Attachment B: Wetland Delineation Data Form

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Table Rock Substation City/County: Jackson County Sampling Date: 9-9-14

Applicant/Owner: PacifiCorp State: OR Sampling Point: SP4

Investigator(s): R. Sumstine, L. Cleveland Section, Township, Range: S26 T39N R5E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): A Lat: 42°28'32.94" N Long: 122°57'52.47" W Datum: WGS83

Soil Map Unit Name: Coquet clay 1 to 5% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: plot adjacent to berm covered in teasel - appears to be artificial

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 6')			
1. Cichorium intybus	5	N	FACU
2. Alopecurus pratensis	10	N	FAC
3. Dipsacus fullonum	5	N	FAC
4. Poa annua	70	Y	FAC
5. Madia gracilis	5	N	UPL
6. Taeniatherum crinitum	5	N	UPL
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

Sampling Point: SP4

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5YR 3/1	100					C L	
0-20	7.5YR 3/1	100					C L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

DRY, CLAYEY SOILS PREVENTED DIGGING FURTHER THAN 9 INCHES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: PLOT LOCATED IN A LOW SPOT WHERE RUNOFF MAY COLLECT OR HIGH GROUNDWATER LEVELS MAY SHOW

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: TABLE ROCK SUBSTATION City/County: JACKSON COUNTY Sampling Date: 9-10-14

Applicant/Owner: PACIFICORP State: OR Sampling Point: SP16

Investigator(s): L. CULVERWELL, B. SEBASTIAN Section, Township, Range: [illegible]

Landform (hillslope, terrace, etc.): SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 1

Subregion (LRR): A Lat: 42° 28' 34.776" N Long: 122° 57' 58.79" W Datum: NAD83

Soil Map Unit Name: DETBENNER - BRADER LOAMS 1-15% SLOPES NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. ALOPECURUS PRATENSIS	100	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Sampling Point: SP16

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					L	
4-9	10YR 3/2	95	7.5YR 4/6	5	C	PL	L	
0-4	7.5YR 2.5/2	100					CL	
4-13	7.5YR 3/2	75	7.5YR 4/4	25	C	PL	CL	
13-20	7.5YR 4/4	98	7.5YR 4/6	2	C	M	L	

update

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

DRY, COMPACT SOILS & UNABLE TO DIG BELOW 9 INCHES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X* No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: * STRONG HYDRIC SOILS & VEG PRESENT — BASED ON PROCEDURES IN MANUAL FOR PROBLEMATIC SITUATIONS DURING DRY SEASON, ASSUME HYDROLOGY IS PRESENT EARLIER IN GROWING SEASON

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: TABLE ROCK SUBSTATION City/County: JACKSON COUNTY Sampling Date: 9-18-14

Applicant/Owner: PACIFICORP State: OR Sampling Point: SP14

Investigator(s): LOWLAND ENVIRONMENTAL Section, Township, Range: 28, T39S R2E

Landform (hillslope, terrace, etc.): SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 1

Subregion (LRR): A Lat: 42°28'34.87"N Long: 122°57'59.773" W Datum: NAD83

Soil Map Unit Name: DEBENGER-WALKER LOAMS 1-15% SLOPES NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ~~X~~ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ~~X~~)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ~~X~~)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 6')			
1. ALOPECURUS PRATENSIS	90	Y	
2. POA SP	10	N	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ~~X~~)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Sampling Point: SP17

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 3/3	98	7.5YR 4/6	2	C	PL	L	
0-1.5	10YR 3/3	100					SiL	
1.5-16	10YR 3/3	100					CL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

DRY, COMPACT SOILS & UNABLE TO DIG BELOW 8 INCHES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: TALENT SUBSTATION City/County: JACKSON COUNTY Sampling Date: 9-10-14

Applicant/Owner: PACIFICORPS State: OR Sampling Point: SP19

Investigator(s): CLEVELAND B SAMATIAN Section, Township, Range: S36 T39 R5E

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 2

Subregion (LRR): A Lat: 42° 28' 34.093" N Long: 122° 57' 55.566" W Datum: NAD 83

Soil Map Unit Name: DEBENGER BRADDOCK LOAMS 1-15% SLOPES NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ~)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ~)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 6')			
1. ALOPECURUS PRATENSIS	100	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ~)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 3/2	95	7.5YR 5/6	5	C	M	L	Fe must be present in upper 12"
0-1	organic duff layer							
1-2.5	10YR 2/2	100					CL	
2.5-9.5	10YR 3/2	90	10YR 3/6	10	C	PL	CL	
9.5-19	10YR 3/3	98	10YR 4/4	2	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

DRY COMPACT SOILS & UNABLE TO DIG BELOW 14 INCHES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X* No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: * STRONG HYDRIC SOILS & VEG PRESENT — BASED ON PROCEDURES IN MANUAL FOR PROBLEMATIC SITUATIONS DURING DRY SEASON, ASSUME HYDROLOGY IS PRESENT EARLIER IN GROWING SEASON.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Table Rock Substation City/County: Jackson County Sampling Date: 9-10-14

Applicant/Owner: PacifiCorp State: OR Sampling Point: SP20

Investigator(s): [illegible] Section, Township, Range: S36 T34 R5E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR): A Lat: 42° 28' 33.85" N Long: 122° 57' 54.71" W Datum: NAD 83

Soil Map Unit Name: DEBENGER BRADER LOAMS 1-15% SLOPES NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ✓)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ✓)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 6')			
1. Poa bulbosa	10	N	FACU
2. Alopecurus pratensis	40	N	FAC
3. Taeniatherum caput-medusae	50	Y	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ✓)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species	50	x 5 =	250
Column Totals:	100 (A)		410 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

Sampling Point: SP 2.0

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/3	95	5YR 4/6	5	C	M	L	
0-3	10YR 4/3	95	7.5YR 4/6	5	C	M	CL	
3-16.5	10YR 3/4	100					SiCL	

update

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ **Depleted Matrix (F3)**
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

DRY, COMPACT SOILS & UNABLE TO DIG BELOW 12 INCHES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: TABLEROCK SUBSTATION City/County: JACKSON COUNTY Sampling Date: 9-10-14

Applicant/Owner: ARMY CORPS State: OR Sampling Point: SP24

Investigator(s): L. CLEVELAND, B. WINTSINN Section, Township, Range: S36 T2W R5E

Landform (hillslope, terrace, etc.): VALLEY BOTTOM Local relief (concave, convex, none): CONCAVE Slope (%): 0

Subregion (LRR): A Lat: 42°28'30.714"N Long: 122°57'50.822"W Datum: NAD83

Soil Map Unit Name: CARNEY CLAY 1-5% SLOPES NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ✓)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ✓)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10')			
1. JUNCUS TENUIS	90	Y	FAC
2. CICHORIUM INTYBUS	T	N	FACU
3. TRIOPODON PORRIFOLIUS	T	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ✓)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

Sampling Point: SP24

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	99	7.5YR 3/4	1	C	M	L	
0-15+	2.5Y 3/3	100					CL	really dense & dry

update

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

DRY, COMPACT SOILS & UNABLE TO DIG BELOW 8 INCHES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PLOT LOCATED IN LOW SPOT WHERE RUNOFF MAY ACCUMULATE OR HIGH WATER TABLE SURFACE

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: TABLE ROCK SUBSTATION City/County: JACKSON COUNTY Sampling Date: 9-11-14

Applicant/Owner: PACIFICORP State: OR Sampling Point: SP26

Investigator(s): L. CLINTSMAN, S. SAMA-JIAN Section, Township, Range: S36 T39 R1E

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 2

Subregion (LRR): A Lat: 42°28' 31.827"N Long: 122°57' 50.89"W Datum: NAD83

Soil Map Unit Name: COKER CLAY 0-3% SLOPES NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 6')			
1. MADIA GRACILIS	5	Y	UPL
2. ALOPECURUS PRATENSIS	10	Y	FAC
3. CICHORIUM INTYBUS	T	N	FACU
4. TAENIATHERUM CRINITUM	5	Y	UPL
5. POLYPOGON MONSPELIENSIS	5	Y	FACW
6. RUMEX CRISPUS	T	N	FAC
7. POA SP	10*	N	—
8.			
9.			
10.			
11.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 65

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	25 (A)		90 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: * UNABLE TO IDENTIFY TO SPECIES — NOT INCLUDED IN VEG CALCS

Sampling Point: SP26

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					CL	
0-9	10YR3/1	100					CL	
9-12	10YR 3/1	30					CL	
9-12	10YR 5/6	70					LS	loamy sand
12-24+	10YR3/1	100					CL	

update

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

82% compact soils if digging to dig below 12 inches

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Table Rock Substation City/County: Jackson County Sampling Date: 9/2/15

Applicant/Owner: Pacificorp State: OR Sampling Point: SP30

Investigator(s): B. Sahatjian / M Witter Section, Township, Range: S36 T2W R5E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): A Lat: 42°28'34.431"N Long: 122°57'52.273"W Datum: NAD83

Soil Map Unit Name: DebengerBraderloams, 1-15% slopes (D61) NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ____	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. yellow starthistle (centaurea solstialis)	70	Y	UPL
2. alopecurus pratensis	20	N	FAC
3. Erysimbrium (mustard)	10	N	UPL
4. Chondrostegia (Brassicaceae)	50	Y	UPL
5. bromus	10	N	UPL
6.			
7.			
8.			
9.			
10.			
11.			
	160 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: weed infested patch

SOIL

Sampling Point: SP30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					L	many fine roots
4-18	10YR 3/3	100					SiL	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: no hydric soil indicators present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: no hydrology indicators present

Attachment A-3:

DSL Concurrence

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 7, 2015

State Land Board

Kate Brown
Governor

Jeanne P. Atkins
Secretary of State

Ted Wheeler
State Treasurer

PacifiCorp
Attn: John Aniello
825 NE Multnomah, Suite 1700
Portland, OR 97232

Re: WD #2015-0187 Wetland Delineation Report for Table Rock Substation
Jackson County; T36S R2W Sec. 5, Tax Lots 600, 700, 701

Dear Mr. Aniello:

The Department of State Lands has reviewed the wetland delineation report prepared by HDR Engineering, Inc. for the site referenced above. 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 Figures 5-1 through 5-5 of the report. Please replace all copies of the preliminary wetland map with these final Department-approved maps.

Within the study area, three wetlands (Wetlands A-C) and two ditches (Ditch 1-2) were identified. The wetlands (totaling approximately 4.78 acres) and Ditch 1 are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined). Ditch 2 is exempt per OAR 141-085 -0515(10); therefore, is not subject to current state Removal-Fill requirements.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

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. Please phone me at 503-302-3290 if you have any questions.

Sincerely,

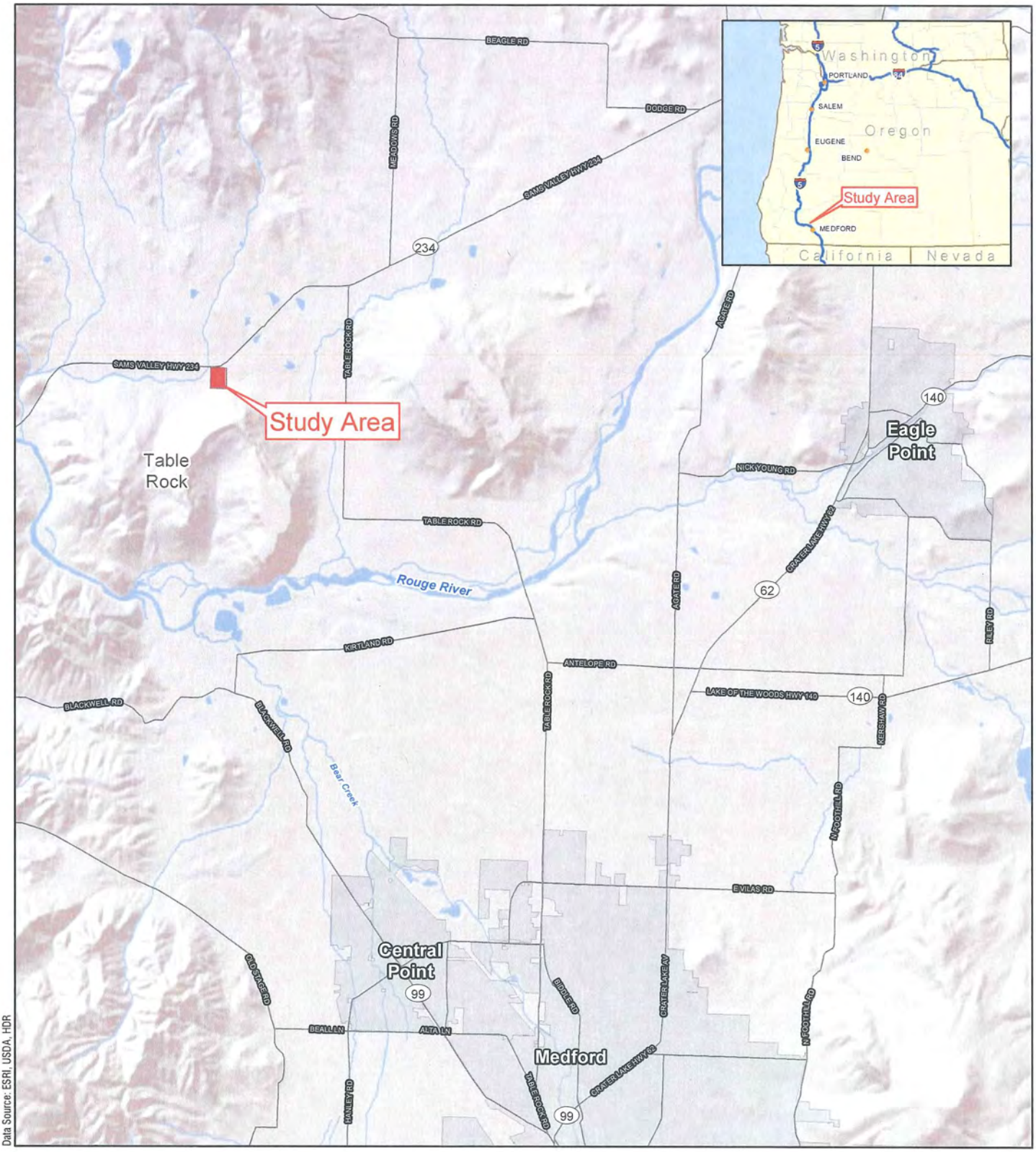
Lauren Brown
Jurisdiction Coordinator

Approved by

Kathy Verble, CPSS
Aquatic Resource Specialist

Enclosures

ec: Leandra Cleveland, HDR Engineering, Inc.
Jackson County Planning Department (Maps enclosed for updating LWI)
Omar Ortiz, Corps of Engineers
Bob Lobdell, DSL



Major Road

Study Area

City Limits

Location Map

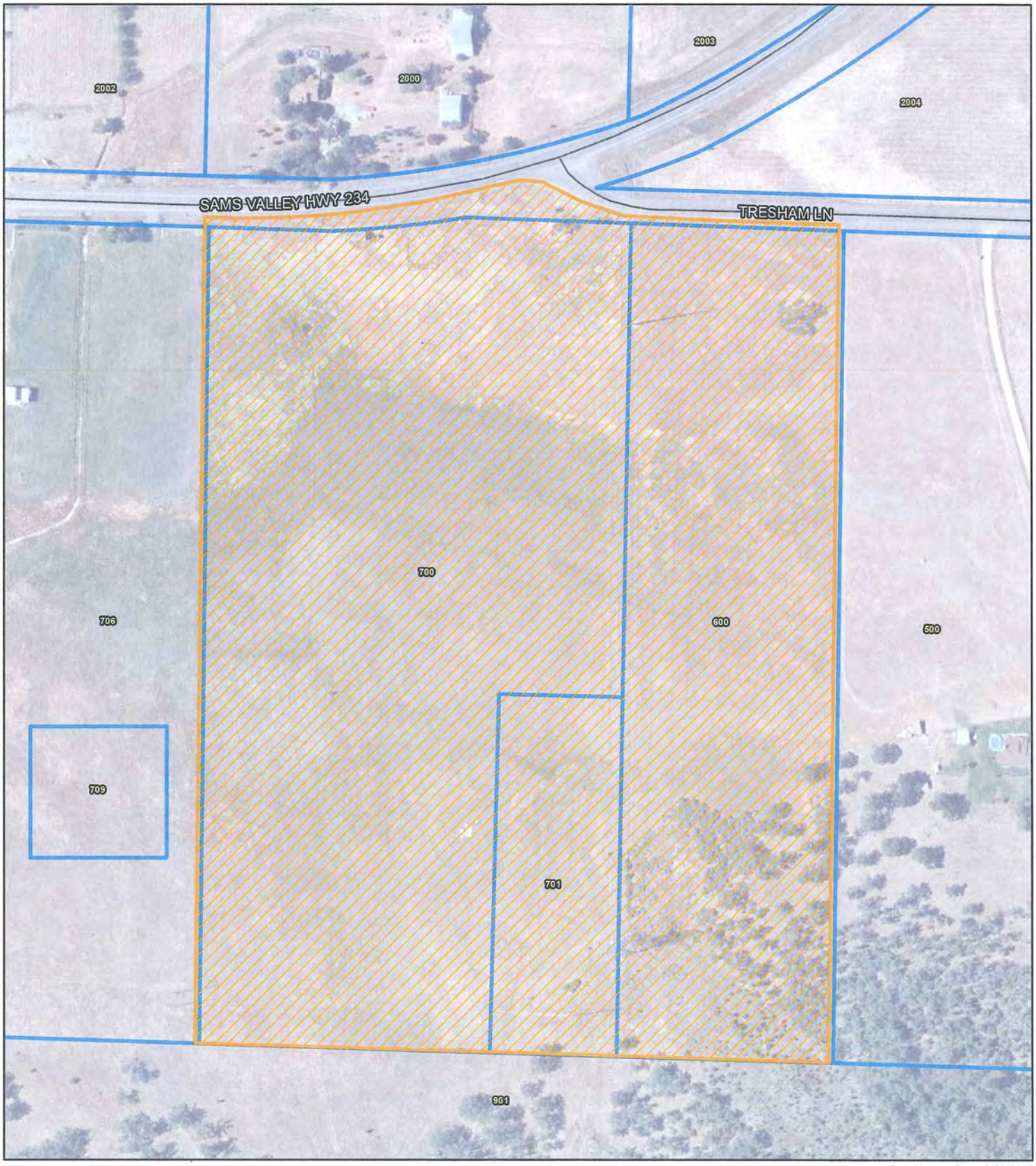
Figure 1

0 1 2

Miles

N

Table Rock Substation | PacifiCorp



Data Source: ESRI, Jackson County, HDR

Aerial Image Date: 6/28/2010

Study Area

Taxlot

Street

Taxlot Map

Figure 2

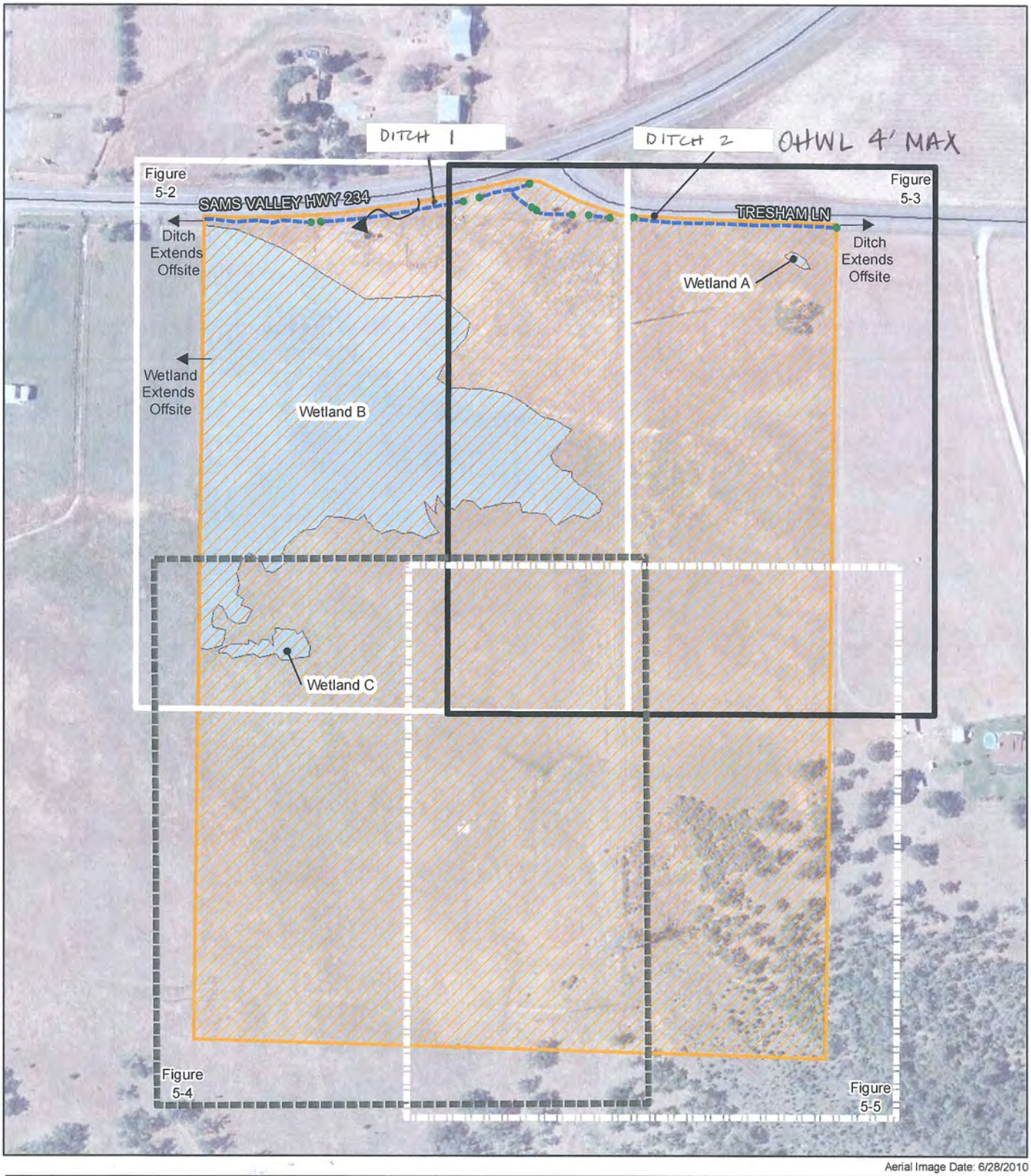
0 200 400

Feet

N

HDR

Table Rock Substation | PacifiCorp



Data Source: ESRI, Jackson County, HDR

Aerial Image Date: 6/28/2010

Study Area
Street
Culvert
Delineated Wetland
Delineated Ditch
Direction of Flow

DSL WD # 2015-0187

Approval Issued 10-07-2015

Approval Expires 10-07-2020

*Data plot locations, wetland boundaries were recorded using a resource grade Trimble GeoXH 6000 Global Positioning System (GPS). Mapping accuracy of the unit is 50 cm (1.64 feet) using post-processed differential data correction (DGNSS). GPS data was post-processed and corrected after data was downloaded.

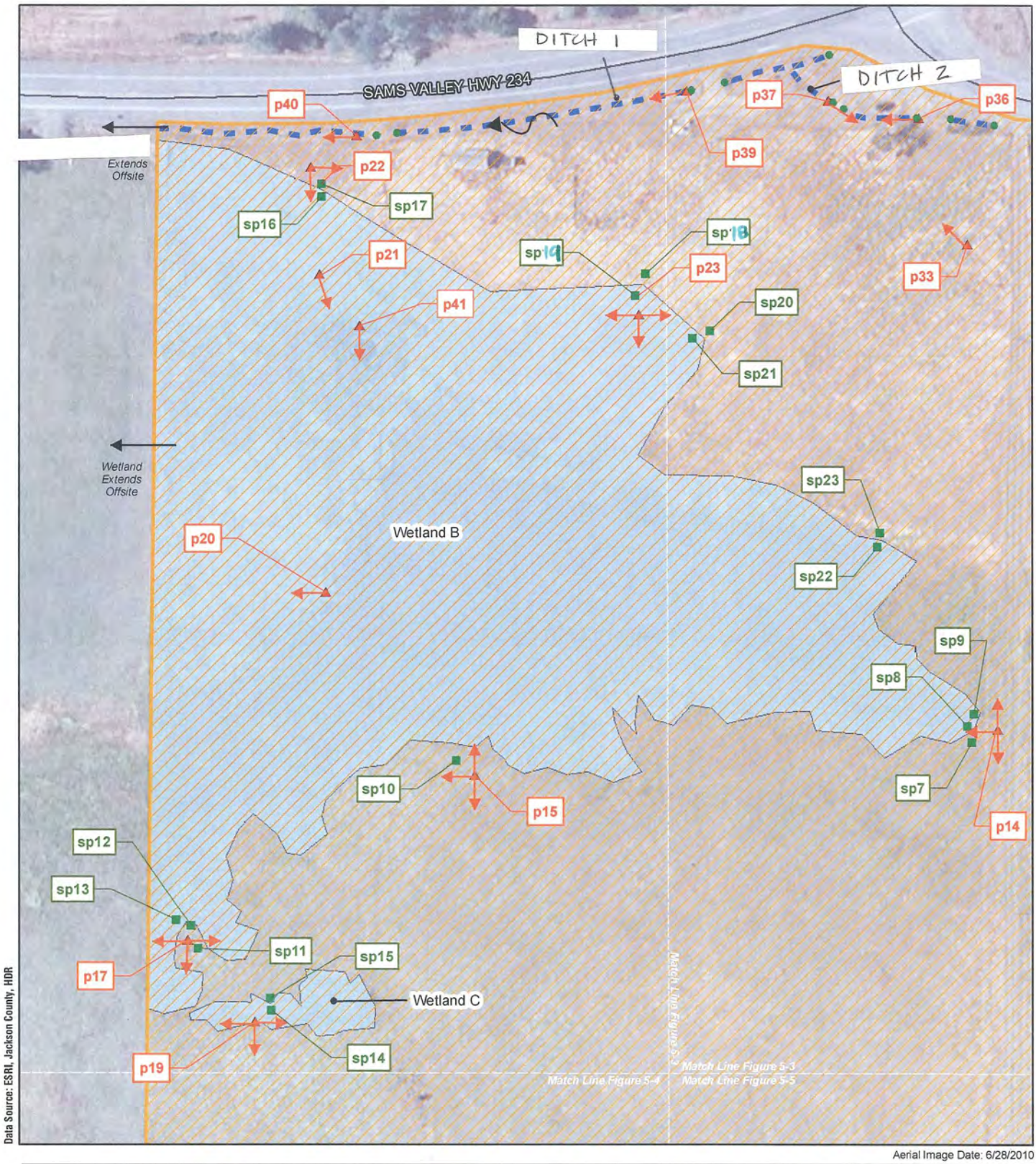
Wetland Delineation Map Index

Figure 5-1

0 200 400
Feet

N

Table Rock Substation | PacifiCorp



Data Source: ESRI, Jackson County, HDR

Aerial Image Date: 6/28/2010

Culvert
Photo Point
Sample Plot
Direction of Flow
Study Area
Delineated Wetland
Delineated Ditch
Street

DSL WD # 2015-0187

Approval Issued 10-07-2015

Approval Expires 10-07-2020

Wetland Delineation Map

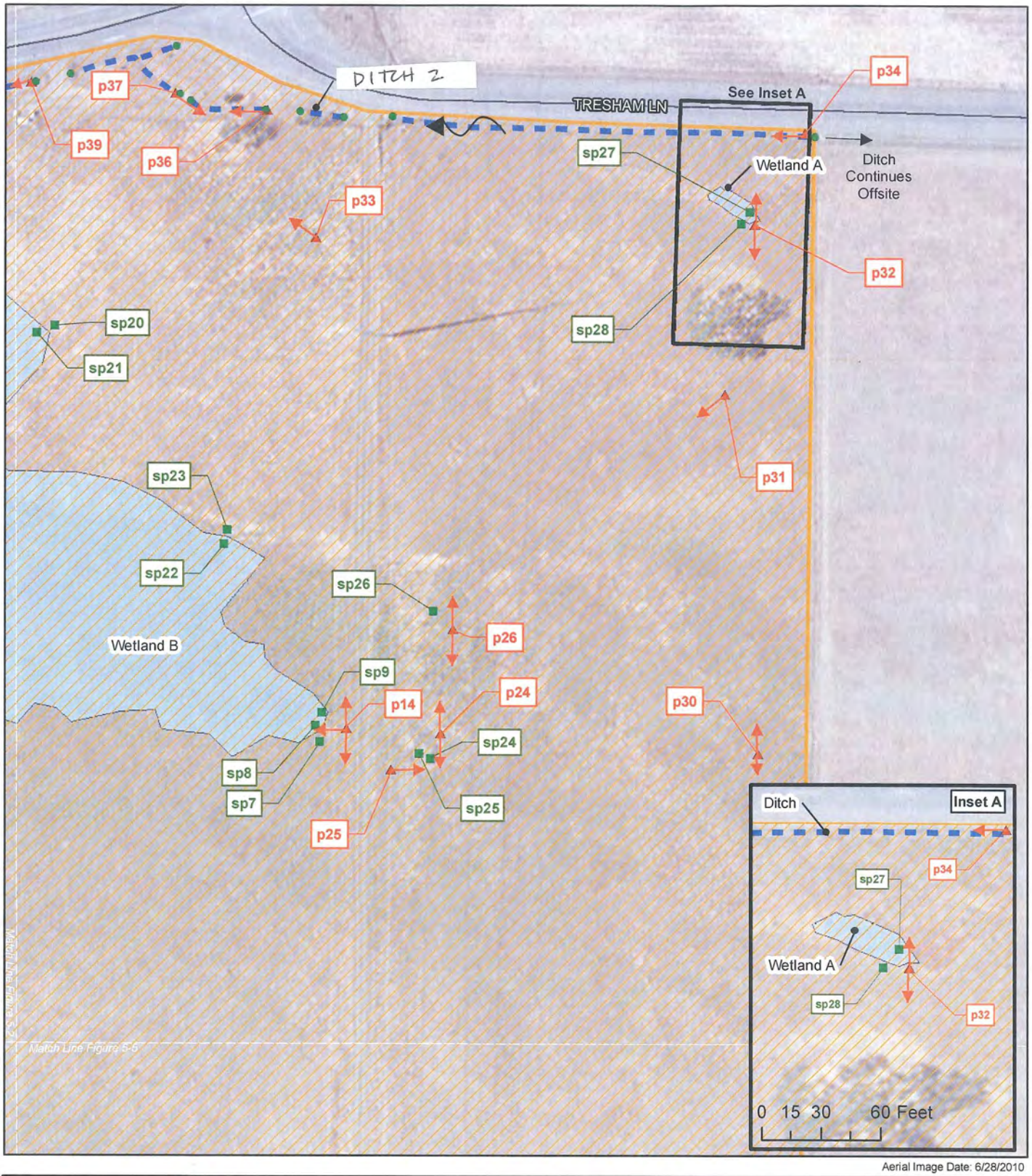
Figure 5-2

0 50 100
Feet

N

*Data plot locations, wetland boundaries were recorded using a resource grade Trimble GeoXH 6000 Global Positioning System (GPS). Mapping accuracy of the unit is 50 cm (1.64 feet) using post-processed differential data correction (DGNSS). GPS data was post-processed and corrected after data was downloaded.

Table Rock Substation | PacifiCorp



Data Source: ESRI, Jackson County, HDR

Aerial Image Date: 6/28/2010

Culvert
Photo Point
Sample Plot
Direction of Flow
Study Area
Delineated Wetland
Delineated Ditch
Street

DSL WD # 2015-0187

Approval Issued 10-07-2015

Approval Expires 10-07-2020

Wetland Delineation Map

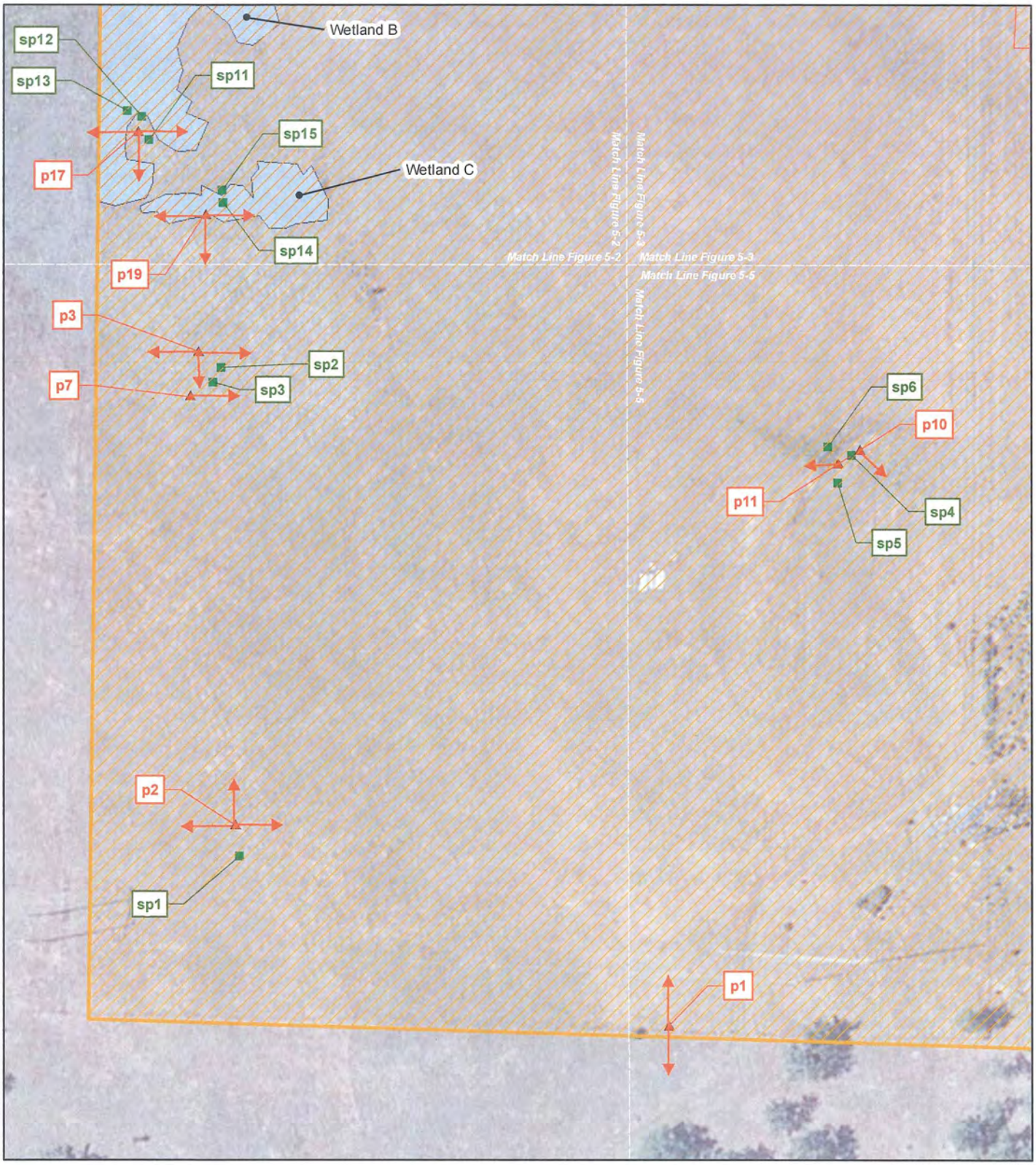
Figure 5-3

0 50 100 Feet

N

*Data plot locations, wetland boundaries were recorded using a resource grade Trimble GeoXH 6000 Global Positioning System (GPS). Mapping accuracy of the unit is 50 cm (1.64 feet) using post-processed differential data correction (DGNSS). GPS data was post-processed and corrected after data was downloaded.

Table Rock Substation | PacifiCorp



Data Source: ESRI, Jackson County, HDR

Aerial Image Date: 6/28/2010

▲ Photo Point

■ Sample Plot

Study Area

Delineated Wetland

DSL WD # 2015-0187

Approval Issued 10-07-2015

Approval Expires 10-07-2020

*Data plot locations, wetland boundaries were recorded using a resource grade Trimble GeoXH 6000 Global Positioning System (GPS). Mapping accuracy of the unit is 50 cm (1.64 feet) using post-processed differential data correction (DGNSS). GPS data was post-processed and corrected after data was downloaded.

Wetland Delineation Map

Figure 5-4

0 50 100

Feet

N

Table Rock Substation | PacifiCorp



Data Source: ESRI, Jackson County, HDR

Aerial Image Date: 6/28/2010

▲ Photo Point

■ Sample Plot

Study Area

DSL WD # 2015-0187

Approval Issued 10-07-2015

Approval Expires 10-07-2020

*Data plot locations, wetland boundaries were recorded using a resource grade Trimble GeoXH 6000 Global Positioning System (GPS). Mapping accuracy of the unit is 50 cm (1.64 feet) using post-processed differential data correction (DGNSS). GPS data was post-processed and corrected after data was downloaded.

Wetland Delineation Map

Figure 5-5

0 50 100

Feet

N

Table Rock Substation | PacifiCorp

Attachment B:

USGS Topographic Map

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

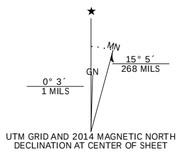
SAMS VALLEY QUADRANGLE
OREGON-JACKSON CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 10T
10 000-foot ticks: Oregon Coordinate System of 1983 (south zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, June 2012 - July 2012
Roads.....HERE, ©2013
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2012
Contours.....National Elevation Dataset, 2000
Boundaries.....Multiple sources; see metadata file 1972 - 2013
Public Land Survey System.....BLM, 2011



UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
EN / EM
Grid Zone Designation 10T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 MILES 1
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16



QUADRANGLE LOCATION

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

1	2	3
4		5
6	7	8

1 McConville Peak
2 Boswell Mountain
3 Shady Cove
4 Gold Hill
5 Eagle Point
6 Mount Isabelle
7 Medford West
8 Medford East

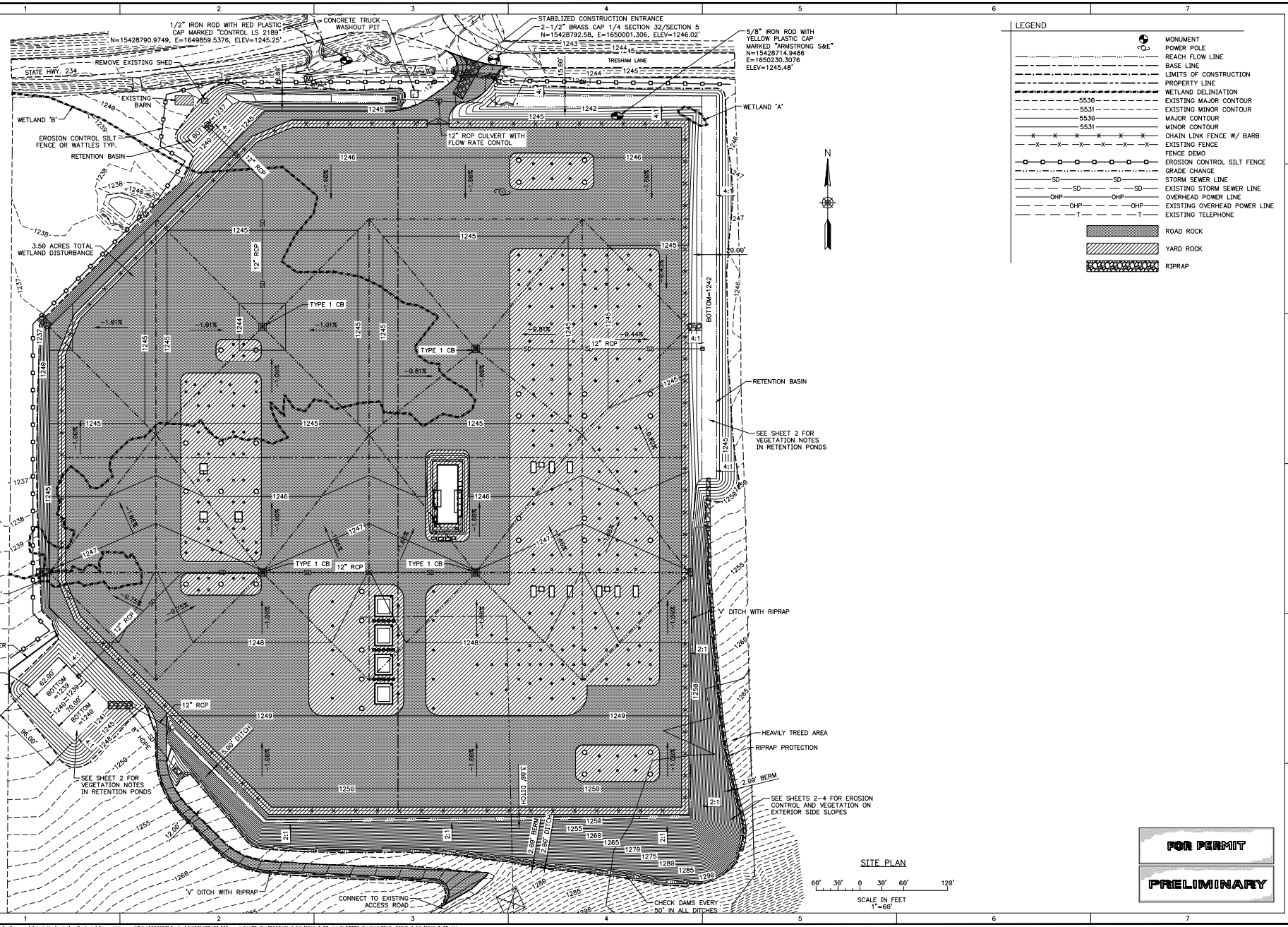
ADJOINING QUADRANGLES

SAMS VALLEY, OR
2014

NSN. 7643016390667
NGA REF NO. USGSX24K39565

Attachment C:

Site Plan Drawings



FOR PERMIT

PRELIMINARY

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

PACIFICORP

CIVIL

PROJ/REF	10652553	DISCIPLINE ENG.	
DATE	02/15/2016	PROJECT ENG.	
DWG.	G. HUNTING	DES. G. HUNTING	APPROVAL ENG.
DR.	G. HUNTING	CH.	
SCALE:			1"=60'

SAMS VALLEY SUBSTATION
JACKSON COUNTY, OREGON
GRADING PLAN
OVERALL SITE PLAN

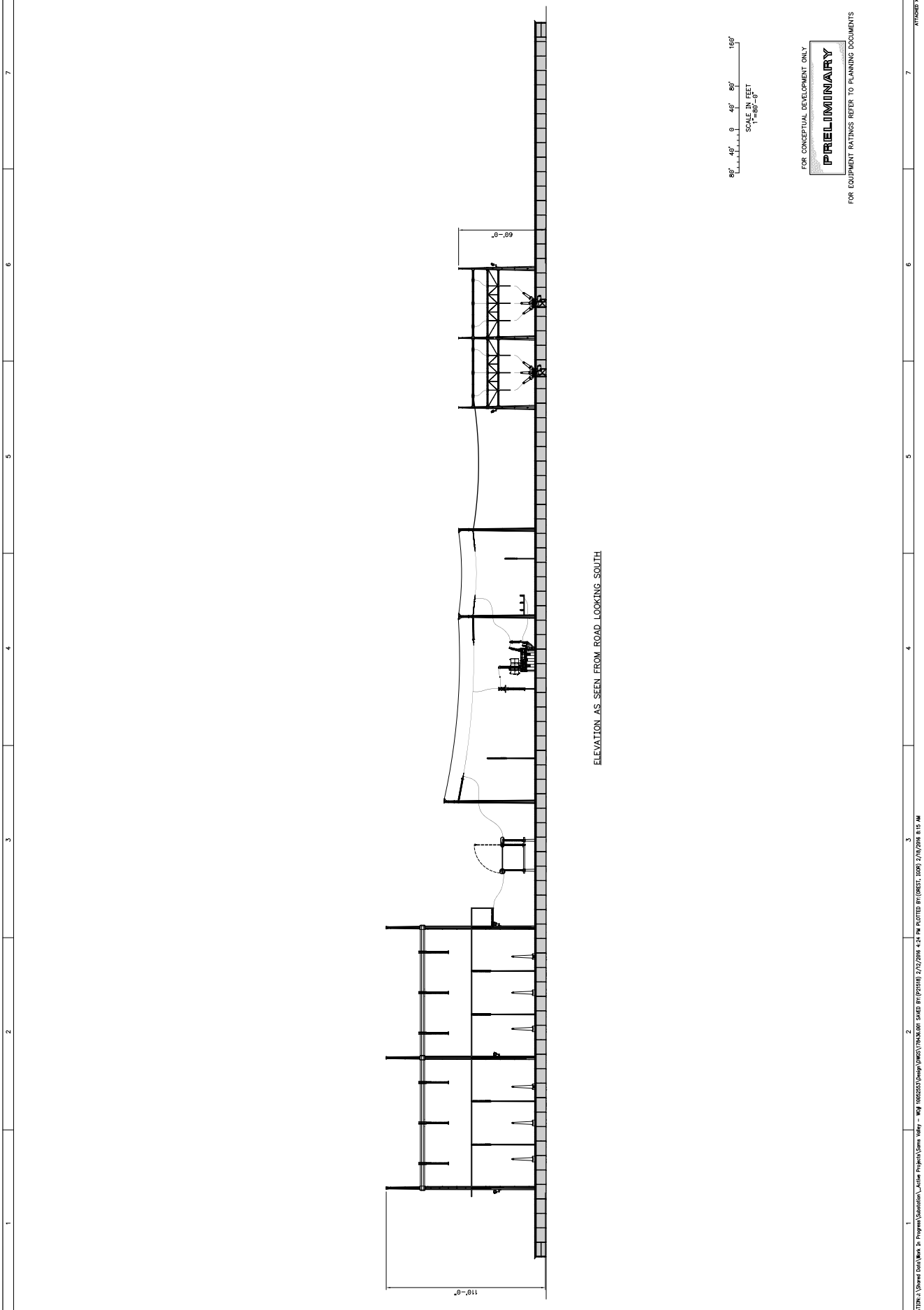
178455.001

REVISION 0A

SHEET 1 OF 4

REVISED 06/02/14 D. HURLEY

FILE LOCATION: J:\Shared Data\Work In Progress\Substation_Active Projects\Sams Valley - WO# 10652553\Design\DWGS\178455.000.pond SAVED BY:(P26346) 2/16/2016 8:37 AM PLOTTED BY:(HUNTING, RICK) 2/16/2016 8:38 AM


ELEVATION AS SEEN FROM ROAD LOOKING SOUTH
60'-0"
110'-0"
80' 40' 0 40' 80' 160'
SCALE IN FEET
1"=80'-0"
FOR CONCEPTUAL DEVELOPMENT ONLY
PRELIMINARY
FOR EQUIPMENT RATINGS REFER TO PLANNING DOCUMENTS

PRELIMINARY

REVEGETATION NOTES

1. RECOMMENDED SEEDING MIXTURES MUST BE DONE ON A SITE SPECIFIC BASIS WHICH ACCOUNTS FOR THE FOLLOWING: SOIL PROPERTIES, CLIMATIC FACTORS, TOPOGRAPHIC POSITION AND FEASIBILITY.
2. VEGETATIVE PLANTING SHALL BE DONE WHERE DEEMED NECESSARY TO HASTEN THE RETURN OF PRE-EXISTING SITE CHARACTERISTICS AND ON ANY FINISHED SLOPE WHICH WILL REMAIN UNDISTURBED FOR AT LEAST 10 YEARS.
3. ALL DISTURBED OPEN SPACE AREAS, AND CUT AND FILL AREAS, SHALL RECEIVE AN ACCEPTABLE SEED MIX.
4. SEED MIX SHALL BE APPLIED AT A RATE SO THAT GERMINATION AND SUBSEQUENT COVERAGE REACHES 80 PERCENT IN A REPRESENTATIVE 10' x 10' AREA. IF COVERAGE DOES NOT REACH 80 PERCENT, RESEEDING MUST OCCUR.
5. APPROPRIATE FERTILIZER SHALL BE APPLIED TO ALL SLOPES RECEIVING SEED. APPLICATION RATES OF THE FERTILIZER SHALL BE STRICTLY ADHERED TO.

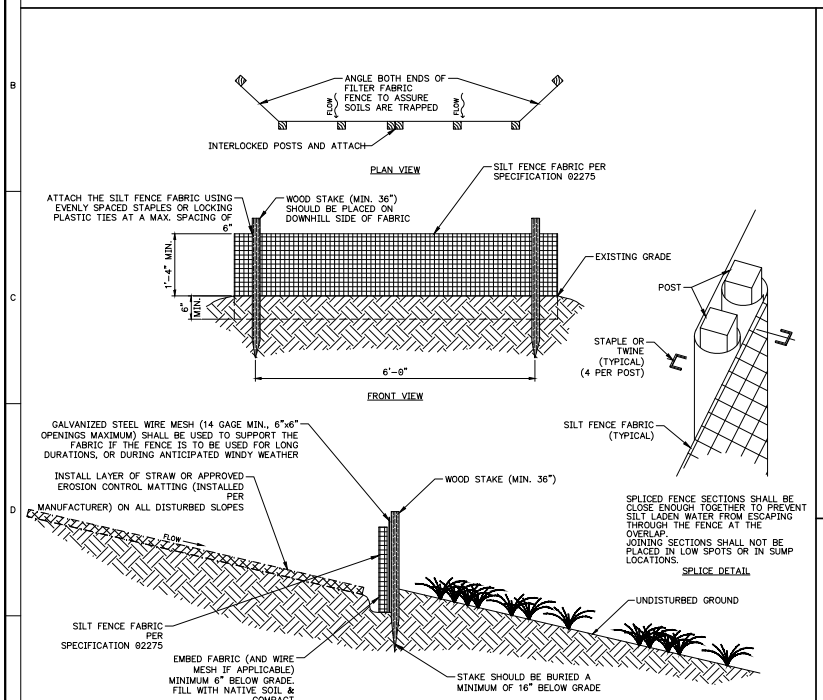
EROSION CONTROL NOTES

1. CONTROLLING SEDIMENT MIGRATION DURING STORM EVENTS AND PREVENTING AND/OR CORRECTING PROBLEMS ASSOCIATED WITH EROSION WHILE RUNOFF IS OCCURRING (WHICH CAN OCCUR BOTH DURING AND AFTER PROJECT CONSTRUCTION) WILL BE CLOSELY MONITORED. ALL MUNICIPALITIES HAVE DEFINED BEST MANAGEMENT PRACTICES (BMPs) THAT SHALL BE IMPLEMENTED TO PREVENT THE TRANSFER OF SEDIMENT AND TO CONTROL EROSION DURING EARTH MOVING ACTIVITIES. PERIODIC MAINTENANCE AND INSPECTION OF EROSION CONTROL DEVICES SHALL BE SCHEDULED.
2. THE CONTRACTOR SHALL COMPLY WITH JACKSON COUNTY, THE STATE OF OREGON AND OTHER GOVERNING AGENCIES FOR TEMPORARY EROSION CONTROL MEASURES.
3. EROSION CONTROL-SHOULD SILT LEAVE THE SITE OR EROSION OCCUR, THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE CORRECTIVE ACTION AND REPAIR ANY DAMAGE CAUSED BY THE SILT OR EROSION IMMEDIATELY. ALL COSTS ASSOCIATED WITH THE PREPARATION, MODIFICATION AND APPROVAL OF THE PLAN WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. BEFORE CONSTRUCTION BEGINS, THE LIMITS OF DISTURBANCE BOUNDARY SHALL BE FLAGGED ON SITE AND APPROVED BY PACIFICORP. UNDER NO CIRCUMSTANCES SHALL SITE DISTURBANCE OCCUR OUTSIDE THE DESIGNATED AREAS AT ANY TIME DURING CONSTRUCTION.
4. EXCAVATION AND EMBANKMENT OPERATIONS SHALL PROCEED IN SUCH A MANNER SO THAT FINISHING OF SLOPES, INCLUDING REVEGETATION, SHALL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER ROUGH GRADING. ALL SLOPES 2:1 OR FLATTER SHALL BE SCARIFIED WITH HEAVY EQUIPMENT, LEAVING TRACKS PERPENDICULAR TO THE SLOPE. THE TOPS OF ALL CUT SLOPES IN SOIL SHALL BE ROUNDED FOR A HORIZONTAL DISTANCE OF THREE FEET BEYOND THE CATCH POINT. SLOPE ROUNDING SHALL OCCUR AS THE SLOPE IS BEING BROUGHT DOWN. THE OVERALL SHAPE, HEIGHT AND GRADE OF ANY CUT AND/OR FILL SLOPE SHALL BE DEVELOPED IN CONCERT WITH THE EXISTING NATURAL CONTOURS, SCALE AND VEGETATION OF NATURAL TERRAIN.
5. STABILIZATION PRACTICES MAY INCLUDE, BUT NOT BE LIMITED TO TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, GEOTEXTILES, SOD STABILIZATION, VEGETATIVE BUFFER STRIPS, PRESERVATION OF NATURAL VEGETATION, AND OTHER APPROPRIATE MEASURES. USE OF IMPERVIOUS SURFACES FOR STABILIZATION SHALL BE AVOIDED. EXCEPT AS PROVIDED BELOW, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE IN DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 15 DAYS AFTER ACTIVITY IN THAT PORTION OF THE SITE HAS PERMANENTLY CEASED.

5.1. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 15TH DAY AFTER CONSTRUCTION ACTIVITY PERMANENTLY CEASES IS PRECLUDED BY DEEP SNOW OR FROZEN GROUND CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE.

5.2. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING WILL RESUME WITHIN 15 WORKING DAYS, TEMPORARY STABILIZATION MEASURES NEED NOT BE INITIATED ON THAT PORTION OF THE SITE.

6. SPECIFICALLY OUTLINED DISTURBED AREAS, BOTH ON AND OFF-SITE SHALL BE REVEGETATED. THESE AREAS SHALL INCLUDE, BUT NOT BE LIMITED TO ALL UNSURFACED AREAS WITHIN THE FLAGGED LIMITS OF DISTURBANCE, STAGING AND STORAGE AREAS, MATERIAL WASTE AREAS, UNDERGROUND UTILITY CONSTRUCTION AREAS, BENCHED AREAS, AND TEMPORARY OR EXISTING ACCESS ROADS USED FOR CONSTRUCTION ACTIVITIES. CUT AND FILL SLOPES OVER 3:1 REQUIRE THE PLACEMENT OF EROSION CONTROL/REVEGETATION MATTING. SLOPES LESS THAN 3:1 MAY BE SPRAYED WITH TACKIFIER.
7. SEDIMENT TRAPS MUST OUTLET ONTO STABILIZED (PREFERABLY UNDISTURBED) GROUND, OR LEFT TO PERCOLATE INTO THE GROUND.
8. CONTROLLED OUTLETS SHALL DIRECT COLLECTED RUNOFF THROUGH SILT FENCES OR STRAW BALES.
9. TYPICAL FUGITIVE DUST SHALL BE CONTROLLED BY WATERING AND/OR CHEMICAL STABILIZATION, PROVIDING VEGETATIVE OR SYNTHETIC COVER AND WIND BREAKS CONSISTENT WITH THE COUNTY OF JACKSON AND THE STATE OF OREGON REQUIREMENTS.
10. SEE CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

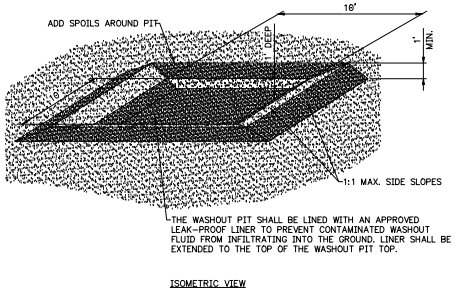


NOTES

1. INSTALL SILT FENCE ALONG CONTOURS. TO AVOID CREATING LOW POINTS ALONG THE SILT FENCE, ALIGN THE FENCE ALONG THE CONTOUR AS MUCH AS POSSIBLE. WHERE EXCESSIVE RUNOFF WILL ACCUMULATE AT A LOW POINT, PROVIDE AN OPENING IN THE FENCE AND INSTALL A SEDIMENT TRAP.
2. EMBED BOTTOM OF SILT FENCE FABRIC 6" VERTICALLY BELOW FINISHED GRADE. COMPACT ALL AREAS WHERE THE FABRIC IS EMBEDDED.
3. 2"x2" FIR, PINE OR STEEL FENCE POSTS.
4. STITCHED LOOPS TO BE INSTALLED UPHILL SIDE OF SLOPE.
5. DO NOT PLACE SILT FENCE ACROSS POTENTIAL CONCENTRATED FLOWS (PIPE OUTLETS, DRAINAGE CHANNELS, CUT DITCHES).
6. SEDIMENT CONTROL FABRIC SHALL BE USED FOR INSTALLATIONS OF SHORT DURATION. THE FABRIC IS CUT ON SITE TO THE DESIRED WIDTH, UNROLLED ALONG THE LENGTH OF THE FENCE. THE FABRIC TOE IS SECURED WITH ROCKS OR DIRT AND THE FABRIC IS SECURED TO THE STAKES WITH TWINE, STAPLES, OR SIMILAR DEVICES. AFTER THE CONSTRUCTION AREA IS STABILIZED AND EROSION ACTIVITY CURTAILED, THE SILT FENCES SHALL BE REMOVED AND THE SEDIMENT THAT WAS CONTAINED SHALL BE LEVELED, SEEDED, AND MULCHED. SPECIAL PROTECTION OF THE SEED BED MAY BE NECESSARY IF THE LAYERS ARE OVER 1 FOOT THICK.
7. SEDIMENT FROM THE STORM EVENT AND THE FENCE TRENCH SPOIL ON THE UPHILL SIDE OF THE FENCE SHALL BE REMOVED FROM THE SITE OR STORED IN THE STOCKPILE AREA.
8. AFTER THE SURROUNDING AREAS HAVE BEEN STABILIZED AND THE PROJECT IS APPROVED BY PACIFICORP, THE FENCE POST AND FENCE SHALL BE REMOVED COMPLETELY AND HAULED TO AN APPROVED LOCATION OFFSITE.
9. AS AN ALTERNATIVE, A STRAW WATTLE SHALL BE USED IN PLACE OF A SILT FENCE WHEN WINDY WEATHER IS ANTICIPATED OR WHEN THE BMPs ARE TO REMAIN INSTALLED FOR LONG PERIODS OF TIME.

USED FOR SHEET FLOWS

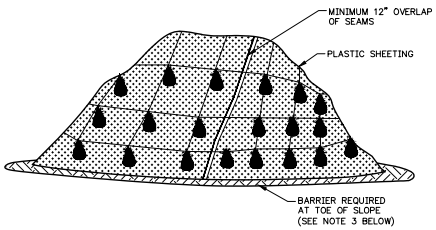
SILT FENCE DETAIL



NOTES

1. A WASHOUT PIT SHALL BE CONSTRUCTED FOR CONCRETE TRUCK WASHING. THE LOCATION SHALL BE COORDINATED WITH PACIFICORP PRIOR TO CONSTRUCTION AND SHALL COMPLY TO THE REQUIREMENTS OF THE STATE AND LOCAL GOVERNING AGENCIES.
2. WASHING OUT OF CONCRETE TRUCKS AND RINSING OF THE CONCRETE TRUCK CHUTES SHALL BE STRICTLY MONITORED TO AVOID THE CONTAMINATION OF DOWNSTREAM WATERWAYS.
3. EXCESS WASHOUT FLUID AND CONCRETE MATERIALS IN THE PIT SHALL BE REMOVED REGULARLY TO AVOID OVERFLOW. DISPOSAL MATERIALS SHALL BE HAULED TO AN APPROVED DISPOSAL LOCATION OFFSITE.
4. AFTER COMPLETION OF THE PROJECT, WASHOUT PIT INCLUDING ALL EXCESS WASHOUT, AND CONCRETE SHALL BE DISPOSED OF AT AN APPROVED DISPOSAL LOCATION OFFSITE.

CONCRETE TRUCK WASHOUT PIT DETAIL



NOTES

1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.
3. BARRIERS AT THE TOE OF STOCKPILE SHALL BE CONSTRUCTED WITH SEDIMENT FENCES, MULCH BERMS, CLIPPINGS, STRAW WATTLES, OR OTHER APPROVED BMP MATERIALS.
4. PLASTIC SHEETING IS USED TO PROVIDE IMMEDIATE PROTECTION TO SLOPES AND STOCKPILES.
5. DO NOT USE PLASTIC COVERING UPSLOPE OF AREAS SUCH AS STEEP AND/OR UNSTABLE SLOPES THAT MIGHT BE ADVERSELY AFFECTED BY CONCENTRATED RUNOFF.
6. WHEN NECESSARY, INSTALL AN INTERCEPTOR DIKE, GRAVEL OR RIPRAP BERM, OR OTHER SUITABLE PROTECTION DEVISE UPHILL OF THE STOCKPILE TO DIVERT FLOWS AROUND THE STOCKPILE OR TO DISSIPATE RUNOFF VELOCITY.
7. TOE-IN THE TOP OF THE SHEETING IN A 6"x6" TRENCH BACKFILLED WITH COMPACTED NATIVE MATERIAL.
8. ANCHOR THE PLASTIC USING SANDBAGS, TIRES, OR OTHER SUITABLE TETHERED ANCHOR SYSTEM SPACED ON A 10' GRID SPACING IN ALL DIRECTIONS.
9. OVERLAP SEAMS 1' TO 2', TAPE, ROLL AND STAKE THE SEAMS AND THEN WEIGH DOWN THE ENTIRE LENGTH.
10. REPLACE TORN SHEETS AND REPAIR OPEN SEAMS. WHEN THE PLASTIC SHEET BEGINS TO DETERIORATE, IT SHALL BE REMOVED AND REPLACED COMPLETELY.

STOCKPILE OR SURCHARGE SHEETING DETAIL

RETENTION POND NOTES (FOR TOPSOIL AND COMPOST):

THE TOPSOIL SHALL NOT CONTAIN SUBSTANCES DETRIMENTAL TO THE GROWTH OF PLANTS AND SHALL BE FREE OF PLANTS DESIGNATED BY THE WASHINGTON STATE NOXIOUS WEED CONTROL BOARD AS CLASS "A" OR CLASS "B" WEEDS. UNSUITABLE TOPSOIL, OR TOPSOIL PLACED BY THE CONTRACTOR WITHOUT APPROVAL IN STORMWATER FACILITIES, MAY BE REQUIRED TO BE REPLACED AT NO ADDITIONAL COST TO THE COMPANY.

THE TOPSOIL MATERIAL SHALL BE ANY BLEND OF LOAMY SOIL, SAND, AND COMPOST THAT IS 30-40% COMPOST (BY VOLUME) AND MEETS THE OTHER CRITERIA AS SPECIFIED BELOW:

- A SIEVE ANALYSIS OF THE BLENDED MATERIAL, INCLUDING COMPOST, SHALL BE CONDUCTED IN CONFORMANCE WITH ASTM C117/C136, AASHTO T11/T27 OR ASTM D422/D1140.
- THE ANALYSIS SHALL INCLUDE THE FOLLOWING SIEVE SIZES: 1 INCH, 3/8 INCH, #4, #10, #20, #40, #60, #100, #200. THE GRADATION OF THE BLEND SHALL MEET THE GRADATION CRITERIA SHOWN IN THE TABLE ABOVE
- THE TOPSOIL BLEND SHALL HAVE A COEFFICIENT OF UNIFORMITY (D60/D10) EQUAL TO OR GREATER THAN 6 TO ENSURE THAT IT IS WELL GRADED. IT SHALL BE LOOSE AND FRIABLE, WELL MIXED AND HOMOGENOUS, BE FREE OF WOOD PIECES, PLASTIC, AND OTHER FOREIGN MATTER, AND SHALL HAVE NO VISIBLE FREE WATER.
- THE PH OF THE BLENDED MATERIAL SHALL BE TESTED AND BE BETWEEN 6 AND 8.
- THE TOPSOIL MATERIAL SHALL BE PROTECTED FROM ALL SOURCES OF CONTAMINATION, INCLUDING WEED SEEDS, WHILE AT THE SUPPLIER, IN CONVEYANCE, AND AT THE PROJECT SITE.
- THE MATERIAL SHALL BE PLACED IN LOOSE LIFTS, NOT TO EXCEED 8 INCHES EACH AND EACH LIFT SHALL BE COMPACTED WITH A WATER-FILLED LANDSCAPE ROLLER. THE MATERIAL SHALL NOT OTHERWISE BE MECHANICALLY COMPACTED.
- WEATHER PERMITTING AND AS APPROVED, PLANTS SHALL BE INSTALLED AS SOON AS POSSIBLE AFTER PLACING AND GRADING THE TOPSOIL IN ORDER TO MINIMIZE EROSION AND FURTHER COMPACTION.
- TEMPORARY EROSION CONTROL MEASURES ARE REQUIRED UNTIL PERMANENT STABILIZATION MEASURES ARE FUNCTIONAL.
- IN ALL CASES, THE INSTALLED TOPSOIL MATERIAL MUST BE PROTECTED FROM FOOT OR EQUIPMENT TRAFFIC AND SURFACE WATER RUNOFF. TEMPORARY FENCING SHALL BE INSTALLED AS NEEDED TO KEEP WORKERS, PEDESTRIANS, AND EQUIPMENT OUT OF THE AREA. UNDER NO CIRCUMSTANCES SHOULD MATERIALS AND EQUIPMENT BE STORED ON TOP OF THE INSTALLATION AREA.
- PLACEMENT OF THE TOPSOIL WILL NOT BE ALLOWED WHEN THE GROUND IS FROZEN OR SATURATED OR WHEN THE WEATHER IS TOO WET AS DETERMINED BY THE COMPANY'S REPRESENTATIVE.
- THE COMPOST SHALL BE DERIVED FROM PLANT MATERIAL UNDER CONDITIONS DESIGNED TO PROMOTE AEROBIC DECOMPOSITION AND PROVIDED BY A MEMBER OF THE US COMPOSTING COUNCIL SEAL OF TESTING ASSURANCE (STA) PROGRAM (SEE WWW.COMPOSTINGCOUNCIL.ORG FOR A LIST OF LOCAL PROVIDERS). THE MATERIAL SHALL BE WELL COMPOSTED, FREE OF VIABLE WEED SEEDS, AND STABLE WITH REGARD TO OXYGEN CONSUMPTION AND CARBON DIOXIDE GENERATION. THE COMPOST SHALL HAVE NO VISIBLE FREE WATER AND PRODUCE NO DUST WHEN HANDLED. IT SHALL MEET THE FOLLOWING CRITERIA:
- 100% OF THE MATERIAL MUST PASS THROUGH A 1/2-INCH SCREEN.
- THE PH OF THE MATERIAL SHALL BE BETWEEN 6 AND 8.
- MANUFACTURED INERT MATERIAL (PLASTIC, CONCRETE, CERAMICS, METAL, ETC.) SHALL BE LESS THAN 1.0% BY WEIGHT.
- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 30 AND 70% (DRY WEIGHT BASIS).
- SOLUBLE SALT CONTENT SHALL BE LESS THAN 6.0 MMHOS/CM.
- MATURITY INDICATOR SHALL BE GREATER THAN 80% FOR GERMINATION AND VIGOR.
- STABILITY SHALL BE 'STABLE' TO 'VERY STABLE'.
- CARBON/NITROGEN (C/N) RATIO SHALL BE LESS THAN 25:1.
- SHALL PASS THE TRACE METALS TEST.
- SUBMIT THE FOLLOWING AT LEAST 14 WORKING DAYS IN ADVANCE OF CONSTRUCTION:
- DOCUMENTATION FOR THE TWO ANALYSES (PARTICLE GRADATION WITH CALCULATED COEFFICIENT OF UNIFORMITY; AND PH) SHALL BE PERFORMED BY AN ACCREDITED LABORATORY WITH CURRENT CERTIFICATION. THE DATE OF THE ANALYSES SHALL BE NO MORE THAN 90 CALENDAR DAYS PRIOR TO THE DATE OF THE SUBMITTAL. THE REPORT SHALL INCLUDE THE FOLLOWING INFORMATION:
  - NAME AND ADDRESS OF THE LABORATORY.
  - PHONE CONTACT AND E-MAIL ADDRESS FOR THE LABORATORY.
  - TEST DATA, INCLUDING THE DATE AND NAME OF THE TEST PROCEDURE.
  - A COMPOST TECHNICAL DATA SHEET FROM THE COMPOST VENDOR. THE ANALYSIS AND REPORT MUST CONFORM TO THE SAMPLING AND REPORTING REQUIREMENTS OF THE US COMPOSTING COUNCIL SEAL OF TESTING ASSURANCE (STA) PROGRAM. THE ANALYSIS SHALL BE PERFORMED AND REPORTED BY AN APPROVED INDEPENDENT STA PROGRAM LABORATORY AND BE NO MORE THAN 90 CALENDAR DAYS PRIOR TO THE DATE OF THE SUBMITTAL.
  - TWO 5-GALLON BUCKETS OF THE BLENDED MATERIAL, AND A DESCRIPTION OF THE LOCATION, EQUIPMENT, AND METHOD PROPOSED TO MIX THE MATERIAL.

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

PACIFICORP

PROJ/REF	10652553
PLT	
DATE	02/15/2016
DWG	G. HUNTING
DES.	G. HUNTING
DR.	G. HUNTING
CK.	
APPROVAL ENG.	
SCALE:	NONE
SHEET	2

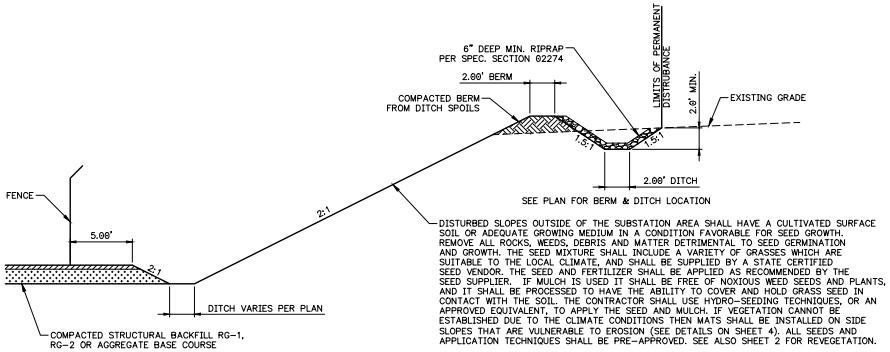
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PROJECT ENG.:

SAMS VALLEY SUBSTATION
JACKSON COUNTY, OREGON
GRADING PLAN
EROSION CONTROL DETAILS

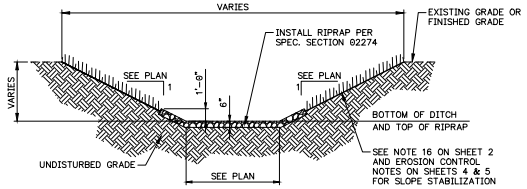
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REVISED 06/02/14 D. HURLEY

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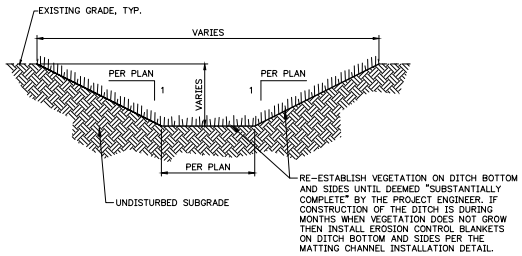


SIDE SLOPE PROTECTION DETAIL

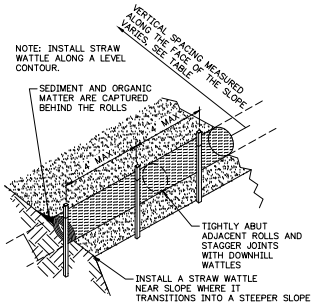


DITCH SECTION WITH RIPRAP

SCALE: N.T.S.



DITCH CROSS-SECTION DETAIL

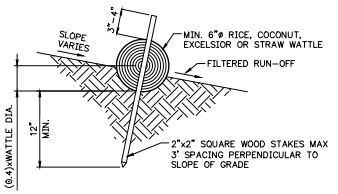


TYPICAL STRAW WATTLE INSTALLATION DETAIL

WATTLE SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1	10'-0"
2:1	20'-0"
3:1	30'-0"
4:1	40'-0"

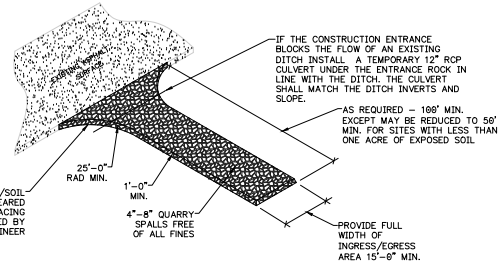
NOTES

1. WATTLES SHALL CONSIST OF CYLINDERS OF BIODEGRADABLE PLANT MATERIAL SUCH AS COCONUT EXCELSIOR, STRAW, COIR, COMPOST OR WOOD SHAVINGS ENCASED WITHIN BIODEGRADABLE OR PHOTO DEGRADABLE NETTING. WATTLES SHALL BE AT LEAST 6 INCHES IN DIAMETER, UNLESS OTHERWISE SPECIFIED. ENCASING MATERIAL SHALL BE CLEAN, EVENLY WOVEN AND FREE OF ENCRUSTED CONCRETE OR OTHER CONTAMINATING MATERIALS SUCH AS PRESERVATIVES. ENCASING MATERIAL SHALL BE FREE FROM CUTS, TEARS OR WEAK PLACES AND SHALL HAVE A LIFE SPAN GREATER THAN 6 MONTHS. COMPOST FILLER SHALL MEET THE MATERIAL REQUIREMENTS AS SPECIFIED BY THE GOVERNING AGENCY.
2. PLACE WATTLES IN SHALLOW TRENCHES EXCAVATED ALONG SLOPE CONTOURS. BEGIN WATTLE INSTALLATION AT THE BOTTOM OF THE SLOPE AND WORK UP. CONSTRUCT TRENCHES AT CONTOUR INTERVALS OF 25' AND 300' APART DEPENDING ON STEEPNESS OF SLOPE. THE STEEPER THE SLOPE, THE CLOSER TOGETHER THE TRENCHES (SEE WATTLE SPACING TABLE). IT IS CRITICAL THAT THE WATTLES ARE INSTALLED PERPENDICULAR TO WATER MOVEMENT AND PARALLEL TO THE SLOPE CONTOUR.
3. WATTLES SHALL BE INSPECTED REGULARLY AND AFTER EACH RAINFALL TO ENSURE THAT THEY ARE THOROUGHLY ENTRENCHED, INTACT WITH THE SOIL AND FUNCTIONING PROPERLY. DAMAGED WATTLES SHALL BE REPAIRED OR REPLACED TO WORKING ORDER. ALSO INSPECT THE SLOPES AFTER EACH SIGNIFICANT STORM EVENT FOR EROSION, AND ANY RILLS OR GULLIES SHALL BE REPLACED AND REPAIRED IMMEDIATELY.
4. THE TRENCH SHOULD BE DEEP ENOUGH TO ACCOMMODATE HALF THE THICKNESS OF THE WATTLE.
5. THE TRENCH SPOIL SHALL BE STORED IN THE STOCKPILE OR HAULED TO AN APPROVED LOCATION OFFSITE.
6. LAY THE WATTLE WITHIN THE TRENCH AND FIT IT TIGHTLY AGAINST THE SOIL TO ELIMINATE GAPS BETWEEN THE SOIL AND THE WATTLE.
7. USE A STRAIGHT BAR TO DRIVE HOLES THROUGH THE WATTLE AND INTO THE SOIL. DRIVE THE STAKE THROUGH THE PREPARED HOLE INTO THE GROUND. LEAVE ONLY 1 INCH TO 2 INCHES OF STAKE EXPOSED ABOVE THE ROLL. INSTALL STAKES AT LEAST EVERY 4 FEET APART THROUGH THE WATTLE. ADDITIONAL STAKES MAY BE DRIVEN ON THE DOWNSLOPE SIDE OF THE TRENCHES ON HIGHLY EROSIVE OR VERY STEEP SLOPES.
8. SEDIMENT SHALL BE REMOVED FROM THE WATTLE UPGRADIENT SIDE WHEN IT HAS REACHED ONE THIRD THE EXPOSED HEIGHT OF THE WATTLE. SEDIMENT SHALL BE STORED IN THE STOCKPILE.
9. RESEED OR REPLANT VEGETATION IF NECESSARY UNTIL THE SLOPE IS STABILIZED.
10. AFTER THE SURROUNDING AREAS HAVE BEEN STABILIZED AND THE PROJECT IS APPROVED BY PACIFICORP, THE WATTLES AND STAKES SHALL BE REMOVED COMPLETELY AND HAULED TO AN APPROVED LOCATION OFFSITE. THE EXPOSED TRENCH AREAS SHALL BE LEVELED, SEEDED, AND MULCHED.



ENTRENCHMENT DETAIL

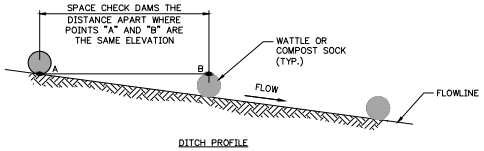
PRELIMINARY



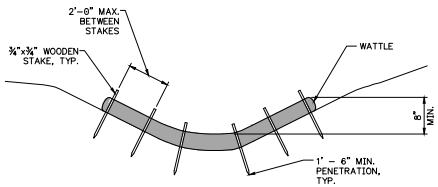
NOTES

1. INSTALL WOVEN GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.
2. A VEHICLE WASHDOWN AREA, IF REQUIRED, SHALL BE INSTALLED AND USED TO REMOVE SEDIMENT FROM VEHICLES BEFORE LEAVING THE CONSTRUCTION SITE. THE WASH DOWN AREA SHALL BE MADE OF THE SAME QUARRY SPALLS AS A CONSTRUCTION ENTRANCE.
3. THE LOCAL GOVERNING AGENCY MAY REQUIRE ADDITIONAL OR ALTERNATE CONSTRUCTION ENTRANCE DETAILS.
4. IF REQUIRED BY THE LOCAL GOVERNING AGENCY, AN AREA OF 2'-4" X 20' ADJACENT TO THE EDGE OF THE RIGHT-OF-WAY ENTRANCE SHALL BE PAVED TO AVOID DAMAGE TO THE EXISTING ROADWAY. CONSTRUCT 3" THICK ASPHALT AND 9" ROCK SECTIONS PER SPECIFICATION SECTION 02570.
5. THE CONTRACTOR SHALL ENSURE THAT ALL VEHICLES USE THIS ENTRANCE AND ARE CLEANED OF SOILS BEFORE LEAVING THE PROJECT, AND THAT THE ENTRANCE IS TO BE KEPT CLEAN AT ALL TIMES. THIS MAY REQUIRE TOP DRESSING AND REPAIR.
6. IF THE PLANS SPECIFY A PERMANENT CULVERT, CONTRACTOR SHALL CONSTRUCT A PERMANENT CULVERT INSTEAD OF THE TEMPORARY CULVERT.

STABILIZED CONSTRUCTION ENTRANCE DETAIL



DITCH PROFILE



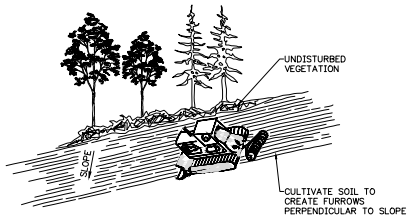
NOTE: WATTLES SHALL BE INSTALLED PER DETAIL ON SHEET 2

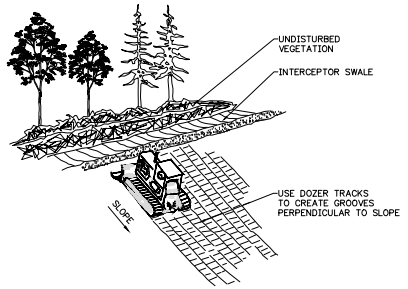
WATTLE OR COMPOST STOCK CHECK DAM DETAIL

SCALE: NTS

NOTES

1. CHECK DAMS ARE CONSTRUCTED ACROSS THE DITCH TO REDUCE VELOCITIES OF CONCENTRATED FLOWS, THEREBY REDUCING EROSION AND ALLOWING A SIGNIFICANT AMOUNT OF SUSPENDED SEDIMENT TO SETTLE OUT BEHIND THE CHECK DAM.
2. CHECK DAMS SHALL BE USED IN DITCHES THAT ARE NOT YET VEGETATED.
3. SPAN ENTIRE DITCH WIDTH AND ENSURE THE CENTER OF THE DAM IS 8" LOWER THAN THE OUTER ENDS.
4. INSPECT CHECK DAMS ONCE PER WEEK AND WITHIN 24 HOURS FOLLOWING A RAIN EVENT UNTIL CONSTRUCTION IS COMPLETE. REMOVE SEDIMENT BEHIND EACH WATTLE WHEN IT REACHES ONE-THIRD THE DEPTH OF THE WATTLE. THE CHECK DAMS SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED INSIDE THE DITCHED.





SURFACE ROUGHENING DETAIL

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

PACIFICORP

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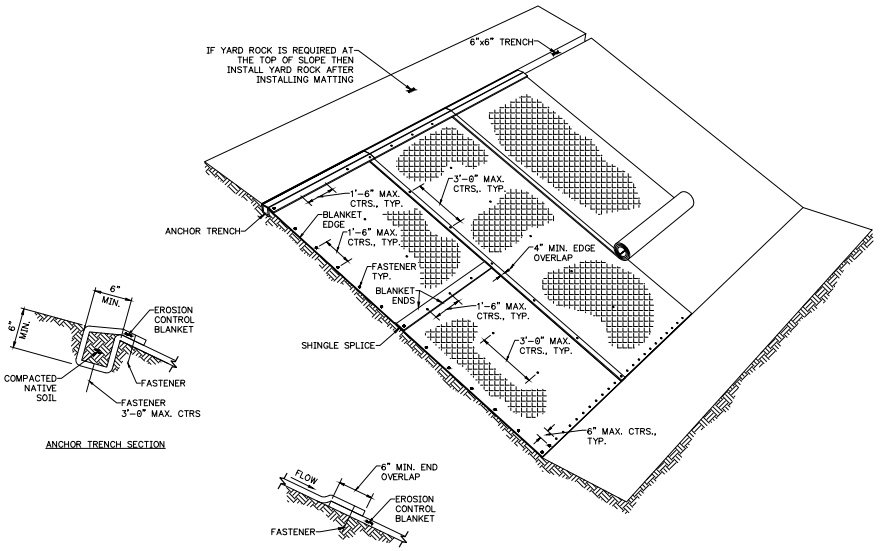
SAMS VALLEY SUBSTATION
JACKSON COUNTY, OREGON
GRADING PLAN
EROSION CONTROL DETAILS

PROJ/ITEM	10652553	DISCIPLINE ENG.	
PLT		PROJECT ENG.	
DWG.	G. HUNTING 02/15/2016	APPROVAL ENG.	
DR.	G. HUNTING DES. G. HUNTING	CK.	NONE
SCALE:		SHEET	3

178455.003

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REVISED 06/02/14 D. HURLEY



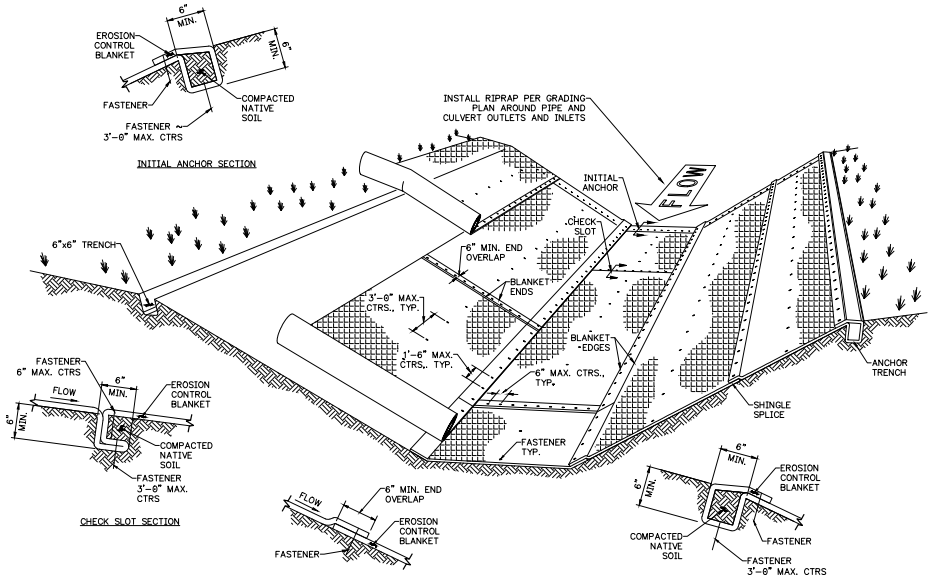
ANCHOR TRENCH SECTION

SHINGLE SPLICE SECTION

MATTING SLOPE INSTALLATION DETAIL

NOTES

1. MORE THAN THE MINIMUM OF ONE FASTENER PER SQUARE YARD MAY BE REQUIRED DUE TO CONDITIONS SUCH AS BLANKET COMPOSITION, SOIL TYPE, SURFACE UNIFORMITY, AND SLOPE STEEPNESS.
2. FASTENERS SHALL BE PER MATTING MANUFACTURER.
3. THE SLOPE RATING OF THE BLANKET, AS SPECIFIED BY THE MANUFACTURER, SHALL BE APPROPRIATE FOR THE INTENDED SLOPE. TEMPORARY EROSION CONTROL BLANKETS, HAVING AN OPEN AREA OF 60 PERCENT OR GREATER, MAY BE INSTALLED PRIOR TO SEEDING. BLANKETS LESS THAN 60 PERCENT OPEN SPACE SHALL BE INSTALLED IMMEDIATELY FOLLOWING THE SEEDING AND FERTILIZING OPERATION.
4. EROSION CONTROL BLANKETS PROTECT SOIL FROM RUN-OFF AND SHEET EROSION UNTIL PERMANENT VEGETATION IS ESTABLISHED. ORGANIC BLANKETS ARE MADE OF JUTE, STRAW, WOOD SHAVINGS, COCONUT FIBER (COIR), OR VARIOUS COMBINATIONS OF EACH. CONSULT THE PROJECT ENGINEER TO DETERMINE THE INTENDED LONGEVITY OF THE MATTING.
5. SLOPED SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS.
6. APPLY LIME, FERTILIZER AND PERMANENT SEEDING PRIOR TO INSTALLING MATTINGS. TREE AND SHRUB PLANTING SHALL OCCUR AFTER INSTALLING MATS.
7. LAY MATS LOOSELY AND STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH THE MATS TIGHT. ALLOW THE MATS TO ROLL TO MOLD TO ANY IRREGULARITIES.
8. STAPLE AND ANCHOR MATTING PER THE DETAILS ABOVE OR PER MANUFACTURERS SPECIFICATIONS.
9. WHEN ENCOUNTERING NON-COHESIVE SOIL, CONTRACTOR SHALL USE LONGER STAPLES.
10. REPAIR ANY DAMAGED AREAS OF THE MAT AND STAPLE INTO THE GROUND ANY AREAS NOT IN CLOSE CONTACT WITH THE GROUND SURFACE.



INITIAL ANCHOR SECTION

CHECK SLOT SECTION

SHINGLE SPLICE SECTION

ANCHOR TRENCH SECTION

MATTING CHANNEL INSTALLATION DETAIL

NOTES

1. MORE THAN THE MINIMUM OF ONE FASTENER PER SQUARE YARD MAY BE REQUIRED DUE TO CONDITIONS SUCH AS BLANKET COMPOSITION, SOIL TYPE, SURFACE UNIFORMITY, AND SLOPE STEEPNESS.
2. FASTENERS SHALL BE PER MATTING MANUFACTURER.
3. THE SLOPE RATING OF THE BLANKET, AS SPECIFIED BY THE MANUFACTURER, SHALL BE APPROPRIATE FOR THE INTENDED SLOPE. TEMPORARY EROSION CONTROL BLANKETS, HAVING AN OPEN AREA OF 60 PERCENT OR GREATER, MAY BE INSTALLED PRIOR TO SEEDING. BLANKETS LESS THAN 60 PERCENT OPEN SPACE SHALL BE INSTALLED IMMEDIATELY FOLLOWING THE SEEDING AND FERTILIZING OPERATION.
4. EROSION CONTROL BLANKETS PROTECT SOIL FROM RUN-OFF AND SHEET EROSION UNTIL PERMANENT VEGETATION IS ESTABLISHED. ORGANIC BLANKETS ARE MADE OF JUTE, STRAW, WOOD SHAVINGS, COCONUT FIBER (COIR), OR VARIOUS COMBINATIONS OF EACH. CONSULT THE PROJECT ENGINEER TO DETERMINE THE INTENDED LONGEVITY OF THE MATTING.
5. SLOPED SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS.
6. APPLY LIME, FERTILIZER AND PERMANENT SEEDING PRIOR TO INSTALLING MATTINGS. TREE AND SHRUB PLANTING SHALL OCCUR AFTER INSTALLING MATS.
7. LAY MATS LOOSELY AND STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH THE MATS TIGHT. ALLOW THE MATS TO ROLL TO MOLD TO ANY IRREGULARITIES.
8. STAPLE AND ANCHOR MATTING PER THE DETAILS ABOVE OR PER MANUFACTURERS SPECIFICATIONS.
9. WHEN ENCOUNTERING NON-COHESIVE SOIL, CONTRACTOR SHALL USE LONGER STAPLES.
10. REPAIR ANY DAMAGED AREAS OF THE MAT AND STAPLE INTO THE GROUND ANY AREAS NOT IN CLOSE CONTACT WITH THE GROUND SURFACE.
11. PROVIDE CHECK SLOTS PER MANUFACTURERS RECOMMENDATIONS.
12. ROLL ENDS MAY BE SPLICED IN A CHECK SLOT.

PRELIMINARY

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED

PACIFICORP

CIVIL

PROJ/REF# 10652553 DISCIPLINE ENG.
DATE 02/15/2016 PROJECT ENG.
DES. G. HUNTING DES. G. HUNTING APPROVAL ENG.
DR. G. HUNTING CH. NONE
SCALE:

SAMS VALLEY SUBSTATION
JACKSON COUNTY, OREGON
GRADING PLAN
EROSION CONTROL DETAILS

SHEET 4

REVISION 0A

178455.004

REVISED 06/02/14 D. HURLEY

FILE LOCATION: J:\Shared Data\Work In Progress\Substation_Active Projects\Sams Valley - WO# 10652553\Design\DWGS\178455.000 SAVED BY:(P26346) 2/15/2016 2:88 PM PLOTTED BY:(HUNTING, RICK) 2/15/2016 2:24 PM

Attachment D:

Recent Aerial Photo


Recent Aerial Photo
Imagery Date: 7/4/2014
Sams Valley Hwy
234
Tresham Ln
Google earth
N
700 ft

Attachment E:

Pre-Printed Mailing Labels

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Attachment F:

Alternatives Analysis

Section 404(b)(1) Alternatives Analysis

Sams Valley Substation

Jackson County, OR

April 13, 2016

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1 Introduction

Pacific Power is proposing a project (Sams Valley Substation) to improve system reliability in the Medford, Grants Pass, and Crescent City areas. The project would involve construction, operation, and maintenance of a new 500 kV/230 kV substation in Jackson County, Oregon.

Construction of the proposed substation would result in discharge of fill material into 3.5 acres of waters of the state (wetlands). This discharge would require Pacific Power to gain authorization from the U.S. Army Corps of Engineers (USACE) for a Department of the Army (DA) Standard Individual Permit (IP) pursuant to Section 404 of the Clean Water Act (CWA). Pacific Power prepared this alternatives analysis to provide information to USACE to assist them with a permit decision under Section 404 of the CWA.

1.1 Regulatory Setting

This impact analysis is provided in accordance with Section 404(b)(1) of the CWA [40 C.F.R. 230]. Pursuant to Section 404 of the CWA, any activity requiring a removal/fill IP must undergo an analysis of alternatives in order to identify the Least Environmentally Damaging Practicable Alternative (LEDPA) using guidelines established by the United States Environmental Protection Agency (EPA), known as the Section 404(b)(1) Guidelines. Under the Section 404(b)(1) Guidelines, USACE must consider a number of factors when making its permit decisions, including whether there are practicable alternatives to the proposed discharge. USACE is prohibited from issuing a permit for the discharge of dredged or fill material into navigable waters if "there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." (40 C.F.R. 230.10[a]). An alternative is "practicable" if "it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes." (40 C.F.R. 230.10[a][2]).

If a project is not water dependent (e.g., a port or marina facility that requires access to or locating in special aquatic sites to fulfill the basic purpose) and the project proposes to discharge into a special aquatic site (e.g., including sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes), the guidelines require USACE to presume that a less environmentally damaging practicable alternative exists, unless the permit applicants can clearly demonstrate otherwise (40 CFR 230.10[a][2]). Therefore, the applicants must clearly refute the regulatory presumption that a less environmentally damaging practicable alternative exists for a permit to be issued.

The EPA's guidelines suggest a sequential approach to project planning that considers mitigation measures only after the project proponent shows that no practicable alternatives are available that could achieve the basic purpose and result with less environmental impacts. Once it is determined that no practicable alternatives are available, the guidelines then require that appropriate and practicable steps be taken to minimize potential adverse effects on the aquatic ecosystem (40 CFR 230.10[d]). Such

steps may include actions to control the discharge location, define the material to be discharged, determine the fate of material after discharge or describe the method of dispersion, and list actions related to technology, plant and animal populations, or human use (40 CFR 230.70-230.77).

In addition to the 404(b)(1) alternatives analysis, USACE is required to analyze alternatives pursuant to NEPA. Under NEPA, the range of alternatives is governed by the rule of reason, which provides that a decision document is required to set forth those alternatives necessary to permit a reasoned choice. A decision document must consider a reasonable range of alternatives as defined by the specific facts and circumstances of the proposed action. Alternatives must be feasible and consistent with the statement of purpose and need. If alternatives have been eliminated from detailed study, the decision must briefly discuss the reasons for their elimination. Under NEPA, feasible alternatives must be addressed at the same level of detail as a proposed project. In addition, under NEPA, the alternatives analysis should present the environmental impacts of the proposed project and the alternatives "in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public." (40 C.F.R. § 1502.14).

2 Project Description

2.1 Proposed Action Alternative

The Proposed Action is to construct, operate, and maintain a new 500 kV/230 kV substation in Jackson County, Oregon north of Medford (Figure 1). The substation would be located on private land, at the intersection of a new 230 kV line and the existing Dixonville-Meridian 500 kV transmission line (Figure 2). The substation would occupy approximately 20 acres and consist of a fenced, secured, and graveled yard containing transformers and switches. Existing vegetation on site would be cleared and the site would be filled, graded, and insulating rock would be installed. Appropriate erosion and sediment control measures and best management practices will be implemented (e.g., silt fence) during construction. The site would be graded such that stormwater would flow into collector basins and would be conveyed through a series of storm drains into retention basins constructed in the northwest and southwest corners of the site. The site would be accessed via an existing entrance at the intersection of Tresham Lane and Oregon Route 234. The existing entrance would be improved, the access road would be extended around the western substation boundary, and it would connect to an existing access road south of the substation. Access improvements would include a 14-foot travel way, on average, with additional area for drainage and maneuverability as needed. Improvements would involve removing vegetation, blading to shape existing road surface, and placing surfacing aggregate (i.e., road rock or riprap) to stabilize the entrance and road surfacing. An existing culvert that spans the construction entrance will be replaced during access road improvement. The culvert is located within a non-jurisdictional roadside ditch. Construction of the substation is planned for 2018.

Figure 1. Vicinity Map

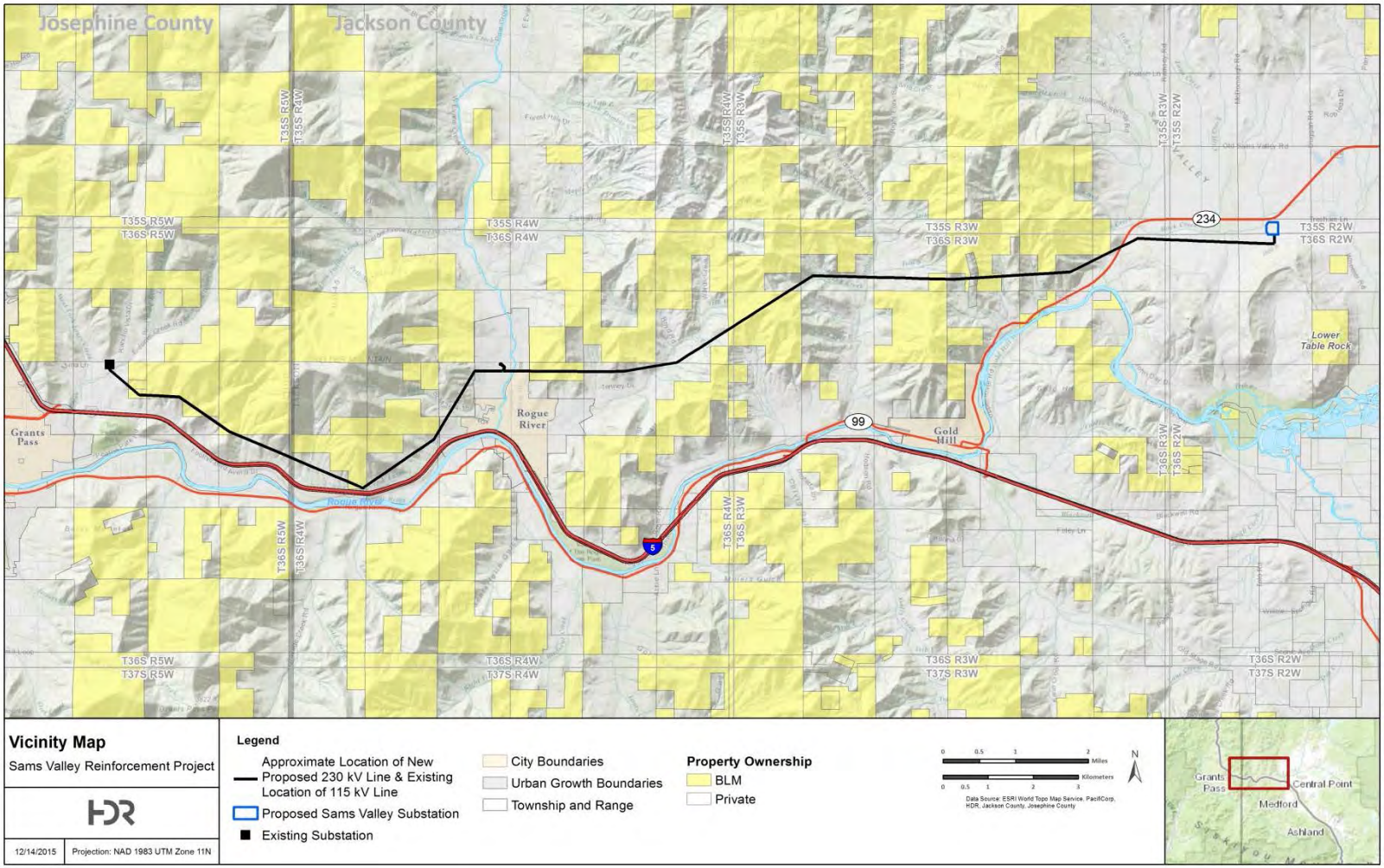
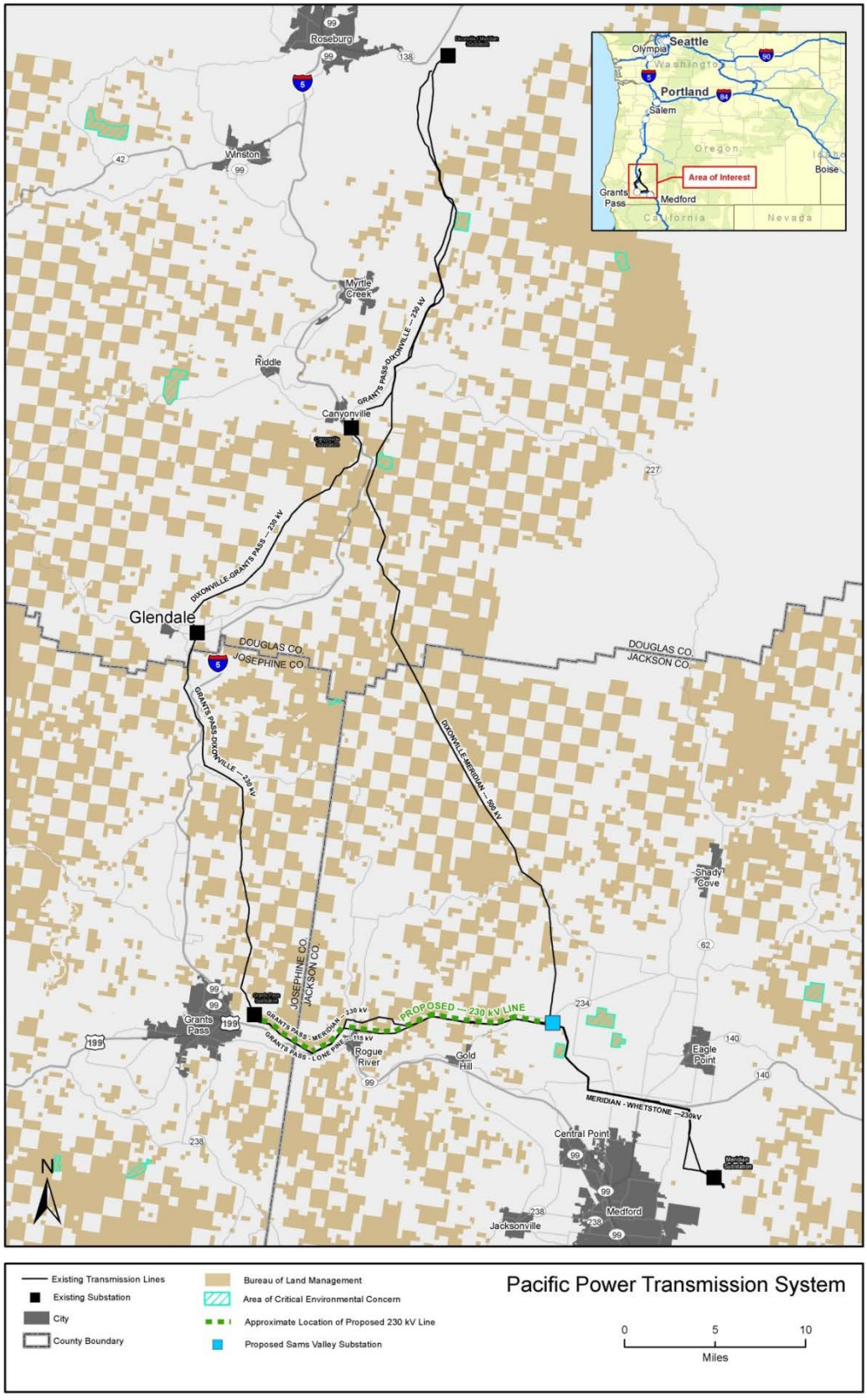


Figure 2. System Map



2.2 Purpose and Need Statement

2.2.1 Project Purpose

The purpose of the project is to construct, operate, and maintain a new 500 kV/230 kV substation to provide system reliability to reduce the possibility of large-scale load dropping in Medford, Grants Pass, and Crescent City in the event of an outage. The new substation will facilitate the development of the new transmission line, help meet new power demands due to regional growth, and act as a redundant path for power in the event another local transmission line is damaged or experiences disruption of service. It will improve and strengthen the power grid for the entire region, including the more than 88,000 Jackson County and 41,000 Josephine County customers of Pacific Power.

The basic purpose for the project is "energy transmission," and is, therefore, not water dependent. The discharge of fill material is proposed to occur in wetlands that are considered to be a "special aquatic site" under EPA guidelines. The presumption is that a practicable alternative site or project design that does not affect special aquatic sites is available.

2.2.2 Project Need

System modeling indicates that a new 500 kV/230 kV substation, which interconnects a new 230 kV line to the existing Dixonville-Meridian 500 kV line, is necessary to increase capacity and improve reliability in the Southern Oregon region as part of the North American Electric Reliability Corporation (NERC) reliability standards and the Western Electricity Coordinating Council (WECC) system operating standards.

Current modeling indicates that the current system is at risk of unacceptable failure based on a lack of redundant paths of power in the region. If any of the existing transmission lines that surround the project were to fail, including the 230 kV Grants Pass-Dixonville line, 230 kV Meridian-Whetstone line, and 230 kV Meridian-Lone Pine No. 1 and No.2 lines, other lines in the system would become overloaded, leading to additional line failures, a loss of supply to existing substations, and significant load shedding (i.e., the need to drop customers). Therefore, a new substation, located at the intersection of a new 230 kV line and the existing Dixonville-Meridian 500 kV line, is necessary for redundancy.

New infrastructure must be sited with security in mind. Therefore, concentration and/or expansion of existing substations are not feasible. Risk assessments were performed by Pacific Power using the WECC method of evaluating overall Homeland Security risks. Results of these studies indicate that co-locating a new 500/230kV substation with the existing Meridian Substation would result in a greater risk to the regional supply of power than a new, separate facility built miles away. By locating infrastructure facilities in multiple sites which are separated miles apart, risk to the overall system is reduced, as a security event in one location will not impact multiple facilities which are intended to operate redundantly. Therefore, concentration of critical infrastructure in a single location is not recommended in terms of security and reliability. Co-locating the new 500-230 kV substation with the existing Whetstone Substation would result in similar security risks and is not recommended.

3 Alternatives Analysis

3.1 Methods

This section describes how alternatives were selected and evaluated for practicability and how the LEDPA was chosen for advancement into the Sams Valley Reinforcement Project Environmental Assessment (EA). The first tier of screening (Section 3.2, Alternatives Development) identified reasonable alternatives that are feasible from a constructability standpoint and are capable of meeting the overall project purpose and need. The second tier of screening (Section 3.3, Practicability Evaluation) evaluated the practicability of each alternative in terms of cost, logistics, and aquatic and environmental impacts, in order to determine the LEDPA. Both tiers of screening were performed through desktop analysis using the following GIS data layers:

- National Hydrography dataset (NHD)
- National Wetland Inventory (NWI)
- Oregon Department of Fish and Wildlife (ODFW) Fish Distribution dataset (2010)
- National Marine Fisheries Service (NMFS) Essential Fish Habitat for Salmon in Oregon dataset (2001)
- Oregon Biodiversity Information Center (ORBIC) Species Occurrence dataset (2014)
- Federal Emergency Management Agency (FEMA) Flood Hazard Area dataset
- National Land Cover Database (NLCD 2011)
- Google Earth Pro Aerial Imagery (1994-2015)
- Jackson County Zoning Data
- Jackson County Tax Assessor, Property Data Online

Detailed field wetland delineation was performed for the Proposed Action alternative (Site 1) only. A copy of the wetland delineation report has been provided to USACE as an attachment to the Joint Permit Application packet.

3.2 Alternatives Development

3.2.1 Siting Requirements and Assumptions

In selecting substation site alternatives, Pacific Power determined that the following assumptions regarding substation design and siting would be necessary to meet the overall project purpose and need.

Design

The new substation must be 500 kV/230 kV to provide a means of interconnection for a new 230kV line and the existing Dixonville-Meridian 500 kV line.

In addition, the substation footprint (size, shape, and configuration) is fixed and cannot be modified to fit into smaller or narrower, oddly-shaped parcels. This is

because the substation design must accommodate the amount of space needed for the terminations for any incoming and outgoing 500 and 230 kV lines. These terminations are pre-defined and cannot be reduced in size. In addition, required clearances between bus work, current transformers/potential transformers, etc., limit how many possible configurations are available. The proposed substation has been designed to fit into the smallest footprint possible and there are no additional design-changes that would result in a smaller substation footprint.

Security

A new substation that interconnects a new 230 kV line and the existing Dixonville-Meridian 500 kV line is necessary to meet security and redundancy requirements of NERC and WECC. As described in Section 2.2.2, Project Need, system modeling indicates that concentration and/or expansion of existing substations is not feasible. Co-locating the new 500-230 kV substation with the existing Meridian or Whetstone Substations would result in greater security risks when compared to a separate facility and is not recommended. Therefore, co-location of the substation with existing substations was not considered an option when selecting potential sites.

Location

Reasonable substation alternatives must be located within close proximity (less than 1 mile) to the intersection of the existing 500 kV and the new 230 kV transmission line (Figure 3). Unless the substation is located directly underneath this intersection, additional tap line connections would be required between the substation and 500 kV/230 kV lines. These connecting tap lines would substantially increase costs associated with construction, right-of-way (ROW) acquisition, and residential displacements. In addition, tap lines would require numerous permits, approvals, and easements that would introduce uncertainty into the project. For these reasons, sites located far away (more than 1 mile) from the 500 kV/230kV intersection were considered unreasonable per the Oregon PUC requirements for ensuring reasonable costs to the rate payers and were excluded from consideration in this analysis.

A total of eight substation siting alternatives, including the proposed alternative substation site evaluated in the EA, were identified as reasonable alternatives capable of meeting the project's overall purpose and need, while also satisfying the above listed substation design and siting requirements. Each of the substation alternatives are described below and are shown in Figure 3 through Figure 10.

3.2.2 Site 1 (Proposed Alternative)

Site 1 is located directly under the 500 kV/230 kV intersection, just south of the Sams Valley Hwy at Tresham Lane (Figure 3). This project site would allow Pacific Power to connect the substation directly to the overhead lines and eliminate the need for additional connections along transmission line corridors, or real estate acquisition. The site would be accessed via an existing entrance at the intersection of Tresham Lane and Oregon Route 234. Site 1 has been used as pastureland and is now vacant. The site has no residences and is zoned for exclusive farm use (EFU). Rock Creek and the buffer for Rock Creek occur west of Site 1.

Pacific Power has had a presence at Site 1 since the late 1960s. Site 1 occurs within three parcels, one of which was purchased in 1967 (taxlot 600), when the existing 230 kV transmission line was built. A switching station of less than an acre was built on the site in 1967. The second parcel at the site (taxlot 701) was purchased in 1989, with the 500 kV transmission line being built around the same time period. The switching station remained on the site until the early 1990's. The final parcel at the site (taxlot 700) was purchased by Pacific Power in 2015.

Site 1 has been investigated at greater detail than the other prospective sites. Existing data shows one ephemeral stream within Site 1, but does not show a wetland. Field delineation identified three palustrine, emergent wetlands along with one mapped jurisdictional ditch at the site; the NHD mapped ephemeral stream was not observed in the field.

3.2.3 Site 2

Site 2 is located approximately 1,500 feet north of the 500 kV/230 kV intersection, just north of the intersection of Sams Valley Hwy and Tresham Lane (Figure 4). Since the substation at this site is situated directly underneath the existing 500 kV line, a tap line connection to the 500 kV line would not be required. One new tap line connection between the substation and the new 230 kV line would be needed. The 230 kV tap line would run parallel to the existing 500 kV line, would be approximately 2,217 feet in length, and would require a 125-foot-wide ROW corridor. A crossover structure would be required where the 230kV tap line crosses over the existing 230kV transmission line. Access to the site would be provided via roads constructed off of Sams Valley Hwy. Both the substation site and the ROW corridor for the tap line occur on EFU zoned parcels. Existing residences are located within the substation site and the tap-line ROW corridor. Existing data shows one perennial stream within Site 2, but does not show a wetland.

3.2.4 Site 3

Site 3 is located approximately 1,750 feet west of the 500 kV/230 kV intersection, just south of the Sams Valley Hwy (Figure 5). The substation at this site would require tap line connections to both the 230 kV and 500 kV lines. The 500 kV tap line would consist of a looped system, with the tap line looping into the southeast corner of the substation and looping out of the northeast corner of substation. The 230 kV tap line would extend from the southwest corner of the substation and would be routed directly south to the proposed 230 kV line. The tap lines would require a 250-foot-wide ROW corridor, for the 500 kV line, and a 125–foot-wide corridor for the 230 kV line. Multiple corner structures would be required to accommodate angles in the tap line routes, and a crossover structure would be required where the proposed 230 kV tap line crosses over the existing 230 kV transmission line. Access to the site would be provided via roads constructed off of Sams Valley Hwy.

The substation site is located on EFU zoned parcels, without residential properties, and has multiple mapped streams, including Rock Creek (perennial, fish bearing). The site is also located within a FEMA regulated, 100-year floodplain. Existing data does not show mapped wetlands within Site 3. The ROW corridor for the tap line crosses EFU and Rural Residential (RR-5) zoned parcels that contain residences and mapped aquatic resources including streams, wetlands, and floodplains.

3.2.5 Site 4

Site 4 is located approximately 2,500 feet north of the 500 kV/230 kV intersection, on the north side of the Sams Valley Hwy (Figure 6). The substation at this site would require tap line connections to both the 230 kV and 500 kV lines. The 500 kV tap line would consist of a looped system, with the tap line looping into the southeast corner of the substation and looping out of the northeast corner of substation. The 230 kV tap line would extend from the southwest corner of the substation, would be routed across the existing 500 kV line, and then south to the 230 kV line near the 500 kV/230 kV intersection. The tap lines would require a 250 foot–wide-ROW corridor for the 500 kV lines, and a 125-foot-wide corridor for the 230 kV line. Multiple corner structures would be required to accommodate angles in the tap line routes, and a crossover structure would be required where the proposed 230 kV tap line crosses over the existing 230 kV transmission line. Access to the site would be provided via roads constructed off of Sams Valley Hwy. Both the substation site and the ROW corridor for the tap line occur on EFU zoned parcels containing residences. Existing data does not show mapped streams or wetlands within Site 4. Only the tap line ROW contains mapped aquatic resources.

3.2.6 Site 5

Site 5 is located approximately 2,000 feet west of the 500 kV/230 kV intersection, on the south side of the proposed 230 kV corridor (Figure 7). The substation at this site would require tap line connections to both the 230 kV and 500 kV lines. The 500 kV tap line would consist of a looped system, with the tap line looping into the southeast corner of the substation and looping out of the northeast corner of substation. A short 230 kV tap line would extend from the ROW into the northwest corner of the substation. The tap lines would require a 250 foot–wide-ROW corridor for the 500 kV lines, and a 125-foot-wide corridor for the 230 kV line. In addition, the existing 115kV line would need to be re-routed around the northern boundary of the substation. Multiple corner or crossover structures would be required to accommodate angles in the tap line routes and transmission line crossings. Access to the site would be provided via roads constructed off of Sams Valley Hwy, as well extensions of existing access roads to the east.

The substation site is located on EFU zoned parcels, without residential properties. Existing data shows two ephemeral streams within the site, but does not show wetlands. The ROW corridor for the tap line crosses EFU and open space reserve (OSR) zoned parcels that contain one residence and multiple mapped aquatic resources including streams, wetlands, and floodplains.

3.2.7 Site 6

Site 6 is located approximately 4,400 feet northwest of the 500 kV/230 kV intersection, on the north side of Sams Valley Hwy (Figure 8). The substation at this site would require tap line connections to both the 230 kV and 500 kV lines. The 500 kV line would consist of a looped system, with the tap line looping into the southeast corner of the substation and looping out of the northeast corner of substation. Two corner structures would be required, one for the incoming line and one for the outgoing line, to accommodate angles in the tap line route. The 230 kV tap line would extend from the southwest corner of the substation and would be routed directly south to the proposed 230 kV line. The tap lines

would require a 250-foot-wide ROW corridor for the 500 kV lines, and a 125-foot-wide corridor for the 230 kV line. Multiple corner structures would be required to accommodate angles in the tap line routes, and a crossover structure would be required where the proposed 230 kV tap line crosses over the existing 230 kV transmission line. Access to the site would be provided via roads constructed off of Sams Valley Hwy.

Both the substation site and the ROW corridor for the tap line occur on EFU zoned parcels. Existing data does not show mapped streams or wetlands within Site 6.The ROW corridor for the tap line crosses residential properties and multiple mapped aquatic resources including streams, wetlands and floodplains.

3.2.8 Site 7

Site 7 is located approximately 4,000 feet southwest of the 500 kV/230 kV intersection, just south of the existing 115kV and proposed 230 kV ROW corridor (Figure 9). The substation at this site would require tap line connections to both the 230 kV and 500 kV lines. The 500 kV tap line would consist of a looped system, with the tap line looping into the southeast corner of the substation and looping out of the northeast corner of substation. A short 230 kV tap line would extend from the right-of-way into the northwest corner of the substation. The tap lines would require a 250-foot-wide-ROW corridor for the 500 kV lines, and a 125-foot-wide corridor for the 230 kV line. In addition, the existing 115kV line would need to be re-routed around the northern boundary of the substation. Multiple corner or crossover structures would be required to accommodate angles in the tap line routes and transmission line crossings. Access to the site would be provided via roads constructed off of Sams Valley Hwy, as well as extensions of existing access roads to the east.

The substation site is located on an EFU zoned parcel, with no residential properties; however, a road that provides access to a neighboring residential property crosses through the parcel. Existing data does not show mapped streams or wetlands within Site 7. The ROW corridor for the tap line crosses EFU and OSR zoned parcels containing residential properties and multiple mapped aquatic resources including streams, wetlands, and floodplains.

3.2.9 Site 8

Site 8 is located approximately 5,500 feet southwest of the 500 kV/230 kV intersection, just south of the existing 115kV and proposed 230 kV ROW corridor (Figure 10). The substation at this site would require tap line connections to both the 230 kV and 500 kV lines. The 500 kV line would consist of a looped system, with the tap line looping into the southeast corner of the substation and looping out of the northeast corner of substation. Two corner structures would be required, one for the incoming line and one for the outgoing line, to accommodate angles in the tap line route. The 230 kV tap line would extend from the northwest corner of the substation and would be routed directly north to the proposed 230 kV line. The tap lines would require a 250-foot-wide ROW corridor for the 500 kV lines, and a 125-foot-wide corridor for the 230 kV line. Multiple corner or crossover structures would be required to accommodate angles in the tap line routes and transmission line crossings. Access to the site would be provided via roads constructed off of Sams Valley Hwy, as well as extensions of existing access roads to the east.

The substation site is located on an EFU zoned parcel, without residential properties. Existing data does not show mapped streams or wetlands within Site 8. The ROW corridor for the tap line crosses EFU and OSR zoned parcels containing residential properties and multiple mapped aquatic resources including streams, wetlands, and floodplains.

Figure 3. Proposed Sams Valley Substation Site Alternative 1

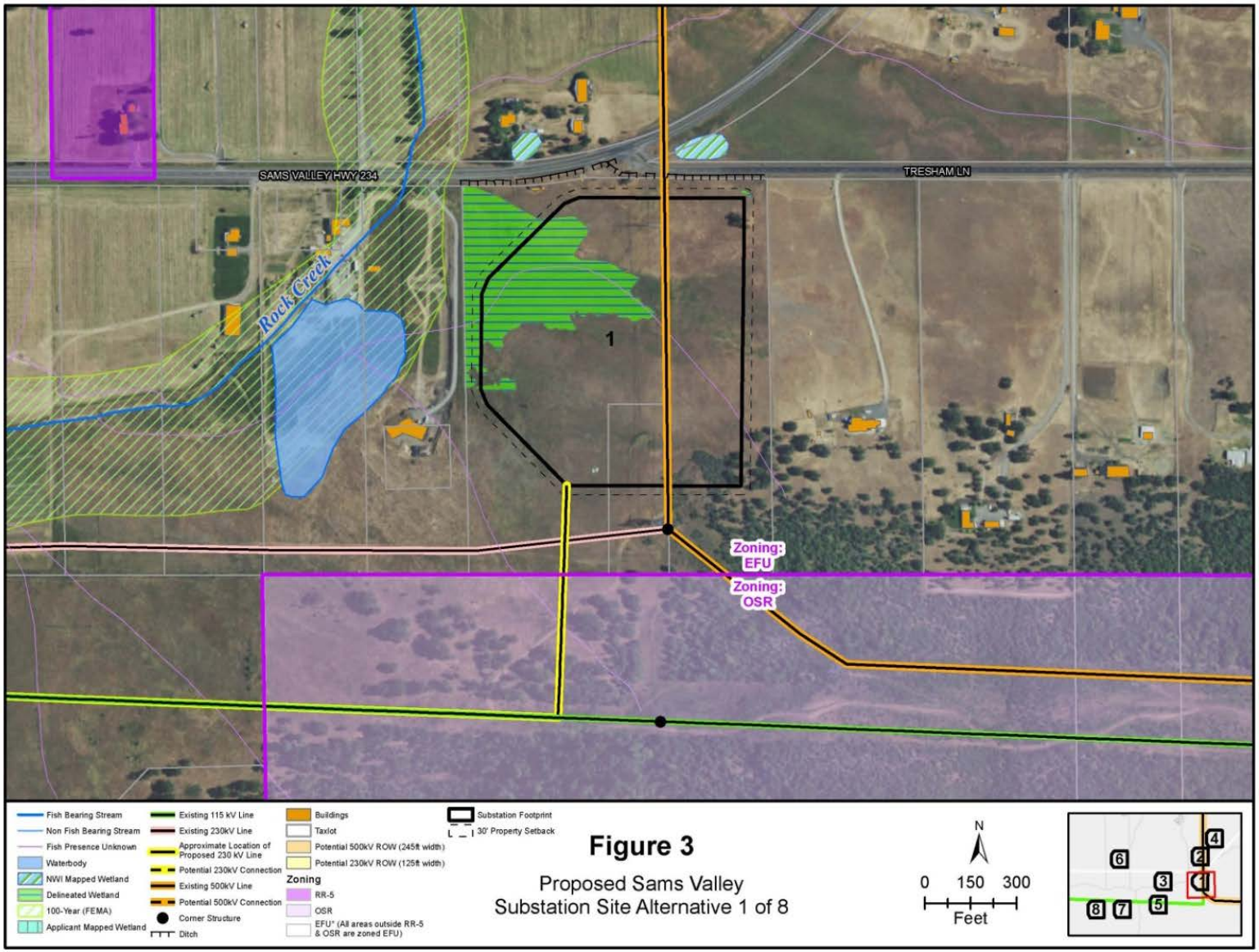


Figure 4. Proposed Sams valley Substation Site Alternative 2

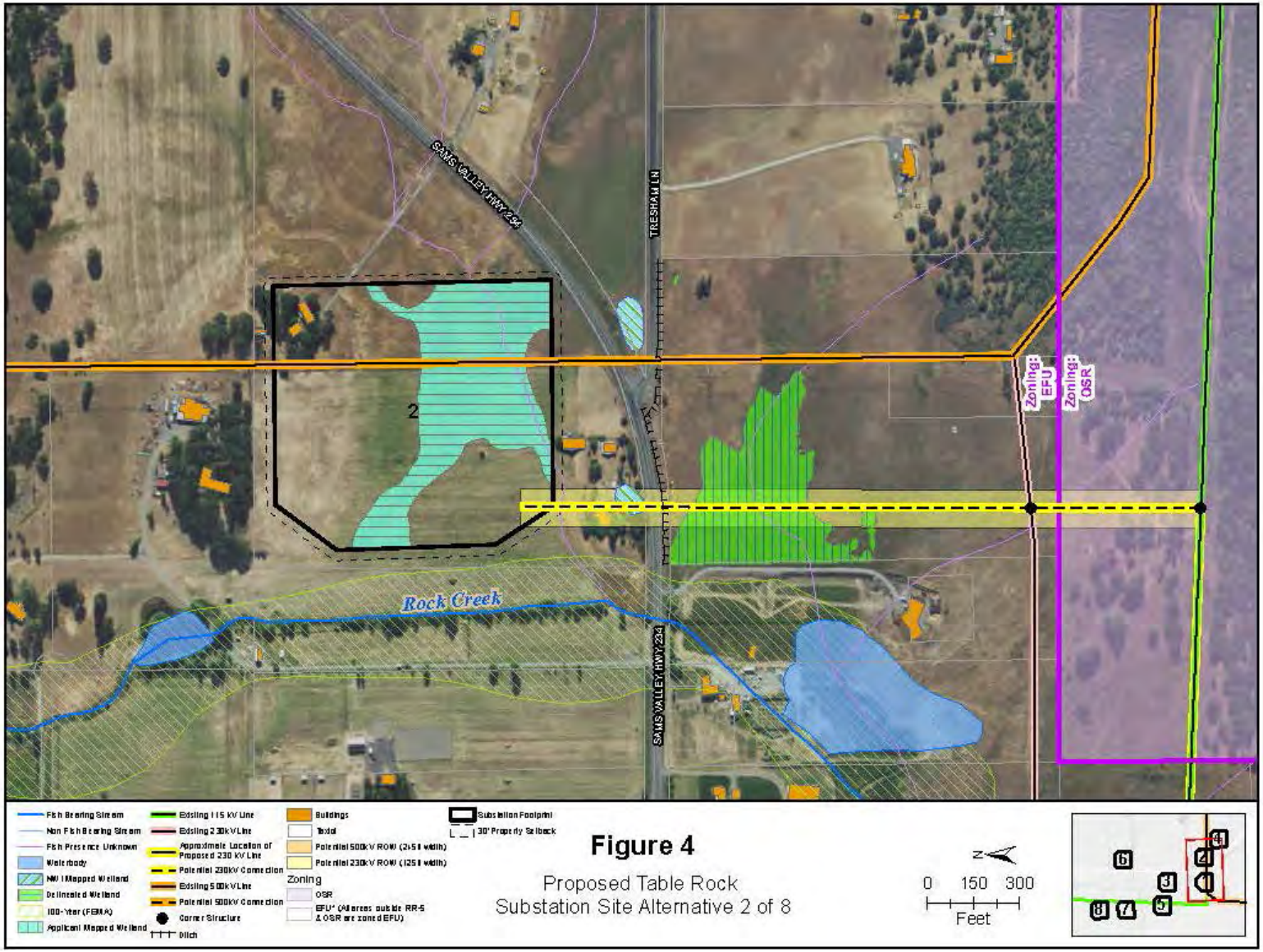


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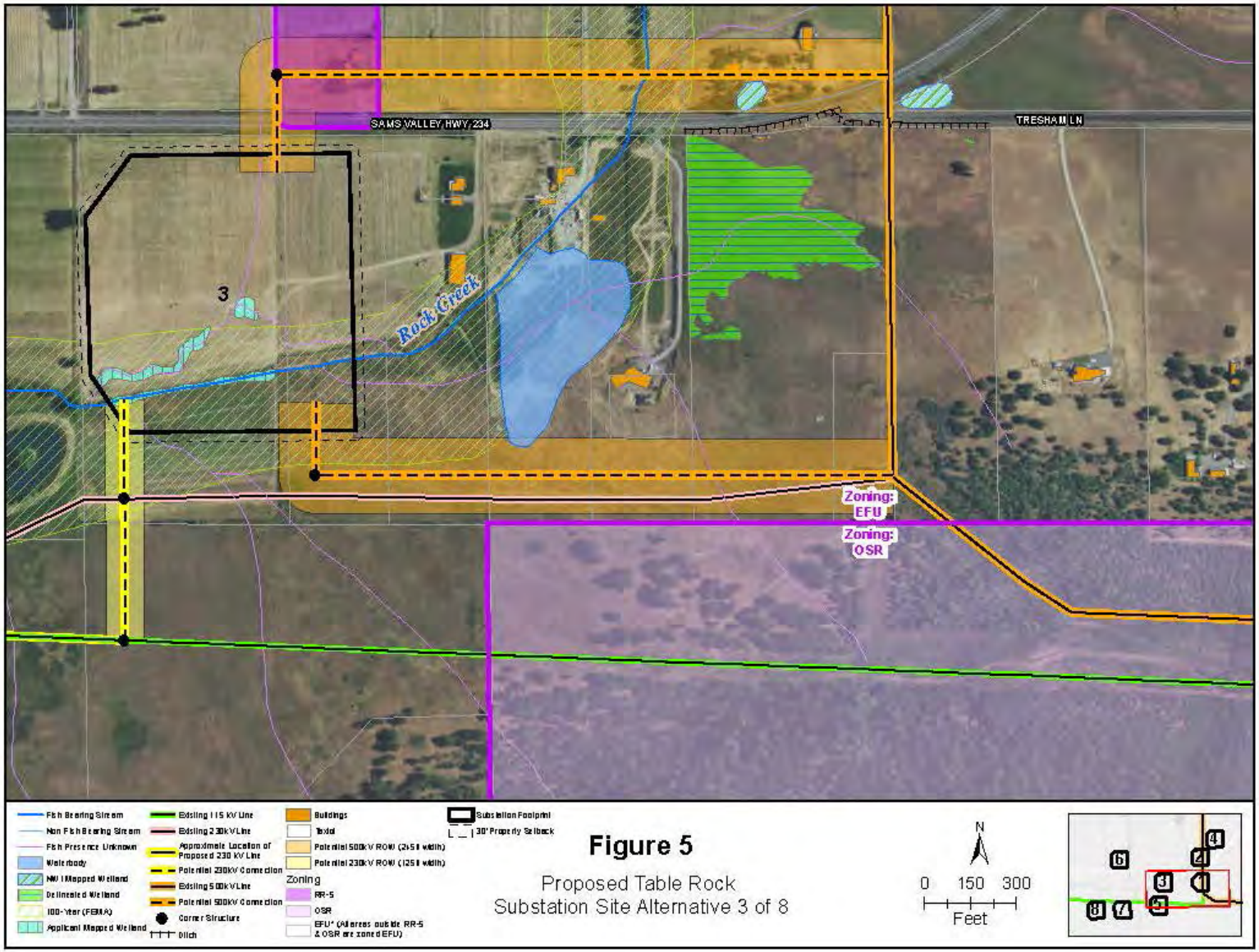


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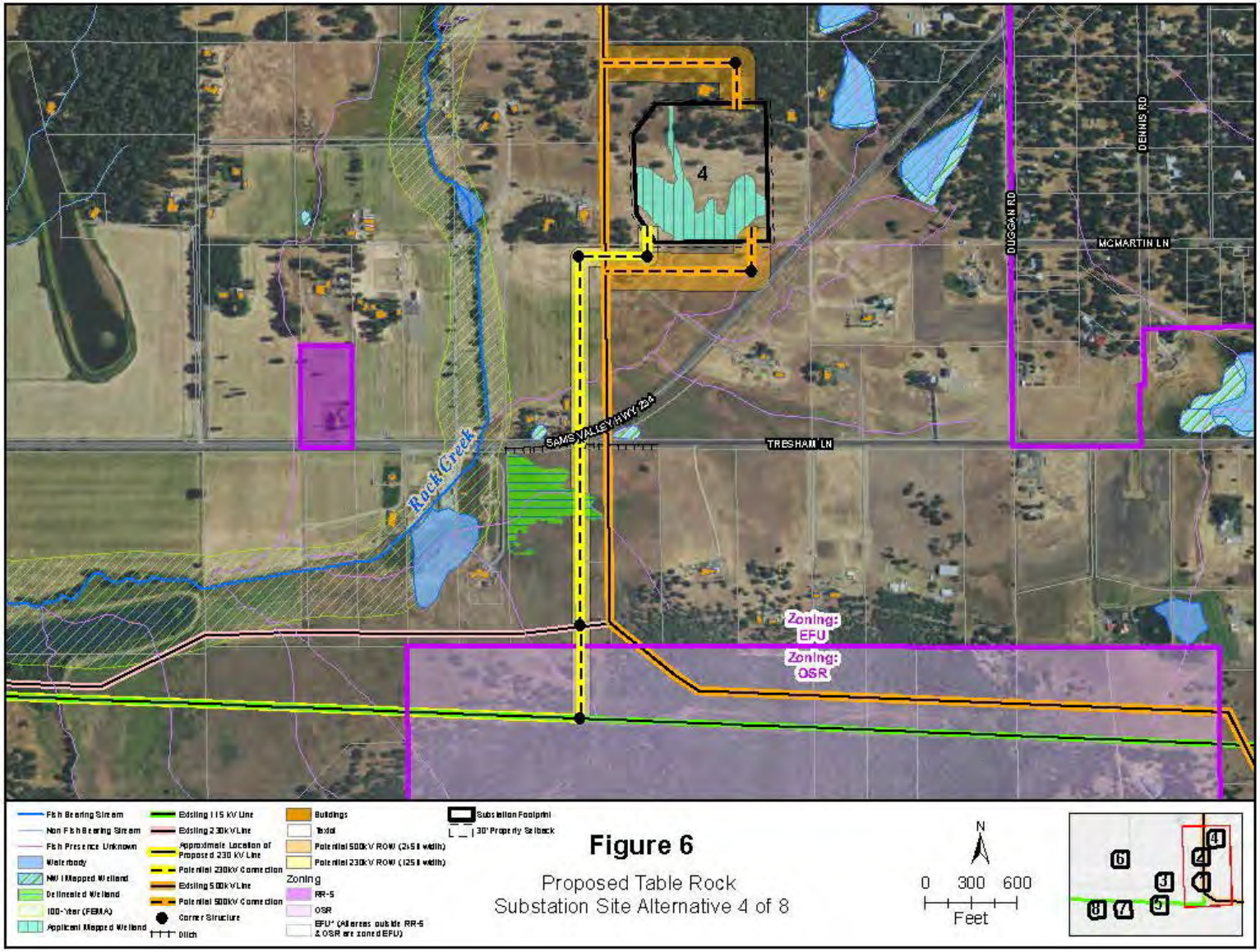


Figure 7. Proposed Sams valley Substation Site Alternative 5

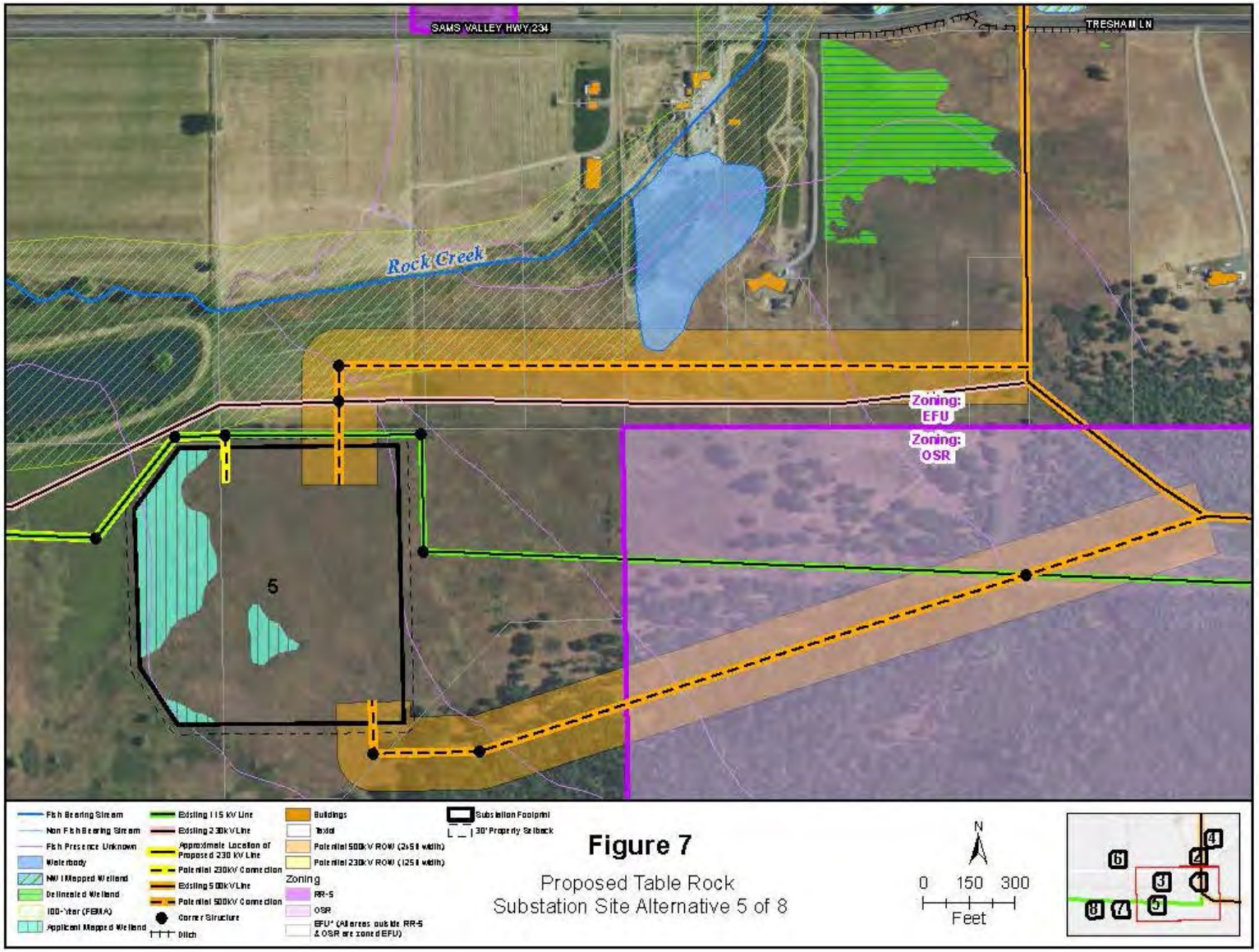


Figure 8. Proposed Sams valley Substation Site Alternative 6

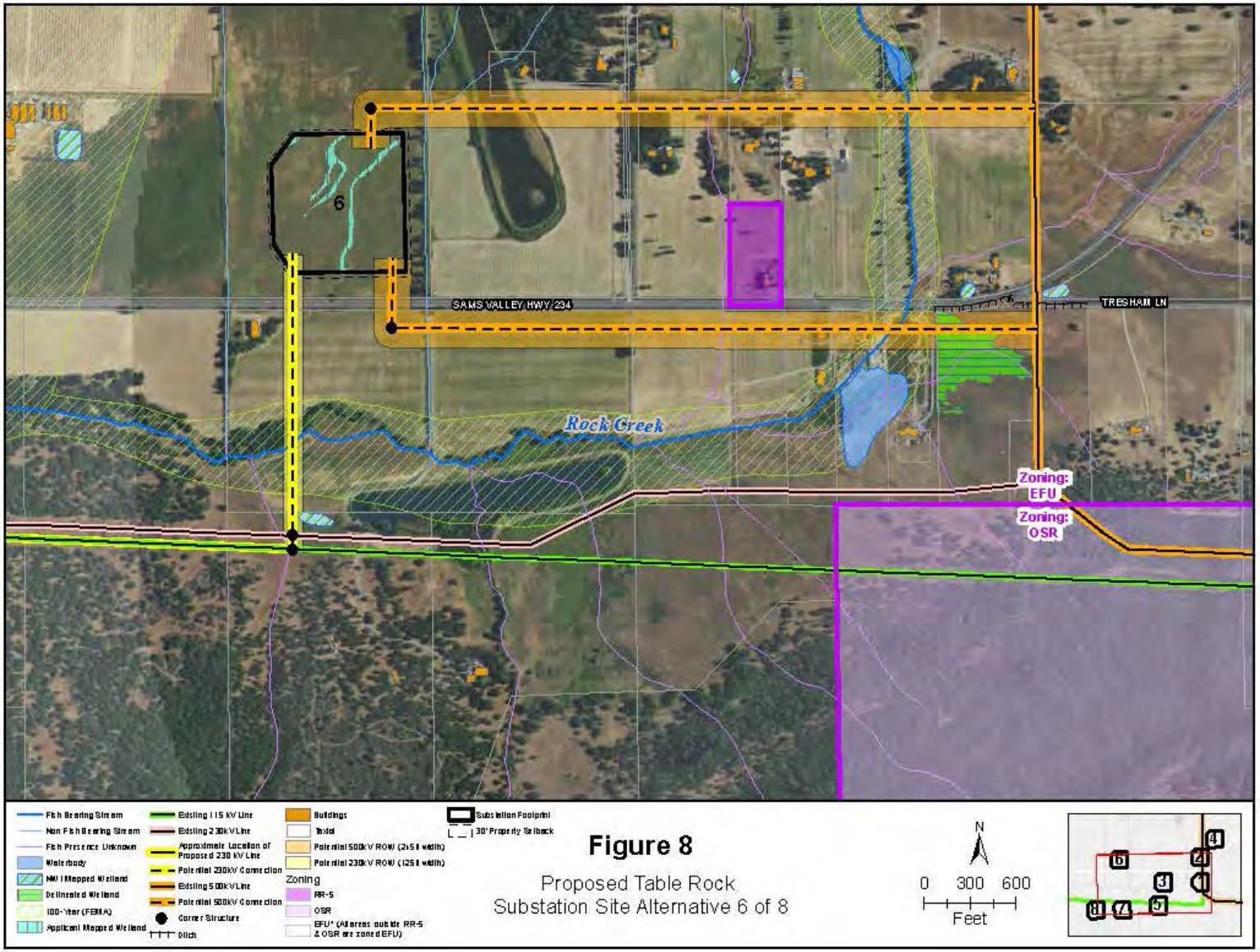


Figure 9. Proposed Sams valley Substation Site Alternative 7

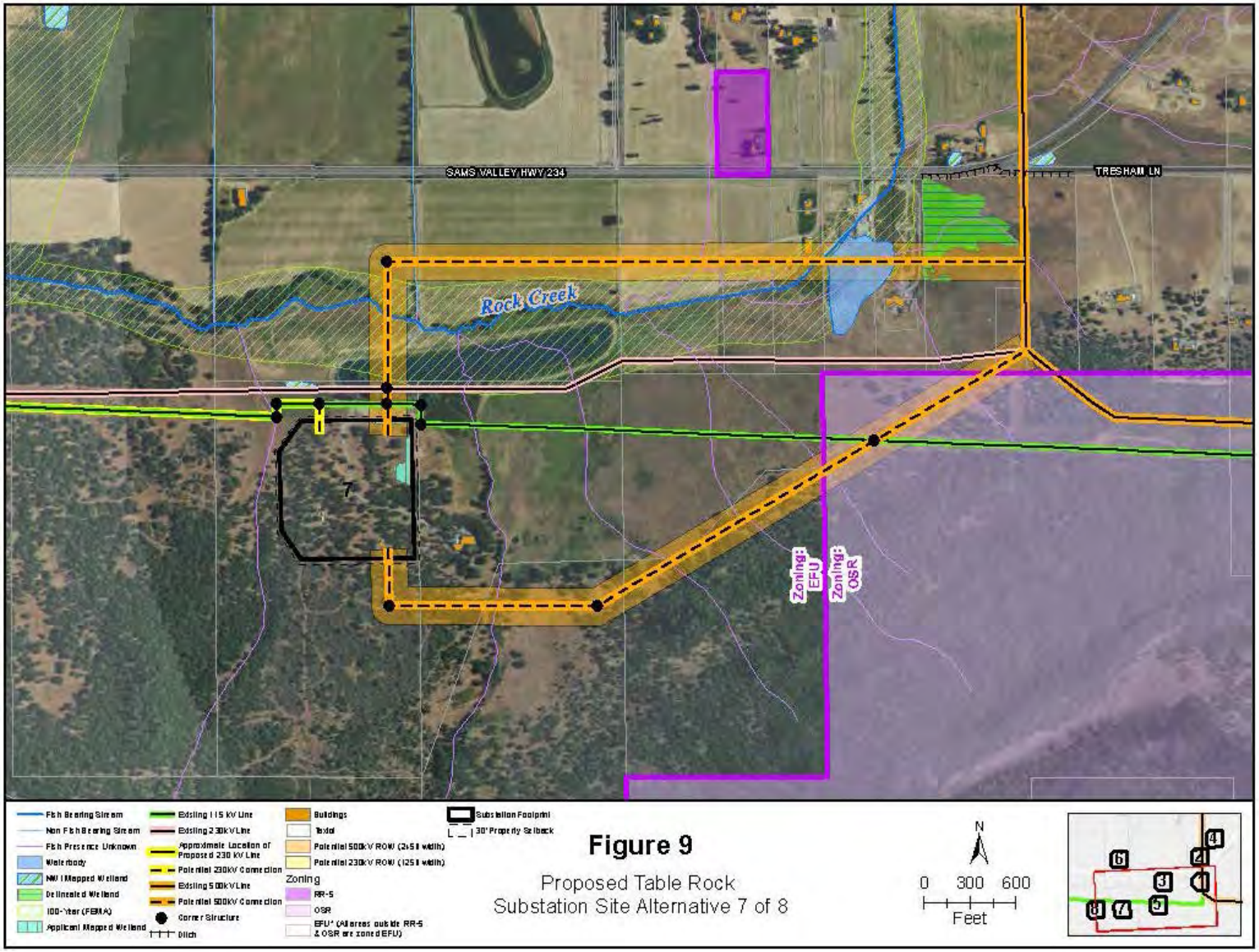
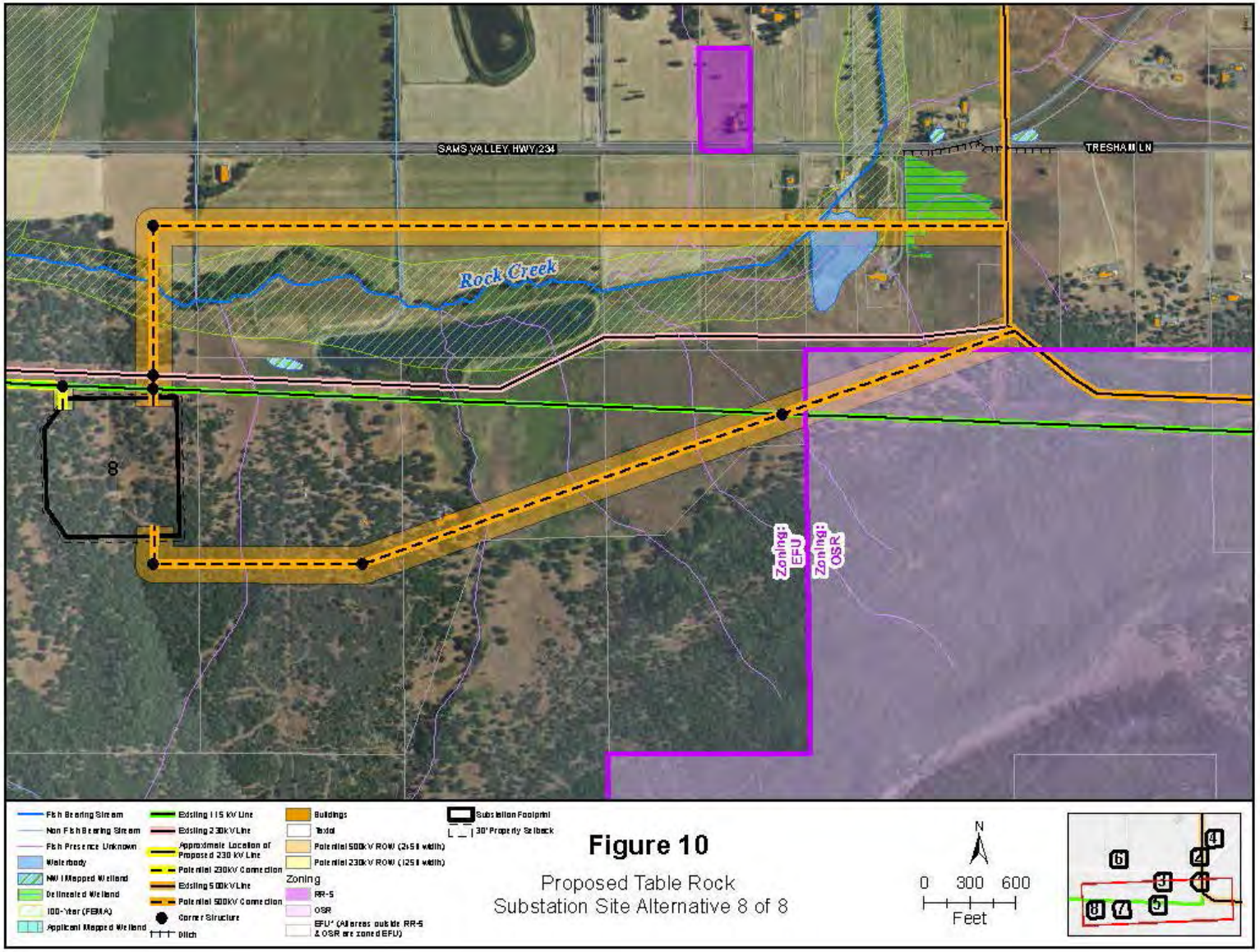


Figure 10. Proposed Sams valley Substation Site Alternative 8



3.3 Practicability Evaluation

The practicability test, described in Subpart B Section 230.10(a) of the Guidelines in 40 CFR Part 230, is one step in identifying the LEDPA. The term practicable means "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." In addition, due to the fact that the project constitutes a non-water dependent use, the applicant must clearly refute USACE's presumption that there is a practicable alternative to the proposed discharge that would have a less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

In accordance with Section 404(b)(1) guidelines, all eight of the substation site alternatives were evaluated for practicability and aquatic and environmental impacts. In evaluating the practicability of the alternatives, cost and logistics were the primary focus since technological constraints are not an issue. For the purpose of this analysis, logistics is defined as the coordination of efforts related to project permits and approvals, land purchases, residential displacements, and ROW easements. Aquatic impacts included impacts to wetlands and waters. Environmental impacts included impacts to land use; private property; floodplains; cultural, historic, or archaeological resources; and threatened or endangered species.

3.3.1 Screening Criteria

The following screening criteria were used to determine the LEDPA. Criteria #1-Cost and Criteria #2-Logistics relate to the practicability of each alternative whereas Criteria #3-Aquatic Impacts and Criteria #4-Environmental Impacts relate to the environmental damage associated with each alternative.

3.3.1.1 Criteria #1: Cost

Costs associated with land acquisition, ROW easements, residential displacements, and construction should be considered when choosing the new substation location to avoid prohibitively or unreasonably expensive development costs. Costs associated with development of the substation itself include the cost of purchasing the land on which the substation will be built, the cost of residential displacements, and construction costs (i.e., equipment purchase and installation). Additionally, substation alternatives that require tap lines would incur additional costs for ROW easements, residential displacements, and construction. The following assumptions regarding land values, property values, and construction costs were used in estimating the cost of each substation alternative.

Land Acquisition and ROW Easements

Costs associated with land acquisition and ROW easements were estimated using an average land value of $6,000 per acre. This value is based on a review of current listings in the Jackson County area for vacant EFU zoned parcels.

At each of the substation sites, approximately 30 to 50 acres of land acquisition would be required for development of the substation. In most cases, the parcels on which the substation is to be built would be purchased in their entirety from existing landowners.

However, in some cases, large parcels would likely be subdivided prior to purchase, to enable the applicant to only purchase what they need and save money. Under Jackson County's Land Development Ordinance (2005), Chapter 4.2.12(A), land divisions on EFU zoned parcels are allowed for non farm uses, including utility facilities, provided that the new parcel is not larger than the minimum size necessary for the use, and a minimum setback of 200 feet from residual farm land is provided. Therefore, when estimating substation costs associated with land purchases, large parcels with only small portions needed for the substation were assumed to be subdivided prior to purchase. The 200-foot setback only applies to subdivided parcels; parcels that are not subdivided are subject to smaller setback requirements (30 feet from property lines),

Tap lines would require the purchase of ROW easements (assuming 250-foot-wide ROW for the 500kV line and 125 feet for the 230kV line) and the acreage of ROW easements needed would depend on the number and length of tap lines required for each alternative. Similar to the cost of land purchases, ROW easements would be calculated as a percentage (50 percent) of the fee value ($6,000 per acre) for the partial interest required. For example, a 1 acre easement would cost $3,000 ($6,000/acre x 1 acre easement x 50 percent).

Residential Displacements

Costs associated with residential displacements were estimated using a median home value of $230,100 for each residence. This value represents the median home value in Jackson County, OR, as of December 2015 (Zillow home value index). Residences that are located on parcels purchased for development of the substation would be permanently displaced. Residences located within tap line ROW easements could also be displaced, if necessary. For any residences that would be displaced, the landowners would be compensated based on fair market value as determined by a Licensed Oregon Appraiser and relocation assistance would be provided in accordance with the Uniform Relocation Act.

Construction Costs

The cost to construct each of the substation alternatives would be largely influenced by the amount of tap line required for each alternative. This is because the cost to construct the substation itself would be relatively uniform across all alternatives, with only minor differences in cost being incurred due to permitting or access needs at each site. The base cost to construct the substation itself (without a tap line) would be approximately $50 million for materials and construction services. Construction of a tap line, including equipment purchase and installation, typically costs approximately $3 million per mile for a 500 kV line and $1.25 million per mile for a 230 kV line.

3.3.1.2 Criteria #2: Logistics

The substation should be sited with logistics in mind to minimize the number of permits, approvals, acquisitions, or easements needed, thereby reducing associated schedule and budget concerns. Logistical constraints were evaluated for each substation alternative based on the presence of mapped environmental resources at each site, the number of residential structures or property boundaries crossed by each of the

substation alternatives, and other local permitting considerations such as land divisions for large parcels or road crossing permits.

Some of the more common permits and approvals considered include a development permit, land division, or road crossing permit. In addition, sites that cross aquatic sites such as streams, wetlands, or floodplains require additional permits from the County (i.e., floodplain development or stream crossing permit), the State (removal/fill permit) and possibly consultation with the Fish and Wildlife Service or NMFS for impacts to protected fish species.

Substation alternatives that require tap lines require an additional 250-foot-wide ROW for the 500 kV line and 125 feet for the 230 kV line. ROW easements would need to be acquired for each parcel crossed, and existing residences that occur within the ROW could potentially be displaced. The greater the distance between the substation and the 500 kV line, the greater the impact to adjacent land uses and property owners, due to additional ROW easements. Additionally, ROW acquisitions and residential displacements would introduce uncertainty into the project, and would have implications for schedule and cost. Therefore, locating the substation as close as possible to the existing 500 kV and proposed 230 kV intersection would minimize these logistical constraints.

3.3.1.3 Criteria #3: Aquatic Impacts

Alternatives must have similar or fewer impacts to aquatic resources as compared to the proposed action (Alternative 1). The proposed action alternative would impact approximately 3.5 acres of wetland. Therefore, alternatives to the proposed action must result in fewer than 3.5 acres of wetland impacts.

Wetland and water field delineation was performed for the proposed action alternative (Site 1), but was not performed for the remaining substation alternatives 2 through 8. Therefore, reasonable assumptions were made in determining the presence or absence of wetlands and waters at each of the non-delineated substation sites. Any mapped streams or wetlands from the NHD and NWI datasets were assumed to be present. In addition, substation sites containing wetland signatures when viewed from an aerial photograph were assumed to potentially contain wetlands. Wetland signatures were mapped at each of the substation sites based on aerial photo interpretations (ranging from 1994 to 2015) and are shown on Figure 3 through Figure 10.

3.3.1.4 Criteria #4: Environmental Impacts

Alternatives that are found to have fewer aquatic impacts when compared to the proposed alternative must not result in other significant adverse environmental consequences, such as impacts to surrounding land owners and land uses, threatened or endangered species, fish and wildlife, floodplains, or cultural or historic resources. To minimize impacts to these environmental resources, the substation should be sited to avoid residential and commercial buildings, incompatible land uses, floodplains, fish-bearing streams, cultural and historic resources, threatened and endangered species and designated critical habitat. In addition, locating the substation as close as possible to the existing 500 kV and proposed 230 kV intersection would minimize the amount of land required, thereby reducing the amount of ROW acquisitions, residential displacements,

and land use impacts, and reduce the likelihood of encountering other sensitive environmental resources, such as floodplains and fish-bearing streams.

A substation tap line would require an additional 250-foot-wide ROW for the 500 kV line and 125 feet for the 230 kV line. Existing residences that occur within the ROW would be displaced, and existing land uses would be permanently converted to a ROW utility use. Vegetation within the ROW would be maintained to satisfy transmission line clearance and safety requirements, and would require the removal of any incompatible vegetation within the ROW, such as tall-growing trees.. The greater the distance between the substation and the 500 kV line, the greater the impact to adjacent land uses, property owners, and vegetation, due to additional ROW easements.

The environmental impacts associated with the proposed alternative form a baseline to which all other alternatives will be compared. The proposed substation alternative Site 1 does not contain any mapped floodplains or known occurrences of threatened or endangered species. There would be no residential displacements under the proposed alternative, and no fish-bearing streams would be crossed. Therefore, alternatives that result in any residential displacements or impacts to floodplains, fish bearing streams, threatened or endangered species, or designated critical habitat would have greater impacts compared to the proposed substation alternative.

3.3.2 Results

The cost, logistical constraints, and environmental and aquatic impacts associated with each of the substation alternatives are summarized in Table 1. None of the substation alternatives contained threatened or endangered species or designated critical habitat, therefore, those parameters are excluded from Table 1. The sections that follow Table 1 provide a detailed description of each alternative's ability to meet the screening criteria

Table 1. Comparison of Substation Site Alternatives

Impacts	Site 1 (Proposed Action)	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8
Cost								
Substation Construction	$50,000,000	$50,000,000	$50,000,000	$50,000,000	$50,000,000	$50,000,000	$50,000,000	$50,000,000
Tap Line Construction	$0	$524,858	$2,708,143	$2,232,150	$3,250,758	$5,718,704	$5,889,915	$7,358,381
Land Purchase	$120,000	$222,000	$173,160	$239,820	$319,740	$240,000	$240,000	$240,000
ROW Easements	$0	$19,080	$81,180	$71,490	$96,300	$172,380	$174,720	$218,220
Residential Displacement Cost	$0	$460,200	$460,200	$690,300	$0	$920,400	$230,100	$460,200
Total Cost	$50,120,000	$51,226,138	$53,422,683	$53,233,760	$53,666,798	$57,051,484	$56,534,735	$58,276,801
Price Difference from Site 1 (Proposed Action)	n/a	$1,106,138	$3,302,683	$3,113,760	$3,546,798	$6,931,484	$6,414,735	$8,156,801
Percent Difference	n/a	+2%	+7%	+6%	+7%	+14%	+13%	+16%
Logistics								
Land Purchased for Substation (acres/# parcels)	17.74 acres/1 parcel[1]	37 acres/ 2 parcels	28.86 acres/ 2 parcels	39.97 acres/ 1 parcel	53.29 acres/ 2 parcels	40 acres/ 1 parcel	40 acres/ 1 parcel	40 acres/ 1 parcel
Tap Line ROW (acres)	0	6.36	27.06	23.83	32.10	57.46	58.24	72.74
# ROW Easements Needed for Tap Line	0	3	15	6	11	27	15	14
230 kV Tap Line Length (feet)	0	2,217	788	3,659	152	1,927	195	153
500 kV Tap Line Length (feet)	0	0	4,438	2,404	5,658	9,262	10,285	12,887
Aquatic Impacts								
Wetland Impacts (acres)	3.5	6.16[2]	0.70[2]	6.35[2]	3.29[2]	1.50[2]	0.73[2]	0[2]

Impacts	Site 1 (Proposed Action)	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8
Stream Impacts[3](linear feet)	0	646 (P)	2,710 (P/F,I,E)	-	1,240 (E)	-	-	-
Environmental Impacts								
Residential Displacements due to Substation Siting	0	2	0	1	0	0	0	0
Potential Residential Displacements due to Tap Line Easements	0	0	2	2	0	4	1	2
Total Land Use Impact (acres for substation and tap line ROW combined)	30.48	43.36	55.92	63.80	84.95	97.46	97.68	112.74

[1] Two additional parcels at Site 1 were previously purchased by Pacific Power in 1967 and 1989, respectively. [2]Wetland impacts are estimated from wetland signatures in aerial imagery and have not been field verified

[3]Stream types: E=ephemeral, P=perennial, I=intermittent, F=fish bearing

3.3.2.1 Site 1

Cost

Development of the substation at Site 1 would cost approximately $50,120,000. This includes the base cost to construct the substation itself (without any tap lines) and the cost to purchase one additional parcel (taxlot 700) that is adjacent to two parcels, which have been owned by Pacific Power since 1967 and 1989, respectively. . Since the substation at this site would be located directly underneath the intersection of the existing 500 kV and proposed 230 kV transmission lines, additional costs for tap line construction would not be incurred. In addition, ROW costs associated with easements and residential displacements would not be incurred for development of Site 1.

Logistics

Permits and approvals required for development of the substation at Site 1 include a local development permit and a removal/fill permit for wetland impacts. The substation would constitute a permitted "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval by the Jackson County Planning Commission. Impacts to wetlands present onsite would require a USACE/ Department of State Lands (DSL) removal/fill permit and compensatory mitigation for impacts. One parcel, totaling 17.7 acres, was already purchased for the substation However the parcel was vacant and did not require any residential displacements.

Aquatic Impacts

Site 1 contains a mapped ephemeral stream (NHD), but does not contain mapped NWI wetlands. However, wetland signatures are present in aerial photographs of the site. Field delineation was performed for the site during the summer of 2014, followed by a second visit in the summer of 2015. Approximately 3.5 acres would be permanently filled for development of the substation (Figure 3). No streams were found to occur at the site, however, a roadside ditch that borders the southern side of Sams Valley Highway was determined to be jurisdictional by DSL (Ditch 1). The jurisdictional ditch occurs outside of the substation and would not be impacted during construction or operation.

Environmental Impacts

Aside from wetland impacts, other environmental impacts associated with Site 1 would primarily relate to land use. Under this alternative, approximately 30.48 acres of existing EFU land would be purchased for development of the substation, and permanently converted to a utility use. However, property acquisitions and ROW easements would not be required, therefore, residences would not be physically displaced. Additionally, the site is in close proximity (500 feet or less) to three adjacent residential buildings and active farmland, which could affect visual quality and land value. There are no floodplains or fish-bearing streams that occur within the site. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site. Existing vegetation is predominantly herbaceous and would be relatively easy to clear during construction.

Practicability Finding

Site 1 is considered practicable given its low cost and limited logistical constraints relative to other alternatives evaluated. Approximately 3.5 acres of wetland impacts would occur under this alternative, however, other environmental impacts to surrounding land uses, residences, floodplains, and fish-bearing steams would be limited, especially when compared to other alternatives. Impacts to wetlands would require compensatory mitigation to satisfy USACE/DSL permitting requirements.

3.3.2.2 Site 2

Cost

Development of the substation at Site 2 would cost approximately $51,226,138 including costs for construction, land acquisition, ROW easements, and residential displacements. The substation itself would cost $50,000,000 to construct, $222,000 to purchase the land, and $460,200 for two residential displacements. The 230 kV tap line would cost $524,858 to construct and $19,080 for ROW easements. The cost of a substation at Site 2 would exceed the cost of Site 1 (Proposed Action) by approximately $1,106,138, which represents a 2 percent increase. Logistics

Permits and approvals required for Site 2 would include a local development permit, road crossing permit, and possibly a removal/fill permit for impacts to wetlands and waters. The substation and tap line would constitute a permitted "Type 2" use in the areas zoning designations cross, and would subject to administrative review and approval by the Jackson County Planning Commission. A road crossing permit would be needed for the tap line crossing of Sams Valley Highway (OR-234). Based on the high potential for wetlands and waters to be found at both the substation site and within the tap line ROW corridor, a wetlands and waters determination would be needed to confirm the presence or absence of wetlands and waters prior to construction. If wetlands and waters are found to occur, a removal/fill permit would be required. Two parcels, totaling 37 acres total, would need to be purchased for the substation, resulting in two residential displacements, which would require negotiations with property owners and relocation assistance. In addition, the tap line crosses 3 parcels and would require an additional 6.36 acres of ROW easements.

Aquatic Impacts

Site 2 contains one mapped perennial stream (NHD), but does not contain mapped NWI wetlands. The aerial image of site 2 shows a possible wetland signature, near the southwest corner of the site and extending off-site into the area between Sams Valley Highway and Tresham Lane. Approximately 6.16 acres of wetlands were mapped within the substation boundary at Site 2 using aerial imagery to detect wetland signatures (Figure 4). Construction of the substation itself (not including tap lines) would result in permanent impacts to approximately 646 linear feet of the mapped perennial stream, and could potentially result in permanent impacts to mapped wetlands (up to 6.16 acres).

In addition, the tap line corridor for Site 2 crosses mapped streams and wetlands, including the delineated wetland at Site 1. Construction of the tap line could result in temporary impacts to wetlands and waters from ground disturbance caused by

construction vehicles and equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 2 primarily relate to land use and ROW. Under this alternative, at least two residences would be displaced, and approximately 37 acres of existing (EFU) farmland would be permanently converted to a utility use for development of the substation. Incompatible land uses within the tap line ROW (6.36 acres) would also be converted to a utility use, if necessary. The substation is in close proximity (500 feet or less) to three adjacent residential buildings and active farmland, which could affect visual quality and land value. In addition to the visual impact of the substation, the overhead tap line would also result in visual impacts for adjacent land uses. There are no floodplains or fish-bearing streams that occur within the site. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site. With the exception of some large trees in the northwest corner of the site existing vegetation is predominantly herbaceous and would be relatively easy to clear during construction.

Practicability Finding

Site 2 would be practicable, in light of cost and logistics. Although the costs to construct would be higher than the proposed alternative (Site 1) by $1,245,218, and logistical constraints associated with property acquisitions, ROW easements, and potential wetland and waters permitting would introduce uncertainty into the project and would have implications for schedule and cost, increased costs and logistical constraints would not be sufficient to make this alternative impracticable. However, when compared to the proposed alternative (Site 1), Site 2 is likely to result in greater wetland, stream, land use and ROW impacts. Therefore, Site 2 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

3.3.2.3 Site 3

Cost

Development of the substation at Site 3 would cost approximately $53,422,683 including costs for construction, land acquisition, ROW easements, and residential displacements. The substation itself would cost $50,000,000 to construct and $173,160 to purchase the land. The 500 kV and 230 kV tap lines would cost $2,708,143 to construct, $81,180 for ROW easements, and $460,200 for two potential residential displacements. The cost of a substation at Site 3 would exceed the cost of Site 1 (Proposed Action) by approximately $3,302,683, which represents a 7 percent increase.

Logistics

Permits and approvals required for Site 3 would include a local development permit, floodplain development permit, road crossing permit, and removal/fill permit for impacts to waters. The substation and tap lines would constitute a permitted "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval by the Jackson County Planning Commission. A road crossing permit would be

needed for the tap line crossing of Sams Valley Highway (OR-234). Site 3 is located within the 100-year floodplain, which requires a Jackson County floodplain development permit. Assuming that mapped streams including one perennial, three intermittent, and one ephemeral occur on-site, impacts to water resources present on site would require a USACE/DSL removal/fill permit and compensatory mitigation for impacts. In addition, based on the high potential for wetlands to be found at both the substation site, a wetlands and waters determination would be needed to confirm the presence or absence of wetlands prior to construction. If wetlands are found to occur, a removal/fill permit would be required for wetland impacts as well.

The site overlaps a fish bearing perennial stream, Rock Creek, which is designated as essential fish habitat (EFH) for coho and Chinook. The NMFS may need to be consulted for impacts to EFH. Summer steelhead populations within Rock Creek are classified by the State of Oregon as a species of concern, but are not threatened or endangered. ODFW would review and comment on the USACE/DSL permit application.

Two parcels, totaling 28.86 acres total, would need to be purchased for the substation. In addition, the tap line crosses 15 parcels and would require an additional 27.06 acres of ROW easements and two potential residential displacements, which would necessitate negotiations with property owners and relocation assistance.

Aquatic Impacts

Site 3 contains five mapped streams (NHD), including one perennial/fish-bearing (Rock Creek), three intermittent, and one ephemeral. The substation site does not contain mapped NWI wetlands, however, the aerial image of site 3 shows a possible wetland signature in the southern half of the site. Approximately 0.70 acre of wetlands was mapped within the substation boundary at Site 3 using aerial imagery to detect wetland signatures (Figure 5). Construction of the substation itself (not including tap lines) would result in impacts to approximately 2,710 linear feet of mapped streams, including 750 feet of a perennial, fish-bearing stream (Rock Creek), and could potentially result in permanent impacts to mapped wetlands (up to 0.70 acres).

In addition, the tap line corridors for Site 3 cross mapped streams and wetland features. Construction of the tap line could result in temporary impacts to wetlands and waters from ground disturbance caused by construction vehicles and equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 3 include impacts to floodplains, fish species and habitats, land use, and ROW. Under this alternative, at least two residences would potentially be displaced and approximately 28.86 acres of existing EFU land would be permanently converted for development of the substation. Incompatible land uses within the tap line ROW (27.06 acres) would also be converted to a utility use, if necessary. The substation is in close proximity (500 feet or less) to two adjacent residential buildings and active farmland, which could affect visual quality and land value. In addition to the visual impact of the substation, the overhead tap lines and tower structures would also result in visual impacts for adjacent land uses.

The substation itself (not including tap lines) would be sited within a 100-year floodplain and would permanently impact approximately 750 linear feet of a fish-bearing stream (Rock Creek) containing designated EFH. Potential fish species within Rock Creek include coho, chinook, and summer steelhead. Filling or diverting the stream channel could compromise the quality of in-stream habitat for these species, both within the project site and downstream from the project site. Development within the floodplain could also reduce the beneficial functions of the floodplain (flood storage), and increase the flood risk on adjacent properties. Although there are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site, impacts to EFH may require consultation with NMFS.

Extensive clearing of riparian vegetation could impact local wildlife species through displacement and fragmentation of habitat. The tap line corridors would also cross Rock Creek and the 100-year floodplain, however, impacts to these resources resulting from the tap lines would be minimal as overhead structures would avoid direct ground disturbance in these areas. Limited vegetation clearing may be needed within the riparian zone of Rock Creek to meet clearance and safety requirements for the tap lines.

Practicability Finding

Site 3 would not be practicable, in light of costs, logistics, and aquatic or environmental impacts. The costs to construct would be higher than the proposed alternative (Site 1) by $3,503,863 and logistical constraints associated with property acquisitions, ROW easements, floodplain development, permitting for stream impacts and agency consultations for protected fish species would introduce uncertainty into the project and would have implications for schedule and cost. Compared to the proposed alternative (Site 1), Site 3 would likely result in fewer wetland impacts, but larger stream impacts. In addition, Site 3 would result in greater environmental impacts from land use conversion, residential displacements, removal or modification of riparian habitat and in-stream fish habitat, and floodplain development relative to the proposed alternative. Therefore, Site 3 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

3.3.2.4 Site 4

Cost

Development of the substation at Site 4 would cost approximately $53,233,760 including costs for construction, land acquisition, ROW easements, and residential displacements. The substation itself would cost $50,000,000 to construct, $239,820 to purchase the land and $230,100 for one residential displacement. The 500 kV and 230 kV tap lines would cost $2,232,150 to construct, $71,490 for ROW easements, and $460,200 for two potential residential displacements. The cost of a substation at Site 4 would exceed the cost of Site 1 (Proposed Action) by approximately $3,113,760, which represents a 6 percent increase.

Logistics

Permits and approvals required for Site 4 would include a local development permit, road crossing permit, and possibly a removal/fill permit for impacts to wetlands and waters.

The substation and tap lines would constitute a permitted "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval by the Jackson County Planning Commission. A road crossing permit would be needed for the tap line crossing of Sams Valley Highway (OR-234). Based on the potential for wetlands and waters to be found at both the substation site and within the tap line ROW corridors, a wetlands and waters determination would be needed to confirm the presence or absence of jurisdictional wetlands and waters prior to construction. If jurisdictional wetlands and waters are found to occur, a USACE/DSL removal/fill permit would be required.

One 39.97-acre parcel would need to be purchased for the substation, resulting in one residential displacement, which would necessitate negotiations with the property owner and relocation assistance. In addition, the tap lines cross six parcels, would require an additional 23.83 acres of ROW easements, and would result in at least two potential residential displacements, which would require negotiations with property owners and relocation assistance.

Aquatic Impacts

Site 4 does not contain any mapped wetlands or waters. However, aerial imagery of Site 4 shows possible wetland signatures in the southern half of the site. Approximately 6.35 acres of wetlands were mapped within the substation boundary at Site 4 using aerial imagery to detect wetland signatures (Figure 6). Construction of the substation itself (not including the tap lines) could potentially result in permanent impacts to mapped wetlands (up to 6.35 acres).

In addition, the tap line corridors for Site 4 cross mapped streams and wetlands, including the delineated wetland at Site 1. Construction of the tap line could result in temporary impacts to wetlands and waters from ground disturbance caused by construction vehicles and equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 4 primarily relate to land use and ROW. Under this alternative, at least one residence would be displaced for development of the substation, and additional two residences would potentially be displaced for the tap line ROW, and approximately 39.97 acres of existing EFU land would be permanently converted to a utility use. Incompatible land uses within the tap line ROW (23.83 acres) would also be converted to a utility use, if necessary. The substation is in close proximity (500 feet or less) to five adjacent residential buildings and active farmland, which could affect visual quality and land value. In addition to the visual impact of the substation, the overhead tap lines and tower structures would also result in visual impacts for adjacent land uses. There are no floodplains or fish-bearing streams that occur within the site. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site.

Practicability Finding

Site 4 would not be practicable, in light of costs, logistics, and other environmental factors. The costs to construct would be higher than the proposed alternative (Site 1) by

$3,305,250 and logistical constraints associated with property acquisitions, ROW easements, and potential wetland and waters permitting would introduce uncertainty into the project, and would have implications for schedule and cost. In addition, Site 4 is likely to result in greater wetland, land use and ROW impacts when compared to the proposed alternative (Site 1). Therefore, Site 4 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

3.3.2.5 Site 5

Cost

Development of the substation at Site 5 would cost approximately $53,666,798including costs for construction, land acquisition, and ROW easements. The substation itself would cost $50,000,000 to construct and $319,740to purchase the land. The 500 kV tap lines would cost $3,250,758 to construct and $96,300 for ROW easements. The cost of a substation at Site 5 would exceed the cost of Site 1 (Proposed Action) by approximately $3,546,798, which represents a 7 percent increase.

Logistics

Permits and approvals required for Site 5 would include a local development permit, floodplain development permit, land division permit, and possibly a removal/fill permit for impacts to wetlands. The substation and tap lines would constitute a permitted "Type 1" or "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval by the Jackson County Planning Commission. One of the tap line tower structures is located within the 100-year floodplain, which requires a Jackson County floodplain development permit. Based on the potential for wetlands to be found at the substation site, a field determination would be needed to confirm the presence or absence of wetlands prior to construction. If jurisdictional wetlands are found to occur, a USACE/DSL removal/fill permit would be required.

Two parcels, totaling 53.29 acres, would need to be purchased for the substation. Due to the large size of one parcel, a land division would likely be required to avoid purchasing more land than is needed for the substation. In addition, the tap lines cross 11 parcels and would require an additional 32.10 acres of ROW easements.

Aquatic Impacts

Site 5 contains two mapped ephemeral streams (NHD), but does not contain any mapped NWI wetlands. However, aerial imagery of Site 5 shows possible wetland signatures in the western half of the site. Approximately 3.29 acres of wetlands were mapped within the substation boundary at Site 5 using aerial imagery to detect wetland signatures (Figure 7). Construction of the substation itself (not including tap lines) would result in permanent impacts to approximately 1,240 linear feet of the mapped ephemeral streams, and could potentially result in permanent impacts to mapped wetlands (up to 3.29 acres).

In addition, the tap line corridors for Site 5 cross mapped streams, waterbodies, and wetland features. Construction of the tap line could result in temporary impacts to wetlands and waters from ground disturbance caused by construction vehicles and

equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 5 primarily relate to land use and ROW. Under this alternative, approximately 53.29 acres of land zoned for EFU or OSR would be permanently converted to a utility use. Incompatible land uses within the tap line ROW (31.66 acres) would also be converted to a utility use, if necessary. The substation is in close proximity (500 feet or less) to active farmland, which could affect visual quality and land value. In addition to the visual impact of the substation, the overhead tap lines and tower structures would also result in visual impacts for adjacent land uses. One tower structure would be located within the 100-year floodplain, however, floodplain impacts resulting from tower installation would be minimal and beneficial floodplain functions (flood storage) would remain similar to existing conditions. Extensive vegetation clearing within the southernmost 500 kV tap line ROW could impact local wildlife species through displacement and fragmentation of habitat. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site.

Practicability Finding

Site 5 would not be practicable, in light of costs, logistics, and other environmental factors. The costs to construct would be higher than the proposed alternative (Site 1) by $3,725,673 and logistical constraints associated with property acquisitions, ROW easements, floodplain development, and permitting for stream or wetland impacts would introduce uncertainty into the project, and would have implications for schedule and cost. Although Site 5 would likely result in fewer wetland impacts and similar or larger stream impacts when compared to the proposed alternative (Site 1), land use and ROW impacts would be greater than the proposed alternative. Therefore, Site 5 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

3.3.2.6 Site 6

Cost

Development of the substation at Site 6 would cost approximately $57,051,484 including costs for construction, land acquisition, ROW easements, and residential displacements. The substation itself would cost $50,000,000 to construct and $240,000 to purchase the land. The 500 kV and 230 kV tap lines would cost $5,718,704 to construct, $172,380 for ROW easements, and $920,400 for four potential residential displacements. The cost of a substation at Site 6 would exceed the cost of Site 1 (Proposed Action) by approximately $6,931,484, which represents a 14 percent increase.

Logistics

Permits and approvals required for Site 6 would include a local development permit, land division, road crossing permit, and possibly a removal/fill permit for impacts to wetlands. The substation and tap lines would constitute a permitted "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval

by the Jackson County Planning Commission. A road crossing permit would be needed for the tap line crossing of Sams Valley Highway (OR-234). Based on the potential for wetlands to be found at the substation site, a field determination would be needed to confirm the presence or absence of wetlands prior to construction. If jurisdictional wetlands are found to occur, a USACE/DSL removal/fill permit would be required.

One parcel would need to be purchased for the substation. Due to the large size of the parcel, a land division permit would likely be required to avoid purchasing more land than is needed for the substation. In addition, the tap lines would cross 27 parcels, require an additional 57.46 acres of ROW easements, and result in four potential residential displacements, which would require negotiations with property owners and relocation assistance.

Aquatic Impacts

Site 6 does not contain any mapped wetlands or waters; however, aerial imagery of Site 6 shows possible wetland signatures along drainages that intersect through the middle of the site. Approximately 1.50 acre of wetlands was mapped within the substation boundary at Site 6 using aerial imagery to detect wetland signatures (Figure 8). Therefore, construction of the substation itself (not including tap lines) could potentially result in permanent impacts to mapped wetlands (up to 1.50 acres).

In addition, the tap line corridors for Site 6 cross mapped streams and wetlands. Construction of the tap line could result in temporary impacts to wetlands and waters from ground disturbance caused by construction vehicles and equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 6 primarily relate to land use and ROW. Under this alternative, four residences would potentially be displaced from the tap line ROW and approximately 40 acres of existing EF) land would be permanently converted to a utility use for development of the substation. Incompatible land uses within the tap line ROW (57.46 acres) would also be converted to a utility use, if necessary. The substation is in close proximity (500 feet or less) to active farmland, which could affect visual quality and land value. In addition to the visual impact of the substation, the overhead tap lines and tower structures would also result in visual impacts for adjacent land uses. The tap line corridors would cross a perennial fish bearing stream (Rock Creek) and the 100-year floodplain, however, impacts to these resources would be negligible as overhead structures would avoid direct ground disturbance in these areas. A limited amount of vegetation clearing may be needed within the riparian zone of Rock Creek, which could have a minor impact on some riparian wildlife species through displacement and fragmentation of habitat. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site.

Practicability Finding

Site 6 would not be practicable, in light of costs, logistics, and other environmental factors. The costs to construct would be higher than the proposed alternative (Site 1) by $7,223,864, and logistical constraints associated with property acquisitions, ROW

easements, and a potential removal/fill permit would introduce uncertainty into the project, and would have implications for schedule and cost. Compared to the proposed alternative (Site 1), Site 6 would likely result in fewer wetland and water impacts. However, Site 6 would result in greater land use and ROW impacts relative to the proposed alternative. Therefore, Site 6 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

3.3.2.7 Site 7

Cost

Development of the substation at Site 7 would cost approximately $56,534,735including costs for construction, land acquisition, ROW easements, and residential displacements. The substation itself would cost $50,000,000 to construct and $240,000 to purchase the land. The 500 kV and 230 kV tap lines would cost $5,889,915 to construct, $174,720for ROW easements, and $230,100 for one potential residential displacement. The cost of a substation at Site 7 would exceed the cost of Site 1 (Proposed Action) by approximately $6,414,735, which represents a 13 percent increase.

Logistics

Permits and approvals required for Site 7 would include a local development permit, land division permit, and possibly a removal/fill permit for impacts to wetlands. The substation and tap lines would constitute a permitted "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval by the Jackson County Planning Commission. Based on the potential for wetlands to be found at the substation site, a field determination would be needed to confirm the presence or absence of wetlands prior to construction. If jurisdictional wetlands are found to occur, a USACE/DSL removal/fill permit would be required.

One parcel would need to be purchased for the substation. Due to the large size of the parcel, a land division permit would likely be required to avoid purchasing more land than is needed for the substation. In addition, the tap lines would cross 15 parcels, require an additional 58.24 acres of ROW easements, and result in one potential residential displacement, which would require negotiations with property owners and relocation assistance. The substation would also impact driveway access to one residential property located east of the substation, which would require additional negotiations and compensation.

Aquatic Impacts

Site 7 does not contain any mapped wetlands or waters, however aerial imagery of Site 7 shows a possible wetland signature in the northeast corner of the site. Approximately 0.73 acre of wetlands was mapped within the substation boundary at Site 7 using aerial imagery to detect wetland signatures (Figure 9). Therefore, construction of the substation itself (not including tap lines) could potentially result in permanent impacts to mapped wetlands (up to 0.73 acre).

In addition, the tap line corridors for Site 7 cross mapped streams and wetlands, construction of the tap line could result in temporary impacts to wetlands and waters from

ground disturbance caused by construction vehicles and equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 7 primarily relate to land use and ROW. Under this alternative, at least one residence would potentially be displaced from the tap line ROW, and approximately 40 acres of existing EFU land would be permanently converted to a utility use for development of the substation. Incompatible land uses within the tap line ROW (57.68 acres) would also be converted to a utility use, if necessary. The substation is in close proximity (500 feet or less) to one adjacent residential building and active farmland, which could affect visual quality and land value. In addition to the visual impact of the substation, the overhead tap lines and tower structures would also result in visual impacts for adjacent land uses. The tap line corridors would cross a perennial fish bearing stream (Rock Creek) and the 100-year floodplain, however, impacts to these resources would be negligible as overhead structures would avoid direct ground disturbance in these areas. A limited amount of vegetation clearing may be needed within the riparian zone of Rock Creek, which could have a minor impact on some riparian wildlife species through displacement and fragmentation of habitat. Extensive vegetation clearing within the substation site and the southernmost 500 kV tap line ROW could impact local wildlife species through displacement and fragmentation of habitat. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site.

Practicability Finding

Site 7 would not be practicable, in light of costs, logistics, and other environmental factors. the costs to construct would be higher than the proposed alternative (Site 1) by $6,659,930, and logistical constraints associated with property acquisitions, ROW easements, and a potential removal/fill permit would introduce uncertainty into the project, and would have implications for schedule and cost. Compared to the proposed alternative (Site 1), Site 7 would likely result in fewer wetland and water impacts. However, Site 7 would result in greater land use and ROW impacts relative to the proposed alternative. Therefore, Site 7 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

3.3.2.8 Site 8

Cost

Development of the substation at Site 8 would cost approximately $58,276,801 including costs for construction, land acquisition, ROW easements, and residential displacements. The substation itself would cost $50,000,000 to construct and $240,000 to purchase the land. The 500 kV and 230 kV tap lines would cost $7,358,381 to construct, $218,220 for ROW easements, and $460,200 for two potential residential displacements. The cost of a substation at Site 8 would exceed the cost of Site 1 (Proposed Action) by approximately $8,156,801, which represents a 16 percent increase.

Logistics

Permits and approvals required for Site 8 would include a local development permit and land division. The substation and tap lines would constitute a permitted "Type 2" use in the areas zoning designations cross, and would be subject to administrative review and approval by the Jackson County Planning Commission.

One parcel would need to be purchased for the substation. Due to the large size of the parcel, a land division permit would likely be required to avoid purchasing more land than is needed for the substation. In addition, the tap lines would cross 14 parcels, require an additional 72.74 acres of ROW easements, and result in two potential residential displacements, which would require negotiations with property owners and relocation assistance.

Aquatic Impacts

Site 8 does not contain any mapped wetlands or waters, therefore, construction of the substation itself (not including the tap line) is not anticipated to result in permanent impacts to streams or wetlands. However, since the tap line corridors for Site 8 cross mapped streams and wetlands, construction of the tap line could result in temporary impacts to wetlands and waters from ground disturbance caused by construction vehicles and equipment. Clearing within the tap line ROW could also impact riparian or wetland vegetation.

Environmental Impacts

Aside from aquatic impacts, other environmental impacts associated with Site 8 primarily relate to land use and ROW. Under this alternative, two residences would be potentially displaced from the tap line ROW and approximately 40 acres of existing EFU land would be permanently converted to a utility use for development of the substation. Incompatible land uses within the tap line ROW (72.74 acres) would also be converted to a utility use, if necessary. The overhead tap lines and tower structures would result in visual impacts for adjacent land uses.

The tap line corridors would cross a perennial fish bearing stream (Rock Creek) and the 100-year floodplain, however, impacts to these resources would be negligible as overhead structures would avoid direct ground disturbance in these areas. A limited amount of vegetation clearing may be needed within the riparian zone of Rock Creek, which could have a minor impact on some riparian wildlife species through displacement and fragmentation of habitat. Extensive vegetation clearing within the substation site and the southernmost 500 kV tap line ROW could impact local wildlife species through displacement and fragmentation of habitat. There are no threatened or endangered species known to occur within the site, and designated critical habitat does not occur at the site.

Practicability Finding

Site 8 would not be practicable, in light of costs, logistics, and other environmental factors. The costs to construct would be higher than the proposed alternative (Site 1) by $8,495,021, and logistical constraints associated with property acquisitions and ROW easements would introduce uncertainty into the project and would have implications for

schedule and cost. Compared to the proposed alternative (Site 1), Site 8 would result in fewer wetland and water impacts. However, Site 8 would result in greater land use and ROW impacts relative to the proposed alternative. Therefore, Site 8 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1.

4 Conclusion

When compared to the proposed alternative (Site 1), all other alternatives would result in greater environmental impacts related to land use and ROW. Wetland mapping at Sites 2 and 4 indicates that these alternatives are likely to result in greater wetland impacts than the proposed alternative. Additionally, Site 3 would result in greater impacts to streams, floodplains, and fish habitat when compared to the proposed alternative. Therefore, none of the alternatives to the proposed action would qualify as a less environmentally damaging alternative. Therefore, the proposed alternative at Site 1 is the least environmentally damaging alternative.

Sites 3 through 8 would not be practicable due to unreasonably high costs associated with tap line construction, or significant logistical constraints that would introduce uncertainty into the project and would have implications for schedule and cost. The proposed alternative (Site 1) and Site 2 would be practicable, in terms of costs and logistics. However, Site 2 is likely to result in greater wetland, stream, land use and ROW impacts. Therefore, Site 2 would not constitute a less environmentally damaging alternative to the proposed alternative at Site 1. The proposed alternative at Site 1 is determined to be the least environmentally damaging practicable alternative (LEDPA).

5 References

Jackson County, Oregon. Land Development Ordinance. February 13, 2005. Accessed online at: http://jacksoncountyor.org/ds/PDFs?EntryId=37627

Zillow Home Value Index. http://www.zillow.com/jackson-county-or/home-values/

Attachment J-2. Feature Characteristics and Impacts Tables

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Table J-2.1A. Wetlands

Map Tile	Route	Nearest Mile Post	Feature ID	Size (Total Acres)	Cowardin Class	Characteristics
J-2.11	Grants Pass–Sams Valley Double Circuit 230/115kV	6.4	WL-01	0.0006	PEM	Fringe wetlands along irrigation ditch.
J-2.28	Grants Pass–Sams Valley Double Circuit 230/115kV	17	WL-02	0.166	PEM	Wetland in drainage channel that receives backflow from artificial pond.
J-2.28	Grants Pass–Sams Valley Double Circuit 230/115kV	17	WL-03	0.453	PEM	Wetland in shallow depression adjacent artificial pond.
J-2.27	Grants Pass–Sams Valley Double Circuit 230/115kV	16.1	WL-04A WL-04B	0.537	PEM	Wetlands in shallow depressions to either side of access road.
J-2.30	Dixonville-Sams Valley 500kV	Sams Valley Substation	WL-05	0.09	PEM	Wetland in depression within hay meadow.
J-2.35	Proposed Route	4.2	WL-06	0.521	PEM	Wetland in shallow depression on floodplain (possible vernal pool).
J-2.35	Proposed Route	4.1	WL-07	0.005	PEM	Wetland in broad ditch excavated for quarry operations.
J-2.35	Proposed Route	4, 4.1	WL-08A WL-08B WL-08C WL-08D	0.054	PEM	Wetlands in series of shallow depressions on floodplain; area appears to have been impacted/modified by quarry operations.

Map Tile	Route	Nearest Mile Post	Feature ID	Size (Total Acres)	Cowardin Class	Characteristics
J-2.30	Dixonville-Sams Valley 500kV	Sams Valley Substation	WL-B	4.68	PEM	Large depressional/slope wetland located in pastureland predominantly consisting of emergent vegetation. Wetland extends offsite to the west of the Project site boundary.
J-2.30	Dixonville-Sams Valley 500kV	Sams Valley Substation	WL-C	0.09	PEM	Small depressional/slope wetland located in pastureland predominantly consisting of emergent vegetation.
PEM: Palustrine Emergent						

Table J-2-1B. Other Waters

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.1	Grants Pass–Sams Valley Double Circuit 230/115kV	0.1	WB-1	10	Perennial	Natural drainage
J-2.3	Grants Pass–Sams Valley Double Circuit 230/115kV	1.0	WB-2	3	Ephemeral	Natural drainage
J-2.3	Grants Pass–Sams Valley Double Circuit 230/115kV	1.0	WB-3	1	Ephemeral	Natural drainage
J-2.3	Grants Pass–Sams Valley Double Circuit 230/115kV	1.2	WB-4	1	Ephemeral	Natural drainage
J-2.3	Grants Pass–Sams Valley Double Circuit 230/115kV	1.4	WB-5	6	Ephemeral	Natural drainage
J-2.4	Grants Pass–Sams Valley Double Circuit 230/115kV	2.1	WB-6	4	Ephemeral	Natural drainage w/ culvert
J-2.4	Grants Pass–Sams Valley Double Circuit 230/115kV	2.2	WB-7	1	Ephemeral	Natural drainage
J-2.5	Grants Pass–Sams Valley Double Circuit 230/115kV	3.2	WB-8	2	Ephemeral	Natural drainage w/ culvert
J-2.5	Grants Pass–Sams Valley Double Circuit 230/115kV	3.3	WB-9	1	Ephemeral	Natural drainage w/ culvert

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.6	Grants Pass–Sams Valley Double Circuit 230/115kV	3.6	WB-10	1	Ephemeral	Natural drainage w/ culvert
J-2.6	Grants Pass–Sams Valley Double Circuit 230/115kV	3.9	WB-11	5	Ephemeral	Artificial ditch
J-2.6	Grants Pass–Sams Valley Double Circuit 230/115kV	4.1	WB-12	1	Ephemeral	Natural drainage
J-2.6	Grants Pass–Sams Valley Double Circuit 230/115kV	4.1	WB-13	1	Ephemeral	Natural drainage
J-2.5	Grants Pass–Sams Valley Double Circuit 230/115kV	3.4	WB-14	1	Ephemeral	Natural drainage
J-2.5	Grants Pass–Sams Valley Double Circuit 230/115kV	3.2	WB-15	1	Ephemeral	Natural drainage w/ culvert
J-2.8	Grants Pass–Sams Valley Double Circuit 230/115kV	5.1	WB-16	4	Ephemeral	Artificial ditch
J-2.8	Grants Pass–Sams Valley Double Circuit 230/115kV	5.1	WB-17	4	Ephemeral	Artificial ditch w/ culvert
J-2.7	Grants Pass–Sams Valley Double Circuit 230/115kV	4.7	WB-18	2	Ephemeral	Natural drainage w/ culvert
J-2.8	Grants Pass–Sams Valley Double Circuit 230/115kV	5.1	WB-19	1	Ephemeral	Natural drainage w/ culvert

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.7	Grants Pass–Sams Valley Double Circuit 230/115kV	5.2	WB-20	0.5	Ephemeral	Natural drainage
J-2.9	Grants Pass–Sams Valley Double Circuit 230/115kV	5.6	WB-21	1	Ephemeral	Natural drainage w/ culvert
J-2.10	Grants Pass–Sams Valley Double Circuit 230/115kV	6.2	WB-22	1	Ephemeral	Natural drainage
J-2.10	Grants Pass–Sams Valley Double Circuit 230/115kV	6.1	WB-23	1	Ephemeral	Natural drainage
J-2.10	Grants Pass–Sams Valley Double Circuit 230/115kV	6.3	WB-24	4	Intermittent	Artificial ditch
J-2.11	Grants Pass–Sams Valley Double Circuit 230/115kV	6.4	WB-25	4	Intermittent	Artificial ditch w/ culvert
J-2.9	Grants Pass–Sams Valley Double Circuit 230/115kV	5.6	WB-26	4	Perennial	Natural drainage w/ culvert
J-2.12	Grants Pass–Sams Valley Double Circuit 230/115kV	7.1	WB-27	1	Ephemeral	Natural drainage
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.4	WB-28	1	Ephemeral	Natural drainage
J-2.16	Grants Pass–Sams Valley Double Circuit 230/115kV	9.6	WB-29	0.5	Ephemeral	Natural drainage w/ culvert

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.24	Grants Pass–Sams Valley Double Circuit 230/115kV	13.9	WB-30	3	Ephemeral	Natural drainage w/ culvert
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	15.1	WB-31	1	Ephemeral	Natural drainage
J-2.18	Grants Pass–Sams Valley Double Circuit 230/115kV	11.2	WB-32	1	Ephemeral	Natural drainage w/ culvert
J-2.18	Grants Pass–Sams Valley Double Circuit 230/115kV	11	WB-33	1	Ephemeral	Natural drainage
J-2.18	Grants Pass–Sams Valley Double Circuit 230/115kV	11	WB-34	1	Ephemeral	Natural drainage w/ culvert
J-2.18, J-2.19	Grants Pass–Sams Valley Double Circuit 230/115kV	11.3	WB-35	1	Ephemeral	Natural drainage
J-2.19	Grants Pass–Sams Valley Double Circuit 230/115kV	11.4	WB-36	1	Ephemeral	Natural drainage
J-2.19	Grants Pass–Sams Valley Double Circuit 230/115kV	11.3	WB-37	1	Ephemeral	Natural drainage
J-2.19	Grants Pass–Sams Valley Double Circuit 230/115kV	11.5	WB-38	1	Ephemeral	Natural drainage w/ culvert
J-2.19	Grants Pass–Sams Valley Double Circuit 230/115kV	11.6	WB-39	1	Ephemeral	Natural drainage

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.20	Grants Pass–Sams Valley Double Circuit 230/115kV	12.3	WB-40	2.5	Ephemeral	Natural drainage
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.5	WB-41	2	Ephemeral	Natural drainage w/ culvert
J-2.23	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	WB-42	2	Ephemeral	Natural drainage
J-2.23	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	WB-42B	2	Ephemeral	Natural drainage w/ culvert
J-2.23	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	WB-43	1	Ephemeral	Natural drainage
J-2.23	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	WB-44	3	Ephemeral	Natural drainage
J-2.23	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	WB-44B	3	Ephemeral	Natural drainage w/ culvert
J-2.23	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	WB-45	1	Ephemeral	Natural drainage w/ culvert
J-2.20	Grants Pass–Sams Valley Double Circuit 230/115kV	12	WB-46	15	Perennial	Natural drainage
J-2.20	Grants Pass–Sams Valley Double Circuit 230/115kV	12	WB-47	1	Ephemeral	Natural drainage

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.20	Grants Pass–Sams Valley Double Circuit 230/115kV	12	WB-48	1	Ephemeral	Natural drainage
J-2.27	Grants Pass–Sams Valley Double Circuit 230/115kV	16.3	WB-49	2	Ephemeral	Natural drainage
J-2.28	Grants Pass–Sams Valley Double Circuit 230/115kV	16.8	WB-50	1	Ephemeral	Natural drainage
J-2.31	Sams Valley-Whetstone Reconductored 230kV	1.6	WB-51	1	Ephemeral	Natural drainage
J-2.35	Sams Valley-Whetstone Reconductored 230kV	4.1	WB-52	10	Perennial	Artificial channel
J-2.30	Dixonville-Sams Valley 500kV	Sams Valley Substation	Ditch	2-4	Ephemeral	Roadside ditch has indicators of bed and bank conditions. Likely drains to the west to Rock Creek.

Table J-2-1C. Wetlands (Not Delineated)

Map Tile	Route	Nearest Mile Post	Feature ID	Size (Total Acres)	Cowardin Class	Characteristics
J-2.32	Sams Valley-Whetstone Reconductored 230kV	2.2	NSWL-61	Data Gap	PFO/PSS	NWI mapped wetland.
J-2.32	Sams Valley-Whetstone Reconductored 230kV	2.2	NSWL-62	Data Gap	PEM	NWI mapped wetland.
J-2.33	Sams Valley-Whetstone Reconductored 230kV	3.3	NSWL-65	Data Gap	PFO/PSS	NWI mapped wetland.
J-2.34	Sams Valley-Whetstone Reconductored 230kV	3.5	NSWL-66A	Data Gap	Riverine	NWI mapped wetland.
J-2.34	Sams Valley-Whetstone Reconductored 230kV	3.5	NSWL-66B	Data Gap	Riverine	NWI mapped wetland.
J-2.34	Sams Valley-Whetstone Reconductored 230kV	3.6	NSWL-66C	Data Gap	Riverine	NWI mapped wetland.

PFO: Palustrine Forested, PSS: Palustrine Scrub/Shrub, PEM: Palustrine Emergent

Table J-2-1D. Other Waters (Not Delineated)

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.2	Grants Pass–Sams Valley Double Circuit 230/115kV	0.6	NSWB-01	Data Gap	Ephemeral	NHD Flowline
J-2.2	Grants Pass–Sams Valley Double Circuit 230/115kV	0.7	NSWB-02	Data Gap	Ephemeral	NHD Flowline
J-2.2	Grants Pass–Sams Valley Double Circuit 230/115kV	0.8	NSWB-03	Data Gap	Ephemeral	NHD Flowline
J-2.3	Grants Pass–Sams Valley Double Circuit 230/115kV	1	NSWB-04	Data Gap	Ephemeral	NHD Flowline
J-2.4	Grants Pass–Sams Valley Double Circuit 230/115kV	2.5	NSWB-05	Data Gap	Intermittent	NHD Flowline
J-2.5	Grants Pass–Sams Valley Double Circuit 230/115kV	2.9	NSWB-06	Data Gap	Intermittent	NHD Flowline
J-2.5	Grants Pass–Sams Valley Double Circuit 230/115kV	2.9	NSWB-07	Data Gap	Intermittent	NHD Flowline
J-2.6	Grants Pass–Sams Valley Double Circuit 230/115kV	4	NSWB-08	Data Gap	Canal/Ditch	NHD Flowline
J-2.8	Grants Pass–Sams Valley Double Circuit 230/115kV	5.1	NSWB-09	Data Gap	Intermittent	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.8	Grants Pass–Sams Valley Double Circuit 230/115kV	5.2	NSWB-10	Data Gap	Ephemeral	NHD Flowline
J-2.10	Grants Pass–Sams Valley Double Circuit 230/115kV	6	NSWB-11	Data Gap	Ephemeral	NHD Flowline
J-2.10	Grants Pass–Sams Valley Double Circuit 230/115kV	6.1	NSWB-12	Data Gap	Ephemeral	NHD Flowline
J-2.10	Grants Pass–Sams Valley Double Circuit 230/115kV	6.2	NSWB-13	Data Gap	Ephemeral	NHD Flowline
J-2.11	Grants Pass–Sams Valley Double Circuit 230/115kV	6.7	NSWB-14	Data Gap	Artificial Path	NHD Waterbody
J-2.12	Grants Pass–Sams Valley Double Circuit 230/115kV	7.1	NSWB-15	Data Gap	Intermittent	NHD Flowline
J-2.12	Grants Pass–Sams Valley Double Circuit 230/115kV	7.2	NSWB-16	Data Gap	Ephemeral	NHD Flowline
J-2.12	Grants Pass–Sams Valley Double Circuit 230/115kV	7.5	NSWB-17	Data Gap	Ephemeral	NHD Flowline
J-2.12	Grants Pass–Sams Valley Double Circuit 230/115kV	7.5	NSWB-18	Data Gap	Ephemeral	NHD Flowline
J-2.13	Grants Pass–Sams Valley Double Circuit 230/115kV	7.6	NSWB-19	Data Gap	Ephemeral	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.13	Grants Pass–Sams Valley Double Circuit 230/115kV	7.8	NSWB-20	Data Gap	Intermittent	NHD Flowline
J-2.13	Grants Pass–Sams Valley Double Circuit 230/115kV	7.9	NSWB-21	Data Gap	Intermittent	NHD Flowline
J-2.13	Grants Pass–Sams Valley Double Circuit 230/115kV	7.9	NSWB-22	Data Gap	Ephemeral	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.4	NSWB-23	Data Gap	Ephemeral	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.4	NSWB-24	Data Gap	Ephemeral	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.5	NSWB-25	Data Gap	Ephemeral	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.6	NSWB-26	Data Gap	Ephemeral	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.8	NSWB-27	Data Gap	Ephemeral	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.8	NSWB-28	Data Gap	Perennial	NHD Flowline
J-2.14	Grants Pass–Sams Valley Double Circuit 230/115kV	8.9	NSWB-29	Data Gap	Intermittent	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.15	Grants Pass–Sams Valley Double Circuit 230/115kV	9.2	NSWB-30	Data Gap	Ephemeral	NHD Flowline
J-2.15	Grants Pass–Sams Valley Double Circuit 230/115kV	9.3	NSWB-31	Data Gap	Ephemeral	NHD Flowline
J-2.16	Grants Pass–Sams Valley Double Circuit 230/115kV	9.6	NSWB-32	Data Gap	Intermittent	NHD Flowline
J-2.16	Grants Pass–Sams Valley Double Circuit 230/115kV	9.7	NSWB-33	Data Gap	Ephemeral	NHD Flowline
J-2.16	Grants Pass–Sams Valley Double Circuit 230/115kV	9.8	NSWB-34	Data Gap	Ephemeral	NHD Flowline
J-2.17	Grants Pass–Sams Valley Double Circuit 230/115kV	10.7	NSWB-35	Data Gap	Ephemeral	NHD Flowline
J-2.18	Grants Pass–Sams Valley Double Circuit 230/115kV	11.2	NSWB-36A	Data Gap	Ephemeral	NHD Flowline
J-2.18	Grants Pass–Sams Valley Double Circuit 230/115kV	11.2	NSWB-36B	Data Gap	Ephemeral	NHD Flowline
J-2.19	Grants Pass–Sams Valley Double Circuit 230/115kV	12	NSWB-37	Data Gap	Perennial	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.5	NSWB-38A	Data Gap	Ephemeral	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.6	NSWB-38B	Data Gap	Ephemeral	NHD Flowline
J-2.20	Grants Pass–Sams Valley Double Circuit 230/115kV	12.3	NSWB-39A	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.6	NSWB-39B	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.3	NSWB-39C	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.7	NSWB-40	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.8	NSWB-41	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.9	NSWB-42	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.9	NSWB-43A	Data Gap	Ephemeral	NHD Flowline
J-2.21	Grants Pass–Sams Valley Double Circuit 230/115kV	12.9	NSWB-43B	Data Gap	Ephemeral	NHD Flowline
J-2.22	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	NSWB-44	Data Gap	Ephemeral	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.22	Grants Pass–Sams Valley Double Circuit 230/115kV	13.2	NSWB-45	Data Gap	Ephemeral	NHD Flowline
J-2.22	Grants Pass–Sams Valley Double Circuit 230/115kV	13.3	NSWB-46A	Data Gap	Ephemeral	NHD Flowline
J-2.22	Grants Pass–Sams Valley Double Circuit 230/115kV	13.3	NSWB-46B	Data Gap	Ephemeral	NHD Flowline
J-2.22	Grants Pass–Sams Valley Double Circuit 230/115kV	13.4	NSWB-47	Data Gap	Ephemeral	NHD Flowline
J-2.22	Grants Pass–Sams Valley Double Circuit 230/115kV	13.7	NSWB-48	Data Gap	Ephemeral	NHD Flowline
J-2.24	Grants Pass–Sams Valley Double Circuit 230/115kV	13.9	NSWB-49	Data Gap	Perennial	NHD Flowline
J-2.24	Grants Pass–Sams Valley Double Circuit 230/115kV	14.3	NSWB-50	Data Gap	Ephemeral	NHD Flowline
J-2.24	Grants Pass–Sams Valley Double Circuit 230/115kV	14.3	NSWB-51	Data Gap	Intermittent	NHD Flowline
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.7	NSWB-52A	Data Gap	Ephemeral	NHD Flowline
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.7	NSWB-52B	Data Gap	Ephemeral	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.7	NSWB-52C	Data Gap	Ephemeral	NHD Flowline
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.9	NSWB-53A	Data Gap	Ephemeral	NHD Flowline
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.9	NSWB-53B	Data Gap	Ephemeral	NHD Flowline
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.9	NSWB-54A	Data Gap	Ephemeral	NHD Flowline
J-2.25	Grants Pass–Sams Valley Double Circuit 230/115kV	14.9	NSWB-54B	Data Gap	Ephemeral	NHD Flowline
J-2.26	Grants Pass–Sams Valley Double Circuit 230/115kV	15.3	NSWB-55	Data Gap	Perennial	NHD Flowline
J-2.26	Grants Pass–Sams Valley Double Circuit 230/115kV	15.6	NSWB-56A	Data Gap	Intermittent	NHD Flowline
J-2.26	Grants Pass–Sams Valley Double Circuit 230/115kV	15.6	NSWB-56B	Data Gap	Ephemeral	NHD Flowline
J-2.26	Grants Pass–Sams Valley Double Circuit 230/115kV	15.6	NSWB-57	Data Gap	Ephemeral	NHD Flowline
J-2.29	Grants Pass–Sams Valley Double Circuit 230/115kV	17.7	NSWB-58	Data Gap	Ephemeral	NHD Flowline

Map Tile	Route	Mile Post	Feature ID	Width (Feet)	Flow Duration	Characteristics
J-2.29	Grants Pass–Sams Valley Double Circuit 230/115kV	17.7	NSWB-59	Data Gap	Ephemeral	NHD Flowline
J-2.32	Sams Valley-Whetstone Reconductored 230kV	2.1	NSWB-60A	Data Gap	Ephemeral	NHD Flowline
J-2.32	Sams Valley-Whetstone Reconductored 230kV	2.1	NSWB-60B	Data Gap	Ephemeral	NHD Flowline
J-2.33	Sams Valley-Whetstone Reconductored 230kV	2.8	NSWB-63A	Data Gap	Intermittent	NHD Flowline
J-2.33	Sams Valley-Whetstone Reconductored 230kV	2.8	NSWB-63B	Data Gap	Intermittent	NHD Flowline
J-2.34	Sams Valley-Whetstone Reconductored 230kV	3.2	NSWB-64	Data Gap	Perennial	NHD Flowline
J-2.35	Sams Valley-Whetstone Reconductored 230kV	3.9	NSWB-67	Data Gap	Pond	NHD Water Body
J-2.36	Sams Valley-Whetstone Reconductored 230kV	4.6	NSWB-68	Data Gap	Pond	NHD Water Body

Table J-2-1E. Wetland Impacts

Feature ID	Impacts (Acres)	
	Permanent	Temporary
Wetland B	3.40	–
Wetland C	0.09	–
Grand Total	**3.49**	**–**

Attachment J-3. Transmission Line Study Area Wetland Delineation Report

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Sam's Valley Transmission Project

Jackson and Josephine Counties, Oregon

Aquatic Resource and Wetland Delineation Report



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1.0 INTRODUCTION

PacifiCorp is proposing development of the Sam's Valley Transmission Project, an upgrade utility line (reconductoring) to an approximately 22-mile (mi; 35.4-kilometer [km]) long section of existing transmission line (Figure 1). This upgrade follows existing utility corridors and will originate at the existing Grant's Pass substation, located approximately 2.5 mi (4.0 km) east of Grants Pass, Oregon, and terminates at the existing Whetstone substation, located approximately 3.5 mi (5.6 km) west of White City, Oregon. The proposed transmission line and access roads will collectively be referred to as the Study Area. The Study Area consists of a transmission line corridor of 135 feet (ft; 41.1 meters [m]), based on the existing 75-ft (22.9-m) ROW and newly added 60-ft (18.3-m) ROW, with an associated 50-ft (15.2-m) access road corridor (25 ft [7.6 m] to either side of the centerline). The Study Area crosses lands managed by the Bureau of Land Management (BLM) Medford Field Office, as well as private lands. HDR Engineering, Inc. (HDR) has been contracted to prepare environmental review documents for the transmission project.

HDR has subcontracted Western EcoSystems Technology, Inc. (WEST) to conduct biological reviews and surveys to support HDR's environmental review documents. This report summarizes the 2017 aquatic resources surveys and wetland delineation conducted by WEST within the proposed Study Area.

1.1 Landscape Setting and land Use

The Study Area extends east from Grants Pass along the foothills immediately north of Interstate 5, to a point northeast of Gold Hill, where it continues east and then south, dropping into Sam's Valley and crossing the Rogue River (Figure 1). The foothills area comprises the western and central portions of the Study Area (approximately 15.5 mi [25 km]), and features moderate to steep slopes and deeply incised drainages. The area is dominated by oak woodland and savannas with interspersed grassland. Dominant overstory species in oak woodland include Oregon white oak (*Quercus garryana*), California black oak (*Quercus kelloggii*), and madrone (*Arbutus menziesii*). Scattered ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) also occur in the overstory. Oak stands support shrub cover of varying density and composition, but poison oak (*Toxicodendron diversilobum*) is the dominant shrub species. Other common shrub species include buckbrush (*Ceanothus cuneatus*) and whiteleaf manzanita (*Arctostaphylos viscida*). Much of the upper slopes and ridgetops above the Project corridor are composed of chaparral communities, primarily dominated by buckbrush and manzanita (*Arctostaphylos* spp.). Land use in the approximately 15.5-mile foothills section of the Study Area includes livestock grazing, timber harvesting, hay production, and rural residential development. Portions of the Study Area along this section have been burned by wildfires in recent history. Riparian areas along the major drainages in the Project area are dominated by bigleaf maple (*Acer macrophyllum*), white alder (*Alnus rhombifolia*), and Oregon ash (*Fraxinus latifolia*). Major drainages include Evans Creek, Ward Creek, and Sardine Creek, all draining south into the Rogue River.

East of the foothills section the Study Area descends into Sam's Valley, extending for approximately 5 miles (8 km) along low rolling hills and the eastern side slope of Lower Table Rock Preserve, a unique volcanic plateau owned by The Nature Conservancy (TNC). This portion of the Study Area is mostly composed of oak savanna with interspersed meadows used for hay production and livestock grazing. The remaining (easternmost) section of the Study Area, comprising approximately 1.7 miles (2.7 km), extends into the Rogue River valley and floodplain (Figure 1). Land use along this portion includes crop and livestock production, on the north side of the river, and an active quarry operation on the south side of the Rogue. The Study Area south of the river, within and adjacent to the quarry, is mostly composed of disturbed grassland.

2.0 SITE ALTERATIONS

Most of the Study Area has been altered through one or a combination of the following: livestock grazing, timber harvest operations, wildfire, mining operations (i.e., quarrying), and/or land conversion from native woodland and grassland to agricultural lands including hay production and crops. Wetlands 7 and 8a-d are located on the south side of the Rogue River floodplain, within an area of active quarry operations. These wetlands may have been created as a result of quarry activities as considerable surface disturbance, including excavation, has occurred in this area. Additionally, six of the waterbodies (potential WUS) identified within the Study Area have been excavated for irrigation purposes (see Table 2).

3.0 PRECIPITATION DATA AND ANALYSIS

Table 1 summarizes precipitation data recorded in Medford, Oregon. The monthly percent of normal precipitation for each of the 3 months preceding the field investigation was 35% of the normal for the month of August, 53% of the normal for September, and 79% of the normal for October (Table 1). In the two weeks prior to the November 7-10 field work (October 24-November 6), there was a total of 0.52 inches (in; 1.32 centimeters [cm]) of precipitation. Precipitation recorded over the 4 days that field work was conducted was as follows: November 7 – none; November 8 – 0.1 in (0.25 cm); November 9 – 0.16 in (0.41 cm); November 10 – 0.44 in (1.1 cm).

Table 1. Summary of precipitation between August 2017 and October 2017 in Medford, Oregon.

Category	August cm/in	September cm/in	October cm/in	2016-2017 Water Year Totals cm/in
Recorded Precipitation	0.36/0.14	0.76/0.30	2.26/0.89	52.3/20.61
WETS Average	1.02/0.40	1.45/0.57	2.87/1.13	46.6/18.35
Percent Normal Recorded	35%	53%	79%	112%

Source: WETS tables from AgACIS 2017 (Rogue Valley International-Medford Airport).

Based on WETS averages and precipitation data, precipitation was 112% of normal for the rain-year (November 1, 2016 – October 31, 2017) preceding the November 2017 field investigation (Table 1).

4.0 METHODS

A field investigation to document aquatic resources and wetlands within the Study Area was conducted from November 8-10, 2017. Prior to conducting fieldwork, US Geological Survey (USGS) 7.5 minute topographic maps (Grants Pass, Rogue River, Gold Hill, Sams Valley), soil survey information from the Natural Resource Conservation Service (NRCS), USFWS National Wetlands Inventory (NWI) maps, and USGS National Hydrography Dataset (NHD) maps for the Study Area were reviewed. All portions of the proposed Project were covered on foot and using a Utility Task Vehicle to investigate and delineate wetlands and water resources identified in the desktop analysis and to investigate the potential presence of other wetlands and water resources not identified in the desktop review. A survey corridor of 135 feet (ft; 41.1 meters [m]), based on the existing 75-ft (22.9-m) ROW and newly added 60-ft (18.3-m) ROW, was utilized for the transmission line and a 50-ft (15.2-m) corridor (25 ft [7.6 m] to either side of the centerline) was used for access roads.

Wetlands were delineated in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (US Army Corps of Engineers [USACE] 2010), and OARs 141-90-0005 through 141-090-0055 (Oregon Department of State Land [ODSL] 2013) for wetland delineation. Wetland plant indicator status was determined using the *State of Oregon 2016 Wetland Plant List* (Lichvar et al. 2016). The delineated wetlands were classified according to methodologies set forth in *Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). All drainage features within the survey area, including those identified in the NHD dataset, were examined for inclusion as potential waters of the US (WUS) and waters of the state of Oregon. This field review was focused on the presence of a definable bed and bank, ordinary high water mark (OHWM), surface connection to navigable waters, evidence of periodic flow, and/or presence of areas that meet the Corps criteria for wetlands. Additionally, drainage features were evaluated using guidance provided in OAR 141-085-0510 through 141-085-530 (ODSL).

Paired plots (wetland and upland) were evaluated for each wetland identified (Appendix A). Plots were located in areas that best represented the vegetation, soils, and hydrology of the site. Depending on the size and complexity of each wetland, one to several data points were used to delineate it. All wetlands and potential WUS were photographed (Appendix E and Appendix F, respectively). Wetland limits and sample points were surveyed using a Trimble Geo 7x global positioning system (GPS) with sub-foot accuracy.

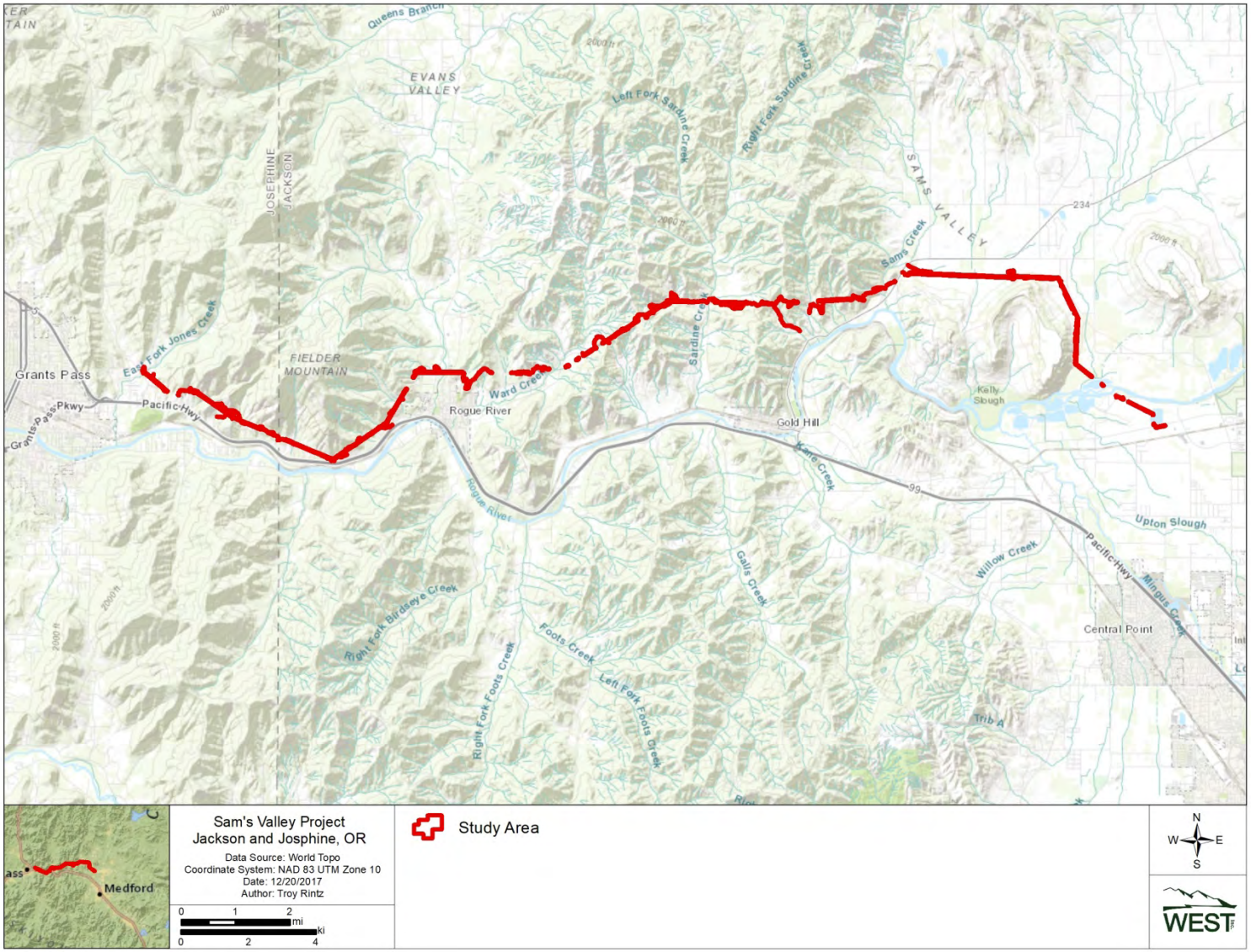


Figure 1. Sam's Valley Transmission Project Study Area, Josephine and Jackson Counties, Oregon.

5.0 DESCRIPTION OF ALL WETLANDS AND NON-WETLAND WATERS

5.1 Wetlands

A total of seven wetlands, comprising twelve wetland polygons, were delineated along the proposed Project corridor. All of the seven wetlands were classified as Palustrine Emergent (PEM) wetlands. Descriptions for the seven wetlands are provided in Table 1. Figures depicting the locations of wetlands and waters of the US are provided in Appendix A and B. USACE wetland datasheets are provided in Appendix D. Wetland photographs are provided in Appendix E.

5.2 Non-Wetland Waters

Fifty-two drainage features, including some of the waterbodies identified in the NHD desktop review, were determined to be non-wetland waters (Table 2). Many of these waterbodies, particularly those in the steep foothills in the western portion of the transmission line corridor, had marginally defined channels often less than one ft (0.3 m) in width. Flow regime for each potential WUS was determined in the field using the Streamflow Duration Assessment method for the Pacific Northwest (SDAM; Nadeau 2015). Based on this analysis, four non-wetland waters were identified as "perennial", two as "intermittent", and forty-six as "ephemeral" (Table 2). Figures depicting waterbody (and wetland) locations are provided in Appendix A and B. Photographs of all non-wetland waters identified along the Project corridor are provided in Appendix F. SDAM dataforms are provided in Appendix G.

5.3 National Hydrography Dataset Features Examined and Dismissed as Potential Waters of the US

A total of 74 features identified in the NHD review as waterbodies were examined in the field and rejected as potential WUS. A list of all the features examined, their locations, and the rational for exclusion as WUS are provided in Table 3. The determinations were based on the absence of a defined bed and bank, OHWM, evidence of periodic flow, wetlands, and surface connection to navigable waters. Due to the large number of NHD features identified as non-WUS, a photograph appendix was not included. Photographs are available upon request.

6.0 DEVIATION FROM LOCAL WETLAND INVENTORY OR NATIONAL WETLAND INVENTORY

The Study Area is located in rural Josephine and Jackson counties and there is no Local Wetland Inventory-mapping for this area (ODSL 2017). The NWI maps showed two polygons within the Study Area, located along the east side slope of Lower Table Rock Preserve (Appendix C). Although hydrophytic vegetation was present, hydric soils (clay; 10YR 5/2 with no redox) and indicators of hydrology were absent.

Table 2. Wetlands documented along the Sam's Valley transmission line and access road corridor.

Wetland Sample Point ID	Cowardin Classification	Dominant Plant Species	Description	Wetland Size (hectares/ acres)
WL-1a-b	PEM	*Cyperus squarros, Phalaris arundinacea*	Fringe wetlands along irrigation ditch.	0.0003/0.0006
WL-2	PEM	*Typha latifolia, Eleocharis palustris*	Wetland in drainage channel that receives backflow from artificial pond.	0.067/0.166
WL-3	PEM	*Eleocharis palustris*	Wetland in shallow depression adjacent artificial pond.	0.183/0.453
WL-4a-b	PEM	*Juncus effusus*	Wetlands in shallow depressions to either side of access road.	0.216/0.537
WL-6	PEM	*Polygonum aviculare, Plagiobothrys scouleri*	Wetland in shallow depression on floodplain (possible vernal pool).	0.211/0.521
WL-7	PEM	*Salix laevigata, Eleocharis palustris*	Wetland in broad ditch excavated for quarry operations.	0.002/0.005
WL-8a-d	PEM	*Hordeum jubatum, Eleocharis palustris*	Wetlands in series of shallow depressions on floodplain; area appears to have been impacted/modified by quarry operations.	0.022/0.054

Table 3. Waterbodies documented along the Sam's Valley transmission line and access road corridors.

Waterbody ID	Waterbody Location: Transmission Line (TL) or Access Road (AR) Corridor	Type	Flow Regime[1]	OHWM Width (ft)
WB-1	TL/AR	Natural drainage	Perennial	10
WB-2	TL	Natural drainage	Ephemeral	3
WB-3	AR	Natural drainage	Ephemeral	1
WB-4	TL	Natural drainage	Ephemeral	1
WB-5	TL	Natural drainage	Ephemeral	6
WB-6	TL/AR	Natural drainage w/ culvert	Ephemeral	4
WB-7	TL/AR	Natural drainage	Ephemeral	1
WB-8	TL/AR	Natural drainage w/ culvert	Ephemeral	2
WB-9	TL/AR	Natural drainage w/ culvert	Ephemeral	1
WB-10	TL/AR	Natural drainage w/ culvert	Ephemeral	1
WB-11	AR	Artificial ditch	Ephemeral	5
WB-12	TL/AR	Natural drainage	Ephemeral	1
WB-13	TL/AR	Natural drainage	Ephemeral	1
WB-14	TL/AR	Natural drainage	Ephemeral	1
WB-15	TL/AR	Natural drainage w/ culvert	Ephemeral	1
WB-16	AR	Artificial ditch	Ephemeral	4
WB-17	AR	Artificial ditch w/ culvert	Ephemeral	4
WB-18	TL/AR	Natural drainage w/ culvert	Ephemeral	2
WB-19	TL/AR	Natural drainage w/ culvert	Ephemeral	1
WB-20	TL/AR	Natural drainage	Ephemeral	0.5
WB-21	TL/AR	Natural drainage w/ culvert	Ephemeral	1
WB-22	TL	Natural drainage	Ephemeral	1
WB-23	TL	Natural drainage	Ephemeral	1
WB-24	TL	Artificial ditch	Intermittent	4
WB-25	AR	Artificial ditch w/ culvert	Intermittent	4
WB-26	TL/AR	Natural drainage w/ culvert	Perennial	4
WB-27	AR	Natural drainage	Ephemeral	1
WB-28	AR	Natural drainage	Ephemeral	1
WB-29	AR	Natural drainage w/ culvert	Ephemeral	0.5
WB-30	AR	Natural drainage w/ culvert	Ephemeral	3
WB-31	TL/AR	Natural drainage	Ephemeral	1
WB-32	AR	Natural drainage w/ culvert	Ephemeral	1
WB-33	TL	Natural drainage	Ephemeral	1
WB-34	AR	Natural drainage w/ culvert	Ephemeral	1
WB-35	TL	Natural drainage	Ephemeral	1
WB-36	TL	Natural drainage	Ephemeral	1
WB-37	AR	Natural drainage	Ephemeral	1
WB-38	TL	Natural drainage w/ culvert	Ephemeral	1
WB-39	AR	Natural drainage	Ephemeral	1

Table 3. Waterbodies documented along the Sam's Valley transmission line and access road corridors.

Waterbody ID	Waterbody Location: Transmission Line (TL) or Access Road (AR) Corridor	Type	Flow Regime[1]	OHWM Width (ft)
WB-40	TL	Natural drainage	Ephemeral	2.5
WB-41	AR	Natural drainage w/ culvert	Ephemeral	2
WB-42	AR	Natural drainage	Ephemeral	2
WB-42b	AR	Natural drainage w/ culvert	Ephemeral	2
WB-43	AR	Natural drainage	Ephemeral	1
WB-44	AR	Natural drainage	Ephemeral	3
WB-44b	AR	Natural drainage w/ culvert	Ephemeral	3
WB-45	AR	Natural drainage w/ culvert	Ephemeral	1
WB-46	AR	Natural drainage	Perennial	15
WB-47	AR	Natural drainage	Ephemeral	1
WB-48	AR	Natural drainage	Ephemeral	1
WB-49	TL/AR	Natural drainage	Ephemeral	2
WB-50	TL/AR	Natural drainage	Ephemeral	1
WB-51	TL/AR	Natural drainage	Ephemeral	1
WB-52	TL	Artificial channel	Perennial	10

[1]**Flow regime determined using Streamflow Duration Assessment Method for the Pacific Northwest (SDAM; Nadeau 2015).**

Table 4. National Hydrography Dataset features examined but rejected as Waters of the U.S. along the Sam's Valley transmission line and access road corridors.

Non-WUS ID (Photo ID)	Non-WUS Location: Transmission Line (TL) or Access Road (AR) Corridor	Rational for Rejection as WUS
5370	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5639	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5638	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5380	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5381	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5382	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5383	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5384	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5388	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5389	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5390	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5395	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5396	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5400	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5401	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5407	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5406	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5409	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5412	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5415	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5430	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5432	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.

Table 4. National Hydrography Dataset features examined but rejected as Waters of the U.S. along the Sam's Valley transmission line and access road corridors.

Non-WUS ID (Photo ID)	Non-WUS Location: Transmission Line (TL) or Access Road (AR) Corridor	Rational for Rejection as WUS
5433	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5434	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5435	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5436	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5438	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5439	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5440	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5445	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5443	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5542	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5441	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5469	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5468	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5478	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5475	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5480	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5490	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5491	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5492	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5493	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5494	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5495	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.

Table 4. National Hydrography Dataset features examined but rejected as Waters of the U.S. along the Sam's Valley transmission line and access road corridors.

Non-WUS ID (Photo ID)	Non-WUS Location: Transmission Line (TL) or Access Road (AR) Corridor	Rational for Rejection as WUS
5496	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5497	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5498	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5501	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5525	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5453	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5448	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5450	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5449	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5461	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5460	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5459	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5458	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5457	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5456	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5455	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5540	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5543	AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5545	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5535	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5533	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5532	TL	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.

Table 4. National Hydrography Dataset features examined but rejected as Waters of the U.S. along the Sam's Valley transmission line and access road corridors.

Non-WUS ID (Photo ID)	Non-WUS Location: Transmission Line (TL) or Access Road (AR) Corridor	Rational for Rejection as WUS
5551	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5553	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5552	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5554	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5555	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5557	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5559	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.
5565	TL/AR	No defined bed and bank or OHWM; no evidence of periodic flow; no surface connection to navigable waters.

7.0 MAPPING METHOD

The boundaries of all wetlands were surveyed by walking the perimeters of the wetlands with a hand-held global positioning system (GPS) with sub-foot accuracy (Trimble Geo 7X). Locations of sample points were also documented with the GPS unit.

8.0 DISCLAIMER

This report documents the investigation, best professional judgement, and conclusions of the principal investigator, WEST. It is correct and complete to the best of WEST's knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at HDR's risk unless it has been reviewed and approved in writing by the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-0055 (ODSL 2013).

9.0 LITERATURE CITED

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