
- Impervious Surface Removal
- Airfield and Safety Area

Fig 6. Outfall #2 Drainage Basin Improvements

Aerial Imagery Source: Esri

OTH North Bend Oregon

Southwest Oregon Regional Airport

APPENDIX A: Technical Memorandum – Regulatory Compliance for Fill at the Southwest Oregon Regional Airport

Technical Memorandum

To: Chelsea Schnabel – City Planner, City of North Bend

From: Aaron Killgore – Project Manager, Mead & Hunt

Date: May 13, 2019

Subject: Regulatory Compliance for Fill at the Southwest Oregon Regional Airport

Introduction and Background

The Southwest Oregon Regional Airport (OTH) is a commercial service airport located on the southern coast of Oregon, within the City of North Bend. The Airport's primary runway is Runway 4-22. Currently, the Runway Safety Area (RSA) for Runway 4-22 does not meet the design standards for C-III airports as established by the FAA. The Airport completed an Airport Master Plan in 2013 which identified the need to correct the RSA for Runway 4-22. The FAA's Seattle Airport District Office (ADO) concurred with the findings of the Master Plan and directed OTH to complete an Environmental Assessment (EA).

To meet FAA standards, OTH proposes a one-time fill at the northeast end of Runway 4-22, where Pony Slough empties into Coos Bay. The fill will occur in a Federal Emergency Management Agency (FEMA) Zone AE floodplain. There are defined Base Flood Elevations (BFEs) for the Zone AE floodplain but there is no defined floodway. The flooding source in the project area is listed as Pony Slough.

Regulatory Information

44 CFR Ch1, Section 60.3, c. states the following applicable regulatory requirements for construction projects in flood-prone areas where the Administrator has provided a notice of final flood elevations for one or more special flood hazard areas on the community's Flood Insurance Rate Map (FIRM) but has not identified a regulatory floodway or a costal high hazard area:

- Notify adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse;
- Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained; and
- Demonstrate that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood by more than one foot.

The City of North Bend has issued Ordinance No. 2027, which repeals and replaces the text of North Bend City Code Title 18, Chapter 18.48. In Ordinance No. 2027, Section 18.48.140 states that it must be demonstrated that the cumulative effect of proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood by more than one foot.

For Pony Slough, in both the case of 44 CFR Ch1, Section 60.3, c. and Ordinance No. 2027, the base flood is the 1-Percent Annual Chance Event.

Approach

In an email to Aaron Killgore (Mead & Hunt) on April 19, 2019, Chelsea Schnabel (City of North Bend) confirmed that there is no history of development that would affect future permit approvals. Therefore, the full one foot of water surface elevation increase is still available for proposed development.

To demonstrate that the proposed fill at the northeast end of Runway 4-22 will not increase Pony Slough water surface elevations by more than one foot, Mead & Hunt developed a hydraulic model of Pony Slough. Publicly available bathymetry and topography were used for the model geometry, and the hydrologic data published in the most recent FEMA Flood Insurance Study (FIS) was used for the model boundary conditions.

Analysis

Mead & Hunt used the Hydrologic Engineering Center's (CEIWR-HEC) River Analysis System (HEC-RAS) version 5.0.7 to perform the hydraulic analysis. Publicly available bathymetry data from the University of Oregon was used to represent the Pony Slough channel (Eidam, 2019). Publicly available topography data from the Oregon Department of Geology and Mineral Industries (DOGAMI) was used to represent the overbank area (Oregon Department of Geology and Mineral Studies, 2019). The bathymetry and the topography were combined into a single terrain using Esri's ArcMap version 10.3.1.

The combined terrain was imported into HEC-RAS. Mead & Hunt digitized cross-sections along Pony Slough, from the downstream end of Pony Slough where it empties into Coos Bay upstream to the point where Pony Slough becomes Pony Creek. Station-elevation data was extracted from the combined terrain along the digitized cross-sections.

The upstream and downstream boundary conditions for the model were defined using data from the Coos County FIS (Federal Emergency Management Agency, 2018). Table 1 lists the upstream flows and the downstream water surface elevations used in the hydraulic model.

Table 1. Hydraulic Model Boundary Conditions

Model Boundary Condition	10-Percent Annual Chance Event	2-Percent Annual Chance Event	1-Percent Annual Chance Event	0.2-Percent Annual Chance Event
Upstream Flow	320 cfs	420 cfs	480 cfs	590 cfs
Downstream Water Surface Elevation	11.3 feet	12.0 feet	12.2 feet	12.8 feet

The Coos County FIS states that roughness factors (Manning's n-values) for the study area range from 0.030 to 0.060 for the main channel and range from 0.035 to 0.080 for the overbank. Preliminary simulations confirmed that the model was not sensitive to adjustment of Manning's n-values, because the water surface elevations were controlled by the downstream boundary conditions.

In a preliminary version of the geometry, ineffective flow areas were defined in the overbanks, primarily where divided flow was occurring. Preliminary simulations confirmed that the model was not sensitive to the addition of ineffective flow areas, because water surface elevations were controlled by the downstream boundary conditions.

After the Existing Conditions geometry was finalized, a copy of the geometry was made and modified to represent the Proposed Conditions. At the two downstream cross-sections, numbered 650 and 712, the terrain data was modified to represent the proposed fill for the Runway 4-22 RSA. Because of the backwater effect from Coos Bay, there was no increase (0.00 feet) in the water surface elevation for any of the Annual Chance Events simulated.

The finalized HEC-RAS project with the Existing Conditions and Proposed Conditions geometry files, plan files, and flow file are included as an electronic attachment to this memorandum.

Conclusion

The objective of this analysis was to demonstrate that proposed fill for the Runway 4-22 RSA along the left bank of Pony Slough, just before it empties into Coos Bay, would not increase the water surface elevation of the base flood by more than one foot. The results of the hydraulic model show that the proposed fill will cause no increase in the water surface elevation of the base flood on Pony Slough.

Recommendation

Based on the analysis presented in this memorandum, the proposed fill for the Runway 4-22 RSA should be approved by the local floodplain administrator, as it meets both the requirements of both 44 CFR Ch1, Section 60.3, c. and the City of North Bend Ordinance No. 2027.

Floodplain Administrator's Acknowledgement

Signature indicates acceptance of the above stated recommendations.

_____ _____

Name, Title Date

_____

Signature

APPENDIX B: Technical Memorandum: Basis of Design for Runway Safety Area Fill Volumetric Calculations

Technical Memorandum

Date: August 2, 2019

Subject: Basis of Design for Runway Safety Area Fill Volumetric Calculations

(1) Introduction and Background

A portion of the Runway Safety Area (RSA) and the Runway Object Free Area (ROFA) do not meet the FAA RSA and ROFA criteria for C-III aircraft. RSA requirements for a C-III aircraft approach category (AAC) and airplane design group (ADG) requires a 1,000-foot RSA beyond the departure end. Various alternatives have been considered throughout the master planning and NEPA process. The preferred alternative includes adding a bulkhead to northwest end of the Runway 4/22 RSA, in the adjacent Coos Bay, to meet FAA safety standards. In-water work in Coos Bay is managed by various agencies including USFWS, Coos County, NOAA, USACE and Oregon Dept of State Lands.

Depending on the size of the extended ground, the RSA Fill Area may overlap with a surveyed area of eelgrass, a federally designated Essential Fish Habitat (EFH) and a Habitat of Particular Concern under the Magnuson-Stevens Fishery Conservation and Management Act.

This memorandum describes the approach used to quantify the proposed RSA bulkhead area and volume for the purposes of the Environmental Assessment.

(2) Approach

Filling a section of Coos Bay to meet the required area of the RSA has been determined as the preferred alternative in the OTH Master Plan. The options for fill design include the following:

1. Place fill material level to the existing runway edge and surround with riprap along a 15-degree fill slope, which terminates in the bay.

2. Place fill material level to the existing runway edge and install eco-block or sheet pile at the limits of the fill.

Option 1 has a significantly larger surface area and volume, and the extended footing of this method will directly impact the eelgrass, and have more significant indirect impacts. Option 2 is approximately 35 feet from the eelgrass beds and is not expected to directly impact the eelgrass, based on the 2019 survey results of eelgrass presence of Coos Bay (2019 OTH Biological Assessment). Option 2 is the preferred option.

(3) Analysis

The various data sources that Mead & Hunt used for the analysis were in different vertical datums. As discussed below, Mead & Hunt converted all the data sources to the North American Vertical Datum of 1988 (NAVD88).

Airport Design:
FAA eNASR data was used to input runway end points, runway centerline was derived from eNASR runway end latitude and longitude. Runway end points were converted from WGS84 to NAD 1983 2011 State Plane Oregon South FIPS 3602 Ft International. RSA layer was created by offsetting C-III design distances from runway end points/centerline.

Bathymetry:
For the analysis, Mead & Hunt used publicly available bathymetry, compiled and combined by the University of Oregon (Eidam, 2019). The bathymetry was stored as depth (in meters) below Mean Sea Level (MSL). Mead & Hunt converted the data to elevation (in feet, NAVD88).

The University of Oregon data is in TIN format, so the horizontal spacing of points varies. Because the data is a mosaic of multiple data sources, vertical accuracy is not reported. The original datasets, referenced by the University of Oregon, also do not discuss vertical accuracy.

Reference: Eidam, E. (2019, April 22). Coos Bay Bathymetry. Retrieved from Github: https://github.com/das7105/Coos-Bay-Bathymetry.

Topography:
Publicly available topography data from the Oregon Department of Geology and Mineral Industries (DOGAMI) was used to represent the overbank area. The DOGAMI data is in raster format, with a horizontal cell size of 3 feet by 3 feet. The vertical datum is NAVD88.

Because this data is a mosaic of multiple data sources, vertical accuracy is not reported. The following disclaimers are listed in the metadata:

> *This mosaic data set provides a mosaic of digital elevation model (DEM) rasters collected in Oregon. This dataset includes DEM lidar data collected by the Oregon Department of Geology and Mineral Industries (DOGAMI) and the Oregon Lidar Consortium as well as other organizations that have provided a copy of lidar data to DOGAMI. This dataset provides high resolution elevation data that is used to produce three-dimensional models of the earth surface for the purpose of managing natural resources and mapping natural hazards.*

Reference: Oregon Department of Geology and Mineral Studies. (2019, February 27). Data and Publications - LiDAR. Retrieved from State of Oregon Department of Geology and Mineral Industries: https://www.oregongeology.org/lidar/

Combined surface:
The two elevation data sources were combined in Esri's ArcMap v10.3.1 as utilized as a composite representation of existing conditions for planning purposes.

Fill calculations:

The existing runway surface is at elevation 12.0 feet (NAVD88). To evaluate the fill options, the existing runway surface was extended, level with the runway, to the edge of the proposed fill.

1. For Option 1, the top of slope was established outside of the Runway RSA, with no point along the top of slope being within 10-feet of the edge of the Runway RSA. The top of slope was defined to match the curvature of the existing fill that defines the airport. From the top of slope, the riprap was projected downward at a 15-percent slope until the surface intersected the existing bathymetry. At the deepest point, the fill is approximately 23 feet high. The total fill volume is approximately 23,026 cubic yards. **Figure 1** displays the details of Option 1.

2. For Option 2, there is a 10-foot buffer around the Runway RSA to accommodate a road around the Runway RSA. Because Option 2 includes eco-block or sheet pile, the edge of fill is vertical. Including the 10-foot buffer, the north side of the fill is approximately 89 feet and the east side of the fill is approximately 67 feet. The fill area is approximately triangular. At the deepest point, the fill is approximately 23 feet high. The total fill volume is approximately 2,215 cubic yards. **Figure 2** displays details of Option 2, which is the preferred option.

The jurisdictional elevations of the surface waters (Coos Bay and Pony Slough) for the project area were established in Table 2 and mapped on Figure 6B of the *Wetland Delineation Report* (PBS, 2019). The fill below each of these jurisdictional elevations was calculated for regulatory discussions.

Reference: PBS, *Wetland Delineation Report* – SW Oregon Regional Airport Safety Improvements, February 15, 2019

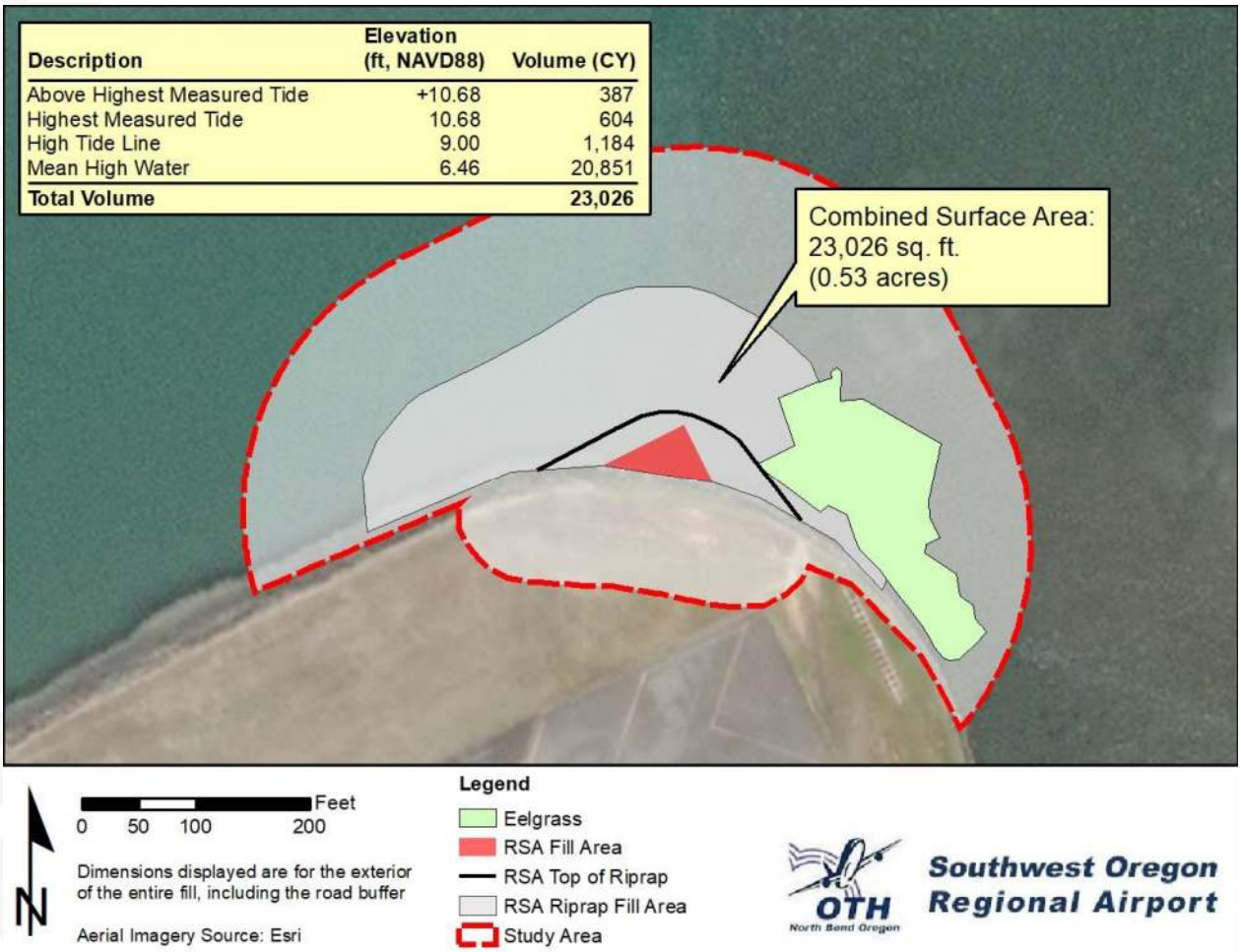


Figure 1. RSA fill area and sloped riprap for Fill Option 1.

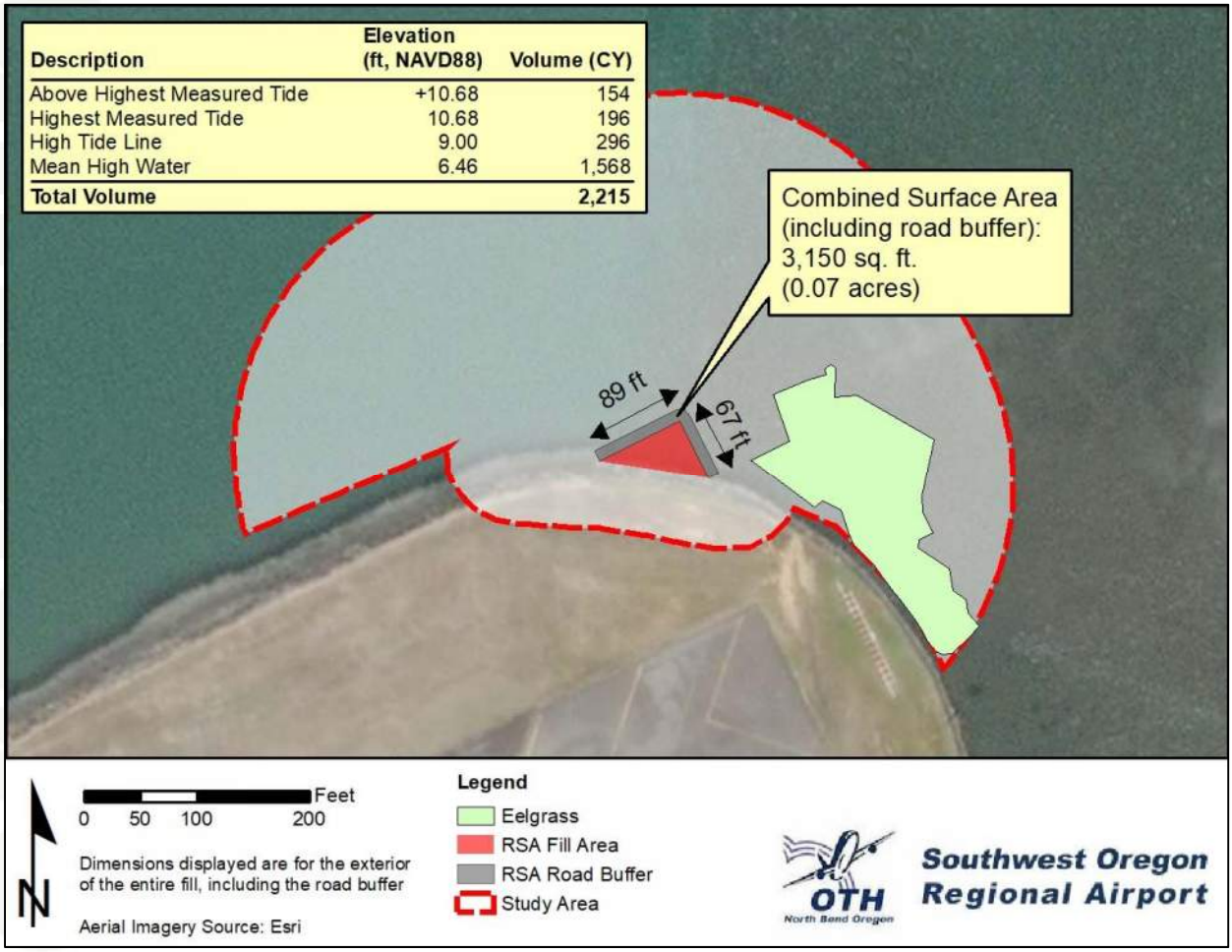


Figure 2. RSA fill area and buffer for Fill Option 1 (Preferred Fill Option).

(4) Conclusion

Using the preferred option, the estimated fill as a result of this analysis was approximately 2,215 cubic yards.

(5) Recommendation

The vertical accuracy of both the topographic and bathymetric data sets was not reported. Therefore, a topographic and bathymetric survey of actual site conditions is recommended prior to design of improvements and final quantification of fill impacts.

FLOOD HAZARD INFORMATION

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

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	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 or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard *Zone X*
	Effective LOMRs
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
OTHER FEATURES	20.2 / 17.5 Cross Sections with 1% Annual Chance
	Water Surface Elevation
	Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

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To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

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SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

0 50 100 200 300 400 Meters

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

COOS COUNTY, OREGON AND INCORPORATED AREAS

PANEL 186 OF 1075

Panel Contains:

COMMUNITY	NUMBER	PANEL
CONFEDERATED TRIBES OF COOS LOWER UMPQUA AND OREGON	410292	0186
CITY OF NORTH BEND	410048	0186
OREGON COOS COUNTY OREGON	410048	0186

MAP NUMBER
41011C0186E
EFFECTIVE DATE
03/17/2014

Preliminary Ownership Summary

www.oregon.gov/dsl/

REQUEST INFORMATION

Staff Name: Jacob Taylor and Amber McKernan

Preferred contact method(s): Phone ☐ Email ☒

Phone: 503-986-5303

Email Address: jacob.taylor@dsl.state.or.us, amber.mckernan@dsl.state.or.us

Site Location:

County: SW Oregon Regional Airport

Latitude/Longitude: 43.423749, -124.240247

Township, Range and Section(s): 25S13W09 and 25S13W10

Map and Tax Lot (if applicable):

Waterway (if applicable): Coos Bay

LAS App Number (if applicable):

Land Parcel Number (if applicable):

Description and reason for request: The Southwest Oregon Regional Airport will be applying to fill approximately 3,150 square feet at the northeast corner of the runway for safety improvements. The Department needs to know if the fill is occurring on State-owned waterway. Jacob Taylor had a request in July 2020 that there is additionally a mitigation site for which ownership needs to be determined.

Questions may also be directed to the DSL Ownership Specialist at 541-388-6290

STAFF FOLLOW-UP

Staff Name: Erin Serra

Initial date and method of contact with requestor: 10/4/2019, July 2020

Date and method of notifying requestor and/or staff of initial findings: 10/4/19, 9/22/20

Is further ownership follow-up required? Yes ☐ No ☒ Area added to Ownership Studies GIS? Yes ☒ No ☐

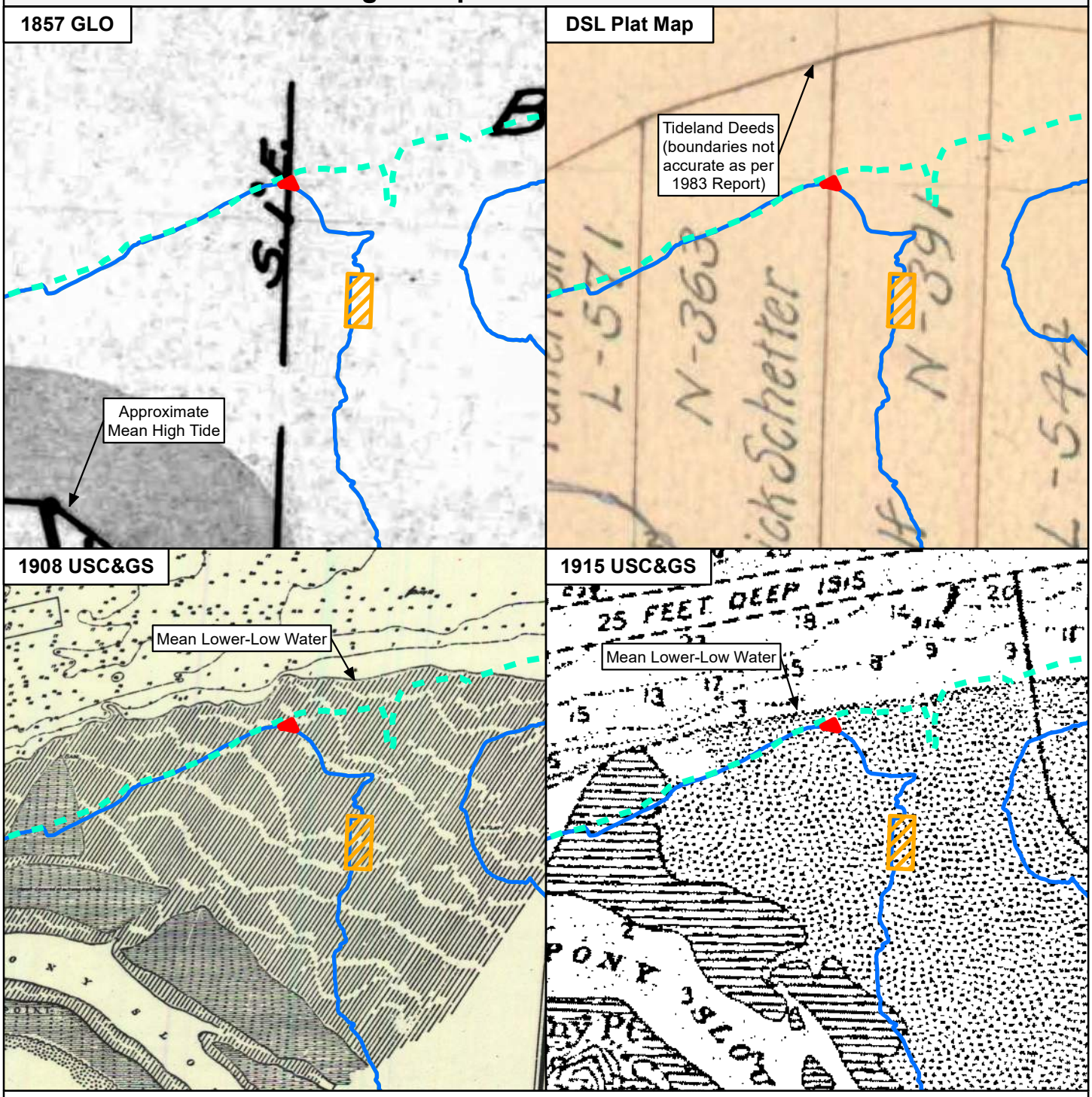
Preliminary findings: 10/8/19 The proposed fill location is on state conveyed tideland corresponding to deeds N-363 and N-391.

Exhibit A shows the 1857 GLO map, DSL plat map, 1908 US Coast & Geodetic Survey (USC&GS) chart and 1915 USC&GS chart. Exhibits B and C show deeds N-363 and N-391, respectively. Exhibit D shows the 1939 and 1944 aerial photographs, 1983 ownership study and 2018 aerial photograph. There is conflict between the aerial photos and the 1983 ownership study. As per review by Nancy Pustis, the 1983 Department ownership line will be used in this area.

Based on the 1983 ownership line, this review concludes that the proposed fill location and mitigation site are on state conveyed tideland.

These preliminary findings may change based on additional information and do not represent a Department decision on ownership.

Oregon Department of State Lands



Attachment A: Early Surveys and Charts

- Proposed Fill Location
- Proposed Mitigation Site
- 1983 Ownership Line
- 2015 Approximate Mean High Water Line

0 500 1,000
Feet

N W E S

Notes: The 1908 and 1915 mean lower low water are below State ownership. State ownership is approximately 1.1 feet higher at mean low water (DSL 1989). Research from the filled lands project shows that this area was impacted by an avulsion in 1912. The proposed fill location is on tideland deeded by the State in deeds N-363 and N-391.

Map Projection: Oregon Statewide Lambert, NAD83, International Feet

State of Oregon
Department of State Lands
1645 NE Forbes Rd. Ste 112
Bend, OR 97701
541-388-6112
www.oregon.gov/DSL
Date: 9/22/2020

TIDE

STATE OF OREGON.

In consideration of Two Hundred and Thirty Four Dollars, paid to the Board of Commissioners for the sale of School, University and other State Lands, the State of Oregon does hereby grant, bargain, sell and convey unto Fredk Schutter &

his heirs and assigns, the following described Tide lands, situate in Lane County, Oregon, to-wit:

All the Tide lands lying North of and fronting and abutting on Lots 1 and 2 of Section 4 Township 20 South Range 12 West of the W. M. Containing 117 acres more or less

To Have and to Hold the said premises, with their appurtenances, unto the said Frederick Schutter

his heirs and assigns forever.

Witness the seal of the State affixed this 20th day of November 1884

Z. F. Moody — Governor.

B. P. Cornwall — Secretary.

[L. S.]

Cornelius Hirsch — Treasurer.

THE STATE OF OREGON.

In consideration of

Three Hundred and Twenty Seven and 00/100 Dollars,

paid to the Board of Commissioners for the sale of School, University and other State Lands, the State of Oregon does hereby grant, bargain, sell and convey unto William P. Metcalf

his heirs and assigns, the following described Tideland lands, situate in Lewis County, Oregon, to-wit:

All the Tideland lands lying North of and fronting and abutting on Lot 5 of Section 19 and Lot 10 of Section 15 Township 8 South Range 13 West of the Willamette Mer. Containing 163.74 acres

To Have and to Hold the said premises, with their appurtenances, unto the said William P. Metcalf

his heirs and assigns forever.

Witness the seal of the State affixed this 8th day of January 1885

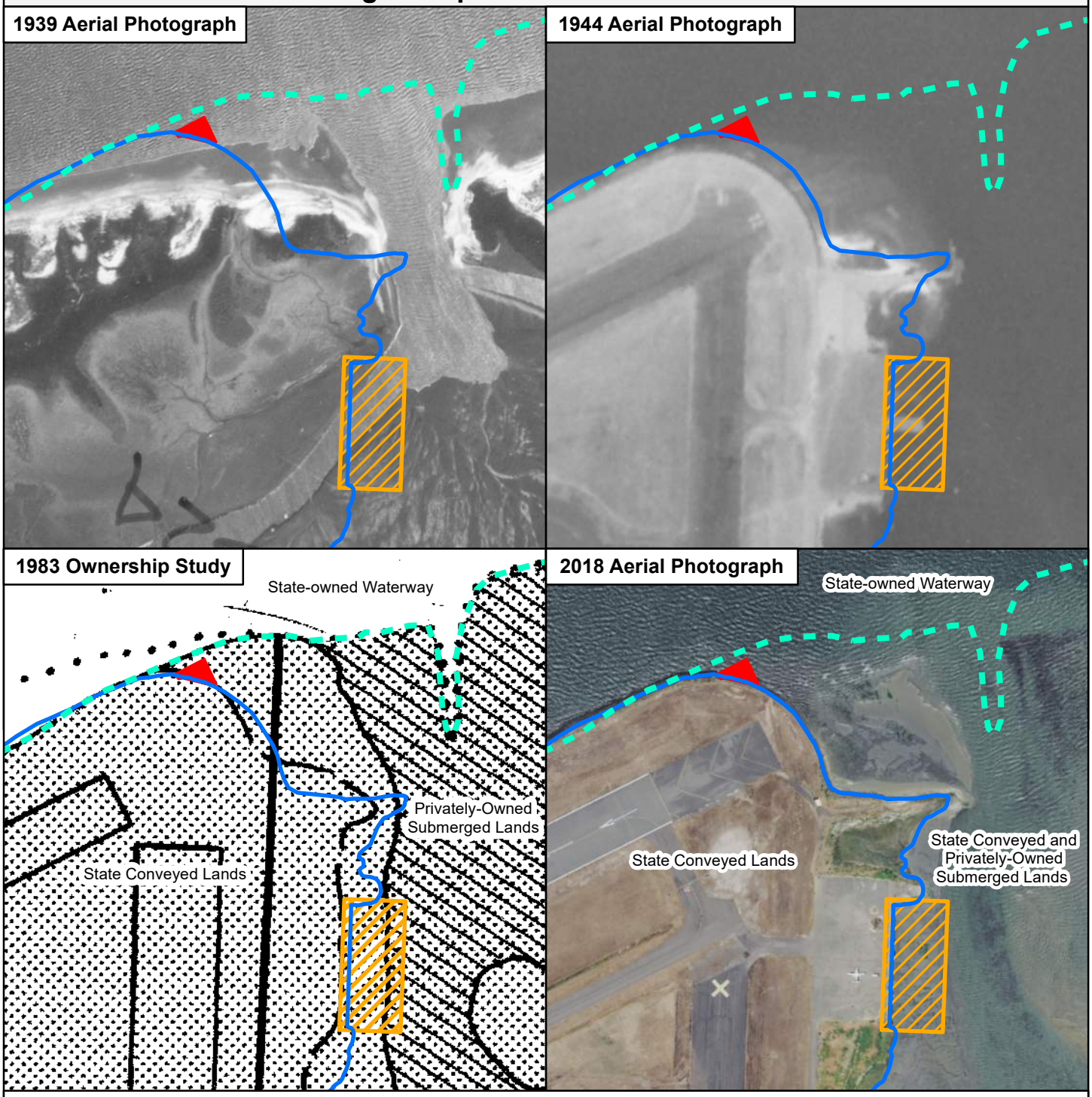
[L. S.]

J. H. Moreby — Governor.

R. P. Earnhart — Secretary.

Edward Hirsch — Treasurer.

Oregon Department of State Lands



Attachment B. Aerial Photographs and 1983 Ownership Study

- Proposed Fill Location
- Proposed Mitigation Site
- 1983 Ownership Line
- 2015 Approximate Mean High Water Line

0 200 400
Feet

N W E S

Notes: The 1983 ownership study identifies the proposed fill location as being on state conveyed lands, which are also above the pre-avulsion 1908 MLLW and 1928 MLLW lines. The filled lands study identified the existing airport as historic fill, as well as mapped the approximate current mean high water line. The proposed fill would occur on state conveyed lands and is estimated at 3,150 square feet.

Map Projection: Oregon Statewide Lambert, NAD83, International Feet

State of Oregon
Department of State Lands
1645 NE Forbes Rd. Ste 112
Bend, OR 97701
541-388-6112
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Date: 9/22/2020

Appendix I
Biological Assessment

BIOLOGICAL ASSESSMENT
Southwest Oregon Regional Airport Runway Safety Area Improvements
(Coos County, Oregon)
HUC 17100304

Prepared for the Port of Coos Bay
Prepared by Aaron Killgore, Biologist
Mead & Hunt
10/10/2019

Likely to Adversely Affect Biological Assessment Southwest Oregon Regional Airport Runway Safety Area Improvements (Coos County, Oregon)

1. INTRODUCTION

This Biological Assessment (BA) has been prepared to address the effects of potential impacts on fish and wildlife species associated with proposed projects for Runway Safety Area Improvements at Southwest Oregon Regional Airport (OTH or Airport). This document also addresses the potential effects of the proposed project on designated or proposed Critical Habitat and on Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation Act (MSA). Due to the federal funding associated with the proposed actions, and that the proposed project will require a U.S. Army Corp of Engineers (Corps) permit under Section 10 of the Rivers and Harbors Act and Section 404 of the federal Clean Water Act (CWA), this federal nexus requires a BA.

The United States Endangered Species Act (ESA) of 1973 serves to administer permits, implement recovery plans, and monitor federally protected threatened and endangered species. The ESA is administered and regulated by the US Fish and Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration (NOAA)-National Marine Fisheries Service (NMFS). The State of Oregon also regulates species with a distinct state ESA of 1987, which limits jurisdiction to state-owned, leased, or easement land. Species listed as threatened and endangered by the Oregon State ESA are not subject to federal Section 7 jurisdiction.

This BA was prepared pursuant to Section 7(c) of the ESA by Mead and Hunt, Inc. for OTH, on behalf of the Port of Coos Bay (the Port), to facilitate the Corps' compliance with Section 7(a)(2) of the ESA, as amended. Section 7(a)(2) ensures that through consultation (or conferencing for proposed species) with the NMFS and USFWS, federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species or result in the destruction or adverse modification of designated or proposed Critical Habitat.

1.1 Purpose and need

The purpose of the proposed action is to improve deficiencies in safety-related infrastructure at the Airport to meet Federal Aviation Administration (FAA) compliance. In addition to addressing safety compliance, the purpose of this project is to update aging Airport infrastructure (medium intensity approach lighting system with runway alignment indicator lights (MALSR) unit and apron repavement).

The proposed action will address objectives outlined in the Master Plan Update (2013). The Master Plan is available through the Coos County Airport District website[1]. The project supports these objectives by allowing the Airport to continue operations while carrying out safety improvements and infrastructure updates identified through the Master Plan process, which includes:

- Meet FAA safety standards at the northwest end of the Runway 4/22 Runway Safety Area (RSA).
- Relocate taxiway connectors to enhance safety.

[1] https://cooscountyairportdistrict.com/coos-county-aiport-district-master-plan/

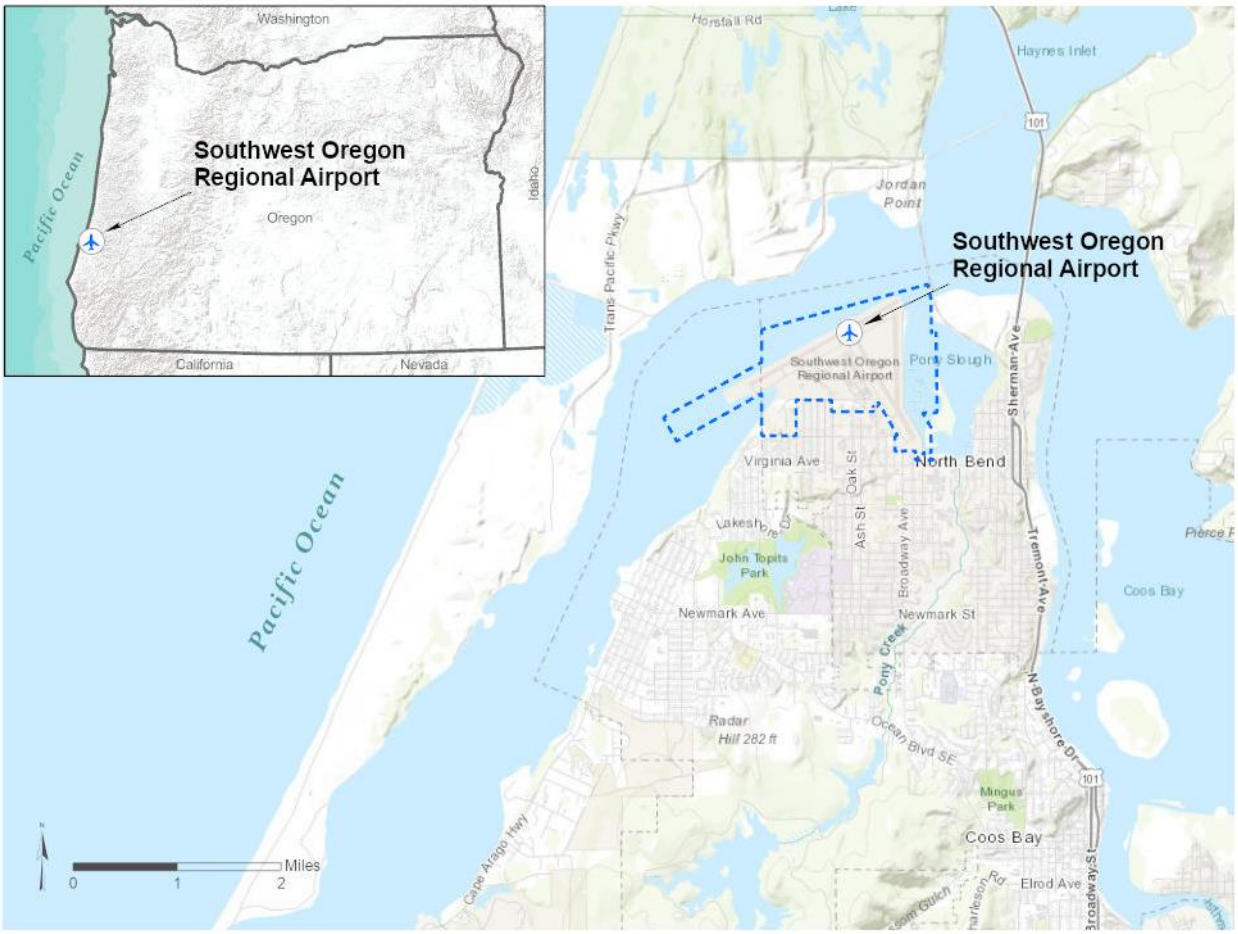
- Reconstruct the main general aviation apron pavement.
- Install maintenance improvements to the MALSR.
- Relocate the glide slope 150 feet from center of Runway 4/22 to meet minimum safety distance requirements.

Failure to meet FAA safety regulations would lead to de-certification of the Airport by the FAA, which could jeopardize continued commercial passenger and cargo service to North Bend. This would have a significant impact on the economy of the Coos Bay - North Bend area, and the wider southern Oregon coast region.

2. PROJECT BACKGROUND

The Airport is a commercial service airport located on the southern coast of Oregon within the City of North Bend, in Coos County, Oregon (**Figure 1: Southwest Oregon Regional Airport Location Map**). The proposed project is located in Township 25 South, Range 13 West, Section 9 and is split between two United States Geologic Survey (USGS) 7.5-minute topographic quadrangle maps (1971 North Bend, OR and 1970 Empire, OR). The Airport is 1.5 miles northwest of the city center of North Bend, Oregon, and 3.5 miles northwest of the city of Coos Bay, Oregon. The Airport is located in hydrologic unit number 17100304.

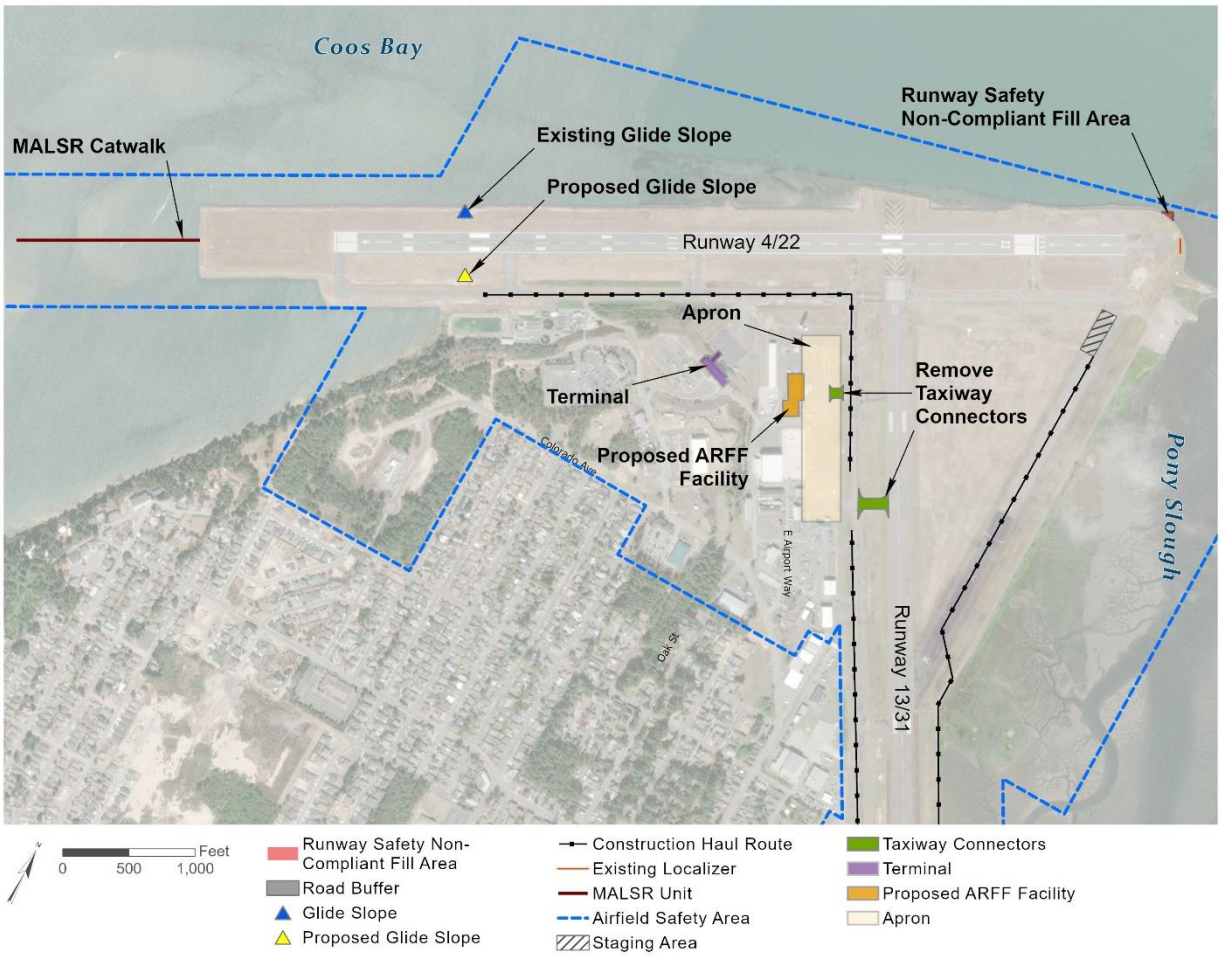
Figure 1: Southwest Oregon Regional Airport Location Map



As the only commercial airline service currently on the Oregon coast, OTH serves as a general aviation (GA) airport with two runways, parallel taxiways, a terminal building, hangars, an Aircraft Rescue and Firefighting (ARFF) facility, and a GA apron for aircraft parking. The Airport's operational area, called the Airport Safety Area (**Figure 2: Action Areas Overview**), includes airfield land and an extended object free area over the adjacent waterways. The primary runway, designated as Runway 4/22, is 5,980 feet long and 150 feet wide. The parallel taxiway serving Runway 4/22 (Taxiway C) is 50 feet wide and has several connector taxiways between the apron, hangars, and runway. Coos Aviation, a fixed-base operator (FBO) located at the Airport, provides 11,250 square feet of maintenance space, ground handling equipment, fuel trucks, fuel storage, etc. The design aircraft for OTH is C-III, which is defined as aircraft with wingspans between 79 and 117 feet and tail heights between 30 and 45 feet. The Airport currently has 45 based aircraft. The five proposed projects are located throughout the Airport (**Figure 2: Action Areas Overview**) and include:

- Installation of a bulkhead at the northeast end of the Runway 4/22 to address RSA compliance.
- Reconstruction of the main GA apron pavement and relocation of the taxiway connectors.
- Relocation and reconstruction of the Aircraft Rescue and Firefighting (ARFF) facility according to FAA standards
- Installation of maintenance improvements to the MALSR catwalk.
- Relocation of glide slope tower to 150 feet south of the Runway 4/22 centerline.

Figure 2: Action Areas Overview



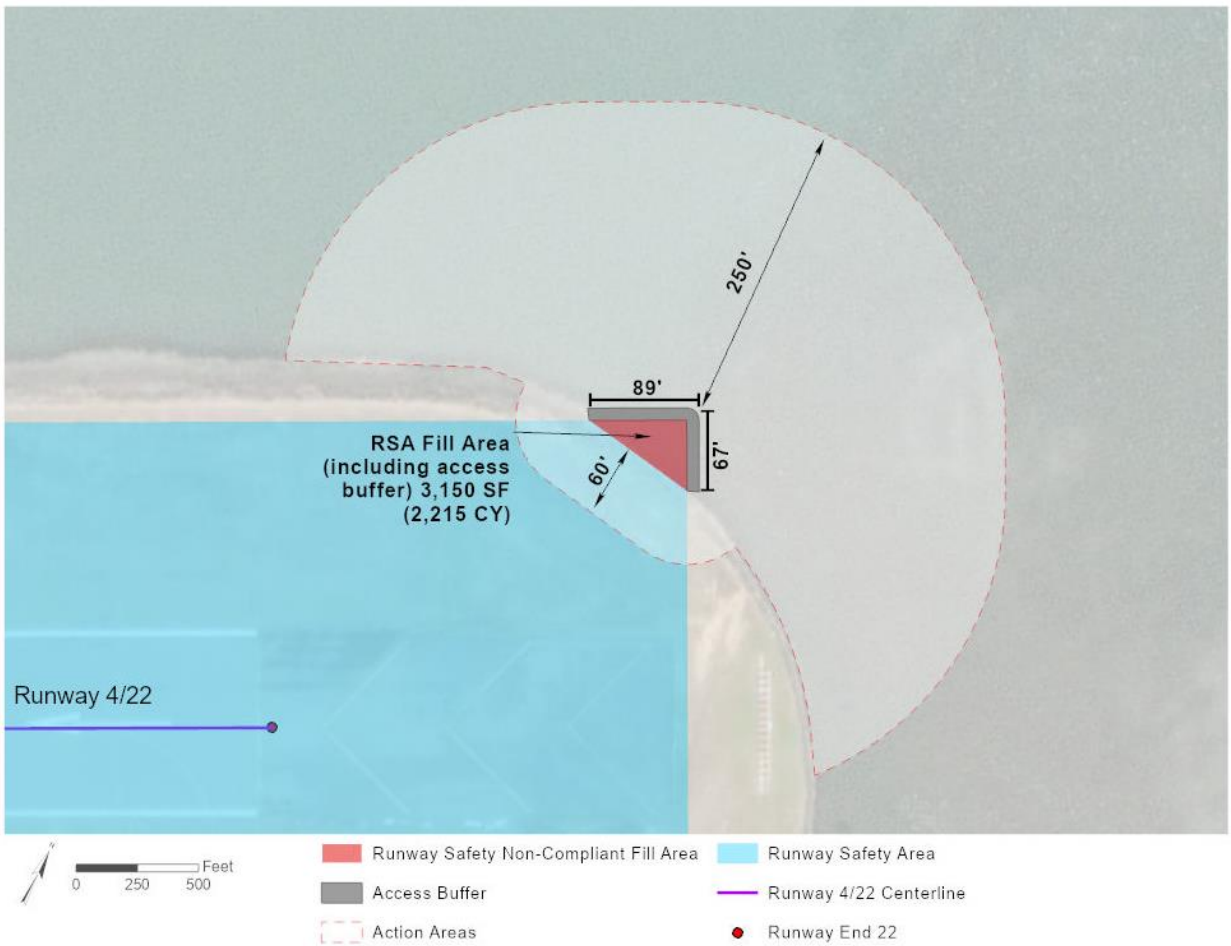
The Port is proposing to fill a 2,215-cubic-yard bulkhead to comply with FAA runway safety requirements (**Figure 3: RSA Fill Area**). All work conducted below the highest measured tide (HMT) of the Coos River will occur between October 1 and February 15 in compliance with the Oregon Department of Fish and Wildlife (ODFW) preferred in-water work window (IWWW) for Coos River.

Construction crews and equipment will access the project site via existing Airport roadways, embankments, and floating barges. Fill activities will be conducted using an excavator and/or hydraulic suction dredge operated from a floating barge, in accordance with Oregon Fill-Removal Law (ORS 196.795-990).

2.1 Action Areas

For the purposes of this analysis, the project action area includes all areas of the Airport and the Coos Bay estuary directly or indirectly affected by the proposed project (**Figure 2: Action Areas Overview**). The action area is not limited to the project footprint exclusively; it includes all areas that could experience temporary effects, for example downstream water quality due to construction turbidity. As such, based on the proposed project activities, conservation measures, and existing site conditions, the project action area includes an in-water construction buffer of 250 feet for proposed fill work on a 89-foot by 67-foot triangular fill area, comprised of the mandatory RSA (red) and a 10-foot road buffer (grey) for emergency vehicle access (see **Figure 3: RSA Fill Area**). There is an additional 60-foot action area on land for vehicle support and construction staging.

Figure 3: RSA Fill Area



The in-water extent of the action area beyond the project footprint is based on the potential for minor, temporary increased downstream turbidity and sedimentation. Due to the relative size of the Coos River and proposed timing of in-water work (October 1 – February 15), it is expected that any concentration of turbidity will not result in adverse effects. Initial in-water work (coffer dam installation) will be timed with the outflow of tides, to minimize possible impacts on adjacent eelgrass beds. Dewatering of the construction site will be conducted through an outflow sediment filter.

Within the OTH property there are five action areas, each with different construction methods and potential impacts. For analysis under the ESA, the action areas are defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 Code of Federal Regulations [CFR] § 402.02). This includes all areas to be affected due to impacts from fill, construction and staging areas, and related haul roads. The five action areas and their buffers (MALSR-25 feet, Glide Slope-100 feet, Apron/Connectors/ARFF-100 feet, RSA-250 feet) total approximately 32 acres and are summarized below in **Table 1**.

Table 1: Action Areas and Impacts Summary

Project	Direct impact type	Quantity	Indirect impact type	Action Area
MALSR catwalk	None	None	None	1.62 acres[1]
Glide Slope System	None	None	Stormwater Re-design	2.98 acres
Runway Safety Area	Fill into Coos Bay	2,215 cubic yards	Critical Habitat adverse modification	0.07 acres
Apron/Connectors	None	None	None	22.5 acres
ARRF Facility	None	None	New impervious surfaces	0.3 acres

[1]*MALSR* unit maintenance improvements are above water, on catwalk. No proposed in-water work.

2.2 Conservation Measures

Appropriate conservation measures have been incorporated into the proposed project design to minimize and avoid adverse effects to ESA-listed species, their designated Critical Habitat elements, and EFH. These measures will include the following:

- All work conducted below the HMT of the Coos River will occur during the permitted period for the Coos River estuary (October 1 – February 15). During this time ESA-listed species are less likely to be present within the project action area.
- All heavy equipment (i.e., cranes) will access the project site via existing roadways and/or floating barges.
- In-water work will be timed so that tides will be flowing out of Pony Slough, reducing the potential for sedimentation on adjacent eelgrass beds.
- A Pollution Control Plan (PCP) that includes the following will be prepared by the Contractor and carried out commensurate with the scope of the project:
    - Best management practices to confine, remove, and dispose of construction waste.
    - Procedures to contain and control a spill of any hazardous material.
- All conditions of Oregon Department of Environmental Quality’s (ODEQ) 401 Water Quality Certification will be followed.
- All equipment will be inspected daily for fluid leaks; any leaks detected will be repaired before operation resumes.
- Stationary power equipment operated within 150 feet of the Coos River will be diapered to prevent leaks.

3. NATURAL HISTORY AND SPECIES OCCURRENCE

3.1 Habitat Summary

OTH is a triangular-shaped property that is surrounded on multiple sides by marine aquatic resources. The northwest side of the property is surrounded predominantly by open water of the Coos Bay estuary; intertidal estuarine wetlands run along the shoreline at the western extent of Runway 4. The east boundary of OTH is defined by Pony Slough and its estuarine intertidal wetland system. The southern boundary of the property is developed and dominated by airport related facilities and infrastructure. The habitat types surrounding OTH are described and discussed in the following paragraphs.

Within the 619 acres of OTH, wildlife habitat in general is minimized due to the danger that air strikes of wildlife pose to airport operations. There are extensive areas of impervious surfaces, structures, infrastructure, and closely cropped/mowed grass monocultures and other vegetation. OTH is surrounded by fences maintained for the purposes of wildlife exclusion. While passerine birds may seasonally nest in Ornamental trees and shrubs, no long-term wildlife habitat occurs or is sustained within the property.

3.2 The Coos Bay Estuary

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. It ranges from 0.5 miles to 1.5 miles wide by 15 miles long and has approximately 30 tributaries. Coos River is the major tributary flowing into Coos Bay and the river is also an important shipping channel. The Port of Coos Bay is a major deep-draft coastal harbor with a 15-mile navigation channel that is adjacent to OTH.

Much of the shoreline and subtidal habitat of Coos Bay consists of unvegetated mud and sand that is mixed with areas of various algae species. Clams and shrimp are also found here with varied abundance and diversity (SEACOR Holdings Inc., 2008). Salinity and other water quality characteristics vary with proximity to the estuary mouth and with the volume of freshwater entering sloughs.

Pony Slough borders the eastern side of the property. It is identified as an estuarine intertidal wetland system (E2USN) by the USFWS National Wetland Inventory (NWI). Freshwater is supplied into the slough by Pony Creek, a perennial stream.

4. ENVIRONMENTAL BASELINE

4.1 Coos Bay

OTH is located along the lower Coos estuary navigation channel. In general, the environmental baseline within the action area has been impacted by urbanization, past industrialization, development, and human activity. The predominant substrate in the basin is mud or sand/mud mixture. This is a high energy area of the river with strong lateral currents and steep banks that limit near-shore shallow habitat suitable for juvenile fish rearing and provide very little habitat complexity. The riverbank at this location is armored with riprap and concrete and contains minimal riparian vegetation. OTH is south of the flowing channel, armored by riprap shorelines, MALSR pilings, and concrete vessel boat launches to the east. River flows in the Coos estuary are subject to twice-daily tidal fluctuations.

The project region is developed land with small areas of coniferous regeneration. An on-site investigation performed in October 2018 found five distinct wetland subclasses within the basin: subtidal channel and basin, intertidal mudflats, low salt marsh (*Carex* dominated), intertidal high salt marsh

(*Juncus/Salicornia/Carex* dominated), and intertidal high brackish marsh (Scirpus dominated). A band of low salt marsh runs around the edge of the subtidal channel. It is dominated by *Carex lyngbyei* (Lyngbye's sedge). There is an area of high intertidal salt marsh in the southeastern comer of the wetland basin. It is dominated by *Juncus balticus* (Baltic rush), with patches of Lyngbye's sedge and *Scirpus maritimus* (seacoast bulrush). Lesser amounts of *Potentilla pacifica* (Pacific silverweed), *Deschampsia cespitosa* (tufted hairgrass), *Plantago maritima* (seaside plantain), and *Grindelia integrifolia* (gumweed) are found in this plant community. Cover by macrophytes in this community is about 80%, the remainder being bare mud substrate. High intertidal sltmarsh also extends in a fringe around the wetland basin in some places. The western side of the basin is characterized as a high brackish marsh dominated by a dense (100% cover) stand of *Scirpus validus* (soft-stem bulrush).

The steeply sloping upland fringe of the basin is dominated by *Salix hookerana* (Hooker willow), *Rubus procerus* (Himalayan blackberry), *Cytisus scoparius* (Scotch broom), *Ceanothus thyrsiflorus* (blueblossom), and *Lonicera involucrata* (twinberry). To the west, there is a densely wooded area dominated by the same species, and in addition some *Pinus contorta* (shore pine) and *Alnus rubra* (red alder). The small channel to the west is overhung by shore pine, Hooker willow, Himalayan blackberry, and *Rubus spectabilis* (salmoriberry). The herbaceous layer is dominated by *Phalaris arundinacea* (reed canarygrass), creating a fringe of wetland along the channel.

Roye (1979) identified much of Pony Slough as habitat for soft-shell clam. *Macoma* spp. clam beds were also mapped as present in Pony Slough, including the project area. However, other important invertebrates, such as gaper clams (*Tresus capax*), cockles (*Clinocardium nuttallii*), butter clams (*Saxidomus giganteus*), and littlenecks (*Protothaca staminea*) were not identified in Pony Slough. Pony Slough tideflats are used by *Corophium spinicorne*, a crustacean important as a prey species for salmonids and other fishes.

4.2 Baseline conditions within the Action area

4.2.1 Essential Fish Habitat (EFH) - Eelgrass

EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Seagrass species found on the west coast of the US include eelgrass species (*Zostera spp*.), widgeongrass (*Ruppia maritima*), and surfgrasses (*Phyllospadix spp*.). These grasses are vascular plants, not seaweeds, forming dense beds of leafy shoots year-round in the lower intertidal and subtidal areas. Given the significance and diversity of the functions and services provided by seagrass, Costanza et al. (1997) determined seagrass ecosystems to be one of Earth's most valuable.

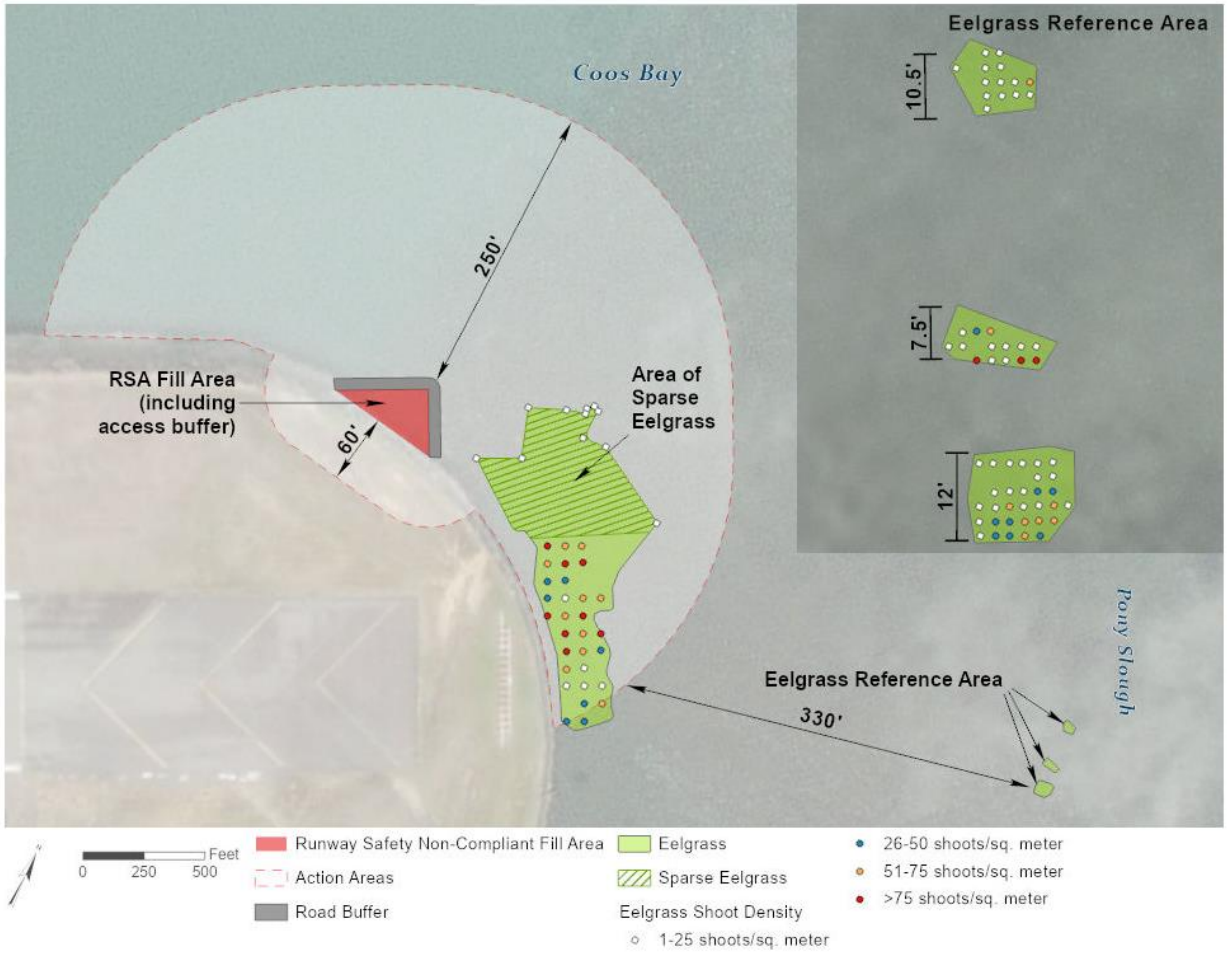
Seagrass beds known as eelgrass (*Zostera* spp.) are a major habitat component of Coos Bay and Pony Slough. Vegetated shallows that support eelgrass are considered special aquatic sites under the 404(b)(1) guidelines of the CWA (40 CFR § 230.43). Two eelgrass species are known to be present in this ecoregion, the native *Z. marina* and the non-native *Z. japonica*. *Z. japonica* was first reported in 1957 in Willapa Bay, Washington, and is thought to have been introduced in the early twentieth century along with oyster stock imported from Japan (Shafer, Kaldy, and Gaeckle 2014).

Both eelgrass species contribute to ecosystem functions at multiple levels: as primary and secondary producers, as habitat structuring elements, as a substrate for epiphytes and epifauna, and as sediment stabilizers and nutrient cycling facilitators. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish such as the Pacific herring. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help ameliorate the effects of ocean acidification.

Eelgrass is an EFH and a Habitat Area of Particular Concern (HAPC). A HAPC is a subset of EFH that is rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts.

Baseline surveys were conducted in June 2019 to delineate and characterize eelgrass beds in the vicinity of the proposed Action Area **(Figure 4: Eelgrass Survey Data).** June 3 and 4, 2019 were identified as appropriate sampling dates for the survey based on a strong minus morning low tide to maximize dewatering of the bay and resultant exposure of *Z. marina.* The survey team identified and delineated the boundaries and spatial distribution of the eelgrass beds in accordance with the protocols outlined in the document US Army Corps of Engineers Seattle District (2018), using the eelgrass bed edge definition described in NOAA Fisheries Western Region (2014).

Figure 4: Eelgrass Survey Data

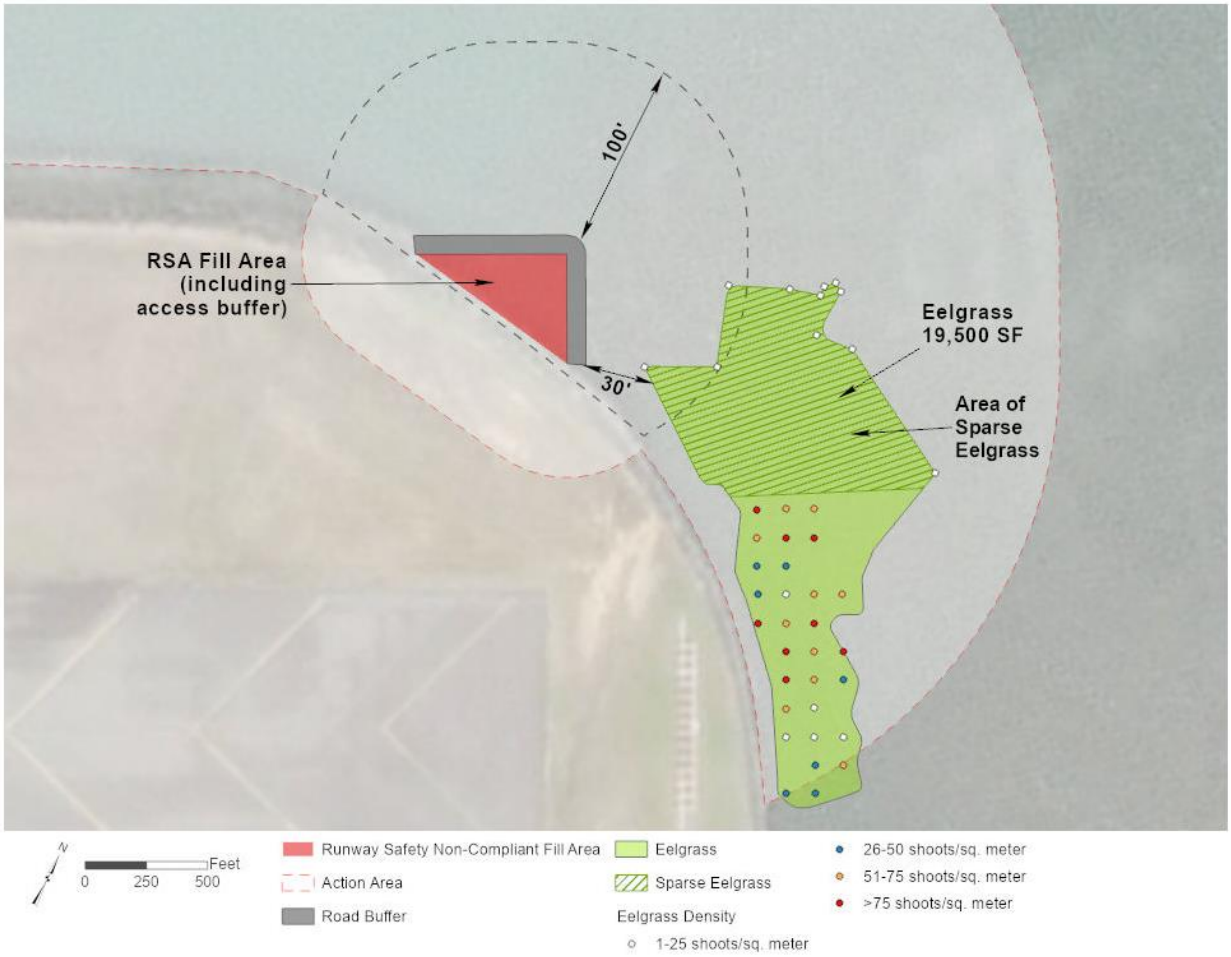


For the purpose of this survey, eelgrass beds were considered continuous if any eelgrass was within a one square meter quadrat and within 1 meter of another shoot. In areas where there are too few native eelgrass shoots to meet the bed thresholds described above, the survey map should indicate that widely scattered or sparse eelgrass shoots are present in the area, with no discernable beds. Within each bed, eelgrass shoot density was measured using a series of ¼ meter² plots arranged in a regularly spaced grid. The positions of the survey points are shown in (**Figure 4: Eelgrass Survey Data**). Data values

were converted to numbers of eelgrass shoots per square meter. Baseline surveys were also conducted in a reference area for use in interpreting the results of subsequent eelgrass monitoring surveys.

The survey results indicated the presence of approximately 19,500-square feet of eelgrass occurring within the 250-foot radius of the project footprint perimeter. The closest eelgrass bed edge was located approximately 30 feet from the proposed bulkhead. (**Figure 5: Eelgrass Presence in RSA Action Area**) The average eelgrass shoot density in the project area was 54 ± 27 shoots/square meter (± = standard deviation, n = 30), with a range of 8 to 112 shoots/square meter. The average eelgrass shoot density in the reference area was 37 ± 30 shoots/square meter (± = standard deviation, n = 39), with a range of 4 to 132 shoots per square meter.

Figure 5: Eelgrass Presence in RSA Action Area



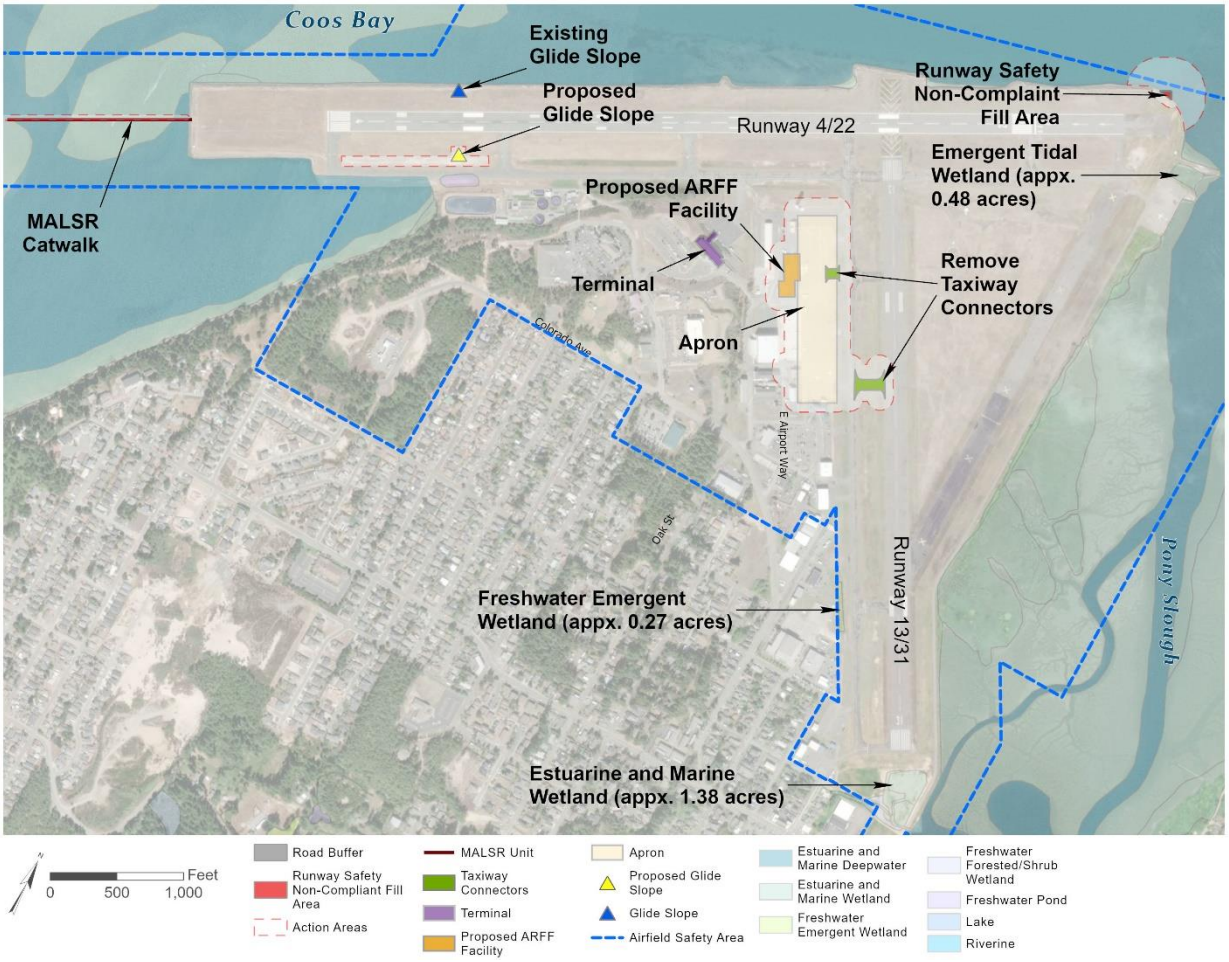
4.2.2 Wetlands

OTH includes an enclosed wetland basin, with a small channel that enters the basin from the west and a small area of tidal marsh and mudflats in the southwestern corner of Pony Slough. The basin, channel, and associated wetlands total approximately 3.88 acres. There are five distinct wetland subclasses within the basin; these subclasses include the subtidal channel and basin, intertidal mudflats, low salt marsh (*Carex* dominated), intertidal high salt marsh (*Juncus/ Salicornia/ Carex* dominated), and intertidal high brackish marsh (*Scirpus* dominated). In addition, a tidally influenced stream channel extends to the west of the basin (**Figure 6: Preferred Alternative - Wetlands**).

According to the USFWS NWI, prior wetland delineations, and a wetland field survey conducted in 2018, there are three non-coastal wetlands located on Airport property, which include:

- One freshwater emergent wetland located between Taxiways A and H (approximately 0.27 acres).
- One estuarine and marine wetland (approximately 1.38 acres) located south of the Runway 31 threshold.
- An emergent tidal wetland (0.48 acres) was identified beyond the southeast portion of the Runway Safety Non-Compliant Fill Action Area. The wetland is located within a sloping alcove, formerly a boat ramp.

Figure 6: Preferred Alternative – Wetlands



4.3 Protected Species

4.3.1 Species/Critical Habitat Considered Threatened and Endangered Species

The following list (**Table 2**) of federally protected (threatened and endangered) species reflects species whose range or Critical Habitat overlap with the project study areas. Information regarding state protected species was generated by the ODFW and was updated on June 11, 2018, and Information, Planning, and Consultation System (IPaC) and Oregon Biodiversity Information Center (OBIC) database searches were performed. **Table 2** includes six threatened and one endangered species, of which only the fish species (Coho Salmon, Eulachon, Green Sturgeon) are potentially present in the RSA Fill Action Area. The bald

eagle (*Haliaeetus leucocephalus*) is no longer protected under the ESA but is afforded protection through the Bald and Golden Eagle Protection Act (BGEPA) of 1940. Species addressed in this section include those on the Federally Listed and Proposed Endangered and Threatened Species, Candidate Species, and Species of Concern list provided by the USFWS. A data search was conducted by the Oregon Natural Heritage Program and the NMFS. Presence potential was determined through contact with ODFW biologists familiar with the area, and field visits.

Federally protected species and their respective habitats are briefly described in the sections that follow.

Table 2: Protected Species That May Occur Within the Study Area

Species	Population	Federal Status	Closest Designated Critical Habitat*	Potential Site Use
Bird Species				
Marbled Murrelet *Brachyramphus marmoratus*	Pacific North West (CA, OR, WA)	Threatened	Coos Bay	Migration and rearing
Northern Spotted Owl *Strix occidentalis caurina*	Coastal Ranges (CA, OR, WA)	Threatened	Coos Bay	Foraging and migrating
Western Snowy Plover *Charadrius nivosus nivosus*	Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico(within 50 miles of Pacific Coast)	Threatened	Coos Bay	Foraging and migrating
Fish Species				
Coho Salmon (Oregon Coast)* *Oncorhynchus kisutch*	Oregon Coast ESU	Threatened	Coos Bay	Migration and rearing
Eulachon *Thaleichthys pacificus*	Southern DPS	Threatened	Umpqua River	Spawning
Green sturgeon* *Acipenser medirostris*	Southern DPS	Threatened	Coos Bay	Spawning
Plant Species				
Western Lily *Lilium occidentale*	Coos Bay	Endangered	Coos Bay	-

* Species is under the jurisdiction of the NMFS

Sources: NMFS 2019; OBIC 2018; USFWS IPaC 2019

4.4 Bird

4.4.1 Bald eagle (*Haliaeetus leucocephalus*) – Bald and Golden Eagle Protection Act

While foraging habitat for the Bald Eagle occurs in and along the bay, no suitable nesting habitat exists in any of the action areas. No nests are known to occur in or near the multiple project areas. No further analysis will be conducted for this species.

4.4.2 Marbled murrelet (*Brachyramphus marmoratus*) – Federally Threatened

The marbled murrelet is a small, brown diving shorebird with a short bill and tail and narrow wings. It spends most of its life in near-shore ocean waters feeding on fish and invertebrates. This species comes inland up to 50 miles to nest in large unfragmented stands of old growth Douglas fir or redwoods. Historically and currently, this species range includes Alaska, California, Oregon, and Washington within the US.

Critical habitat determination was finalized in August 2016 and confirmed on the effective and revised date of November 4, 2011. The current designation includes over 3 million acres of critical habitat in Washington, Oregon, and California. Suitable nesting habitat for this marine bird includes inland mature coniferous forests with trees that have specific branch structure, trunk diameter, and height. The physical characteristics of these northwestern trees and forests typically require 200 to 250 years to attain the attributes necessary to support marbled murrelet nesting (Federal Register 81 FR 51348).

Marbled murrelets typically forage within 3 miles of the ocean shore and in estuarine areas at the mouths of rivers and creeks. Marbled murrelets are known to forage at the mouth of the Coos River; however, known densities are fairly low (less than one bird per square kilometer (Falxa et al. 2008). Given the project location (15 river miles inland) and proposed timing of construction activities (outside the nesting season for marbled murrelets [April 1 – September 15]), it is unlikely that marbled murrelets will be foraging within the action area during proposed in-water work activities. In addition, based on an initial desktop assessment of potential nesting habitat within the vicinity of the proposed project, it was determined that marbled murrelet nesting habitat does not occur within 0.25 mile of proposed construction activities (the farthest distance at which construction activities could potentially disturb nesting murrelets). The nearest marbled murrelet Critical Habitat is approximately 9 miles away. Given that proposed project activities will occur outside of the murrelet nesting season and will not remove nesting habitat, the proposed project will have no effect on this species and further analysis of impact was deemed unnecessary.

For additional information on the general habitat requirement, life history, and limiting factors for recovery of the marbled murrelet, see the Federal Register Notices published on September 28, 1992 (57 FR 45328), and October 5, 2011 (76 FR 61599).

4.4.3 Northern spotted owl (*Strix occidentalis caurina*) - Federally Threatened

The northern spotted owl is a nocturnal, medium-sized, chocolate brown owl with dark eyes set in prominent facial disks, a barred tail, and white spots on the head and breast. The owl inhabits structurally complex forests from southwestern British Columbia through Washington and Oregon to northern California. These forests are characterized as mature (greater than 150 years old) and by multi-layered and dense canopy closure, abundant logs, standing snags, and live trees with broken tops.

The owl was listed as threatened in June 1990, and critical habitat determination was updated in December 2012. In Oregon, approximately 4,557,852 acres of federal lands are designated as critical habitat. The nearest northern spotted owl Critical Habitat is located approximately 10 miles away.

A recovery plan for the owl was issued in 2008 and revised in 2011. Current forest management practices on federal lands stress limited harvesting in old-growth forests and suggest alternate locations for harvest that are not preferred by the northern spotted owl. Barred owl management and removal are also tools being used to assist with recovery of the owl.

Given that proposed project activities will occur outside of the spotted owl nesting season (March 9 – August 19) and will not remove or affect nesting or foraging habitat, the proposed project will have no effect on this species and further analysis of impact was deemed unnecessary.

4.4.4 Western snowy plover (Charadrius nivosus nivosus) - Federally Threatened

The western snowy plover is a small shorebird with pale brown upper parts, dark patches on either side of the upper chest, and dark gray legs. Habitat for the plover includes coastal areas along the west coast from Washington to Mexico on sandy or salty areas without much vegetation. The Pacific coast population is defined as those individuals that nest within 50 miles of the Pacific Ocean on the mainland

coast, peninsulas, offshore islands, bays, estuaries, or rivers of the United States and Baja California, Mexico (58 FR 12864, USFWS 1993).

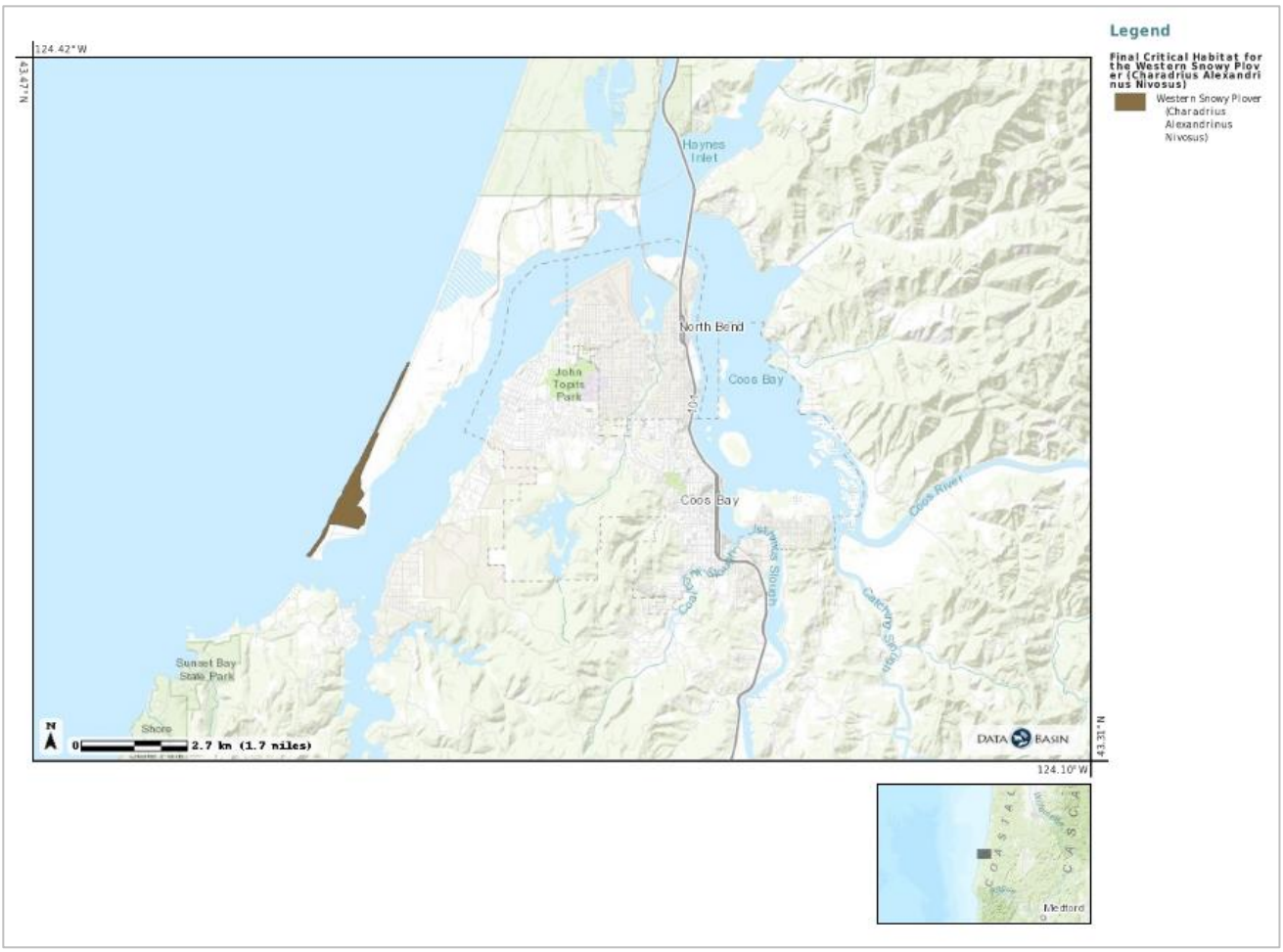
On March 5, 1993, the Pacific coast population of the western snowy plover (*Charadrius nivosus nivosus*) was listed as threatened under provisions of the ESA of 1973, as amended (16 U.S. Code 1531 et seq.). The western snowy plover's threatened status was reaffirmed in 1989 under the Oregon ESA and again in 1993 and 1998 by the Oregon Fish and Wildlife Commission as part of its periodic review process. Critical habitat for this shorebird was designated in June 2012 and includes areas of coastline in California, Oregon, and Washington (77 FR 36728, FWS 2012).

The Pacific coast population of the western snowy plover breeds primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. On the Oregon coast, nesting may begin as early as mid-March, but most nests are initiated from mid-April through mid-July (Wilson-Jacobs and Meslow 1984); peak nest initiation occurs from mid-May to early July (Stern et al. 1990).

The project area includes portions of tidal mudflats, areas of riprap on slopes, and lacks appropriate beach habitat suitable for nesting for this species. There is no proposed modification of beach habitat within the Action Areas, and the nearest possible beach is 0.25 miles away to the East, on the opposite bank of the Pony Slough entrance.

While foraging habitat may be present in Pony Slough and throughout Coos Bay, no nests are known to occur in or near the action areas for this project. No sightings of snowy plovers were documented in Fall and Spring surveys at OTH. The nearest western snowy plover critical habitat is approximately 3.5 miles west of the Airport at the Coos Bay North Spit unit presented in **Figure 7**.

Figure 7: Western Snowy Plover



4.5 Fish

Three federally listed anadromous fish species spend a portion of their life cycle within the estuarine environment of Coos Bay. Oregon Coast Coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) green sturgeon (*Acipenser medirostris*), and southern DPS Pacific eulachon (*Thaleichthys pacificus*), were each federally listed as threatened under the ESA. Use of the Coos Bay system by eulachon and green sturgeon is sporadic (Wagoner et. Al 1990). Migrating habitat exists for Coho salmon in the RSA Fill Action Area and Coos Bay is considered Critical Habitat for Coho salmon.

4.5.1 Coho salmon (*Oncorhynchus kisutch*) – Federally Threatened

The Coho salmon is commonly referred to as the silver salmon due to its dark metallic blue or greenish back with silver sides and a whitish underside. The Coho salmon is an anadromous fish, which spends juvenile development stages (approximately 18 months) in freshwater rivers and streams, spends most of its adult life in the ocean, and then returns to freshwater rivers and streams to spawn. In February 2008, the naturally spawning populations within the evolutionary significant unit (ESU) of Oregon Coast Coho salmon was listed as a federal threatened species under the ESA (73 FR 35755). Critical habitat for Coho salmon encompasses 13 subbasins in Oregon and includes all coastal river and stream reaches accessible to Coho salmon, including adjacent riparian zones. Coos Bay is included as Critical Habitat as part of the Coos Bay watershed.

The Biological Assessment considered the effects of west coast ocean salmon fisheries on listed populations of Coho salmon, including the Oregon Coast ESU (Supplemental Biological Opinion and Incidental Take Statement for the Pacific Coast Salmon Recovery Plan, 1999). The long-term decline in Oregon Coast Coho salmon productivity reflects deteriorating conditions in freshwater habitat as well as extensive loss of access to habitats in estuaries and tidal freshwater. Changes in the watersheds due to land use practices have weakened natural watershed processes and functions, including loss of connectivity to historical floodplains, wetlands, and side channels; reduced riparian area functions (stream temperature regulation, wood recruitment, sediment and nutrient retention); and altered flow and sediment regimes (NMFS 2016b, Recovery Plan for Oregon Coast Coho Salmon ESU).

The essential physical or biological features of freshwater migration corridors associated with spawning and incubation sites include water flow, quality, and temperature conditions supporting larval and adult mobility, abundant prey items supporting larval feeding after yolk sac depletion, and free passage (no obstructions) for adults and juveniles.

Distribution of juvenile Coho salmon within the action area is unknown; however, research in the Coos River observed that juvenile Coho salmon were in greater abundance away from the shoreline areas, often in deep water during their outmigration. Carson et al. (2001) found that in the Coos River, less than 20 percent of all fish were found along the shore and were about evenly split between the channel and channel margins.

For additional information on the general habitat requirements, life history, and limiting factors for recovery of the Oregon Coast Coho salmon ESU see the Federal Register Notice published on June 28, 2005 (70 FR 37160).

4.5.2 Southern Eulachon - Federal Threatened, Southern DPS

Eulachon (*Thaleichthys pacificus*) is a small, anadromous fish from the eastern Pacific Ocean. In North America they range from northern California into the southeastern Bering Sea. On March 18, 2010, NMFS listed the southern DPS of eulachon as threatened under the ESA, followed by designating Critical Habitat for the southern DPS on October 20, 2011. In determining Critical Habitat, the physical or biological features identified by NMFS as essential for eulachon migration and spawning within the Coos River include unobstructed migratory pathways, spring freshet flow regime, pollutant free waters, relatively low water temperatures (generally below 10° Celsius during spawning), suitable spawning substrates (pea gravel and coarse sand are preferred), and abundant prey items (copepod larvae) (76 FR 65324).

Eulachon presence within the Coos River is generally limited to the duration of the yearly spawning run (December – June) (see **Table 2** and 76 FR 65324). Adult eulachon typically begin their spawning migration into the Coos River in December and have emigrated by late March. Egg incubation and larval outmigration in the Coos River begins as early as January and can continue through June (76 FR 65324). When present, eulachon may utilize both shallow and deep-water habitats within the estuary as they migrate to spawning grounds. It is possible that adult and larval eulachon may be present within the action area during proposed in-water activities. The nearest Critical Habitat for eulachon is the Umpqua River, located 17 miles north of OTH.

For additional information on the general habitat requirement, life history, and limiting factors for recovery of the Southern eulachon DPS see the FR Notice published on March 18, 2010 (75 FR 13012), and October 20, 2011 (76 FR 65324). NMFS is currently in the process of evaluating protective regulations for the Southern DPS of eulachon pursuant to Section 4(d) of the ESA. As such, “take” allocations for Southern eulachon have not yet been issued.

4.5.3 Green Sturgeon - Federal Threatened, Southern DPS

Green sturgeon *(Acipenser medirostris)* are long-lived, slow-growing fish that are the most marine-oriented of the sturgeon species. The Southern green sturgeon DPS was listed as threatened on April 7, 2006 (71 FR 17757). The Southern DPS includes all naturally spawned populations originating from coastal watersheds south of the Eel River in California, with the only known spawning population in the Sacramento River.

Critical Habitat for the Southern green sturgeon DPS was designated on October 9, 2009 and includes the Coos River within the action area (NOAA Fisheries, 2018). The primary constituent elements (PCE) associated with Southern green sturgeon Critical Habitat within the action area include freshwater riverine systems and estuarine areas. The physical and biological features identified by NMFS as essential for Southern green sturgeon include available food resources, migratory corridors, sediment quality, substrate type, water depth, water flow, and water quality (NOAA Fisheries, 2018).

Green sturgeon are present in the Coos River from June through October; however, they mainly concentrate in the lower reaches of the estuary below river mile 37 (NOAA Fisheries, 2018). As such, given the proposed timing of in-water work (October 1 – February 15), the presence of adult and juvenile Southern green sturgeon may overlap within the action area during the early stages of proposed in-water activities.

For additional information on the general habitat requirement, life history, and limiting factors for recovery of the Southern green sturgeon DPS see the Federal Register Notice published on April 7, 2006 (71 FR 17757).

4.6 Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act. The project is located within the statewide Pacific Flyway path for migratory birds. The Southern Oregon coast provides wintering and migratory habitat for birds, and Coos Bay is one of several important areas for shorebirds between San Francisco Bay and British Columbia. The Migratory Bird Treaty Act of 1918, as amended, provides federal protection for migratory birds and their nests, eggs, and body parts from harm, sale, or other injurious actions.

No clearing of trees, shrubs, and brush will occur as a result of this project.

Potential migratory birds that may be present within the project area, and their breeding seasons are listed below in **Table 3**.

Table 3: Possible Migratory Birds at OTH

Common Name	Scientific Name	Breeding Season
Allen's hummingbird	*Selasphorus sasin*	February 1 to July 15
Black oystercatcher	*Haematopus bachmani*	April 15 to October 31
Black turnstone	*Arenaria melanocephala*	Breeds elsewhere
Clark's grebe	*Aechmophorus clarkii*	January 1 to December 31
Great blue heron	*Ardea herodias fannini*	March 15 to August 15
Lesser yellowlegs	*Tringa flavipes*	Breeds elsewhere
Long-billed curlew	*Numenius americanus*	Breeds elsewhere
Marbled godwit	*Limosa fedoa*	Breeds elsewhere
Olive-sided flycatcher	*Contopus cooperi*	May 20 to August 31
Red-throated loon	*Gavia stellata*	Breeds elsewhere
Rufous hummingbird	*Selasphorus rufus*	April 15 to July 15
Semipalmated sandpiper	*Calidris pusilla*	Breeds elsewhere
Short-billed dowitcher	*Limnodromus griseus*	Breeds elsewhere
Whimbrel	*Numenius phaeopus*	Breeds elsewhere
Willet	*Tringa semipalmata*	Breeds elsewhere

Source: IPaC Resource List, December 13, 2018.

5. EVALUATION METHODS

Some activities associated with the proposed project, or "action areas," will occur below the HMT of the Coos River. The proposed project activities have the potential to affect designated Critical Habitat for ESA-listed fish species and Pacific Salmon EFH. Each of these ESA-listed species has the potential to occur within the action areas. Further discussion of the natural history and potential occurrence of ESA-listed species within the project action areas is provided in this section.

Factors considered in evaluating the project impacts include:

- The species' dependence on specific habitat components that will be removed or modified.
- The abundance and distribution of those habitat components in the project vicinity.
- The distribution and population levels of the species (if known).
- The possibility of direct and/or indirect effects to the species and their habitats.
- The potential to mitigate adverse effects.

These factors are relevant both for the survival of individuals of the species and recovery prospects of the populations.

The method of analysis used in this BA includes determining the environmental baseline for the action areas, discussing how the proposed action will affect the environmental baseline, and then using that information to arrive at a determination of effect.

For analysis of potential project impacts to salmon species, this BA utilizes methods outlined in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). The information presented in this BA is based on a review of existing database information, site visits, and discussions with the project design team and resource agency staff. Research on species' presence within and near the project area was conducted through a review of species lists and database information from the Information for Planning and Consultation (IPaC), and StreamNet in 2019.

The USFWS' IPaC was accessed on December 13, 2018, for information on threatened and endangered (T&E) species habitat. A request for known occurrences of State sensitive species within a 2-mile radius of the study area was made to the OBIC.

Mead and Hunt, Inc. Environmental Scientist Aaron Killgore conducted field surveys of the site on November 12, 2018, and April 8, 2019. Additional surveys for eelgrass were conducted on June 4-5, and July 2-3, 2019 to determine adjacent eelgrass boundaries and densities and to establish a control plot for eelgrass density for monitoring. Areas identified as likely habitat for T&E species were treated as habitat and surveyed by land-based pedestrian transects using the following methods:

- Visual or auditory encounters with the species
- Confirmed species nesting sites
- Evidence of diseased species
- Other diagnostic indicators of species presence

Prior Environmental Assessments in the area were referenced and interviews were conducted with Federal and State agency personnel, employees of the South Slough National Estuarine Research Reserve, Oregon State University professors, and experts in eelgrass habitat and mitigation.

This section addresses direct, indirect, and cumulative effects on ESA-listed species and their designated Critical Habitat that may result from proposed project actions given the proposed avoidance and minimization measures. Factors considered in this analysis include the following:

- Proximity of the action
- Distribution, timing, and nature of the effect
- Duration
- Disturbance frequency
- Intensity
- Severity

The Sustainable Fisheries Act of 1996 (Public Law 104-267) amended the MSA to establish new requirements designed to identify, conserve, and enhance EFH for those species regulated under a federal Fisheries Management Plan. The MSA requires federal agencies to consult with NMFS on all actions or proposed actions that are authorized, funded, or undertaken by the agency that may adversely affect EFH (MSA §305(b)(2)). Adverse effect means any impact that reduces quality and/or quantity of EFH and may include direct, indirect, site-specific, or habitat-wide impacts including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Any reasonable attempt to encourage the conservation of EFH must also take into account actions that occur outside EFH, such as upstream and upslope activities that may result in adverse effects.

5.1 Direct Effects

Direct effects include all immediate impacts (adverse and beneficial) resulting from project-related actions. Potential direct effects to ESA-listed species associated with the proposed project may include entrainment during dredging activities, temporarily degraded water quality, and minor alteration of substrates associated with dredging and disposal. Following detailed discussion, these effects are summarized in **Table 6** below.

5.1.1 Water Quality

5.1.1.1 Sediment/Turbidity

Short-term, localized increases in adjacent turbidity levels within the RSA Fill Action Area will likely occur as a result of proposed fill activities below the HMT. In the short-term, increases in turbidity can reduce forage quantity for salmonids and disrupt behavioral patterns such as feeding and sheltering. Exposure duration is a critical determinant of physical or behavioral turbidity effects. Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such seasonal high pulse exposures.

Light is one of the most important factors affecting eelgrass depth distribution, abundance, growth and survival. Therefore, any activity which generates turbidity in the water column has the potential to negatively affect eelgrass.

The in-water extent of the Action Area beyond the project footprint is based on the potential for a temporary increase in turbidity and sedimentation. Installation and removal of the coffer dam would result in the highest level of turbidity during the project. This work will be timed with the outflow of tides to reduce the potential for sedimentation near the adjacent eelgrass. Dewatering in the construction area will be done through sedimentation outflow filters. The water will drain into Coos Bay on the westside of the coffer dam/RSA fill area to reduce turbidity and sedimentation within Pony Slough and the adjacent eelgrass to the greatest extent possible.

Given the proposed project conservation measures and fill techniques, it is anticipated that any project related increases in background turbidity will be relatively localized. As such, short-term increases in background turbidity resulting from temporary work below the HMT are not expected to result in any long-term adverse effects to ESA-listed fish species or significant net change in function of the in-stream habitat.

5.1.1.2 Chemical Contamination

Equipment operating near and over the river channel within the action area represent potential sources of chemical contamination. Accidental spills of construction materials or petroleum products would adversely affect water quality and potentially impact ESA-listed species. Development and implementation of a PCP that will include containment measures and spill response for construction-related chemical hazards will significantly reduce the likelihood for chemical releases within the action area.

5.1.1.3 Impervious Surfaces and Water Treatment

The design of the ARFF facility is currently under development. The stormwater runoff associated with the water quality storm event will receive treatment prior to discharge to the Waters of the United States to the maximum extent feasible and will meet SLOPES V standards. A stormwater report associated with the ARFF facility project will detail the associated water quality control design and analysis and is expected to be completed with the final design in March 2020. The stormwater report can be provided upon request once available.

The ARFF facility project will result in a net decrease of 10,163 square feet of impervious surface within the Outfall #2 drainage basin; therefore, there will be an improvement to the stormwater conveyance system capacity and water quality at the existing drainage outfall. The disturbance of underlying soils trigger water treatment requirement.

The water resources report prepared by Mead & Hunt, Inc., dated February 7, 2020, includes the design codes and references, regulatory considerations, surface waters and wetlands, floodplains, drainage infrastructure related to the existing conditions, and potential impacts as a result of the proposed actions.

5.1.2 Alteration of Substrates

As discussed above, the proposed project will result in the fill of up to 2,215 cubic yards of accumulated sediment from within the Coos Bay Estuary (**Figure 3: RSA Fill Area**). In general, the environmental baseline within the action area has been degraded by urbanization, past industrialization, development, and human activity. This is a high energy area of the river with strong lateral currents and steep banks that limit near-shore shallow habitat suitable for juvenile fish rearing and provide very little habitat complexity. As such, given the existing baseline conditions within the bay, and proposed fill of sediments only (consisting primarily of sand and silt) after the bulkhead construction, utilization of silt fencing, and lack of suitable spawning habitat in the action area, it is reasonably certain that the proposed alteration of existing substrates will not result in adverse direct effects to ESA-listed fish species.

5.2 Indirect Effects

Indirect effects of a proposed action are those impacts that are reasonably certain to occur later in time (after construction of the project is complete). As discussed above, short-term increases in turbidity can reduce forage quantity for salmonids and disrupt behavioral patterns such as feeding and sheltering. Forage quantity for juvenile fish may be temporarily reduced within the immediate in-water work area as benthic organisms become disturbed by bulkhead installation; however, recolonization of benthic organisms will likely occur within a month following project completion (NMFS 2009). As such, it is reasonably certain that any potential indirect effects of the proposed project on ESA-listed fish species will be insignificant and discountable.

All project construction and excavation would occur in an estuarine environment. This limits potential impacts to salmonid spawning habitat, eggs, or fry, which all occur in freshwater. Similarly, this proposed project would not affect salmonid smolt migration because Coos Bay in water work periods have been designed and implemented to avoid sensitive and critical life history stages of these fish.

Impacts potentially could be both short- and/or long-term in nature. Short-term risks could include temporary increases in turbidity, threat of construction-related hazardous materials entering a waterbody, and/or disturbance from a variety of construction related activities. Potential long-term impacts might result from an increase in potential predators aggregating in the vicinity of the riprap preying on migrating salmonids. Estuarine shoreline development can have adverse effects on out-migrating juvenile salmon. Smolts can become disoriented and their downstream progress restricted, possibly exposing them to additional predation from fish, birds, or mammals.

The proposed project is not expected to create turbidity levels detrimental to crustaceans or annelids found in Coos Bay. Mobile species, such as fish, generally avoid areas of high turbidity and are able to move out of the area before conditions become detrimental.

5.3 Interrelated and Interdependent Effects

Interrelated actions include actions that are a part of a larger action and depend on the larger action for justification. Interdependent actions are defined as actions with no independent utility apart from the proposed action. As discussed above, the purpose of the proposed project is to address FAA safety regulations for continued operations at OTH. No interrelated or interdependent effects are anticipated as a result of the proposed project.

5.4 Cumulative Effects

Cumulative effects address activities "that are reasonably certain to occur within the action area subject to consultation." Historically, Coastal and southern Oregon has been affected by human activity for thousands of years and the existing environmental conditions in the action area reflect significant changes to natural resources brought about by past human activities. Associated transportation and commercial development within the Coos River basin in the vicinity of the action area are anticipated as population growth continues. **Table 4** lists large-scale projects that could impact water resources in the Coos River estuary as an additional environmental baseline for the impacted watershed. For the purposes of this EA, the geographical extent of future cumulative effects analysis will be limited from the mouth of the Coos River Estuary to Pony Slough.

Table 4: Past, Present, or Reasonably Foreseeable Actions that May Cumulatively Affect Resources in Coos County

Location	Actions
US Army Corps of Engineers	Permits and Mitigation (Coos Fourth-Field Watershed) Various
US Army Corps of Engineers	Coos Bay Federal Navigation Channel Maintenance Dredging
Jordan Cove	Project Impact Mitigation
Jordan Cove	Maintenance Dredging
Port of Coos Bay	Coos Bay Railroad Bridge Rehabilitation
Port of Coos Bay	Maintenance Dredging
Port of Coos Bay	Coos Bay Rail Line Tunnel Rehabilitation
US Army Corps of Engineers	Coos Bay Jetties Rehabilitation Project
Confederated Tribes of Coos, Lower Umpqua Suislaw Indians	Coos Head Area Master Plan, Hollering Place
City of North Bend	Department of Human Services Building Relocation
Port of Coos Bay	Coos Bay Section 408/204(f) Channel Modification b
Tioga	Sports Park
Bureau of Land Management	Catching Creek Conversion Timber Sale
Bureau of Land Management	Other Commercial Thinning Timber Sales

5.4.1 Jordan Cove

The Jordan Cove Liquefied Natural Gas (LNG) Project has released a November 2019 Final Environmental Impact Statement (EIS) requesting authorization to liquefy at a terminal in Coos Bay, Oregon up to 1.04 billion cubic feet of natural gas per day for export for to overseas markets. The 200-acre LNG terminal site would include significant development of the Coos Estuary and coastline on the opposite side from OTH. This development would include:

- An access channel from the existing Coos Bay Federal Navigation Channel to the LNG terminal
- Modifications to the existing Federal Navigation Channel

- A marine slip containing two berths (one Production Loading Berth and one Emergency Lay Berth), a dock for tug and escort boats, and a material offloading facility (MOF)
- LNG loading platform and transfer line
- Two full-containment LNG storage tanks and associated equipment
- Five natural gas liquefaction trains
- Multiple industrial facilities

The extent of this development will affect eelgrass in the estuary; an eelgrass mitigation site has been selected adjacent to OTH, 1000 feet southwest of the MALSR unit, which precludes OTH from selecting a mitigation near to that area, if mitigation is necessary. More detail about the extent of possible impact of this project is found at https://www.energy.gov/nepa/eis-0489-jordan-cove-liquefaction-project-coos-county-or-and-pacific-connector-pipeline-project.

5.4.2 Bay Dredging Plan

The Oregon International Port of Coos Bay is proposing modifications to the lower Coos Bay Federal Navigation Channel to deepen, widen, and lengthen the channel and alter other related federal navigation components. The Port's project is made up of several proposed actions to improve navigation efficiency, to reduce shipping transportation costs, and to facilitate the shipping industry's transition to larger, more efficient vessels.

The Port of Coos Bay is currently in the engineering and design phase of the project and is coordinating with the USACE which is involved with the long-term maintenance of the Coos Bay Channel. This modification project will expand the channel from -37 feet deep and 300 feet wide to -45 feet deep and 450 feet wide from the channel entrance to river mile 8.2. The channel was last deepened from -35 feet to -37 feet beginning in 1996 and completed in 1998. More information about this project can be found on the Port of Coos Bay website at https://www.portofcoosbay.com/channel-deepening.

6. FINDING OF EFFECT

6.1 Analysis of Effects

The potential effects of the proposed action on the environmental baseline conditions are summarized below (**Table 5**). All pathways and indicators are expected to be maintained throughout this project, with the exception of short-term, localized increases in turbidity during the work window and minor alteration of in-water substrates. Given the proposed conservation measures, it is reasonably certain that there is minimal risk of injury, harm, or harassment (i.e., "take") of ESA-listed fish species resulting from the proposed fill activities. It is anticipated that fish will avoid the fill area during construction during the ODFW approved in-water work window.

Table 5: Checklist for documenting environmental baseline and effects of proposed actions on relevant indicators for ESA-listed salmonid species within the action area.

Pathways/Indicators	Baseline	Effects of Proposed Action
Water Quality		
Temperature	Not Properly Functioning	**Maintain**
Sediment/Turbidity	Not Properly Functioning	**Maintain (-):** short-term, localized increases in turbidity
Chemical Contamination	Not Properly Functioning	**Maintain**
Habitat Access		
Physical Barriers	At Risk	**Maintain**
Habitat Elements		
Substrate	Not Properly Functioning	**Maintain (-):** minor alteration of in-water substrates
Large Wood	Not Properly Functioning	**Maintain**
Pool Frequency	N/A	**Maintain**
Pool Quality	N/A	**Maintain**
Off-Channel Habitat	Not Properly Functioning	**Maintain**
Refugia	Not Properly Functioning	**Maintain**
Channel Conditions and Dynamics		
Width/Depth Ratio	Not Properly Functioning	**Maintain**
Streambank Condition	At Risk	**Maintain**
Floodplain Connectivity	Not Properly Functioning	**Maintain**
Flow/Hydrology		
Peak/Base Flows	At Risk	**Maintain**
Drainage Network Increase	Not Properly Functioning	**Maintain**
Watershed Conditions		
Road Density/Location	Not Properly Functioning	**Maintain**
Disturbance History	Not Properly Functioning	**Maintain**
Riparian Reserves	Not Properly Functioning	**Maintain**

Maintain = no localized, temporary, or system-wide effect
Maintain (-) = localized, temporary effect, no system-wide effect

Table 6 provides a summary of the potential effects of the proposed action on Critical Habitat PCE located within the action area. Short-term, localized increases in background turbidity and minor alteration of substrates in estuarine and migration corridors are anticipated. There will be a loss of 2,215 cubic yards of potential migration or refugial critical habitat for Coho salmon and Green sturgeon with the proposed action.

Table 6: Summary of Effects to Critical Habitat Primary Constituent Elements (PCE) within the Action Area

Species	PCEs within the Action Area	Essential Physical and Biological Features	Effects of the Proposed Action
Coho salmon	Freshwater rearing sites	Floodplain connectivity Available forage/ cover Water quality/quantity	None
	Freshwater migration corridors	Free of obstruction Natural cover Water quality/quantity	None
	Juvenile rearing areas	Water quality/quantity Cover/shelter/food Riparian vegetation	None
	Juvenile/adult migration corridors	Substrate Water quality/quantity/ Cover/shelter/food Riparian vegetation Space and safe passage	3,150-sqft adverse modification of critical habitat. Short-term, localized increases in background turbidity and minor alteration of substrates
Southern eulachon	Freshwater spawning and incubation	Flow Water quality/temperature Substrate	None
	Freshwater migration	Migratory corridor Flow Water quality/temperature Food	None
Southern green sturgeon	Freshwater riverine system	Food resources Migratory corridor Sediment quality Substrate Water depth/flow/quality	None
	Estuarine areas	Food resources Migratory corridor Sediment quality Water depth/flow/quality	3,150-sqft adverse modification of critical habitat. Short-term, localized increases in background turbidity and minor alteration of substrates

7. SUMMARY OF EFFECTS

The finding of effect is the conclusion reached on the project's likelihood of affecting a proposed or listed species or its Critical Habitat. The actual finding of effect may be made only by the Federal action agency. The conclusions presented in this report are recommendations. The Federal action agency must give concurrence with the conclusions of the BA for its findings to be valid.

In a letter dated March 5, 2019, the USFWS responded to Mead & Hunt's request for technical assistance on November 9, 2018, and additional project description and maps submitted on December 27, 2018. After review of the IPaC, results for the project area, and of the provided maps, the USFWS believes that no federally listed species under the jurisdiction of the USFWS are present in the action area. The USFWS also recommended coordination with the NOAA for species under their jurisdiction and a review of migratory birds.

Based on the lack of suitable habitat and seasonal avoidance, there will be no effect on the marbled murrelet, western snowy plover, northern spotted owl, or western lily.

7.1.1 Coho Salmon and Southern green sturgeon

The smallest area that must be filled for RSA compliance is 2,215 cubic yards, an adverse modification of critical habitat for Oregon Coast Coho salmon and Southern green sturgeon. The proposed project will result in short-term increases in background turbidity and the minor alteration of in-water substrates within designated critical habitat. However, it is reasonably certain that these actions will not result in long-term adverse effects to substrates, water quality, migratory habitat, food base, or other PCEs within the action area. Turbidity would be controlled by proposed conservation measures (Section 2.2), minimizing potential impacts. The proposed project actions are not expected to result in any net change in function of the in-stream habitat.

Due to permanent adverse modification of critical habitat, this project is likely to adversely affect Oregon Coast Coho salmon and Southern green sturgeon.

7.1.2 Southern Eulachon

The proposed project will result in short-term increases in background turbidity and the minor alteration of in-water substrates within designated critical habitat. However, it is reasonably certain that these actions will not result in long-term adverse effects to substrates, water quality, migratory habitat, food base, or other PCEs within the action area given the proposed conservation measures discussed above. The proposed project actions are not expected to result in any net change in function of the in-stream habitat.

The project may affect, but is not likely to adversely affect, the Southern eulachon. The project construction has the potential to affect migration and rearing habitat for fish species present near and downstream from the project area. Any effects are likely to be immeasurable and insignificant.

7.1.3 Essential Fish Habitat - Eelgrass

Given the proximity of eelgrass to the proposed project area (30 feet), there is the potential for adverse indirect impacts to eelgrass resources. The likelihood of adverse effects are minimized by timing of the construction operations outside the eelgrass peak growing season (October 1 - May 30), and use of a coffer dam and other conservation measures outlines in **Section 2.2** during excavation, fill, and construction.

Due to the avoidance and minimization measures described previously, this project is not likely to adversely affect Essential Fish Habitat (eelgrass). However, a two-year monitoring plan will be

implemented in order to assess the potential for indirect effects to eelgrass as a result of project construction. To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent monitoring surveys will be conducted at a similar time during the growing season (e.g. June - early July) and using the same methodology as the baseline surveys conducted in June 2019. Analysis of the monitoring data will focus on detecting changes in the location of the eelgrass bed boundary, total areal coverage of eelgrass within a 250-foot radius of the project footprint, and changes in eelgrass shoot density.

Data collected in the reference area will be used to assess the possibility of negative effects to eelgrass due to local or regional eelgrass stressors unrelated to the project construction. If there is an observed decline of eelgrass shoot density in both the project area and the reference area, the average decrease in eelgrass shoot density within the reference area will be subtracted from the average decrease in eelgrass shoot density within the project area. The eelgrass survey data will be available for review by agency staff. In the event that the first monitoring survey indicates no detectable impact to eelgrass beds (i.e. no decrease in eelgrass shoot density, and no retraction of the eelgrass bed boundary nearest the project footprint, then no second monitoring effort will be conducted.

The attached (**Attachment A**) permittee-responsible mitigation plan addresses the impacts for Coho salmon and Southern green sturgeon in the Coos River as a result of proposed construction. The impacts on the environmental baseline conditions (habitat Primary Constituent Elements) within the construction area include: 1) the 3,150 square foot permanent adverse modification of critical habitat for ESA-listed fish, and 2) short-term, localized increases in background turbidity and minor alteration of substrates.

There are two primary objectives of the mitigation plan:

1) to restore functional losses of aquatic critical habitat for ESA-listed fish, and
2) to enhance the project area shoreline to improve habitat for benthic organisms.

The restoration of 8,000 square feet of adjacent critical habitat and Essential Fish Habitat (EFH) eelgrass beds represents over a 2:1 ratio compared to the area of critical habitat permanently adversely modified due to the bulkhead construction. Restoration will be accomplished by removing creosote piles and remnant dock structures in Pony Slough. The removal of these items will return the substrate to natural conditions and remove impediments to fish migration and foraging habitat within Pony Slough.

Permittee-Responsible Mitigation Plan

Environmental Assessment

Runway Safety Area Improvements (Runway 4/22)

Southwest Oregon Regional Airport

Report Prepared By

Mead & Hunt

www.meadhunt.com

June 29, 2020

Mead & Hunt Project No. 1417700-171679.01

1. Project Information

Project Name: Southwest Oregon Regional Airport (OTH) Runway Safety Area Bulkhead

NWP Permit No.:

Project Location: 43° 25' 18.4794"N, -124° 14' 18.6432"W (43.421800°, -124.238512°)

Mitigation Site Location(s) (if different): 43°25'18.02"N, -124°14'17.24"W (43.421672°, -124.238122°) (1000ft SE of project site)

Watershed(s): Coos Bay, HUC 171003040405

County or Counties: Coos County

1.1 Plan Overview

This permittee-responsible mitigation plan addresses the permanent adverse modification of critical habitat for Coho salmon and Southern green sturgeon in the Coos River as a result of proposed construction of a triangular bulkhead adjacent to the Southwest Oregon Regional Airport (OTH) in North Bend, Oregon. The Federal Aviation Administration (FAA) requires[1] that the Runway Safety Area (RSA) have a 500-foot width and extend 1,000 feet beyond the ends of the runway. Currently, the northeast portion of Runway 4/22 is approximately 60 feet short of compliance.

Work will take place at the northeastern corner of the Airport property adjacent to and within Coos Bay. The project Action Area includes all areas of OTH, and the Coos Bay estuary directly or indirectly affected by the proposed project (**Figure 1, Runway Safety Area Fill and Construction Buffer**). The Action Area includes an in-water construction buffer of 250 feet for proposed fill activities within the 89-foot by 67-foot triangular fill area, the mandatory RSA, and a 10-foot road buffer for emergency vehicle access. An additional 60-foot Action Area on land is provided for vehicle support and construction staging. Construction crews and equipment will utilize haul routes to the project site via existing Airport roadways and paved areas.

2. Avoidance and Minimization

2.1 Avoidance

An alternatives analysis to meet FAA RSA compliance was conducted during the Master Plan update (2013).[2] These alternatives were further analyzed in the OTH RSA Environmental Assessment, which discusses the impacts to natural resources of each alternative to meet RSA compliance.[3] A triangular

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[1] [1]FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, provides required airport safety area guidance and defines the RSA as a surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway.

[2] Southwest Oregon Regional Airport Master Plan Update, 2013. https://cooscountyairportdistrict.com/coos-county-aiport-district-master-plan/

[3] Mead & Hunt, Environmental Assessment for Southwest Regional Airport Runway Safety Area Improvements (Runway 4/22), May 2020, Chapter 2.4: Build Alternatives.

bulkhead at the northeast end of Runway 4/22 was identified as the preferred alternative because it had the smallest footprint and the least impact to critical habitat of Endangered Species Act (ESA) listed species in Coos Bay. Construction haul routes and staging areas were designed to use existing impervious surfaces when possible and avoid adjacent wetlands.

2.2 Minimization

Appropriate and practical measures have been identified to minimize impacts to the aquatic ecosystem that cannot reasonably be avoided. Work will be performed during the Oregon Department of Environmental Quality (OR DEQ) in-water work window of October 1 to February 15 and will be timed with the outflow of the tides to avoid sedimentation impacts to adjacent eelgrass beds.

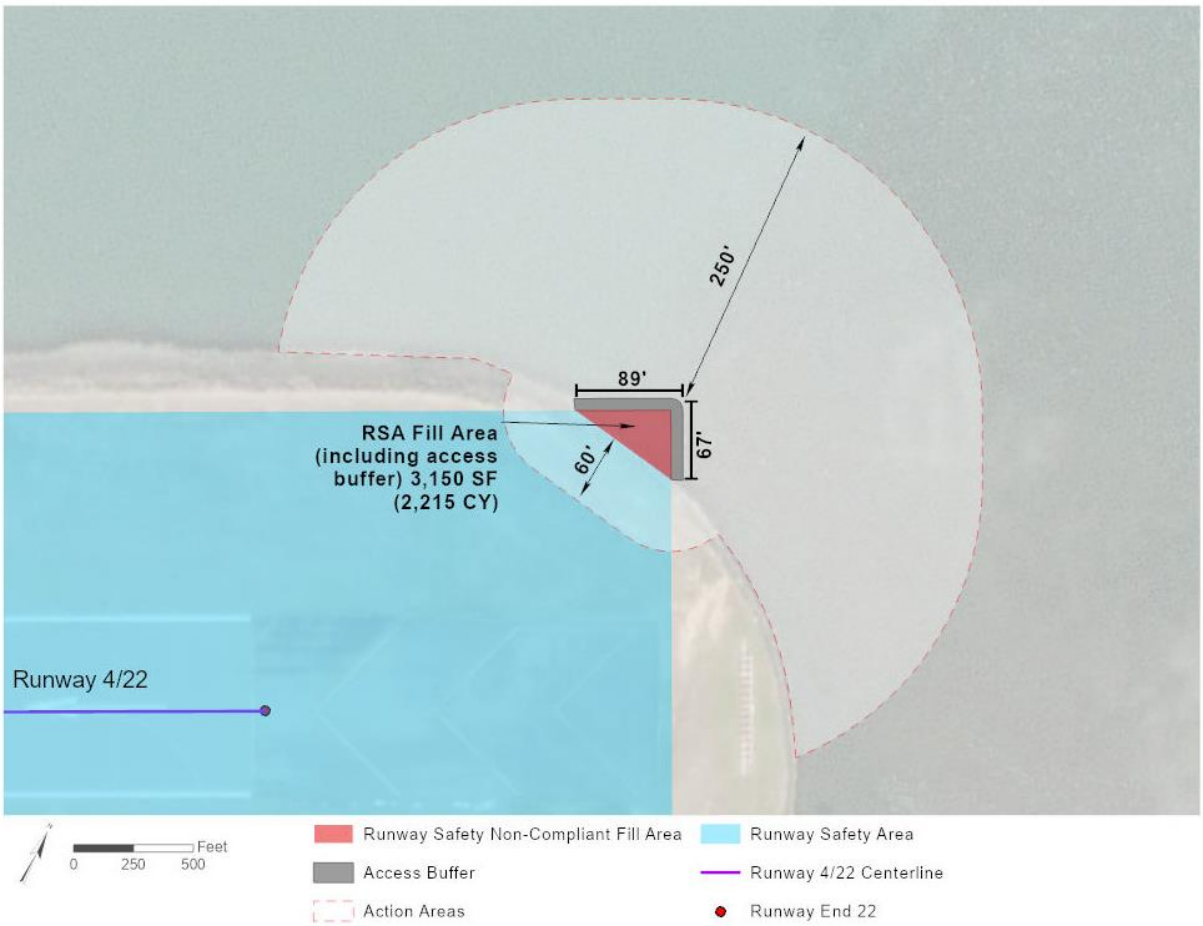

Figure 1: Runway Safety Area Fill and Construction Buffer

A 3,150 square-foot pre-cast concrete block bulkhead will be constructed to form a 0.07-acre (89-foot by 67-foot) triangular surface area at the northeastern corner of Runway 4/22. The bulkhead will be created by using a Mechanically Stabilized Earth (MSE) retaining wall constructed with pre-cast concrete blocks, which was determined to have the smallest construction footprint and have the least environmental

impact on Coos Bay and Pony Slough. The foundation of the bulkhead will be stabilized with sand and 3 inches of rock topped with native slough soils.

Existing riprap cobbles within the construction area will be salvaged and reused for the final structure as armoring stone along the toe of the bulkhead. The armoring would extend slough-ward by approximately 8 feet to dissipate wave energy erosion, decrease scouring and undercutting of the bulkhead structure, and increase structural stability of the bulkhead. To prepare for construction, a temporary single-face sheet pile cofferdam will be installed 12 feet from the exposed slough-ward bulkhead wall for dewatering and excavation of the foundation.

Dewatering of the construction site will be conducted through outflow sediment filters on the west side of the coffer dam to further reduce sedimentation within Pony Slough. Installation and removal of the coffer dam would result in the highest level of turbidity during the course of the project. Work associated with both will be timed with the outflow of tides to reduce the potential for sedimentation on adjacent eelgrass beds. Due to the relative size of the Coos River and proposed timing of in-water work, it is expected that any increase in turbidity would not result in adverse effects.

A 60-foot Action Area on land will be used for vehicle support and construction staging. Construction crews and equipment will access the project site via existing Airport access routes, embankments within the construction area, and floating barges for the installation of the temporary coffer dam. The contractor staging and laydown area will be on land immediately adjacent to the identified construction area.

3. Compensatory Mitigation

3.1 Goals and Objectives

Compensatory mitigation (CM) involves activities conducted by a permittee or third party to create, restore, enhance, or preserve the functions and values of the waters of the state to compensate for the removal/fill-related adverse impacts of project development to waters of the state.

3.2 Ecological Goals

The principal goal of this mitigation plan is to replace the function for the waters of the US that will be lost for the RSA bulkhead construction. The bulkhead site functions as critical habitat for Coho salmon and Southern green sturgeon in the Coos River estuary (Table 1). According to the 2019 Biological Assessment, the impacts on the environmental baseline conditions (habitat Primary Constituent Elements) within the construction area include: 1) the 3,150- square foot permanent adverse modification of critical habitat for

ESA-listed fish, and 2) short-term, localized increases in background turbidity and minor alteration of substrates.[4]

Table 1. ESA-Listed Species with The Potential to Occur within the Project Area

Species	Population (ESU/DPS)	Federal Status	Closest Designated Critical Habitat	Potential Site Use
Coho salmon *Oncorhynchus kisutch*	Oregon Coast ESU	Threatened (76 FR 35755)	Coos Bay	Rearing and migration
Green Sturgeon *Acipenser medirostris*	Southern DPS	Threatened (71 FR 17757)	Coos Bay	Foraging
Eulachon *Thalichthys pacificus*	Southern DPS	Threatened (75 FR 13012)	Approximately 17 miles north of project area at Umpqua River	Rearing and migration

Sources: NMFS (National Marine Fisheries). 2018. Northwest Regional Office, ESA Salmon Listings. http://www.westcoast.fisheries.noaa.gov/index.html.
StreamNet. 2018. Data Query and Critical Habitat Mapper. http://www.streamnet.org/.
USFWS (U.S. Fish and Wildlife Service). 2018. Critical Habitat Mapper. https://ecos.fws.gov/ecp/report/table/critical-habitat.html

3.3 Ecological Objectives

There are two primary objectives of this mitigation plan:

1) to restore functional losses of aquatic critical habitat for ESA-listed fish, and

2) to enhance the project area shoreline to improve habitat for benthic organisms.

The restoration of 8,000 square feet of adjacent critical habitat and Essential Fish Habitat (EFH) eelgrass beds represents a 2:1 ratio over the area of critical habitat permanently adversely modified due to the bulkhead. Restoration will be accomplished by removing creosote piles and remnant dock structures in Pony Slough. The removal of these items will return the substrate to natural conditions and remove impediments to fish migration and foraging habitat within Pony Slough. Improvements in the slough bottom can induce the spread of eelgrass into the area, improving cover from predation and increasing the availability of feeder species. The surrounding Pony Slough estuary includes eelgrass beds that provide complex habitat and are an important foraging area for multiple species, including ESA-listed fish.

In the last phase of construction of the RSA bulkhead, the toe of the eco-block wall will be armored with rip-rap to structurally stabilize the wall, and provide habitat for marine organisms. This new rip-rap toe, as well as adjacent existing rip-rap within 500 feet, will be seeded with crushed oyster shells. This

[4] Mead & Hunt. Biological Assessment for the Southwest Oregon Regional Airport Runway Safety Area Improvements, October 2019. Chapter 4: Environmental Baseline, p.8.

enhancement hopes to provide a fully functioning, three-dimensional bed system that provides associated ecosystem services and biological functions, such as marine biodiversity, shoreline protection, sediment trapping, water quality improvement, and recreational fishing opportunities. If successfully established, the oyster beds will also protect and enhance the adjacent sea grass beds and mitigate for substrate alteration and rip-rap removal during bulkhead construction. [5]

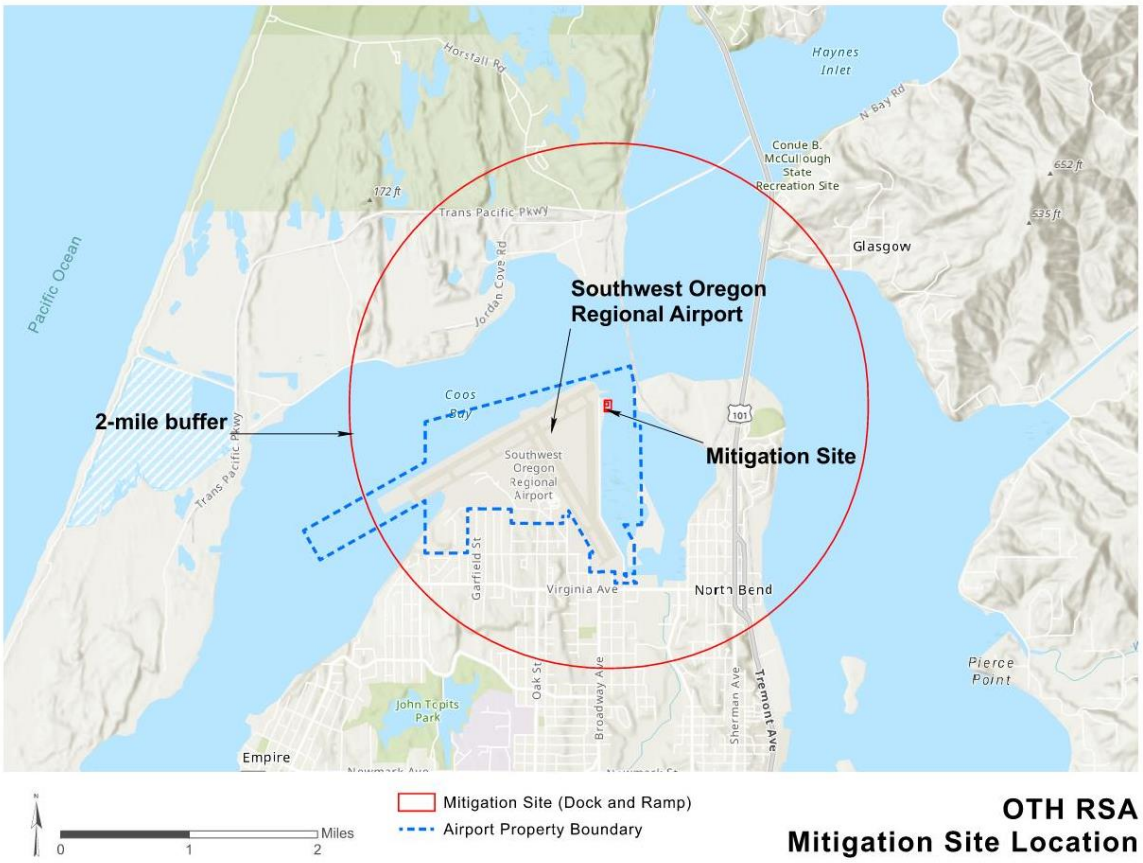

Figure 2: OTH RSA Mitigation Site Location

To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent annual monitoring surveys will be conducted at a similar time during the growing season (e.g. June to early July) using the methodology utilized in baseline surveys conducted in June 2019. Detailed survey methodology is included in **Section 11. Performance Standards/Monitoring Requirements**.

4. Site Selection

Selection of the site was driven primarily by the goal of restoring ecosystem function and providing high-quality habitat for fish. Proximity to project area was also given consideration. The selected sites were

[5] *"NOAA Habitat Conservation | Restoration Center | Restoration Techniques and Monitoring | Oyster Restoration". Habitat.noaa.gov.*

determined to be ecologically suitable for providing the desired compensatory mitigation and are adjacent to existing aquatic resources.

The proposed mitigation sites are located 1,000 feet southeast of the RSA fill bulkhead, east of Runway 4/22 (**Figure 2**). This area is the former location of Ponypoint Park, a City of North Bend facility that accommodated five recreational vehicle camp sites and included a walking trail, a boat ramp, and parking lot. The 3.5-acre mitigation site includes the creosote piles of a boat launch and dock structure within Pony Slough to the east of the paved parking area.

A visual survey of the site identified the structural remnants of an approximate 4,000 square-foot boat dock consisting of at least 68 piles, and an approximate 4,000 square-foot boat ramp with 50 piles and wood planks (**Figure 3**). Exposed piles were found to be creosote coated with metal fasteners.

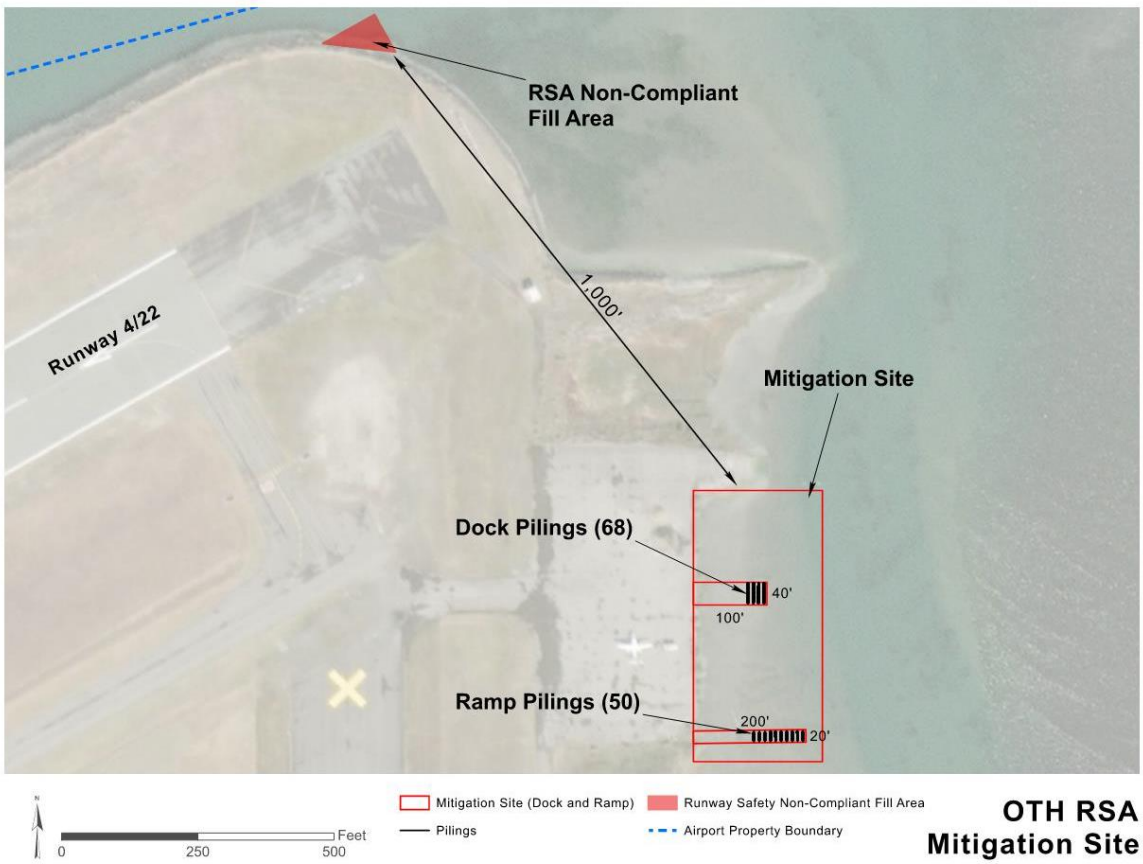

Figure 3: OTH RSA Mitigation Site

Eelgrass beds are located 100 feet from the RSA Fill Action Area and have been designated as EFH, while dispersed eelgrass exists within 30 feet of the construction site. No direct impact to eelgrass is anticipated due to the construction of a coffer dam; however, any in-water work has the potential to increase

sedimentation and turbidity in the surrounding area. Monitoring any potential long-term impacts to eelgrass bed growth will be based on comparing existing and future eelgrass density with an adjacent designated control plot.

Given the existing baseline conditions within the project area and net of in-water/overwater structures, it is reasonably certain that the proposed project will not result in any adverse change to the instream or downstream functions (i.e., hydrologic, geomorphic, biological, or chemical/nutrient) of the Coos River. Potential direct effects of the proposed project on ESA-listed species and their habitats (i.e., hydroacoustic impacts, temporary degraded water quality, and minor alteration of substrates) will be consistent with those addressed under the SLOPES V In-water/Overwater Structures Programmatic Agreement.

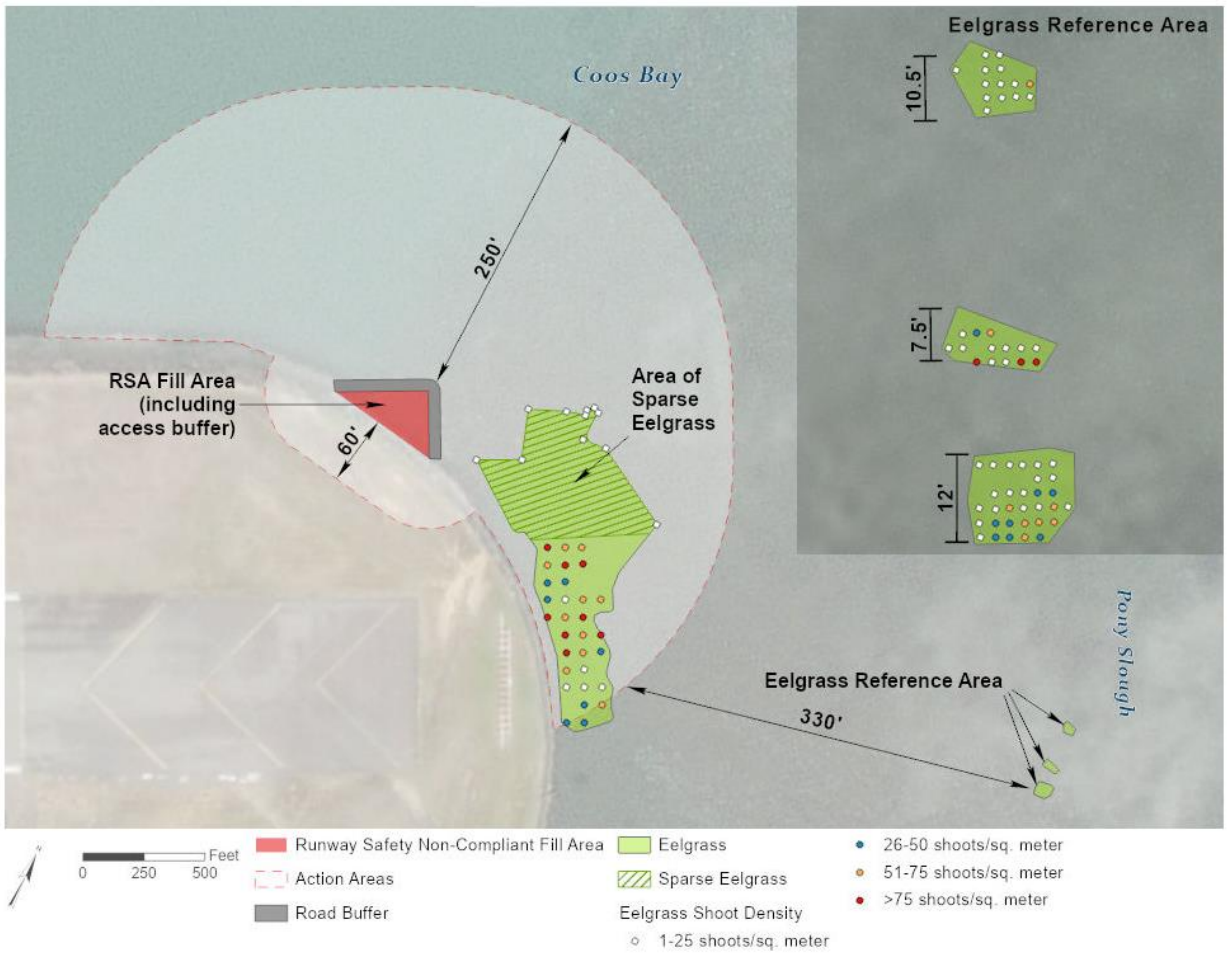

Figure 4: Eelgrass Density Adjacent to RSA Fill Area

5. Easements or Encumbrances

No easements or encumbrances are known to exist. The project site is within tidal water and managed by the Oregon Department of State Lands.

6. Baseline Information

OTH is a triangular-shaped property that is surrounded on multiple sides by the Coos Bay Estuary. The northwest side of the property is surrounded predominantly by the open water of the Coos Bay estuary. The east boundary of OTH is defined by Pony Slough and its estuarine intertidal wetland system.

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. It ranges from 0.5 mile to 1.5 miles wide, is 15 miles long, and has approximately 30 tributaries. The Coos River is the major tributary flowing into Coos Bay and is an important shipping channel. Pony Slough is identified as an estuarine intertidal wetland system (E2USN) by the USFWS National Wetland Inventory (NWI). Freshwater is supplied into the slough by Pony Creek, a perennial stream.

Three federally listed anadromous fish species spend a portion of their lifecycle within the estuarine environment of Coos Bay. Oregon Coast Coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) Green sturgeon (*Acipenser medirostris*), and southern DPS Pacific eulachon (*Thaleichthys pacificus*), were each federally listed as threatened under the Endangered Species Act (ESA). Use of the Coos Bay system by Pacific eulachon and Green sturgeon is sporadic; however, migrating habitat exists for Coho salmon in the RSA Fill Action Area and Coos Bay is considered Critical Habitat for Coho salmon.

Pony Slough has been designated EFH and a Habitat Area of Particular Concern (HAPC) for Coho salmon. EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." A HAPC is a subset of EFH that is rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts.

Estuarine areas are crucial for juvenile salmonids given their multiple functions as areas for rearing/feeding, freshwater-saltwater acclimation, and migration. Nearshore areas also provide important habitat for rearing/feeding and migrating salmonids.[6] Eelgrass supports aquatic organisms, including salmon, by providing food, refuge from predation, and nursery areas. The integrity of nearshore ecosystems where juvenile salmon reside and the capacity of these habitats to provide prey can thus influence overall salmon returns.[7]

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[6] Final Assessment of NOAA Fisheries' Critical Habitat Analytical Review Team (CHART) for the Oregon Coast Coho Salmon Evolutionarily Significant Unit. Accessed February 2020

[7] Eelgrass as Valuable Nearshore Foraging Habitat for Juvenile Pacific Salmon in the Early Marine Period. Accessed February 2020. (https://afspubs.onlinelibrary.wiley.com/doi/pdf/10.1002/mcf2.10018)

Oyster reefs create important habitat for hundreds of other marine species and filter and clean the surrounding water. Species like mussels, barnacles, and sea anemones settle on them, creating abundant food sources for commercially valuable fish species. Oyster reefs provide habitat to forage fish, invertebrates, and other shellfish. Approximately 1 mile away from the project site at the western portion of the airport, significant cockle, shrimp, and bivalve habitat exists in Coos Bay.[8]

Seagrass beds known as eelgrass (*Zostera spp.*) are a major habitat component of Coos Bay and Pony Slough. Vegetated shallows that support eelgrass are considered special aquatic sites under the 404(b)(1) guidelines of the CWA (40 CFR § 230.43). Two eelgrass species are known to be present in this ecoregion, the native *Z. marina* and the non-native *Z. japonica. Z. japonica* was first reported in 1957 in Willapa Bay, Washington, and is thought to have been introduced in the early twentieth century along with oyster stock imported from Japan (Shafer, Kaldy, and Gaeckle 2014).

Both eelgrass species contribute to ecosystem functions at multiple levels: as primary and secondary producers, as habitat structuring elements, as a substrate for epiphytes and epifauna, and as sediment stabilizers and nutrient cycling facilitators. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish such as the Pacific herring. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help ameliorate the effects of ocean acidification.

Creosote has been used as a wood preservative for more than a century to treat telephone poles, railroad ties, piers, docks and floats. Thousands of derelict creosote pilings remain in Oregon coastal waters. Many eventually break up and distribute tons of debris onto beaches throughout the Sound. Creosote comprises more than 300 chemicals that, together, are very effective at achieving their intended purpose of preventing decay or insect infestation.

But chemicals in treated wood—such as those on beaches or old dock pilings—can be harmful and even toxic to marine species. Polycyclic aromatic hydrocarbons (PAHs) are the chemicals of most concern. When exposed to ultraviolet light or sunshine, the chemicals in creosote become more toxic and are more likely to leach from the wood. A piling that contains creosote can leach throughout its lifetime. Studies show that herring eggs exposed to creosote have a high mortality rate. PAHs are known to increase disease and alter growth and reproductive function in English sole. These chemicals affect juvenile salmonids that migrate through contaminated estuaries by reducing their growth and altering immune function.[9]

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[8] https://www.dfw.state.or.us/mrp/shellfish/docs/SEACOR%20environmental%20all.pdf

[9] Washington Department of Natural Resources Derelict Creosote Piling Removal Best Management Practices For Pile Removal & Disposal

7. Mitigation Work Plan

All work will take place during the OR DEQ designated in-water work window (IWWW) of October 1 – February 15, the period during which ESA-listed species are least likely to be present within the vicinity of the project area. The proposed project will require approximately four to eight weeks of in-water/overwater work. Construction crews and equipment will access the project site from the shoreline and from a floating barge. The existing dock and pier (approximately 8,000 square feet total) and 118 pilings will be removed with a crane and/or excavator operating from a floating barge. Removal of any sections of sunken dock and/or pier will occur at low tide so workers can locate and remove the debris without causing turbidity. The 118 existing pilings will be dislodged with a vibratory hammer and slowly lifted from the sediment and placed into a contained area for appropriate upland disposal. No dredging or excavation will be required.

Piling and other structure removal includes untreated and chemically treated wood pilings, piers, boat docks and potentially other structures comprised of plastic, concrete, and other materials. Piling and other structure removal from waterways will improve water quality by eliminating chronic sources of toxic contamination and associated impacts to riparian dependent species. Pilings and other structures occur in estuaries, lakes, and rivers and are typically used in association with boat docks and other facilities. Equipment such as boats, barges, excavators, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

When removing an intact pile:

- Install a floating surface boom to capture floating surface debris.
- To the extent possible, keep all equipment (e.g., bucket, steel cable, vibratory hammer) out of the water, grip piles above the waterline, and complete all work during low water and low current conditions.
- Dislodge the piling with a vibratory hammer, whenever feasible. Never intentionally break a pile by twisting or bending.
- Slowly lift piles from the sediment and through the water column.
- Place chemically treated piles in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment. A containment basin for the removed piles and any adhering sediment may be constructed of durable plastic sheeting with sidewalls supported by hay bales or another support structure to contain all sediment.
- Fill the holes left by each piling with clean, native sediments located from the project area.

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https://www.dnr.wa.gov/publications/aqr_rest_creosote_bmps_pilings.pdf?w8th9

- Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.

When removing a broken pile:

- If a pile breaks above the surface of uncontaminated sediment, or less than 2 feet below the surface, every attempt short of excavation will be made to remove it entirely. If the pile cannot be removed without excavation, excavate sediments and saw the stump off at least 3 feet below the surface of the sediment.
- If a pile breaks above contaminated sediment, saw the stump off at the sediment line: if a pile breaks within contaminated sediment, make no further effort to remove it and cover the hole with a cap of clean substrate appropriate for the site.
- If dredging is likely in the area of piling removal, use a global positioning device (GPS) to note the location of all broken piles for future use in site debris characterization.[10]

Measures to Minimize Impacts: The following conservation measures have been incorporated into the proposed project design and construction methods to minimize and avoid potential adverse effects to ESA- listed fish species, their designated Critical Habitat elements, and Essential Fish Habitat:

- All work conducted below the Highest Median Tide (HMT) will occur during the OR DEQ-preferred IWWW for the Coos River estuary (October 1 – February 15), a period when ESA-listed species are less likely to be present within the vicinity of the project area.
- All heavy equipment (i.e., crane) will access the project site via existing piers and/or floating barges.
- All pilings will be removed with a vibratory hammer. During piling removal, the following criteria will be implemented to minimize creosote release, sediment disturbance and sediment resuspension:
    - Install a floating surface boom to capture floating surface debris.
    - Consider the best tidal condition for piling removal, try to remove in-the-dry.
    - Keep all equipment (e.g., bucket, cable, vibratory hammer) out of the water, grip piles above the waterline, and complete work during low water and low current conditions.
    - Dislodge piling with a vibratory hammer, when possible; never intentionally break a pile.
    - "Wake" the piling by vibrating to break the friction bond between the piling and sediment.
    - Slowly lift the pile from the sediment and through the water column.
    - Place the pile in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment.
    - Fill the holes left by each piling with clean, native sediments immediately upon removal.

[10] Removal of Creosote-Treated Pilings and Structures from San Francisco Bay-Environmental Assessment https://www.sfei.org/sites/default/files/biblio_files/ReportNo605_Creosote_Dec2010_finalJan13.pdf

  - Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.
- When a pile breaks or is intractable during removal, removal will continue as follows:
  - Every attempt short of excavation will be made to remove each piling, if a pile in uncontaminated sediment is intractable, breaks above the surface, or breaks below the surface, cut the pile or stump off at least 3 feet below the surface of the sediment.
- The following conditions will apply when removing preservative-treated wood:
  - To the extent possible, ensure no wood debris falls into the water. If wood debris does fall into the water, remove it immediately.
  - Wood debris will be placed in an appropriate dry storage site until removed from the site.
  - Wood construction debris will not be left in the water or stacked on the bank or below HMT.
  - Wood debris removed during the project will be evaluated to ensure proper disposal.
- The contractor will initiate daily "soft-start" procedures to provide a warning and/or give species near piling removal and installation activities a chance to leave the area prior to a vibratory hammer or impact driver operating at full capacity; thereby, exposing fewer species to loud underwater and airborne sounds.
  - A soft start procedure will be used at the beginning of in-water piling removal and installation, or any time piling removal/installation has ceased for more than 30 minutes.
  - For vibratory hammer operation, the contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.
  - For impact pile driving (if necessary), the contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets. (The reduced energy of an individual hammer cannot be quantified given the variations between individual drivers. In addition, the number of strikes will vary at reduced energy given that raising the hammer at less than full power and then releasing it results in the hammer bouncing as it strikes the pile, resulting in multiple strikes).
- A Pollution Control Plan (PCP) will be prepared by the contractor and carried out commensurate with the scope of the project that includes the following:
  - Best management practices to confine, remove, and dispose of construction waste.
  - Procedures to contain and control a spill of any hazardous material.
- All conditions of Oregon Department of Environmental Quality's (ODEQ's) 401 Water Quality Certification will be followed.
- All equipment will be inspected daily for fluid leaks. Any leaks detected will be repaired before operation is resumed. Stationary power equipment (i.e., cranes) operated within 150 feet of the river will be diapered to prevent leaks.
- All new pilings will be fitted with devices to prevent perching by piscivorous birds.

- All floatation material will be permanently encapsulated to prevent dispersal into the water.
- Replacement overwater piers and floats will be grated to allow for 50 percent light penetration.
- The proposed project will result in a net reduction of approximately 7 square feet of existing overwater area and will result in a net reduction of in-water pilings.

8. Determination of Credits

The construction of the RSA bulkhead is unavoidable and presents the lowest possible impact to EFH and ESA-listed critical habitat. Mitigation of the creosote contamination in Pony Slough proposes a 2:1 ratio. The project has a high likelihood of success and provides a much higher functioning estuarine habitat in Pony Slough than the impact site. Since the likelihood of success is greater and the impacts to potentially valuable migration corridors are reduced during construction, aquatic resource restoration is the best option for permittee-responsible mitigation.

9. Monitoring Plan

Based on the potential for in-water impacts to EFH adjacent to Runway 4/22 during construction, additional BMPs will be put in place to monitor water quality. The construction schedule will be timed to adhere to OR DEQ in-water work windows for the Coos River (October 1 – February 15) and tidal outflows. Sediment outflow filters will be utilized during dewatering to minimize turbidity in Coos Bay.

A 2-year post-construction monitoring plan for eelgrass presence/absence (within 100 feet in deeper habitat) and density (>100 feet in shallow habitat) will be compared with an adjacent control site to monitor potential impacts of the project on EFH. See the attached Biological Assessment for more details/

10. Site Protection Instrument

The project site is within tidal waters and managed by the Oregon Department of State Lands.

11. Performance Standards / Monitoring Requirements

Due to the avoidance and minimization measures described previously, this project is not likely to adversely affect EFH (eelgrass). However, a 2-year monitoring plan will be implemented in order to assess the potential for indirect effects to eelgrass as a result of project construction. To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent monitoring surveys will be conducted at a similar time during the growing season (e.g. June - early July) and using the same methodology as the baseline surveys conducted in June 2019. Analysis of the monitoring data will focus on detecting changes in the location of the eelgrass bed boundary, total areal coverage of eelgrass within a 250-foot radius of the project footprint, and changes in eelgrass shoot density.

Baseline surveys were conducted in June 2019 to delineate and characterize eelgrass beds in the vicinity of the proposed Action Area. June 3 and 4, 2019 were identified as appropriate sampling dates for the survey based on a strong minus morning low tide to maximize dewatering of the bay and resultant exposure of Z. marina. The survey team identified and delineated the boundaries and spatial distribution of the eelgrass beds in accordance with the protocols outlined in the document US Army Corps of Engineers Seattle District (2018), using the eelgrass bed edge definition described in NOAA Fisheries Western Region (2014).

To remain consistent with the 2019 baseline survey, monitoring surveys will consider eelgrass beds continuous if any eelgrass is within a one square meter quadrat and within one meter of another shoot. In areas where there are too few native eelgrass shoots to meet the bed thresholds described above, the survey map will indicate that widely scattered or sparse eelgrass shoots are present in the area, with no discernable beds. Within each bed, eelgrass shoot density will be measured using a series of ¼ square meter plots arranged in a regularly spaced grid. The positions of the survey points will be shown on GIS mapping. Data values will be converted to numbers of eelgrass shoots per square meter. Baseline surveys were also conducted in a reference area for use in interpreting the results of subsequent eelgrass monitoring surveys.

12. Maintenance/Long-term/Adaptive Management Plan

Creosote removal has proven to have such a high success rate for water quality restoration that the Washington Department of Natural Resources has removed 21,300 tons from the Puget Sound area in the last 15 years. Once conditions improve, eelgrass will naturally colonize the site and ongoing maintenance will not be necessary. Similarly, oyster seeding only requires an initial application, with no maintenance necessary. The proposed mitigation will not require maintenance nor long-term planning.

13. Financial Assurances

As a small primary, reliever, and general aviation airport, FAA Airport Improvement Project (AIP) grants cover a range of 90-95 percent of eligible costs, based on statutory requirements. The funding for this project is currently part of the 2021 AIP funding cycle, which includes mitigation as part of the construction of the RSA fill bulkhead.

Appendix J
Oregon Biodiversity Database

Biodiversity Report

43.4236°N, -124.2407°W

Location Information

Latitude:	43°25'25"N	Longitude:	-124°14'26"W
Latitutde (Decimal Minutes):	43°25.4167'N	Longitude (Decimal Minutes):	-124°14.4333'W
Latitutde (Decimal Degrees):	43.4236°N	Longitude (Decimal Degrees):	-124.2407°W
USGS Quad:	North Bend, 43124-D2	Maidenhead Grid Square (ARRL):	CN73VK
Legal (Township Range Section):	Section 9 of Township S25, Range W13	County:	Coos County
Magnetic Declination:	Not Available		
Elevation:	0.38 meters, 1.26 ft	Avg Annual Precipitation:	64 in (inches)
Watershed (10 Digit HUC):	Coos Bay-Frontal Pacific Ocean (1710030403)		
Sub-watershed (12 Digit HUC):	Coos Bay (171003040306)		
Fire Protection District:	SOA	ODF Regulated Use:	CS-1
Fire Weather Zone:	615	ODFW Wildlife Management Unit:	SIXES
Public Ownership:	Not Available		

Animal Species (Aquatic Habitat Associated) in Sub-watershed Coos Bay (171003040306)

*** See Appendix for Status and Rank Code Lookup*

1	Western pond turtle	*Actinemys marmorata*	Relative Abundance Index: *0.78*			
	Global Rank: *G3G4*	Federal Status: *SOC*	View in Wildlife Viewer			
	State Rank: *S2*	State Rank: *SC*	View Habitat Map (pdf)			
	FPA:	Strategy Species: *Y*				
2	Western toad	*Anaxyrus boreas*	Relative Abundance Index: *0.92*			
	Global Rank: *G4*	Federal Status:	View in Wildlife Viewer			
	State Rank: *S4*	State Rank: *S*	View Habitat Map (pdf)			
	FPA:	Strategy Species: *Y*				
3	White-footed vole	*Arborimus albipes*	Relative Abundance Index: *0.08*			
	Global Rank: *G3G4*	Federal Status:	View in Wildlife Viewer			
	State Rank: *S3S4*	State Rank:	View Habitat Map (pdf)			
	FPA:	Strategy Species:				
4	Great blue heron	*Ardea herodias*	Relative Abundance Index: *0.74*			
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer			
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)			
	FPA: *Y*	Strategy Species:				
5	Coastal tailed frog	*Ascaphus truei*	Relative Abundance Index: *0.75*			
	Global Rank: *G4*	Federal Status:	View in Wildlife Viewer			
	State Rank: *S3*	State Rank: *S*	View Habitat Map (pdf)			
	FPA:	Strategy Species: *Y*				
6	Marbled murrelet	*Brachyramphus marmoratus*	Relative Abundance Index: *0.57*			
	Global Rank: *G3*	Federal Status: *LT*	View in Wildlife Viewer			
	State Rank: *S2B*	State Rank: *LT*	View Habitat Map (pdf)			
	FPA: *Y*	Strategy Species: *Y*				

Biodiversity Report

43.4236°N, -124.2407°W

7	Green heron	*Butorides virescens*	Relative Abundance Index: *0.98*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
8	Vaux's swift	*Chaetura vauxi*	Relative Abundance Index: *0.73*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4B*	State Rank:				
FPA:	Strategy Species:				
9	Snowy plover	*Charadrius nivosus*	Relative Abundance Index:		
Global Rank: *G3*	Federal Status: *PS:LT*				
State Rank: *S2*	State Rank: *LT*				
FPA:	Strategy Species:				
10	Olive-sided flycatcher	*Contopus cooperi*	Relative Abundance Index: *0.63*		
Global Rank: *G4*	Federal Status:				
State Rank: *S2S3B*	State Rank: *S/SC*				
FPA:	Strategy Species: *Y*				
11	Townsend's big-eared bat	*Corynorhinus townsendii*	Relative Abundance Index:		
Global Rank: *G4*	Federal Status:				
State Rank: *S2*	State Rank: *SC*				
FPA:	Strategy Species: *Y*				
12	Pacific giant salamander	*Dicamptodon tenebrosus*	Relative Abundance Index: *0.73*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
13	Willow flycatcher	*Empidonax traillii*	Relative Abundance Index: *0.83*		
Global Rank: *G5*	Federal Status: *PS*				
State Rank: *S3B*	State Rank:				
FPA:	Strategy Species: *Y*				
14	Big brown bat	*Eptesicus fuscus*	Relative Abundance Index: *0.84*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
15	Tufted puffin	*Fratercula cirrhata*	Relative Abundance Index:		
Global Rank: *G5*	Federal Status:				
State Rank: *S1B*	State Rank: *SC*				
FPA:	Strategy Species: *Y*				
16	Bald eagle	*Haliaeetus leucocephalus*	Relative Abundance Index: *0.73*		
Global Rank: *G5*	Federal Status: *DL*				
State Rank: *S4B,S4N*	State Rank:				
FPA: *Y*	Strategy Species:				
17	Yellow-breasted chat	*Icteria virens*	Relative Abundance Index: *0.1*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4B*	State Rank: *SC*				
FPA:	Strategy Species: *Y*				

View in Wildlife Viewer
View Habitat Map (pdf)

Biodiversity Report

43.4236°N, -124.2407°W

18	Silver-haired bat	*Lasionycteris noctivagans*	Relative Abundance Index: *0.63*		
Global Rank: *G3G4*	Federal Status:				
State Rank: *S3S4*	State Rank: *S*				
FPA:	Strategy Species: *Y*				
19	Hoary bat	*Lasiurus cinereus*	Relative Abundance Index: *0.74*		
Global Rank: *G3G4*	Federal Status:				
State Rank: *S3*	State Rank: *S*				
FPA:	Strategy Species: *Y*				
20	Hooded merganser	*Lophodytes cucullatus*	Relative Abundance Index: *0.91*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
21	Common merganser	*Mergus merganser*	Relative Abundance Index: *1.2*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
22	California myotis	*Myotis californicus*	Relative Abundance Index: *0.78*		
Global Rank: *G5*	Federal Status:				
State Rank: *S3*	State Rank: *S*				
FPA:	Strategy Species: *Y*				
23	Long-eared myotis	*Myotis evotis*	Relative Abundance Index: *0.76*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
24	Little brown myotis	*Myotis lucifugus*	Relative Abundance Index: *0.79*		
Global Rank: *G3*	Federal Status:				
State Rank: *S3*	State Rank:				
FPA:	Strategy Species:				
25	Long-legged myotis	*Myotis volans*	Relative Abundance Index: *0.76*		
Global Rank: *G4G5*	Federal Status:				
State Rank: *S3*	State Rank: *S*				
FPA:	Strategy Species: *Y*				
26	Yuma myotis	*Myotis yumanensis*	Relative Abundance Index: *0.83*		
Global Rank: *G5*	Federal Status:				
State Rank: *S3*	State Rank:				
FPA:	Strategy Species:				
27	Black-crowned night-heron	*Nycticorax nycticorax*	Relative Abundance Index: *0.23*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
28	Coho salmon (Oregon Coast ESU)	*Oncorhynchus kisutch pop. 3*	Relative Abundance Index: *1.85*		
Global Rank: *G5T2Q*	Federal Status: *LT*				
State Rank: *S2*	State Rank: *S*				
FPA: *Y*	Strategy Species: *Y*				

Biodiversity Report

43.4236°N, -124.2407°W

29 Steelhead (Oregon Coast ESU, winter run) *Oncorhynchus mykiss pop. 31* Relative Abundance Index: *1.72*

Global Rank: *G5T2T3Q* Federal Status: *SOC*
State Rank: *S2S3* State Rank:
FPA: Strategy Species:

30 Band-tailed pigeon *Patagioenas fasciata* Relative Abundance Index: *0.63*

Global Rank: *G4* Federal Status:
State Rank: *S3B* State Rank:
FPA: *Y* Strategy Species:

View in Wildlife Viewer
View Habitat Map (pdf)

31 Dunn's salamander *Plethodon dunni* Relative Abundance Index: *0.74*

Global Rank: *G4* Federal Status:
State Rank: *S4* State Rank:
FPA: Strategy Species:

View in Wildlife Viewer
View Habitat Map (pdf)

32 Red-necked grebe *Podiceps grisegena* Relative Abundance Index:

Global Rank: *G5* Federal Status:
State Rank: *S1B,S4N* State Rank: *SC*
FPA: Strategy Species: *Y*

View in Wildlife Viewer
View Habitat Map (pdf)

33 Purple martin *Progne subis* Relative Abundance Index: *1.02*

Global Rank: *G5* Federal Status:
State Rank: *S2B* State Rank: *SC*
FPA: Strategy Species: *Y*

View in Wildlife Viewer
View Habitat Map (pdf)

34 Southern torrent salamander *Rhyacotriton variegatus* Relative Abundance Index: *0.62*

Global Rank: *G3G4* Federal Status:
State Rank: *S3* State Rank: *S*
FPA: Strategy Species: *Y*

View in Wildlife Viewer
View Habitat Map (pdf)

35 Yellow warbler *Setophaga petechia* Relative Abundance Index:

Global Rank: *G5* Federal Status: *PS:LE*
State Rank: *S4B* State Rank:
FPA: Strategy Species:

View in Wildlife Viewer
View Habitat Map (pdf)

36 Pacific water shrew *Sorex bendirii* Relative Abundance Index: *0.69*

Global Rank: *G4* Federal Status:
State Rank: *S4* State Rank:
FPA: Strategy Species:

View in Wildlife Viewer
View Habitat Map (pdf)

37 Vagrant shrew *Sorex vagrans* Relative Abundance Index: *0.82*

Global Rank: *G5* Federal Status:
State Rank: *S4* State Rank:
FPA: Strategy Species:

View in Wildlife Viewer
View Habitat Map (pdf)

38 Northern rough-winged swallow *Stelgidopteryx serripennis* Relative Abundance Index: *1.49*

Global Rank: *G5* Federal Status:
State Rank: *S4* State Rank:
FPA: Strategy Species:

View in Wildlife Viewer
View Habitat Map (pdf)

Biodiversity Report

43.4236°N, -124.2407°W

Animal Species in Sub-watershed

Coos Bay (171003040306)

*** See Appendix for Status and Rank Code Lookup*

1	Cooper's hawk	*Accipiter cooperii*	Relative Abundance Index: *0.64*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
2	Sharp-shinned hawk	*Accipiter striatus*	Relative Abundance Index: *0.7*		
	Global Rank: *G5*	Federal Status: *PS*	View in Wildlife Viewer		
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
3	Northern saw-whet owl	*Aegolius acadicus*	Relative Abundance Index: *0.57*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4?*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
4	Clouded salamander	*Aneides ferreus*	Relative Abundance Index: *0.72*		
	Global Rank: *G3G4*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S3S4*	State Rank: *S*	View Habitat Map (pdf)		
	FPA:	Strategy Species: *Y*			
5	Red tree vole	*Arborimus longicaudus*	Relative Abundance Index: *0.57*		
	Global Rank: *G3G4*	Federal Status: *PS:C*	View in Wildlife Viewer		
	State Rank: *S3*	State Rank: *S*	View Habitat Map (pdf)		
	FPA:	Strategy Species: *Y*			
6	Lesser goldfinch	*Carduelis psaltria*	Relative Abundance Index: *0.1*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
7	Hermit thrush	*Catharus guttatus*	Relative Abundance Index: *1*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
8	Swainson's thrush	*Catharus ustulatus*	Relative Abundance Index: *0.63*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4S5B*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
9	Brown creeper	*Certhia americana*	Relative Abundance Index: *0.68*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			
10	Western wood-pewee	*Contopus sordidulus*	Relative Abundance Index: *0.72*		
	Global Rank: *G5*	Federal Status:	View in Wildlife Viewer		
	State Rank: *S4*	State Rank:	View Habitat Map (pdf)		
	FPA:	Strategy Species:			

Biodiversity Report

43.4236°N, -124.2407°W

11	Pileated woodpecker	*Dryocopus pileatus*	Relative Abundance Index: *0.67*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank: *S*				
FPA:	Strategy Species: *Y*				
12	Pacific slope flycatcher	*Empidonax difficilis*	Relative Abundance Index: *0.55*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4B*	State Rank:				
FPA:	Strategy Species:				
13	Hammond's flycatcher	*Empidonax hammondii*	Relative Abundance Index: *0.58*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
14	Macgillivray's warbler	*Geothlypis tolmiei*	Relative Abundance Index: *0.63*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4B*	State Rank:				
FPA:	Strategy Species:				
15	Northern pygmy-owl	*Glaucidium gnoma*	Relative Abundance Index: *0.63*		
Global Rank: *G4G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
16	Humboldt's flying squirrel	*Glaucomys oregonensis*	Relative Abundance Index: *0.7*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
17	Purple finch	*Haemorhous purpureus*	Relative Abundance Index: *0.72*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4?*	State Rank:				
FPA:	Strategy Species:				
18	Varied thrush	*Ixoreus naevius*	Relative Abundance Index: *0.57*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
19	Snowshoe hare	*Lepus americanus*	Relative Abundance Index: *0.06*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
20	Red crossbill	*Loxia curvirostra*	Relative Abundance Index: *0.66*		
Global Rank: *G5*	Federal Status:				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				
21	Bobcat	*Lynx rufus*	Relative Abundance Index: *0.73*		
Global Rank: *G5*	Federal Status: *PS:LE,PDL*				
State Rank: *S4*	State Rank:				
FPA:	Strategy Species:				

View in Wildlife Viewer
View Habitat Map (pdf)

Biodiversity Report

43.4236°N, -124.2407°W

22	Pacific marten	*Martes caurina*	Relative Abundance Index:		
	Global Rank: *G4G5*	Federal Status: *PS:LT*			
	State Rank: *S3S4*	State Rank: *S*			View in Wildlife Viewer
	FPA:	Strategy Species: *Y*			View Habitat Map (pdf)
23	Western screech-owl	*Megascops kennicottii*	Relative Abundance Index: *0.75*		
	Global Rank: *G4G5*	Federal Status:			
	State Rank: *S4?*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
24	Western red-backed vole	*Myodes californicus*	Relative Abundance Index: *0.62*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
25	Townsend's chipmunk	*Neotamias townsendii*	Relative Abundance Index: *0.7*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
26	Shrew-mole	*Neurotrichus gibbsii*	Relative Abundance Index: *0.66*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
27	Mountain quail	*Oreortyx pictus*	Relative Abundance Index: *0.65*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S3S4*	State Rank: *S*			View in Wildlife Viewer
	FPA:	Strategy Species: *Y*			View Habitat Map (pdf)
28	Nashville warbler	*Oreothlypis ruficapilla*	Relative Abundance Index: *0.78*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4?B*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
29	Lazuli bunting	*Passerina amoena*	Relative Abundance Index: *0.09*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4B*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
30	Gray jay	*Perisoreus canadensis*	Relative Abundance Index: *0.63*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
31	Downy woodpecker	*Picoides pubescens*	Relative Abundance Index: *0.72*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)
32	Hairy woodpecker	*Picoides villosus*	Relative Abundance Index: *0.68*		
	Global Rank: *G5*	Federal Status:			
	State Rank: *S4*	State Rank:			View in Wildlife Viewer
	FPA:	Strategy Species:			View Habitat Map (pdf)

Biodiversity Report

43.4236°N, -124.2407°W

33	Vesper sparrow	*Pooecetes gramineus*	Global Rank: *G5*	Federal Status:	Relative Abundance Index:
			State Rank: *S4B*	State Rank: *SC*	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
34	Golden-crowned kinglet	*Regulus satrapa*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.64*
			State Rank: *S3*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
35	Townsend's mole	*Scapanus townsendii*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.77*
			State Rank: *S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
36	Allen's hummingbird	*Selasphorus sasin*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.15*
			State Rank: *S3S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
37	Hermit warbler	*Setophaga occidentalis*	Global Rank: *G4G5*	Federal Status:	Relative Abundance Index: *0.56*
			State Rank: *S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
38	Western bluebird	*Sialia mexicana*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.73*
			State Rank: *S4B,S4N*	State Rank: *S*	View in Wildlife Viewer
			FPA:	Strategy Species: *Y*	View Habitat Map (pdf)
39	Pacific shrew	*Sorex pacificus*	Global Rank: *GNR*	Federal Status:	Relative Abundance Index: *0.95*
			State Rank: *S3S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
40	Fog shrew	*Sorex sonomae*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.68*
			State Rank: *S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
41	Trowbridge's shrew	*Sorex trowbridgii*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.66*
			State Rank: *S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
42	Red-breasted sapsucker	*Sphyrapicus ruber*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.66*
			State Rank: *S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)
43	Western spotted skunk	*Spilogale gracilis*	Global Rank: *G5*	Federal Status:	Relative Abundance Index: *0.81*
			State Rank: *S4*	State Rank:	View in Wildlife Viewer
			FPA:	Strategy Species:	View Habitat Map (pdf)

Biodiversity Report

43.4236°N, -124.2407°W

44	Chipping sparrow	*Spizella passerina*		Relative Abundance Index: *0.67*	
	Global Rank: *G5*	Federal Status:			*View in Wildlife Viewer*
	State Rank: *S4B*	State Rank:	*S*		*View Habitat Map (pdf)*
	FPA:	Strategy Species:	*Y*		
45	Spotted owl	*Strix occidentalis*		Relative Abundance Index:	
	Global Rank: *G3G4*	Federal Status:	*LT*		*View in Wildlife Viewer*
	State Rank: *S3*	State Rank:	*LT*		*View Habitat Map (pdf)*
	FPA:	Strategy Species:	*Y*		
46	Western meadowlark	*Sturnella neglecta*		Relative Abundance Index:	
	Global Rank: *G5*	Federal Status:			*View in Wildlife Viewer*
	State Rank: *S4*	State Rank:	*SC*		*View Habitat Map (pdf)*
	FPA:	Strategy Species:	*Y*		
47	Common gray fox	*Urocyon cinereoargenteus*		Relative Abundance Index: *0.74*	
	Global Rank: *G5*	Federal Status:			*View in Wildlife Viewer*
	State Rank: *S4*	State Rank:			*View Habitat Map (pdf)*
	FPA:	Strategy Species:			
48	Cassin's vireo	*Vireo cassinii*		Relative Abundance Index: *0.63*	
	Global Rank: *G5*	Federal Status:			*View in Wildlife Viewer*
	State Rank: *S4?B*	State Rank:			*View Habitat Map (pdf)*
	FPA:	Strategy Species:			
49	Hutton's vireo	*Vireo huttoni*		Relative Abundance Index: *0.64*	
	Global Rank: *G5*	Federal Status:			*View in Wildlife Viewer*
	State Rank: *S4*	State Rank:			*View Habitat Map (pdf)*
	FPA:	Strategy Species:			
50	Pacific jumping mouse	*Zapus trinotatus*		Relative Abundance Index: *0.71*	
	Global Rank: *G5*	Federal Status:			*View in Wildlife Viewer*
	State Rank: *S4*	State Rank:			*View Habitat Map (pdf)*
	FPA:	Strategy Species:			

Biodiversity Report

43.4236°N, -124.2407°W

Ecological Systems in Sub-watershed
Coos Bay (171003040306)

Central Coast Range Ecosection

	Ecological System	Relative Abundance Index
1	*Developed, High Intensity*	*19.175019*
2	*Developed, Medium Intensity*	*17.7178*
3	*Estuary or Intertidal Mudflat*	*13.872903*
4	*Developed, Low Intensity*	*9.670236*
5	*Coastal Cliff, Bluff and Headland*	*8.417362*
6	*Westside Cliff and Canyon*	*8.417362*
7		*7.947635*
8	*Coastal Pine or Cypress*	*6.664636*
9	*Coastal Salt Marsh*	*6.02578*
10	*Westside Freshwater Marsh*	*5.707686*
11	*North Pacific Coastal Sand Dune*	*5.19896*
12	*Dune Wetland*	*5.142664*
13	*California Lowland Riparian*	*3.751785*
14	*Subtidal Salt and Brackish Aquatic Bed*	*3.2859*
15	*Coast Redwood or Port Orford Cedar*	*3.028635*
16	*Freshwater Aquatic Bed*	*2.678563*
17	*Harvested Forest - Shrub Regeneration*	*2.263058*
18	*Tidal Freshwater Wetland*	*2.005537*
19	*Red Alder or Bigleaf Maple*	*1.71249*
20	*Developed, Open Space (Roads, Parks, Golf Courses, Open Space)*	*0.991461*
21	*Westside Grass Bald or Bluff*	*0.904432*
22	*Westside Forested or Shrub Wetland*	*0.853724*
23	*Water*	*0.759977*
24	*Sitka Spruce*	*0.733918*
25	*Harvested Forest - Tree Regeneration*	*0.723126*
26	*Agriculture - Irrigated*	*0.708647*
27	*Freshwater Mudflat*	*0.623666*
28	*Big Leaf Maple - Douglas-fir*	*0.537702*
29	*Westside Lowland Riparian*	*0.523092*
30	*Moist-site Western Hemlock - Douglas-fir*	*0.491552*
31	*Northern California Coastal Scrub*	*0.269315*
32	*Agriculture - Hay/pasture*	*0.217497*
33	*Westside Valley Wet Prairie*	*0.167979*
34	*Oregon White Oak*	*0.147619*
35	*Recently Burned Forest*	*0.041566*
36	*Harvested Forest - Herbaceous Regeneration*	*0.039781*

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37	*Dry-site Douglas-fir - Western Hemlock*	*0.000157*

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Appendix- Keys Codes and Source Information

Latitude: Degrees north of the equator measured in Degrees Minutes Seconds (DMS), Degrees and decimal minutes, and decimal degrees.

Longitude: Degrees west of Greenwich measured in Degrees Minutes Seconds (DMS), Degrees and decimal minutes, and decimal degrees.

Legal: The Public Land Survey System (PLS), Willamette Baseline and Meridian, quarter quarter section, township, and range.

Elevation: The approximate elevation, derived from the 10 meter Digital Elevation Models (DEM).

County: The county in Oregon.

Public Ownership: The generalized public ownership.

Fire Protection District: The Oregon Department of Forestry Fire Protection district.

USGS Quad Name and #: The USGS 7.5 minute quadrangle and "Ohio" code, composed of the 1 degree block, row & column numbers.

Watershed (10 Digit HUC): The Hydrologic Unit Code (HUC), formerly known as the 5th field HUC.

Sub-watershed (12 Digit HUC): The Hydrologic Unit (HUC), formerly known as the 6th field HUC.

Fire Weather Zone: The Oregon Department of Forestry fire weather zone.

Regulated Use: The Oregon Department of Forestry regulated use code.

Rainfall: The approximate rainfall range, derived from Oregon Climate Service PRISM.

Wildlife Management Unit: The Oregon Department of Fish and Wildlife (ODFW) Wildlife management unit.

Magnetic Declination 2009: The magnetic declination for 2009.

Maidenhead Locator Grid Square: An instrument of the *Maidenhead Locator System* (named after the town outside London where it was first conceived by a meeting of European VHF managers in 1980), a grid square measures 1° latitude by 2° longitude and measures approximately 70 × 100 miles in the continental US. A grid square is indicated by two letters (the *field*) and two numbers (the *square*). This is a service of ARRL - The National Association for Amateur Radio .

Biodiversity Report

43.4236°N, -124.2407°W

Biodiversity data provided by the Oregon Biodiversity Information Center

FEDERAL STATUS

LE	Listed as an Endangered Species
LT	Listed as a Threatened Species
PE	Proposed as an Endangered Species
PT	Proposed as a Threatened Species
C	Candidate for Listing as Threatened or Endangered
SOC	Species of Concern - Taxa for which additional information is needed to support a proposal to list under the ESA

STATE STATUS - ANIMALS

LE	Listed as an Endangered Species
LT	Listed as a Threatened Species
PE	Proposed as an Endangered Species
PT	Proposed as a Threatened Species
SC	Sensitive - Critical
SV	Sensitive - Vulnerable

RANKS

G1	Critically imperiled throughout its range
G2	Imperiled throughout its range
G3	Rare, threatened or uncommon throughout its range
G4	Not rare, apparently secure throughout its range
G5	Widespread, abundant and secure throughout its range
S1	Critically imperiled in Oregon
S2	Imperiled in Oregon
S3	Rare, threatened or uncommon in Oregon
S4	Not rare, apparently secure in Oregon
S5	Widespread, abundant and secure in Oregon
T	Rank for a subspecies, variety, or race
Q	Taxonomic questions
H	Historic, formerly part of the native biota with the implied expectation that it may be rediscovered
X	Presumed extirpated or extinct
U	Unknown rank
NR	Not yet ranked
B	Rank of the breeding population (migratory birds)
N	Rank of the wintering population (migratory birds

MIGRATION STATUS

M	Summer resident
W	Winter resident
F	Spring/Fall resident
Y	Year-round resident
U	Unknown residency

SC	Seasonal resident and confirmed breeder
SP	Seasonal resident and probable breeder
S?	Seasonal resident and possible breeder
SH	Seasonal resident and current nonbreeder, historic breeder
SN	Seasonal resident and nonbreeder
YC	Year-round resident and confirmed breeder
YP	Year-round resident and probable breeder
Y?	Year-round resident and possible breeder
YH	Year-round resident and current non-breeder, historic breeder
YN	Year-round resident and nonbreeder
T	Transient

elcode – a NatureServe derived 10 digit code unique to every species found in North America.

sname – Scientific name of the species as recognized in Oregon.

scomname – The common name of the species or the ecological system, as recognized in Oregon.

relative_abundance – Relative abundance is an area weighted ratio, comparing the amount of the species or

ecological system within the subwatershed (12 digit HUC) to the amount of that species within all of the watershed in an Oregon Department of Forestry Ecosection. Values greater than 1 indicate the species is more prevalent at this site than at most other sites where it occurs.

Relative Abundance = ((Area of Species in a Subwatershed/Area of Species in Ecosection)/(Total area of the Subwatershed/Total area of all Subwatersheds in the ecosection with the species present))

conservation_priority_index - "To describe the change in vertebrate distributions caused by anthropocentric changes in Oregon over the last century, we evaluate both the loss of habitat, and how well the current and historic range of the species is protected…. These [values] range from negative to positive, with the species most in need of attention having larger negative values, and those most secure having large positive values."

Dennis White Index: "Denis White of the Environmental Protection Agency lab in Corvallis recommended the … index which allows for weighting of how well areas are protected and how much habitats have been lost. Denis noted that additive indices often work better than multiplicative ones. Values for this index range from positive to negative 1."

Conservation Priority Index (Dennis White) = (1-((current habitat - currently protected habitat)/(current habitat))) + ((current habitat)/(current habitat + currently protected habitat))

Source: Kagan, J.S., J.C. Hak, B. Csuti, C.W. Kiilsgaard, and E.P. Gaines. 1999. Oregon Gap Analysis Project Final Report: A geographic approach to planning for biological diversity. Oregon Natural Heritage Program, Portland, Oregon. 72 pp. + appendices.

g_rank – The global rank of a species, a value from 1 – 5, representing the risk of extinction for every species throughout their entire range on earth, with 1 = Critically imperiled, 2 = imperiled, 3 = threatened, 4 = probably secure and 5 = demonstrably secure.

s_rank – The state rank of the species, a value from 1 – 5, representing the risk of extirpation for every species throughout their entire range in Oregon, with 1 = Critically imperiled, 2 = imperiled, 3 = threatened, 4 = probably secure and 5 = demonstrably secure.

fed_status – the status of a species under the U.S. Endangered Species Act, if any. Values include LE = Listed Endangered, LT = Listed Threatened, C = Candidate, and SOC = Species of Concern. A PS: before a value means partial status, generally indicating status for portions of the distribution in the state.

state_status – the status of a species under the Oregon Endangered Species Act. Values include LE = Listed Endangered and LT = Listed Threatened for all species (plants and animals). In addition, for animals, ODFW includes a SV status indicating the species is on their sensitive species list as "vulnerable" or SC as "sensitive critical". For plants, ODA lists C = Candidate, species considered for potential listing.

strategy_species – any species identified in the Oregon Conservation Strategy as a strategy species.

odf_indicator – Is this a Department of Forestry forest health indicator species? Y = yes.

FPA- Species protected under the Oregon Forest Practices Act

watershed_cd – the 12 digit code for the sub-watershed (also known as the HUC code for hydrologic unit code).

occurrence_status_cd – represents the confidence that the species can be found in the watershed - Probable,

possible and confident

origin_status_cd – Is the species native or introduced in Oregon? N = Native, I = introduced.

migrant_status_cd – This is the migratory status, with M meaning the species is migratory and is a summer resident, breeding in Oregon, Y meaning it occurs year around, and W meaning the species only winters in Oregon. Less commonly, F = spring or fall residents only, and U means residency status is unknown.

update_year – is the year the species status has been updated in this watershed.

wildlife_viewer_url – a link to the wildlife viewer Oregon Explorer page for the species.

habitat_map_pdf – a link to the current Oregon habitat distribution map on the Oregon Explorer.

Appendix K
USFWS Technical Assistance Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon Fish and Wildlife Office
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266
Phone: (503) 231-6179 FAX: (503) 231-6195

Reply To: 01EOFW00-2019-TA-0281
TS Number: 19-227
TAILS: 01EOFW00-2019-TA-0281

MAR 0 5 2019

Mr. Aaron Killgore
Mead & Hunt
9600 NE Cascades Parkway, #100
Portland, OR 97220

Subject: Technical Assistance for the Southwest Oregon Regional Airport improvements and required safety upgrades (*FWS reference 01EOFW00-2019-TA-0281*)

Dear Mr. Killgore:

This letter is in response to Mead & Hunt's November 9th, 2018, correspondence requesting technical assistance from the U.S. Fish and Wildlife Service (Service). We received additional project description information and preliminary maps on December 27th, 2018.

As part of our review process, the online Information for Planning and Consultation (IPaC) (http://ecos.fws.gov/ipac/) tool was utilized. After review of the IPaC results within the project area and the map provided earlier, we believe that no federally-listed species under the jurisdiction of the Service are present in the immediate project area. Additionally, no critical habitat is present within the immediate project area. For this preliminary search, the immediate project area was defined as the dry land airport property as well as the immediate potential runway fill area at the north-east end of runway 4/22, at the confluence of Pony Slough and Coos Bay. We encourage you to use the IPaC tool to conduct similar analysis, especially if the project parameters change in any way.

The Fish and Wildlife Service is the principal Federal agency charged with protecting and enhancing populations and habitat of migratory bird species. The Migratory Bird Treaty Act prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. The potential exists for avian mortality from habitat destruction and alteration within the project boundaries. We recommend undertaking specific analysis of bird species and their respective habitat use on the project site and implementing protective measures during project construction.

If you haven't already contacted the National Oceanic and Atmospheric Administration, we recommend that you do so and discuss the proposed project and any potential impacts to listed species or critical habitat under their jurisdiction.

Thank you for the opportunity to review the preliminary project information. If the project parameters change or if you become aware of federally listed species occurring in the project area, please contact Jeff Everett on my staff at 53-231-6952.

Sincerely,

Jeffrey A. Dillon

Acting for

Paul Henson, Ph.D.
State Supervisor

Appendix L
Permittee-Responsible Mitigation Plan

Permittee-Responsible Mitigation Plan

Environmental Assessment

Runway Safety Area Improvements (Runway 5/23)

Southwest Oregon Regional Airport

Report Prepared By

Mead & Hunt

www.meadhunt.com

November 10, 2021[1]

Mead & Hunt Project No. 1417700-171679.01

[1] updated to reflect Runway designation name change

1. Project Information

Project Name: Southwest Oregon Regional Airport (OTH) Runway Safety Area Bulkhead

NWP Permit No.:

Project Location: 43° 25' 18.4794"N, -124° 14' 18.6432"W (43.421800°, -124.238512°)

Mitigation Site Location(s) (if different): 43°25'18.02"N, -124°14'17.24"W (43.421672°, -124.238122°) (1000ft SE of project site)

Watershed(s): Coos Bay, HUC 171003040405

County or Counties: Coos County

1.1 Plan Overview

This permittee-responsible mitigation plan addresses the permanent adverse modification of critical habitat for Coho salmon and Southern green sturgeon in the Coos River as a result of proposed construction of a triangular bulkhead adjacent to the Southwest Oregon Regional Airport (OTH) in North Bend, Oregon. The Federal Aviation Administration (FAA) requires[2] that the Runway Safety Area (RSA) have a 500-foot width and extend 1,000 feet beyond the ends of the runway. Currently, the northeast portion of Runway 5/23 is approximately 60 feet short of compliance.

Work will take place at the northeastern corner of the Airport property adjacent to and within Coos Bay. The project Action Area includes all areas of OTH, and the Coos Bay estuary directly or indirectly affected by the proposed project (**Figure 1, Runway Safety Area Fill and Construction Buffer**). The Action Area includes an in-water construction buffer of 250 feet for proposed fill activities within the 89-foot by 67-foot triangular fill area, the mandatory RSA, and a 10-foot road buffer for emergency vehicle access. An additional 60-foot Action Area on land is provided for vehicle support and construction staging. Construction crews and equipment will utilize haul routes to the project site via existing Airport roadways and paved areas.

2. Avoidance and Minimization

2.1 Avoidance

An alternatives analysis to meet FAA RSA compliance was conducted during the Master Plan update (2013).[3] These alternatives were further analyzed in the OTH RSA Environmental Assessment, which discusses the impacts to natural resources of each alternative to meet RSA compliance. A triangular bulkhead at the northeast end of Runway 5/23 was identified as the preferred alternative because it had the smallest footprint and the least impact to critical habitat of Endangered Species Act (ESA) listed species in Coos Bay. Construction haul routes and staging areas were designed to use existing impervious surfaces when possible and avoid adjacent wetlands.

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[2] [1]FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, provides required airport safety area guidance and defines the RSA as a surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overrun, or excursion from the runway.

[3] Southwest Oregon Regional Airport Master Plan Update, 2013. https://cooscountyairportdistrict.com/coos-county-aiport-district-master-plan/

2.2 Minimization

Appropriate and practical measures have been identified to minimize impacts to the aquatic ecosystem that cannot reasonably be avoided. Work will be performed during the Oregon Department of Environmental Quality (OR DEQ) in-water work window of October 1 to February 15 and will be timed with the outflow of the tides to avoid sedimentation impacts to adjacent eelgrass beds.

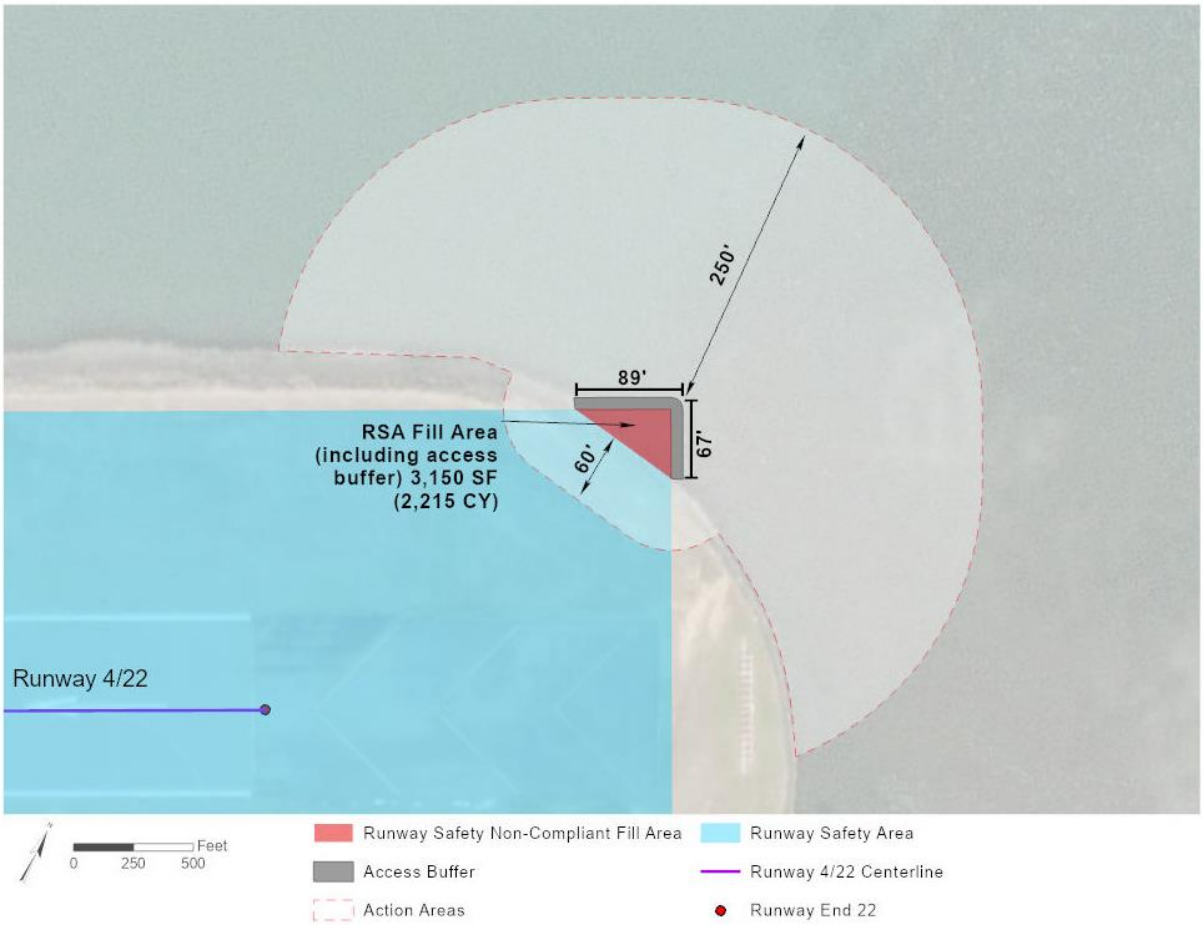

Figure 1: Runway Safety Area Fill and Construction Buffer

A 3,150 square-foot pre-cast concrete block bulkhead will be constructed to form a 0.07-acre (89-foot by 67-foot) triangular surface area at the northeastern corner of Runway 5/23. The bulkhead will be created by using a Mechanically Stabilized Earth (MSE) retaining wall constructed with pre-cast concrete blocks, which was determined to have the smallest construction footprint and have the least environmental impact on Coos Bay and Pony Slough. The foundation of the bulkhead will be stabilized with sand and 3 inches of rock topped with native slough soils.

Existing riprap cobbles within the construction area will be salvaged and reused for the final structure as armoring stone along the toe of the bulkhead. The armoring would extend slough-ward by approximately 8 feet to dissipate wave energy erosion, decrease scouring and undercutting of the bulkhead structure, and

increase structural stability of the bulkhead. To prepare for construction, a temporary single-face sheet pile cofferdam will be installed 12 feet from the exposed slough-ward bulkhead wall for dewatering and excavation of the foundation.

Dewatering of the construction site will be conducted through outflow sediment filters on the west side of the coffer dam to further reduce sedimentation within Pony Slough. Installation and removal of the coffer dam would result in the highest level of turbidity during the course of the project. Work associated with both will be timed with the outflow of tides to reduce the potential for sedimentation on adjacent eelgrass beds. Due to the relative size of the Coos River and proposed timing of in-water work, it is expected that any increase in turbidity would not result in adverse effects.

A 60-foot Action Area on land will be used for vehicle support and construction staging. Construction crews and equipment will access the project site via existing Airport access routes, embankments within the construction area, and floating barges for the installation of the temporary coffer dam. The contractor staging and laydown area will be on land immediately adjacent to the identified construction area.

3. Compensatory Mitigation

3.1 Goals and Objectives

Compensatory mitigation (CM) involves activities conducted by a permittee or third party to create, restore, enhance, or preserve the functions and values of the waters of the state to compensate for the removal/fill-related adverse impacts of project development to waters of the state.

3.2 Ecological Goals

The principal goal of this mitigation plan is to replace the function for the waters of the US that will be lost for the RSA bulkhead construction. The bulkhead site functions as critical habitat for Coho salmon and Southern green sturgeon in the Coos River estuary (Table 1). According to the 2019 Biological Assessment, the impacts on the environmental baseline conditions (habitat Primary Constituent Elements) within the construction area include: 1) the 3,150- square foot permanent adverse modification of critical habitat for ESA-listed fish, and 2) short-term, localized increases in background turbidity and minor alteration of substrates.[4]

[4] Mead & Hunt. Biological Assessment for the Southwest Oregon Regional Airport Runway Safety Area Improvements, October 2019. Chapter 4: Environmental Baseline, p.8.

Table 1. ESA-Listed Species with The Potential to Occur within the Project Area

Species	Population (ESU/DPS)	Federal Status	Closest Designated Critical Habitat	Potential Site Use
Coho salmon *Oncorhynchus kisutch*	Oregon Coast ESU	Threatened (76 FR 35755)	Coos Bay	Rearing and migration
Green Sturgeon *Acipenser medirostris*	Southern DPS	Threatened (71 FR 17757)	Coos Bay	Foraging
Eulachon *Thalichthys pacificus*	Southern DPS	Threatened (75 FR 13012)	Approximately 17 miles north of project area at Umpqua River	Rearing and migration

Sources: NMFS (National Marine Fisheries). 2018. Northwest Regional Office, ESA Salmon Listings. http://www.westcoast.fisheries.noaa.gov/index.html.
StreamNet. 2018. Data Query and Critical Habitat Mapper. http://www.streamnet.org/.
USFWS (U.S. Fish and Wildlife Service). 2018. Critical Habitat Mapper. https://ecos.fws.gov/ecp/report/table/critical-habitat.html

3.3 Ecological Objectives

There are two primary objectives of this mitigation plan:

1) to restore functional losses of aquatic critical habitat for ESA-listed fish, and

2) to enhance the project area shoreline to improve habitat for benthic organisms.

The restoration of 8,000 square feet of adjacent critical habitat and Essential Fish Habitat (EFH) eelgrass beds represents a 2:1 ratio over the area of critical habitat permanently adversely modified due to the bulkhead. Restoration will be accomplished by removing creosote piles and remnant dock structures in Pony Slough. The removal of these items will return the substrate to natural conditions and remove impediments to fish migration and foraging habitat within Pony Slough. Improvements in the slough bottom can induce the spread of eelgrass into the area, improving cover from predation and increasing the availability of feeder species. The surrounding Pony Slough estuary includes eelgrass beds that provide complex habitat and are an important foraging area for multiple species, including ESA-listed fish.

In the last phase of construction of the RSA bulkhead, the toe of the eco-block wall will be armored with rip-rap to structurally stabilize the wall and provide habitat for marine organisms. This new rip-rap toe, as well as adjacent existing rip-rap within 500 feet, will be seeded with crushed oyster shells. This enhancement hopes to provide a fully functioning, three-dimensional bed system that provides associated ecosystem services and biological functions, such as marine biodiversity, shoreline protection, sediment trapping, water quality improvement, and recreational fishing opportunities. If successfully established, the oyster beds will also protect and enhance the adjacent sea grass beds and mitigate for substrate alteration and rip-rap removal during bulkhead construction. [5]

[5] *"NOAA Habitat Conservation | Restoration Center | Restoration Techniques and Monitoring | Oyster Restoration"*. *Habitat.noaa.gov.*

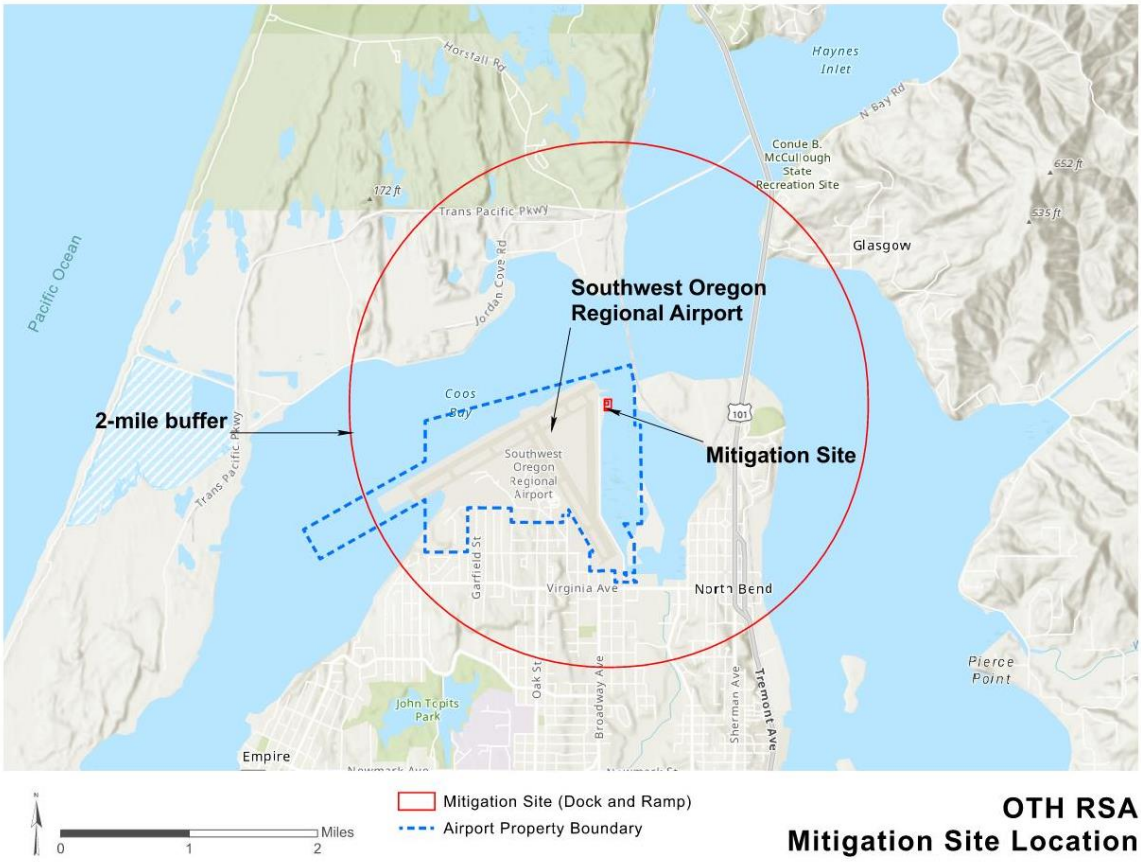

Figure 2: OTH RSA Mitigation Site Location

To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent annual monitoring surveys will be conducted at a similar time during the growing season (e.g. June to early July) using the methodology utilized in baseline surveys conducted in June 2019. Detailed survey methodology is included in **Section 11. Performance Standards/Monitoring Requirements**.

4. Site Selection

Selection of the site was driven primarily by the goal of restoring ecosystem function and providing high-quality habitat for fish. Proximity to project area was also given consideration. The selected sites were determined to be ecologically suitable for providing the desired compensatory mitigation and are adjacent to existing aquatic resources.

The proposed mitigation sites are located 1,000 feet southeast of the RSA fill bulkhead, east of Runway 5/23 (**Figure 2**). This area is the former location of Ponypoint Park, a City of North Bend facility that accommodated five recreational vehicle camp sites and included a walking trail, a boat ramp, and parking lot. The 3.5-acre mitigation site includes the creosote piles of a boat launch and dock structure within Pony Slough to the east of the paved parking area.

A visual survey of the site identified the structural remnants of an approximate 4,000 square-foot boat dock consisting of at least 68 piles, and an approximate 4,000 square-foot boat ramp with 50 piles and wood planks (**Figure 3**). Exposed piles were found to be creosote coated with metal fasteners.

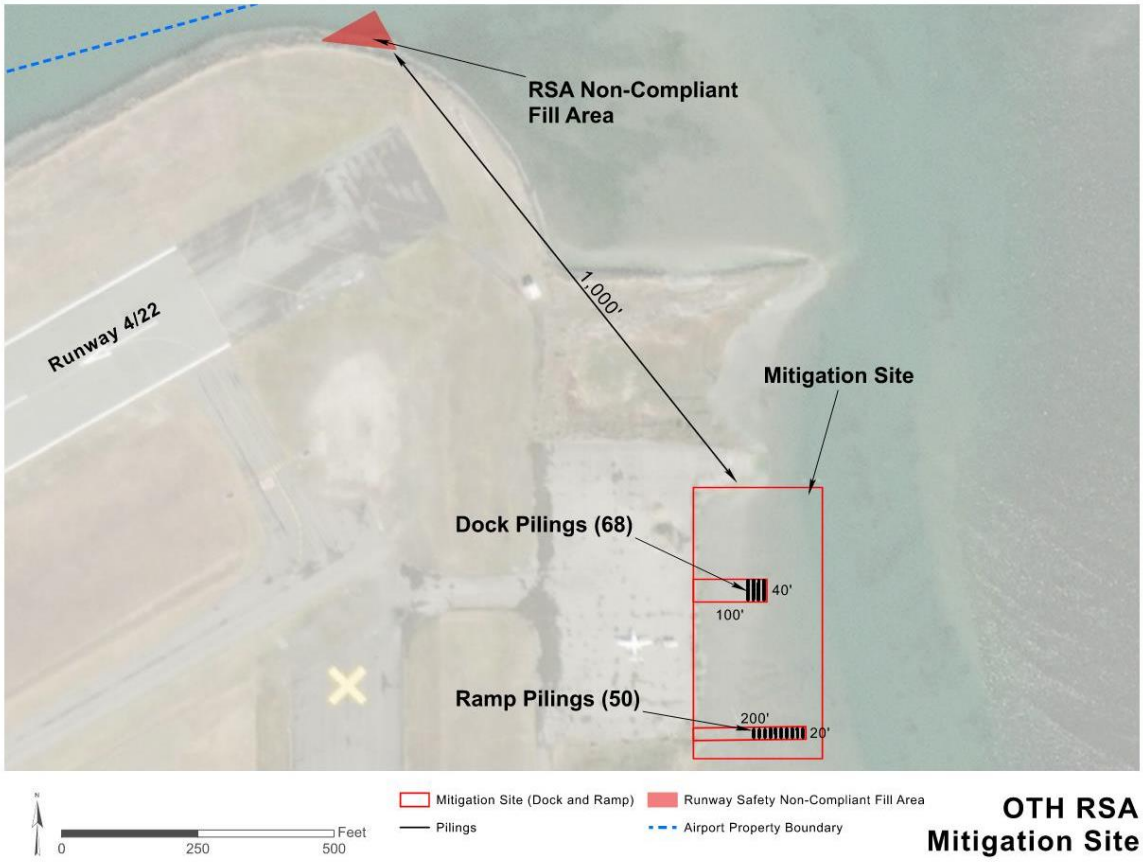

Figure 3: OTH RSA Mitigation Site

Eelgrass beds are located 100 feet from the RSA Fill Action Area and have been designated as EFH, while dispersed eelgrass exists within 30 feet of the construction site. No direct impact to eelgrass is anticipated due to the construction of a coffer dam; however, any in-water work has the potential to increase sedimentation and turbidity in the surrounding area. Monitoring any potential long-term impacts to eelgrass bed growth will be based on comparing existing and future eelgrass density with an adjacent designated control plot.

Given the existing baseline conditions within the project area and net of in-water/overwater structures, it is reasonably certain that the proposed project will not result in any adverse change to the instream or downstream functions (i.e., hydrologic, geomorphic, biological, or chemical/nutrient) of the Coos River. Potential direct effects of the proposed project on ESA-listed species and their habitats (i.e., hydroacoustic impacts, temporary degraded water quality, and minor alteration of substrates) will be consistent with those addressed under the SLOPES V In-water/Overwater Structures Programmatic Agreement.

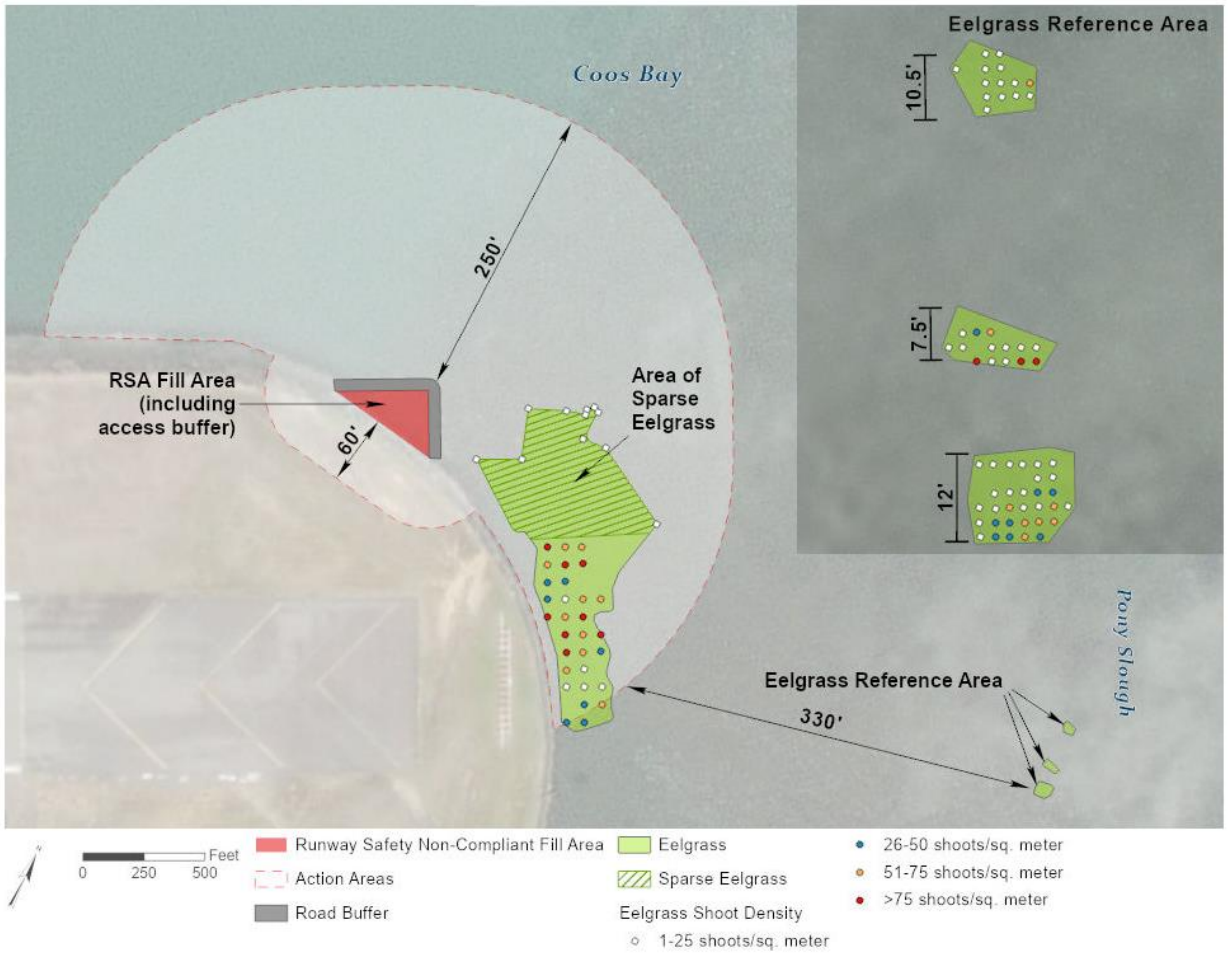

Figure 4: Eelgrass Density Adjacent to RSA Fill Area

5. Easements or Encumbrances

No easements or encumbrances are known to exist. The project site is within tidal water and managed by the Oregon Department of State Lands.

6. Baseline Information

OTH is a triangular-shaped property that is surrounded on multiple sides by the Coos Bay Estuary. The northwest side of the property is surrounded predominantly by the open water of the Coos Bay estuary. The east boundary of OTH is defined by Pony Slough and its estuarine intertidal wetland system.

The Coos Bay estuary covers approximately 54 square miles of open channels and periodically inundated tidal flats. It ranges from 0.5 mile to 1.5 miles wide, is 15 miles long, and has approximately 30 tributaries. The Coos River is the major tributary flowing into Coos Bay and is an important shipping channel. Pony Slough is identified as an estuarine intertidal wetland system (E2USN) by the USFWS National Wetland Inventory (NWI). Freshwater is supplied into the slough by Pony Creek, a perennial stream.

Three federally listed anadromous fish species spend a portion of their lifecycle within the estuarine environment of Coos Bay. Oregon Coast Coho salmon (*Oncorhynchus kisutch*), southern distinct population segment (DPS) Green sturgeon (*Acipenser medirostris*), and southern DPS Pacific eulachon (*Thaleichthys pacificus*), were each federally listed as threatened under the Endangered Species Act (ESA). Use of the Coos Bay system by Pacific eulachon and Green sturgeon is sporadic; however, migrating habitat exists for Coho salmon in the RSA Fill Action Area and Coos Bay is considered Critical Habitat for Coho salmon.

Pony Slough has been designated EFH and a Habitat Area of Particular Concern (HAPC) for Coho salmon. EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." A HAPC is a subset of EFH that is rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts.

Estuarine areas are crucial for juvenile salmonids given their multiple functions as areas for rearing/feeding, freshwater-saltwater acclimation, and migration. Nearshore areas also provide important habitat for rearing/feeding and migrating salmonids.[6] Eelgrass supports aquatic organisms, including salmon, by providing food, refuge from predation, and nursery areas. The integrity of nearshore ecosystems where juvenile salmon reside and the capacity of these habitats to provide prey can thus influence overall salmon returns.[7]

Oyster reefs create important habitat for hundreds of other marine species and filter and clean the surrounding water. Species like mussels, barnacles, and sea anemones settle on them, creating abundant food sources for commercially valuable fish species. Oyster reefs provide habitat to forage fish, invertebrates, and other shellfish. Approximately 1 mile away from the project site at the western portion of the airport, significant cockle, shrimp, and bivalve habitat exists in Coos Bay.[8]

Seagrass beds known as eelgrass (*Zostera spp.*) are a major habitat component of Coos Bay and Pony Slough. Vegetated shallows that support eelgrass are considered special aquatic sites under the 404(b)(1) guidelines of the CWA (40 CFR § 230.43). Two eelgrass species are known to be present in this ecoregion, the native *Z. marina,* and the non-native *Z. japonica. Z. japonica* was first reported in 1957 in Willapa Bay, Washington, and is thought to have been introduced in the early twentieth century along with oyster stock imported from Japan (Shafer, Kaldy, and Gaeckle 2014).

Both eelgrass species contribute to ecosystem functions at multiple levels: as primary and secondary

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[6] Final Assessment of NOAA Fisheries' Critical Habitat Analytical Review Team (CHART) for the Oregon Coast Coho Salmon Evolutionarily Significant Unit. Accessed February 2020

[7] Eelgrass as Valuable Nearshore Foraging Habitat for Juvenile Pacific Salmon in the Early Marine Period. Accessed February 2020. (https://afspubs.onlinelibrary.wiley.com/doi/pdf/10.1002/mcf2.10018)

[8] https://www.dfw.state.or.us/mrp/shellfish/docs/SEACOR%20environmental%20all.pdf

producers, as habitat structuring elements, as a substrate for epiphytes and epifauna, and as sediment stabilizers and nutrient cycling facilitators. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish such as the Pacific herring. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help ameliorate the effects of ocean acidification.

Creosote has been used as a wood preservative for more than a century to treat telephone poles, railroad ties, piers, docks, and floats. Thousands of derelict creosote pilings remain in Oregon coastal waters. Many eventually break up and distribute tons of debris onto beaches throughout the Sound. Creosote comprises more than 300 chemicals that, together, are very effective at achieving their intended purpose of preventing decay or insect infestation.

But chemicals in treated wood—such as those on beaches or old dock pilings—can be harmful and even toxic to marine species. Polycyclic aromatic hydrocarbons (PAHs) are the chemicals of most concern. When exposed to ultraviolet light or sunshine, the chemicals in creosote become more toxic and are more likely to leach from the wood. A piling that contains creosote can leach throughout its lifetime. Studies show that herring eggs exposed to creosote have a high mortality rate. PAHs are known to increase disease and alter growth and reproductive function in English sole. These chemicals affect juvenile salmonids that migrate through contaminated estuaries by reducing their growth and altering immune function.[9]

7. Mitigation Work Plan

All work will take place during the OR DEQ designated in-water work window (IWWW) of October 1 – February 15, the period during which ESA-listed species are least likely to be present within the vicinity of the project area. The proposed project will require approximately four to eight weeks of in-water/overwater work. Construction crews and equipment will access the project site from the shoreline and from a floating barge. The existing dock and pier (approximately 8,000 square feet total) and 118 pilings will be removed with a crane and/or excavator operating from a floating barge. Removal of any sections of sunken dock and/or pier will occur at low tide so workers can locate and remove the debris without causing turbidity. The 118 existing pilings will be dislodged with a vibratory hammer and slowly lifted from the sediment and placed into a contained area for appropriate upland disposal. No dredging or excavation will be required.

Piling and other structure removal includes untreated and chemically treated wood pilings, piers, boat docks and potentially other structures comprised of plastic, concrete, and other materials. Piling and other structure removal from waterways will improve water quality by eliminating chronic sources of toxic contamination and associated impacts to riparian dependent species. Pilings and other structures occur in estuaries, lakes, and rivers and are typically used in association with boat docks and other facilities.

[9] Washington Department of Natural Resources Derelict Creosote Piling Removal Best Management Practices For Pile Removal & Disposal https://www.dnr.wa.gov/publications/aqr_rest_creosote_bmps_pilings.pdf?w8th9

Equipment such as boats, barges, excavators, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

When removing an intact pile:

- Install a floating surface boom to capture floating surface debris.
- To the extent possible, keep all equipment (e.g., bucket, steel cable, vibratory hammer) out of the water, grip piles above the waterline, and complete all work during low water and low current conditions.
- Dislodge the piling with a vibratory hammer, whenever feasible. Never intentionally break a pile by twisting or bending.
- Slowly lift piles from the sediment and through the water column.
- Place chemically treated piles in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment. A containment basin for the removed piles and any adhering sediment may be constructed of durable plastic sheeting with sidewalls supported by hay bales or another support structure to contain all sediment.
- Fill the holes left by each piling with clean, native sediments located from the project area.
- Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.

When removing a broken pile:

- If a pile breaks above the surface of uncontaminated sediment, or less than 2 feet below the surface, every attempt short of excavation will be made to remove it entirely. If the pile cannot be removed without excavation, excavate sediments, and saw the stump off at least 3 feet below the surface of the sediment.
- If a pile breaks above contaminated sediment, saw the stump off at the sediment line: if a pile breaks within contaminated sediment, make no further effort to remove it and cover the hole with a cap of clean substrate appropriate for the site.
- If dredging is likely in the area of piling removal, use a global positioning device (GPS) to note the location of all broken piles for future use in site debris characterization.[10]

Measures to Minimize Impacts: The following conservation measures have been incorporated into the proposed project design and construction methods to minimize and avoid potential adverse effects to ESA- listed fish species, their designated Critical Habitat elements, and Essential Fish Habitat:

- All work conducted below the Highest Median Tide (HMT) will occur during the OR DEQ-preferred IWWW for the Coos River estuary (October 1 – February 15), a period when ESA-listed species are

[10] Removal of Creosote-Treated Pilings and Structures from San Francisco Bay-Environmental Assessment https://www.sfei.org/sites/default/files/biblio_files/ReportNo605_Creosote_Dec2010_finalJan13.pdf

less likely to be present within the vicinity of the project area.

- All heavy equipment (i.e., crane) will access the project site via existing piers and/or floating barges.
- All pilings will be removed with a vibratory hammer. During piling removal, the following criteria will be implemented to minimize creosote release, sediment disturbance and sediment resuspension:
  - Install a floating surface boom to capture floating surface debris.
  - Consider the best tidal condition for piling removal, try to remove in-the-dry.
  - Keep all equipment (e.g., bucket, cable, vibratory hammer) out of the water, grip piles above the waterline, and complete work during low water and low current conditions.
  - Dislodge piling with a vibratory hammer, when possible; never intentionally break a pile.
  - "Wake" the piling by vibrating to break the friction bond between the piling and sediment.
  - Slowly lift the pile from the sediment and through the water column.
  - Place the pile in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment.
  - Fill the holes left by each piling with clean, native sediments immediately upon removal.
  - Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.
- When a pile breaks or is intractable during removal, removal will continue as follows:
  - Every attempt short of excavation will be made to remove each piling, if a pile in uncontaminated sediment is intractable, breaks above the surface, or breaks below the surface, cut the pile or stump off at least 3 feet below the surface of the sediment.
- The following conditions will apply when removing preservative-treated wood:
  - To the extent possible, ensure no wood debris falls into the water. If wood debris does fall into the water, remove it immediately.
  - Wood debris will be placed in an appropriate dry storage site until removed from the site.
  - Wood construction debris will not be left in the water or stacked on the bank or below HMT.
  - Wood debris removed during the project will be evaluated to ensure proper disposal.
- The contractor will initiate daily "soft-start" procedures to provide a warning and/or give species near piling removal and installation activities a chance to leave the area prior to a vibratory hammer or impact driver operating at full capacity; thereby, exposing fewer species to loud underwater and airborne sounds.
  - A soft start procedure will be used at the beginning of in-water piling removal and installation, or any time piling removal/installation has ceased for more than 30 minutes.
  - For vibratory hammer operation, the contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.
  - For impact pile driving (if necessary), the contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two

subsequent sets. (The reduced energy of an individual hammer cannot be quantified given the variations between individual drivers. In addition, the number of strikes will vary at reduced energy given that raising the hammer at less than full power and then releasing it results in the hammer bouncing as it strikes the pile, resulting in multiple strikes).

- A Pollution Control Plan (PCP) will be prepared by the contractor and carried out commensurate with the scope of the project that includes the following:
  - Best management practices to confine, remove, and dispose of construction waste.
  - Procedures to contain and control a spill of any hazardous material.
- All conditions of Oregon Department of Environmental Quality's (ODEQ's) 401 Water Quality Certification will be followed.
- All equipment will be inspected daily for fluid leaks. Any leaks detected will be repaired before operation is resumed. Stationary power equipment (i.e., cranes) operated within 150 feet of the river will be diapered to prevent leaks.
- All new pilings will be fitted with devices to prevent perching by piscivorous birds.
- All floatation material will be permanently encapsulated to prevent dispersal into the water.
- Replacement overwater piers and floats will be grated to allow for 50 percent light penetration.
- The proposed project will result in a net reduction of approximately 7 square feet of existing overwater area and will result in a net reduction of in-water pilings.

Oyster bed seeding will occur post removal of the coffer dam and rip-rap installation. The site must also have a minimum water depth of one foot, even during extreme low-tide conditions. Oysters will die if they become smothered in silt or freeze out of the water, but they will not die if they freeze in the water. Whole oyster shells will be used.

8. Determination of Credits

The construction of the RSA bulkhead is unavoidable and presents the lowest possible impact to EFH and ESA-listed critical habitat. Mitigation of the creosote contamination in Pony Slough proposes over a 2:1 ratio. The project has a high likelihood of success and provides a much higher functioning estuarine habitat in Pony Slough than the impact site. Since the likelihood of success is greater and the impacts to potentially valuable migration corridors are reduced during construction, aquatic resource restoration is the best option for permittee-responsible mitigation.

9. Monitoring Plan

Based on the potential for in-water impacts to EFH adjacent to Runway 5/23 during construction, additional BMPs will be put in place to monitor water quality. The construction schedule will be timed to adhere to OR DEQ in-water work windows for the Coos River (October 1 – February 15) and tidal outflows. Sediment outflow filters will be utilized during dewatering to minimize turbidity in Coos Bay.

A 2-year post-construction monitoring plan for eelgrass presence/absence (within 100 feet in deeper habitat) and density (>100 feet in shallow habitat) will be compared with an adjacent control site to monitor potential impacts of the project on EFH. See the attached Biological Assessment for more details on monitoring protocol for eelgrass.

Additionally, a year one visual monitoring report will be sent to the USACE to ensure that the piles have been removed and that the clam bed reseeding has occurred. This report will be sent to:

Tyler Krug
Regulatory Project Manager | USACE Portland District | North Bend Field Office
2201 Broadway Suite C | North Bend, Oregon 97459
Office: 541.756.2097 |Mobile: 541.520.6278 |E-mail: Tyler.J.Krug@usace.army.mil

10. Site Protection Instrument

The project site is within tidal waters owned by the Coos County Airport District and will be protected by a deed restriction over the 8000 acres at both pile removal sites.

11. Performance Standards / Monitoring Requirements

According to the 2020 Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Southwest Oregon Regional Airport Runway Safety Area Improvements, North Bend, Oregon, the following monitoring requirements will be implemented:

- To implement reasonable and prudent measure #1 (suspended sediment), FAA, the Corps, and the Airport shall ensure:
  - Suspended sediment monitoring occurs hourly during installation and removal of the cofferdam.
  - Suspended sediment monitoring occurs daily for the duration of time the cofferdam is in place.
- To implement reasonable and prudent measure #2 (stormwater), FAA, the Corps, and the Airport shall ensure the Airport drafts and implements a stormwater facility inspection and maintenance plan that includes:
  - Inspection. Each part of the proposed stormwater system must be inspected:
    a. For the first three years:
       1. At least quarterly; and,
       2. At least three times per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.
    b. After three years:
       1. At least twice a year thereafter; and,
       2. At least once per water year within 48-hours following a storm event with more than 0.5 inches of rain over a 24-hour period.

- Maintenance. Maintenance will bring the system back to original design specifications within 7 days of any of the following occurring:
  a. Stormwater does not drain out of the biofiltration swales within 24-hours after rainfall ends.
  b. Any structural component, including inlets and outlets, do not freely convey stormwater.
  c. Desirable vegetation in the biofiltration swales does not cover at least 90% of the facility any time after 3 years – excluding dead or stressed vegetation, dry grass or other plants, and weeds.

- To implement reasonable and prudent measure #3 (monitoring and reporting), FAA, the Corps, and the Airport shall ensure the Airport completes the following monitoring and reporting:
  - A project completion report within 60-days of completing construction, including:
    a. Project name
    b. Airport contact person
    c. FAA contact person
    d. Construction completion date
    e. As-built drawings of all project components
    f. Results of the suspended sediment monitoring from T&C #1
    g. Square footage of fill installed for the bulkhead
    h. Photos of the mitigation areas (including date of photograph, GPS site location of photo point, name of photographer, and other relevant information)
  - Annual reports of the stormwater facility inspection and maintenance plan after the first three full years following construction, including the following information:
    a. Name of person completing each inspection
    b. Date of each inspection
    c. Findings of each inspection
    d. Description of any structural repairs, maintenance, or facility cleanout, e.g., sediment and oil removal and disposal, vegetation management, erosion control, structural repairs or seals, ponding water, pests, trash, or debris removal
    e. An estimate of the percent cover of healthy vegetation in the swales, including a description of any corrective action needed to ensure 90% coverage within three years
  - Each of the above reports and/or plans must be submitted annually to NMFS at the following address, no later than September 30:

National Marine Fisheries Service
Attn: WCRO-2019-03422
2900 NW Stewart Parkway
Roseburg, Oregon 97471

Due to the avoidance and minimization measures described previously, this project is not likely to adversely affect EFH (eelgrass). However, a 2-year monitoring plan will be implemented in order to assess the potential for indirect effects to eelgrass as a result of project construction. To facilitate accurate comparisons of pre-project and post-project eelgrass density and areal coverage, subsequent monitoring surveys will be conducted at a similar time during the growing season (e.g. June - early July) and using the same methodology as the baseline surveys conducted in June 2019. Analysis of the monitoring data will

focus on detecting changes in the location of the eelgrass bed boundary, total areal coverage of eelgrass within a 250-foot radius of the project footprint, and changes in eelgrass shoot density.

Baseline surveys were conducted in June 2019 to delineate and characterize eelgrass beds in the vicinity of the proposed Action Area. June 3 and 4, 2019 were identified as appropriate sampling dates for the survey based on a strong minus morning low tide to maximize dewatering of the bay and resultant exposure of Z. marina. The survey team identified and delineated the boundaries and spatial distribution of the eelgrass beds in accordance with the protocols outlined in the document US Army Corps of Engineers Seattle District (2018), using the eelgrass bed edge definition described in NOAA Fisheries Western Region (2014).

To remain consistent with the 2019 baseline survey, monitoring surveys will consider eelgrass beds continuous if any eelgrass is within a one square meter quadrat and within one meter of another shoot. In areas where there are too few native eelgrass shoots to meet the bed thresholds described above, the survey map will indicate that widely scattered or sparse eelgrass shoots are present in the area, with no discernable beds. Within each bed, eelgrass shoot density will be measured using a series of ¼ square meter plots arranged in a regularly spaced grid. The positions of the survey points will be shown on GIS mapping. Data values will be converted to numbers of eelgrass shoots per square meter. Baseline surveys were also conducted in a reference area for use in interpreting the results of subsequent eelgrass monitoring surveys.

12. Maintenance/Long-term/Adaptive Management Plan

Creosote removal has proven to have such a high success rate for water quality restoration that the Washington Department of Natural Resources has removed 21,300 tons from the Puget Sound area in the last 15 years. Once conditions improve, eelgrass will naturally colonize the site and ongoing maintenance will not be necessary. Similarly, oyster seeding only requires an initial application, with no maintenance necessary. The proposed mitigation will not require maintenance nor long-term planning.

13. Financial Assurances

As a small primary, reliever, and general aviation airport, FAA Airport Improvement Project (AIP) grants cover a range of 90-95 percent of eligible costs, based on statutory requirements. The funding for this project is currently part of the 2021 AIP funding cycle, which includes mitigation as part of the construction of the RSA fill bulkhead.