APPENDIX G

Soil and Geology Appendix

SOIL ASSOCIATION DESCRIPTIONS

SITKA SPRUCE BELT (MLRA-4A)

The Sitka Spruce Belt is a relatively long and narrow zone running north-south along the coast. In the project area, it includes the greater Coos Bay area and the hills and valleys just to the east and south. Most of this part of the Major Land Resource Area (MLRA) has an elevation of 50 to 300 feet. The coastal area around the mouth of floodplains along the major rivers near the coast is flat, but inland areas are very hilly. The area is highly dissected by numerous perennial rivers and creeks which commonly flow into estuaries. The average annual precipitation is 50 to 90 inches. Precipitation is evenly distributed throughout fall, winter, and spring, but summers are cool and dry. Snowfall accumulation is rare. This area lies within the coastal fog belt zone, and heavy fogs are common in summer. The average annual temperature is 45 to 55 degrees Fahrenheit (°F). The freeze-free period ranges from 220 to 365 days in most of this area. Most of MLRA 4A near the project area consists of privately owned residential land, small farms and ranches, or forests. Timber production is the major industry (NRCS 2006). The two major soils associations crossed by the project in this MLRA are described below.

Nehalem-Duneland-Bullards (s6398)

The dominant soil mapping units which are crossed by the proposed pipeline in the Nehalem-Duneland-Bullards soil association are: Coquille silt loam; Templeton silt loam, 30 to 50 percent slopes; and Templeton silt loam, 0 to 30 percent slopes. Five other soil mapping units are crossed by the Pacific Connector pipeline with individual crossing lengths up to 0.13 mile. Coquille soils are susceptible to soil compaction, have a year-round high water table (0 to greater than 6 feet deep), are a hydric soil and prime farmland (farmland of statewide importance). Templeton soils have a paralithic contact with siltstone between 40 and 60 inches deep and are susceptible to soil compaction. Templeton silt loam has steep slopes (30 to 50 percent) which makes it susceptible to water erosion and gives it a potential for reclamation sensitivity. The mean annual precipitation in this soil association is 70 to 90 inches.

Tolovana-Templeton-Salander-Reedsport-Fendall (s6399)

The dominant soil mapping units which are crossed by the proposed pipeline in the Tolovana-Templeton-Salander-Reedsport-Fendall soil association are: Geisel silt loam, 12 to 30 percent slopes; Preacher-Bohannon loams, 30 to 60 percent slopes; Templeton silt loam, 30 to 50 percent slopes; and Templeton silt loam, 0 to 30 percent slopes. Fifteen other soil mapping units are crossed by the Project with individual crossing lengths up to 0.56 mile. All of the soil map units crossed in this soils association are susceptible to soil compaction. Geisel soils have a paralithic contact with siltstone at 40 to 60 inches which rates them as having reclamation sensitivity. The Geisel soil map unit is designated as a farmland of statewide importance. Preacher-Bohannon loams are susceptible to water erosion due to the steep slopes and are designated as having a reclamation sensitivity rating. Templeton soils have a paralithic contact with siltstone between 40 and 60 inches deep and a reclamation sensitivity potential. Templeton silt loam has steep slopes (30 to 50 percent) which makes it susceptible to water erosion and gives it a potential for reclamation sensitivity. The mean annual precipitation in this soil association is 65 to 80 inches.

NORTHERN PACIFIC COAST RANGE, FOOTHILLS, AND VALLEYS (MLRA-1)

The North Pacific Coast Range, Foothills and Valleys MLRA encompasses the Coast Range of Oregon in the project area, which is centered about on the Coos and Douglas County line. Most of the MLRA consists of hills and low mountains with gentle to steep slopes. Elevations near the project area range from 300 to almost 3,000 feet. The valleys are mostly narrow and of small extent. The MLRA receives an average annual precipitation of 60 to 100 inches, which is evenly distributed throughout fall, winter, and spring. Summers are usually dry and warm, but hot days are rare. Winters are cool and snow and freezing temperatures are common only at higher elevations. In most of this area, snow falls only a few days each year. The average annual temperature is 40 to 55°F. The average freeze-free period in this area ranges between 150 to 280 days and decreases with elevation. Most of the area is densely forested, and timber production is the major industry. Recreation and wildlife habitat also are important land uses (NRCS 2006). The major soil resource concerns are water erosion due to steep slopes, erodible soils and high rainfall. The erosion hazard is considerable if plant cover is removed. Surface compaction and sedimentation of streams are also soil resource concerns. Mass movement in the form of landslides and slips is a serious problem and a major source of sediment in the rivers. The three soils associations crossed by the project area are described below.

Peavine-Olyic-Melby-Honeygrove-Blachly (s6396)

The dominant soil mapping units which are crossed by the Peavine-Olvic-Melby-Honeygrove-Blachly soil association are: Honeygrove silty clay loam, 30 to 50 percent slopes; Honeygrove silty clay loam, 3 to 30 percent slopes; Preacher-Blachly association, 12 to 30 percent slopes; and Preacher-Blachly association, 30 to 60 percent slopes. All of the soil map units crossed in this soils association are susceptible to soil compaction. Honeygrove and Blachly soils have greater than 40 percent clay in the control section which classifies them as having a reclamation sensitivity rating. These soils have slopes greater than 30 percent which increases water erosion potential and rates them as having reclamation sensitivity. Landforms are typified by uneven, step-like benches caused by sliding and slumping. The mean annual precipitation ranges from about 75 to 100 inches.

Nekoma-Meda-Kirkendall-Eilertsen (s6402)

The dominant soil mapping units which are crossed by the Nekoma-Meda-Kirkendall-Eilertsen soil association are: Chismore silt loam, 3 to 7 percent slopes; and Pyburn silty clay, 0 to 8 percent slopes. Soils in both map units are prime farmland (farmland of statewide importance). Pyburn soils have greater than 40 percent clay in the control section which causes these soils have a reclamation sensitivity rating. Pyburn soils are hydric soils. Chismore soils have a high water table from November through March that ranges in depth from 1.5 to greater than 6.0 feet. Pyburn soils have a high water table from October through May that ranges from the surface to greater than 6.0 feet. The average annual precipitation of this association is about 75 inches.

Bohannon-Preacher (s6395)

The dominant soil mapping units which are crossed by the Bohannon-Preacher association are: Preacher-Bohannon loams, 3 to 30 percent slopes; Preacher-Blachly-Digger association, 30 to 60

percent slopes; Preacher-Blachly association, 12 to 30 percent slopes; Remote-Digger-Preacher complex, 30 to 50 percent slopes. Ten other soil map units are crossed in this association with individual lengths ranging from 0.05 to 1.10 miles with similar soils and varying slope ranges. All of the dominant soil map units in this association are susceptible to soil compaction. Preacher-Blachly-Digger (45E) and Remote-Digger-Preacher (50E) have steep slopes that increase the potential for water erosion. Remote-Digger-Preacher (50E) is characterized by large stones. Preacher-Bohannon (46D), Preacher-Blachly-Digger (45E), and Remote-Digger-Preacher soil map units have a paralithic contact with sandstone within 20 to 60 inches, and have a potential for reclamation sensitivity.

The dominant soil mapping unit from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) which is crossed by the proposed Pacific Connector pipeline in soils association OR068 is Digger-Bohannon complex, 3 to 30 percent. Soils in this map unit are limited by large stones and are susceptible to compaction. The revegetation potential is low.

Siskiyou-Trinity Area (MLRA-5)

Siskiyou-Trinity Area is the largest MLRA crossed by the proposed Project and it encompasses the three national forests (Umpqua, Rogue River-Siskiyou and portions of the Fremont-Winema), spanning portions of the Klamath Mountain and Cascade west physiographic provinces (crossing 1.8 percent of the pipeline route length). The Siskiyou-Trinity Area receives an average annual precipitation of 40 to 60 inches, with the high precipitation ranges occurring in the mountains. Precipitation is low in summer but is evenly distributed throughout the rest of the year. Summers are warm with an average temperature of 67°F. Winters are cool with snow and freezing temperatures common at higher elevations. The average seasonal snowfall ranges from 10 to 70 inches, varying dramatically depending on the year. During most winters, one or two storms bring strong and sometimes damaging winds. In some years, the accompanying heavy rains cause serious flooding (NRCS 2006).

The Pacific Connector pipeline will cross through the northern section of MLRA-5, crossing on the west the Klamath Mountains section of the Pacific Border Province of the Pacific Mountain System between Highway 42 near Camas Valley and Highway 62 near Trail Oregon. This section consists of an uplifted and eroded peneplain on very hard rocks.

Numerous higher peaks are in scattered areas throughout this mountainous region. The Middle Cascade Mountains Section of the Cascade-Sierra Mountains Province of the Pacific Mountain System is also crossed within this MLRA-5 between about Highway 62 near Trail Oregon and Dead Indian Memorial Highway. This section is an area of steep mountainous terrain with generally accordant summits interspersed with higher volcanic cones (NRCS 2006).

Elevation in the project area ranges from about 600 feet at the Umpqua River crossing north of Myrtle Creek to 5,300 feet at the crest of the Cascades. The freeze-free period averages 240 days and ranges from 110 to 365 days. Shorter freeze-free periods occur at the higher elevations. Most of this area is in coniferous forests that are important for wood products, wildlife habitat and recreation. Irrigated pasture, hay crops and livestock are grown in the valleys where water is available. Because of steep slopes, erodible soils and high rainfall, the major soil resource concern is erosion. The erosion hazard is considerable if plant cover is removed. Mass movement in the

form of landslides and slips is a serious problem and a major source of sediment in the rivers (NRCS 2006).

The 13 soil associations crossed by the project within MLRA-5 are described below.

Windygap-Larmine-Bellpine-Bateman-Atring (s6410)

The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the Pacific Connector pipeline in the Windygap-Larmine-Bellpine-Bateman-Atring soil association are: Windygap clay loam, 12 to 30 percent slopes; Windygap clay loam, 2 to 12 percent slopes; and McNabb-Windygap complex, 3 to 30 percent slopes. All three of these soil map units are characterized by large stones, greater than 40 percent clay in the control section, and are susceptible to soil compaction, which rates them as having reclamation sensitivity potential. However, these soils are also designated as prime farmlands. Twelve other soil map units are crossed by the PCGP Project within this association with individual lengths up to 0.48 mile. The mean annual precipitation of this association is about 45 to 50 inches. Slopes are 2 to 75 percent.

Wapato-Waldo-McAlpin-Cove-Bashaw (s6408)

The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the Pacific Connector pipeline in the Wapato-Waldo-McAlpin-Cove-Bashaw soil association are: Windygap clay loam, 2 to 12 percent slopes; Windygap clay loam, 12 to 30 percent slopes; and Windygap silt loam, 12 to 30 percent slopes. Sixteen other soil map units are crossed within this association with lengths up to 0.32 mile. These soils are characterized by a paralithic contact with weathered siltstone within 40 to 60 inches, greater than 40 percent clay in the control section, and are susceptible to compaction. These characteristics rate these soils as having reclamation sensitivity potential. However, each of these dominant soil map units is listed as prime farmland. The mean annual precipitation is about 45 to 50 inches.

Otwin-Oatman (s6397)

The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the proposed Pacific Connector pipeline in the Otwin-Oatman soil association are: Conser silty clay loam, 0 to 3 percent slopes; Veneta loam, 0 to 12 percent slopes; Josephine-Speaker complex, 30 to 60 percent slopes; and Windygap-Bellpine complex, 30 to 60 percent north slopes. Twelve other soil map units are crossed within this association with individual lengths up to 0.25 mile. The Conser, Veneta, and Windygap-Bellpine map units have greater than 40 percent clay in the control section, are susceptible to soil compaction, and have reclamation sensitivity potential. Conser soils are hydric and have a water table within 6 feet of the surface from November through May. The Veneta soil has a water table within 4 to 6 feet of the surface from November through May. Conser and Veneta soils are listed as prime farmland. The Josephine-Speaker complex and Windygap-Bellpine complex are characterized by steep slopes which increase the water erosion potential, have a paralithic contact with weathered sandstone or metasedimentary rock within 20 to 60 inches, are susceptible to soil compaction, and have a reclamation sensitivity rating. The mean annual precipitation is about 40 inches.

Vermisa-Vannoy-Josephine-Beekman (s6360)

The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the pipeline in the Vermisa-Vannoy-Josephine-Beekman soil association in MLRA 2 are: Speaker-Beekman-Josephine complex, 60 to 90 percent north slopes; Josephine-Speaker complex, 30 to 60 percent north slopes; Speaker-Nonpareil complex, 30 to 60 percent slopes; Debenger-Brader complex, 12 to 30 percent slopes; Oakland-Nonpareil-Sutherlin complex, 30 to 60 percent slopes; and Speaker loam, 30 to 60 percent south slopes. Twenty seven other soil map units are crossed by this association with individual lengths up to 0.62 mile. All of the dominant soil map units are susceptible to soil compaction and have a reclamation sensitivity rating. The Speaker-Beekman-Josephine, Josephine-Speaker, Speaker-Nonpareil, Oakland-Nonpareil-Sutherlin, and Speaker loam map units have steep slopes and water erosion potential. Beekman soils have a lithic contact with sedimentary rock at 20 to 40 inches. Brader and Nonpareil and soils have a paralithic contact with weathered sandstone at 10 to 20 inches. Debenger, Oakland, and Speaker soils have a paralithic contact with weathered sandstone at 20 to 40 inches. Josephine soils have a paralithic contact with weathered metasedimentary rock at 40 to 60 inches. Sutherlin soils are very deep and have a water table at 1.5 to 3.0 feet from November through April. The Debenger-Brader complex map unit is listed as prime farmland (farmland of statewide importance).

Ruch-Medford (s6385)

The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the pipeline in the Ruch-Medford soil association are: Sutherline silt loam, 3 to 12 percent slopes; Coburg silty clay loam, 0 to 5 percent slopes; and Fordice very cobbly loam, 0 to 12 percent slopes. Six other soil map units are crossed within this association with individual lengths ranging from 0.04 to 0.09 mile. Sutherlin and Coburg soils have greater than 40 percent clay in the control section, are susceptible to soil compaction, and are listed as prime farmland. However, because of the high clay content and the soils susceptibility to compaction these soils have a reclamation sensitivity rating. Sutherlin soils have a water table at 1.5 to 3.0 feet from November through April. Coburg soils have a water table at 1.5 to greater than 6 feet from November through May. Fordice soils have large stones, giving this soil a reclamation sensitivity rating. The mean annual precipitation of the association ranges between 25 and 40 inches.

Lettia-Kanid-Atring-Acker (s6382)

This STATSGO soil association occurs in both the Douglas County Soil Survey Area and in the Umpqua National Forest Soil Resource Inventory. The average annual precipitation is about 45 inches. The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the pipeline in the Lettia-Kanid-Atring-Acker soil association are: Acker-Norling complex, 30 to 60 percent north slopes; Dumont gravelly loam, 12 to 30 percent slopes; Sharpshooter loam, 30 to 60 percent north slopes; Sweetbriar silty clay loam, 3 to 30 percent slopes; and Buckeye loam, 2 to 20 percent slopes. Thirteen other soil map units are crossed in this association with individual lengths up to 0.38 mile.

All of the dominant soil map units are susceptible to soil compaction. Acker-Norling map unit is characterized by steep slopes that increase the water erosion potential, large stones, a paralithic

contact with metavolcanic rock at 20 to 60 inches, and reclamation sensitivity potential. Dumont soils have greater than 40 percent clay in the control section, a reclamation sensitivity characteristic. Sharpshooter soils have steep slopes that increase the water erosion potential, a paralithic contact with schist at 40 to 60 inches; and a reclamation sensitivity rating. Sweetbriar soils have greater than 40 percent clay in the control section and reclamation sensitivity potential. Buckeye soils have a lithic contact with greenstone at 20 to 40 inches, greater than 40 percent clay in the control section, providing a reclamation sensitivity rating. Dumont, Sweetbriar, and Buckeye soils are prime farmland (farmland of statewide importance).

The dominant soil mapping units from the Soil Resource Inventory of Umpqua National Forest, Oregon (Forest Service 1976) crossed by the proposed pipeline in this soils association are named: map unit 712; map unit 62; and map unit 25. Six other soil map units are crossed in this association with individual lengths up to 0.23 mile. Map unit 47 is characterized by steep slopes, large stones, a lithic contact with tuffs and breccia at 3 to 8 feet, susceptibility to compaction, and a reclamation sensitivity rating. Map unit 62 is characterized by steep slopes, wind and water erosion potential, a lithic contact with granite at 3 to 6 feet, susceptible to soil compaction, and is rated as having reclamation sensitivity. Map unit 25 is characterized by landslides on steep slopes, hydric soils and water tables associated with sag ponds, and landslides with reclamation sensitivity.

Rock outcrop-Pearsoll-Dubakella-Cornutt (s6377)

The dominant soil mapping units from the Soil Survey of Douglas County Area, Oregon (NRCS 2004) crossed by the proposed pipeline in the Rock outcrop-Pearsoll-Dubakella-Cornutt soil association are: Hilltish very gravelly sandy loam, 60 to 90 percent north slopes; and Hilltish very gravelly sandy loam, 60 to 90 percent south slopes. Four other soil map units are crossed within this association with individual lengths ranging from 0.01 to 0.14 mile. Hilltish soils are characterized by steep slopes that increase the potential for water erosion, large stones, a lithic contact with conglomerate at 20 to 40 inches, susceptibility to soil compaction, and a reclamation sensitivity rating. The mean annual precipitation of the association is about 30 inches.

Tethrick-Tallowbox-Siskyou-Shefflein (s6383)

This STATSGO soil association occurs in both the Douglas County Soil Survey Area and in the Umpqua National Forest Soil Resource Inventory. The annual precipitation is 32 to 45 inches. The dominant soil mapping units from the Soil Survey of Douglas County are: Lettia-Beal-Zing complex, 30 to 60 percent south slopes; Sharpshooter loam, 30 to 60 percent south slopes; Lettia-Beal-Zing complex, 30 to 60 percent north slopes; and Acker-Norling complex, 30 to 60 percent south slopes. Six other soil map units are crossed within this association with individual lengths up to 0.26 mile. All of the dominant soil map units have steep slopes that lead to severe water erosion potential, susceptibility to soil compaction and reclamation sensitivity potential. Lettia soils have a paralithic contact with granodiorite at 40 to 60 inches. Sharpshooter soils have a paralithic contact with weathered schist at 40 to 60 inches. Norling soils have a paralithic contact with metavolcanic rock at 20 to 40 inches. Beal and Zing soils have a water table from 2 to greater than 6 feet from November through May.

The dominant soil mapping units from the Soil Resource Inventory of Umpqua National Forest, Oregon (USFS 1976) crossed by the proposed pipeline in this soil association are named: map

unit 812; and map unit 621. Three other soil map units are crossed within this association with individual lengths up to 0.20 mile. Both of the dominant soil map units have steep slopes, are susceptible to wind and water erosion, have large stones, and have reclamation sensitivity potential. Map unit 812 has a lithic contact with serpentine at 3 to 6 feet. Map unit 621 has a lithic contact with granite at 3 to 8 feet.

Thistleburn-Telemon-Scaredman-Mellowmoon-Lempira-Illahee (s6390)

The dominant soil mapping units from the Soil Resource Inventory of Umpqua National Forest, Oregon (Forest Service 1976) crossed by the r pipeline in this soil association are named: map unit 723; map unit 712; and map unit 421. Four other soil map units are crossed within this association with individual lengths up to 0.46 mile. Each of the dominant map units have steep slopes, large stones, and are susceptible to soil compaction. Map unit 723 has a lithic contact with schist at 3 to 6 feet. Map unit 712 has a lithic contact with schist at 3 to 8 feet. Map unit 621 has a lithic contact with tuffs at 3 to 8 feet. The mean annual precipitation is 60 to 70 inches.

Straight-Geppert-Freezener-Dumont (s6381)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Umpqua National Forest Soil Resource Inventory. The mean annual precipitation ranges from 43 to 50 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the pipeline in this soil association are: McNull loam, 12 to 35 percent north slopes; Straight extremely gravelly loam, 12 to 35 percent north slopes; Freezner gravelly loam, 12 to 35 percent slopes; and McNull loam, 35 to 60 percent north slopes. Twelve other soil map units are crossed within this association with individual lengths up to 0.48 mile. Each of the dominant soil map units has steep slopes, is susceptible to soil compaction, and has a reclamation sensitivity rating. McNull and Straight soils have a lithic contact with andesite at 20 to 40 inches. McNull soils in map unit 114G are susceptible to water erosion. The Straight soil is hydric. The Freezner soil is prime farmland (farmland of statewide importance).

The dominant soil mapping unit from the Soil Resource Inventory of Umpqua National Forest, Oregon (Forest Service 1976) crossed by the proposed pipeline in this soil association is named map unit 222. Map units 421 and 42 are also crossed within this association in small areas. Map unit 222 has steep slopes, a lithic contact with tuffs and breccia at 3 to 8 feet and a reclamation sensitivity rating.

McNull-Medco-McMullin (s6380 and s6386)

The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the pipeline in the McNull-Medco-McMullin soil association are: Medco-McMullin complex, 12 to 50 percent slopes; McMullin-Rock Outcrop, 3 to 35 percent slopes; McMullin-McNull gravelly loams, 35 to 60 percent slopes; Mcmullin-Medco Complex, 15-50 percent slopes; McNull loam, 12 to 35 percent north slopes; and McNull-Medco complex, 12 to 50 percent slopes. Thirty-four other map units are crossed within this association with individual lengths up to 1.88 miles. Each of the dominant soil map units has steep slopes, is susceptible to soil compaction, and has reclamation sensitivity potential. McNull, Medco, and Carney soils have

greater than 40 percent clay in the control section. McNull and Medco soils have large stones. Carney soils have a paralithic contact with weathered sandstone at 20 to 40 inches. McMullin soils have a lithic contact at 12 to 20 inches. McNull soils have a lithic contact with fractured andesite at 12 to 20 inches. McNull soils have a paralithic contact with fractured andesite at 20 to 40 inches. Medco soils have a paralithic contact with weathered tuff at 20 to 40 inches. Medco soils have a water table at 0.5 to 1.6 feet from December through March. Carney soils have a water table at 3 to 3.5 feet from December through April. Carney soils are prime farmland (farmland of statewide importance). This association has a mean annual precipitation of about 30 to 35 inches.

Tatouche-Pinehurst-Farva-Bybee Farva-Tatouche-Bybee (s6384)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Rogue River-Siskiyou National Forest. The mean annual precipitation ranges from 40 to 43 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the pipeline in this soils association are Farva very cobbly loam, 3 to 12 percent slopes; Tatouche gravelly loam 12 to 35 percent slopes; Farva very cobbly loam, 35 to 65 percent slopes; Farva very cobbly loam, 12 to 35 percent slopes; and Freezner gravelly loam, 12 to 35 percent slopes. Four other map units are crossed within this association with individual lengths up to 0.33 mile. Farva soils have large stones, a paralithic contact with partially weathered andesite at 20 to 40 inches, and have reclamation sensitivity potential. Farva soils in map units 57E and 57G have steep slopes. Farva soils in map unit 57G have potential for water erosion due to the steep slopes. Freezner soils have steep slopes, are susceptible to compaction, and thus are rated as having reclamation sensitivity, but are considered farmlands of statewide importance.

The following STATSGO description for this soil association is provided for areas crossed by the pipeline within the Rogue River-Siskiyou National Forest. In this area the Rogue River National Forest Soil Resource Inventory was used to characterize soil properties (Forest Service 1977). The Farva series consists of moderately deep, well drained soils formed in colluvium weathered from andesite, tuffs, basalts and breccias found on mountains at 3,600 to 6,100 feet. The Tatouche series consists of deep, well-drained soils that formed in clayey colluvium weathered from tuff, breccia, and andesite. Tatouche soils are on mountain slopes. The Bybee series consists of deep, somewhat poorly drained soils that formed in clayey colluvium weathered from andesite, volcanic tuffs and breccias. Bybee soils are found on mountains. The mean annual precipitation is about 40 to 43 inches, on slopes of 3 to 70 percent.

Klamath and Shasta Valleys and Basins (MLRA-21)

The proposed pipeline passes through the Klamath and Shasta Valleys and Basins MLRA on the east side of the Cascade Mountains in the Klamath Basin. Most of this section of the project area is approximately 4,000 feet in elevation. As described by NRCS (2006), this area is in a transition zone between the Basin and Range Province to the southeast and the Cascades and Klamath Basins to the west. The area receives an average annual precipitation of 20 to 30 inches, with dry summers. Average temperature for summer is in the mid 60 degrees F range. The winter is in the mid-50°F range. Snowfall accounts for 30 percent of the moisture in the valleys. Average freeze-free period is 70 to 140 days, decreasing with elevation. Most of the land crossed in the Klamath

Basin is in agricultural production including irrigated potatoes, grain, seed crops, hay or pastures. Rangelands are grazed and trees are harvested for lumber in forested areas. The major soil resource concerns are wind erosion, water erosion, maintenance of productivity of the soils, conservation of soil moisture and the quality of irrigation water. The hazard of water erosion is slight in most of the basin areas but can be high in the steeper areas if the surface is bare. In some areas where soils are coarsely textured the hazard of wind erosion can be high, especially when the surface is disturbed during the period of highest wind velocities typically in spring or early summer (NRCS 2006). The eight soil associations crossed in this MLRA are summarized below.

Oatman-Otwin (s6387)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Fremont-Winema National Forest in Klamath County. The mean annual precipitation for this association ranges between 35 and 40 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the proposed pipeline in the Oatman-Otwin soil association is: Oatman cobbly loam, depressional, 0 to 12 percent slopes; Two other soil map units are crossed in this association with individual lengths up to 0.05 mile. Oatman soil has large stones, is susceptible to soil compaction, and has a reclamation sensitivity potential.

The following STATSGO description for this soil association is provided for areas crossed by the pipeline within the Fremont-Winema National Forest. In this area the Winema National Forest Soil Resource Inventory was used to characterize soil properties (Forest Service 1979).
The Oatman series consists of very deep, well-drained soils on plateaus and hillslopes. These soils formed in colluvium and residuum derived dominantly from andesite and volcanic ash (SCS 1993). The Otwin series consists of moderately deep, well-drained soils that formed in colluvium and residuum weathered from andesite and volcanic ash. Otwin soils are found on plateaus. The mean annual precipitation for this association ranges between 35 and 40 inches. Slopes are 0 to 65 percent.

Woodcock-Pokegema-Royst (s6388)

The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the pipeline in the Woodcock-Pokegema-Royst soil association is Pokegema-Woodcock, 1 to 12 percent slopes. Three other soil map units (two of the units are steep units of Pokegema and Woodcock soils) are crossed in this association with individual lengths up to 0.29 mile. Pokegema soils have a paralithic contact with partially weathered andesite at 40 to 60 inches. This soil map unit is susceptible to soil compaction and has a reclamation sensitivity rating. The mean annual precipitation for this association ranges from about 20 to 30 inches.

Sheld-Pinehurst-Greystoke-Bly (s656)

This STATSGO soil association occurs in both the Jackson County Soil Survey Area and in the Klamath County Soil Survey Area. This mapping unit has a mean annual precipitation range between 25 to 37 inches. The dominant soil mapping units from the Soil Survey of Jackson County Area, Oregon (SCS 1993) crossed by the proposed pipeline in this soil association are:

Bly-Royst complex, 1 to 12 percent slopes; Pinejurst-Greystoke complex, 1 to 12 percent slopes; and Greystoke-Pinehurst complex, 12 to 35 percent slopes. Five other soil map units are crossed in this association with individual lengths up to 0.67 mile. Each of the dominant soil map units has large stones, is susceptible to soil compaction, and is rated as having reclamation sensitivity potential. The Royst soil has a lithic contact with andesite at 20 to 40 inches. The Greystoke soil has a paralithic contact with weathered andesite at 40 to 60 inches. The Greystoke-Pinehurst map unit (80E) has steep slopes. The Bly-Royst complex is listed as prime farmland (farmland of statewide importance). The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon Southern Part (SCS 1985) crossed by the proposed pipeline in this soils association is Greystoke-Pinehurst complex, 12 to 35 percent slopes. Two other soil map units are crossed in this association with individual lengths up to 0.33 mile. The Greystoke-Pinehurst map unit has steep slopes, potential for water erosion, large stones, susceptibility to soil compaction, and potential for reclamation sensitivity.

Lorella-Deven-Bieber-Adinot (s542)

The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon, Southern Part (SCS 1985) crossed by the pipeline in the Lorella-Deven-Bieber-Adinot soil association are: Fordney loamy fine sand, 2 to 20 percent slopes; and Woodcock association, south. Seven other soil map units are crossed in this association with individual lengths up to 0.25 mile. Each of the dominant soils is susceptible to compaction. Fordney soils are considered as prime farmland, if irrigated. Lorella soils have steep slopes that increase water erosion potential, have large stones, a lithic contact with volcanic tuff at 10 to 20 inches, and are classed as having reclamation sensitivity. Woodcock soils have steep slopes, large stones, and are listed as farmland of statewide importance. Average annual precipitation is 18 to 23 inches.

Tulebasin-Malin-Lather-Capjac (s1150)

The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon, Southern Part (SCS 1985) crossed by the proposed pipeline in the Tulebasin-Malin-Lather-Capiac soil association are: Laki-Henley loams; Malin clay loam; Zuman silt loam; Deter clay loam; and Scherrard clay loam. Ten other soil map units are crossed in this association with individual lengths up to 0.5 mile. Each of the dominant soil map units is susceptible to soil compaction. Henley soils have a duripan (4 to 50 inches thick) at 10 to 20 inches. Scherrard soils have a duripan (4 to 24 inches thick) at 20 to 40 inches. The Laki-Henley, Malin, Zuman, and Scherrard map units have saline/sodic conditions and have reclamation sensitivity. The Laki-Henley, Malin, Zuman, and Scherrard soil map units have water tables from the surface to greater than 6 feet from January through December and are listed as prime farmland (farmland of statewide importance). Deter soils are listed as prime farmland if irrigated. Average annual precipitation is 10 to 14 inches.

Poe-Pit-Malin-Laki-Henley (s6357)

The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon, Southern Part (SCS 1985) crossed by the pipeline in the Poe-Pit-Malin-Laki-Henley soil association are: Henley-Laki loams; and Laki loams. Six other soil map units are crossed in this association with

individual lengths up to 0.25 mile. Henley soils have a duripan (4 to 50 inches thick) at 10 to 20 inches. Soils in both map units are saline/sodic, are susceptible to soil compaction, and have reclamation sensitivity potential. Henley soils have a water table at 1 to greater than 6 feet from January through December. Laki soils have a water table at 3 to greater than 6 feet from March through August. Both map units are listed as prime farmland (farmland of statewide importance). The average annual precipitation is 10 to 14 inches.

Fordney-Calimus (s6356)

The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon Southern Part (SCS 1985) crossed by the pipeline in the Fordney-Calimus soil association are: Fordney loamy fine sand, 0 to 2 percent slopes; Modoc fine sandy loam, 0 to 2 percent slopes; Calimus loam, 5 to 15 percent slopes; Fordney loamy fine sand, 2 to 20 percent slopes; Calimus loam 0 to 2 percent slopes; and Lorella very stony loam, 2 to 35 percent slopes. Twenty-eight other soil map units are crossed in this association with individual lengths up to 1 mile. All of the dominant soil map units are susceptible to soil compaction. Modoc soils have a duripan at 20 to 40 inches. Lorella soils have a lithic contact with volcanic tuff at 10 to 20 inches. Fordney, Modoc, and Lorella soils are classed as having reclamation sensitivity because of their shallow restrictive layer or coarse textures. However, the Fordney, Modoc, and Calimus (0 to 2 percent) soils are listed as prime farmland if irrigated. Calimus, 5 to 15 percent slopes, is listed as prime farmland (farmland of statewide importance). The average annual precipitation is 10 to 14 inches.

Stukel-Salisbury-Lorella-Fiddler-Dehlinger-Capona (s6355)

The dominant soil mapping unit from the Soil Survey of Klamath County, Oregon Southern Part (SCS 1985) crossed by the proposed pipeline in the Stukel-Salisbury-Lorella-Fiddler-Dehlinger-Capona soil association are: Lorella very stony loam, 2 to 35 percent south slopes; Calimus loam, 5 to 15 percent slopes; and Lorella-Calimus association, steep north slopes. Six other soil map units are crossed in this association with individual lengths up to 0.24 mile. Lorella soils have steep slopes, water erosion potential, large stones, a lithic contact with volcanic tuff at 10 to 20 inches, have greater than 40 percent clay in the control section, and are rated as having reclamation sensitivity. Calimus and Lorella soils are susceptible to compaction. Calimus soils are listed as farmland of statewide importance. The average annual precipitation is 10 to 14 inches.

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TABLE G-1

Soil Associations Crossed by the Pacific Connector Pipeline

From	To	County	Soil Association (STATSGO)	Total Crossing Length (miles) a/	Percent of Project Mileage
MLRA 4A – Sitka Spruce Belt – MPs 1.47R to 19.22					
0.00 1.00 10.88R 11.18R	0.09 1.47 11.08R 11.72BR	Coos	Nehalem-Duneland Bullards (s6398)	1.3	0.6%
0.09 1.74R 11.08R 3.03	1.00 3.03 11.18R 10.88R	Coos	Coos Bay Estuary	2.79	1.2%
11.72BR 13.63BR 15.10BR	13.54BR 13.91BR 15.70BR	Coos	Tolovana-Templeton-Salander-Reedsport Fendall (s6399)	7.82	3.4%
			Total Miles	**11.91**	
MLRA 1 – Northern Pacific Coast Range, Foothills, and Valleys – MPs 19.22 to 47.16					
10.09BR 24.59BR 28.93 30.31	22.40BR 27.79 29.47 32.50	Coos	Peavine-Olyic-Melby-Honeygrove-Blachly (s6396)	12.01	5.2%
22.4BR 29.47	24.59BR 30.31	Coos	Nekoma-Meda-Kirkendall-Eilertsen (s6402)	2.67	1.1%
13.54BR 13.91BR 15.70BR 27.79 32.42	13.63BR 15.10BR 20.09BR 28.93 47.26	Coos/ Douglas	Bohannon- Preacher (s6395)	22.06	9.6%
			Total miles	**36.74**	
MLRA5 – Siskiyou-Trinity Area – MPs 47.16 to 168.0					
47.26 52.50 57.57	48.06 55.18 58.07	Douglas	Windygap-Larmine-Bellpine-Bateman-Atring (s6410)	4.28	1.9%
48.05	52.5	Douglas	Wapato-Waldo-McAlpin-Cove-Bashaw (s6408)	4.47	1.9%
55.18 60.59	57.57 61.48	Douglas	Otwin-Oatman (s6397)	3.35	1.5%
58.07 61.48 71.72 91.90	60.59 70.91 89.39 95.23	Douglas	Vermisa-Vannoy-Josephine-Beekman (s6360)	29.55	12.9%
70.91 146.38	71.72 146.86	Douglas	Ruch-Medford (s6385)	3.35	1.5%
74.13 c/	76.36	Douglas	Rock outcrop-Pearsoll-Dubakella-Comutt (s6377)	2.53	1.1%
73.26 89.39 95.23 104.87	74.13 91.90 96.52 110.10	Douglas/ Jackson	Lettia-Kanid-Atring-Acker (s6382)	6.25	2.7%
96.52	104.87	Douglas	Tethrick-Tallowbox-Siskiyou-Shefflein (s6383)	8.36	3.6%

TABLE G-1 (continued)

Soil Associations Crossed by the Pacific Connector Pipeline

From	To	County	Soil Association (STATSGO)	Total Crossing Length (miles) a/	Percent of Project Mileage
105.7 110.1	109.38 111.77	Douglas Jackson	Thistleburn-Telemon-Scaredman-Mellowmoon-Lempira-Illahee14 (s6390)	5.0	2.2%
111.77	117.75	Jackson	Straight-Geppert-Freezener-Dumont (s6381)	5.98	2.6%
117.75 146.86 153.07	146.38 152.42 155.02	Jackson	Medco-McNull-McMullun (s6380 & S6386)	35.98	15.7%
152.42 155.04	153.07 168.0	Jackson/ Klamath	Tatouche-Pinehurst-Farva-Bybee (s6384)13	13.69	6.0%
			Total miles	**120.81**	
MLRA 21 – Klamath and Shasta Valleys and Basins MPs 168.0 to 228.13*					
168.0	174.69	Klamath	Oatman-Otwin (s6387)13	6.81	3.0%
174.69	180.2	Klamath	Woodcok-Royst-Pokegema (s6388)	5.5	2.4%
180.2	189.96	Klamath	Sheld-Pinehurst-Greystoke-Bly (s656)	9.77	4.3%
189.9 197.86 221.06 221.68 224.85 226.22 227.63	190.83 198.59 221.22 224.09 225.52 227.31 228.81	Klamath	Lorella-Deven-Bieber-Adinot (s542)	7.2	3.1%
190.83 198.59	197.86 199.27	Klamath	Tulebasin-Malin-Lather-Capjac (s1150)	6.66	2.9%
199.27	202.09	Klamath	Poe-Pit-Malin-Laki-Henley (s6357)	2.8	1.2%
202.09 215.89 221.22 224.09 225.52 227.31	214.7 218.8 221.68 224.85 226.22 227.63	Klamath	Fordney-Calimus (s6356)	16.66	7.3%
214.7 218.8	215.89 221.06	Klamath	Stukel-Salisbury-Lorella-Fiddler-Dehlinger-Capona (s6355)	4.42	1.9%
			Total miles	**59.82**	
			Project Total (miles)	**229.28 b/**	

a/ Mileages are rounded to the nearest tenth of a mile; therefore, the totals shown in this table may not equal the sum of addends due to rounding.

b/ In an effort to maintain milepost continuity while adjusting the pipeline route, milepost equations have been incorporated into the alignment. This allows the mileposts, for the most part, to remain unchanged. However, the ending milepost no longer reflects the actual length of the proposed pipeline.

c/ In areas where multiple soil associations are crossed in close proximity, milepost information has been consolidated in some cases and the continuity of milepost order has been altered in some cases to present the most useful summary of the data.

TABLE G-2

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
MP 0.00 (feature is greater than 1,800 feet from the pipeline)	North Split Landfill	1083	Coos	Primarily, non-recyclable solid waste products (such as metal, plastic, etc.), effluent treatment solids from the facility's clarifiers, boiler ash, and miscellaneous non-routine mill cleanup materials.	Groundwater	No impacts anticipated due to distance and absence of known impacts at nearest groundwater monitoring wells.	Monitoring wells located between the landfill and the Proposed Route have never shown signs of groundwater contamination.
MP 0.00 (feature is 325 feet from the North Spit Dock Pipe Yard)	Underground Storage Tanks	4 LUST sites	Coos	Heating oil, miscellaneous gas, and waste oil	Soil	No impacts anticipated due to distance and because there would be no excavation at the proposed pipe yard.	Unknown
Sites are located from immediately adjacent to the site to 0.25 mile of the Brunell Pipe Yard	**Underground Storage Tanks	14 LUST sites	Coos	Gasoline/diesel spills or leaks, residential heating oil tank leaks	Soil, groundwater	At least one site is located adjacent to the pipe yard; and conditions of site closure are unknown; therefore, coordination with ODEQ is recommended.	Unknown
Within Brunell Pipe Yard	**Champion International Underground Storage Tank	LUST 06-90-0009	Coos	Diesel spill, leaded gasoline spill	Soil, groundwater, surface water	Conditions of site closure are unknown; therefore, residual contamination may exist and coordination with ODEQ is recommended.	Site has been closed.
Within Brunell Pipe Yard	**Central Dock	4646	Coos	Petroleum compounds and/or metals, primarily arsenic and copper.	Soil, sediment, groundwater	Additional follow-up discussions with ODEQ are necessary to determine which areas of the proposed pipe yard should be avoided.	Remediation includes capping and institutional controls (no excavation groundwater extraction, etc.).
690 feet south of the Brunell Pipe Yard	Marshfield Corp. Property	4196	Coos	Arsenic, chromium, lead, diesel and lube oil range TPH; PCBs	Soil	No impacts anticipated due to distance.	This location is on the Confirmed Release List and Inventory list as of 2005. No remediation has occurred at this time.
100 feet north of Brunell Pipe Yard	**BLM Parking Lot Coos Bay	1945	Coos	Unknown	Unknown	The nature of contamination and conditions of site closure are unknown; therefore, residual contamination may exist and coordination with ODEQ is recommended.	No further state action required.

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
500 feet south of Brunell Pipe Yard	Southern Oregon Marine	1908	Coos	Unknown	Unknown	No impacts anticipated due to distance from the site and because there would be no excavation at the proposed pipe yard.	This location has been remediated, and the log files have been closed.
MP 1.28 (410 feet south in North Bend)	Kazanas Industrial Maintenance	2022	Coos	Paint-related waste; zinc and lead, thinners (methyl ethyl ketone), reducers (methyl isobutyl ketone), ethylbenzene and xylene.	Soil	No impacts anticipated due to distance and media impacted (soil only).	unknown
Sites are located from immediately adjacent to the site to 0.25 mile of Menasha Pipe Yard	Underground Storage Tanks	15 LUST sites	Coos	Leaking residential heating oil tanks, gasoline/diesel spills, or leaks.	Soil, groundwater	At least one site is located adjacent to the pipe yard; however, because there would be no excavation at the pipe yard, no impacts are anticipated.	Unknown
Within the Menasha Pipe Yard	Chamber Fuel Oil	22	Coos	Total petroleum hydrocarbons	Soil, groundwater	No impacts anticipated due to documentation of soil cleanup and because there would be no excavation at the pipe yard.	The site was backfilled with clean sand and regraded and is now considered remediated.
1,020 feet south of the Menasha Pipe Yard	North Bend Pipeline	4375	Coos	Oil spill	Soil	No impacts anticipated due to distance from the site.	The site is considered remediated.
MP 7.44 80 feet from a TEWA	Private Residence Heating Oil Tank	LUST 06-10-0979	Coos	Heating oil	Unknown	No impacts anticipated based on site remediation, nature of the contaminant, and distance from the pipeline.	The site is considered remediated.
Within Millington Pipe Yard	**Underground Storage Tanks	LUST 06-98-0036	Coos	Diesel fuel	Soil, groundwater	Conditions of site closure are unknown; therefore, residual contamination may exist and coordination with ODEQ is recommended.	This site has been remediated and the log file has been closed.
Both sites located over 1,000 feet from Coquille Park Pipe Yard	Underground Storage Tanks	2 LUST sites	Coos	Gasoline, diesel	Soil	No impacts anticipated based on media impacted (soil only) and distance from the pipe yard.	Both of these locations have been remediated, and the log files have been closed.

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
Sites are located from immediately adjacent to the site to within 0.2 mile of Coquille Pipe Yard	Underground Storage Tanks	10 LUST sites	Coos	Gasoline, diesel, heating oil	Unknown	At least one site is located adjacent to the pipe yard; however, because there would be no excavation at the pipe yard, no impacts are anticipated.	All of these locations have been remediated, and the log files have been closed.
MP 50 315 feet from the right-of-way	Kay's Market Underground Storage Tank	LUST 10-99-0024	Coos	Miscellaneous gas products	Soil	No anticipated impact based on distance from the pipeline, low contaminant levels, and that only soil was impacted.	ODEQ has closed out this site, as contaminant levels were low.
400 feet from Hult Chip Yard 1	Roseburg Forest Products-Dillard	583	Douglas	Diesel fuel; methyl isobutyl ketone, toluene, xylene, methyl ethyl ketone, acetone, mineral spirits, chromium, lead, oil.	Soil, groundwater	No impacts anticipated based on distance from the site and because no excavation would occur at the chip yards.	ODEQ Solid Waste is working with Roseburg Forest Products to install a liner in the landfill to stop off-site groundwater contamination.
Sites are located from 0.2 to 0.25 mile of the Hult Chip Yard 2	Underground Storage Tanks	2 LUST sites	Douglas	Unknown	Unknown	No impacts anticipated based on distance from the chip yard and that no excavation would occur at the chip yard.	Unknown
Within the boundary of the Hult Chip Yard 2	Underground Storage Tank	1 LUST site	Douglas	Spilled waste oil	Soil	No impacts anticipated based on site remediation and because no excavation would occur at the chip yards.	This site was remediated, and the site closed out.
Sites are located from immediately adjacent to the site to within 0.2 mile of Green #1 Pipe Yard	**Underground Storage Tanks	5 LUST sites	Douglas	Unknown	Unknown	At least one site is located adjacent to the pipe yard; and conditions of site status are unknown; therefore, contamination may exist and coordination with ODEQ is recommended.	Unknown
125 feet south of Green #1 Pipe Yard	**Horizon Auto Body & Glass	2287	Douglas	PAHs, metals, and VOCs	Surface water, soil	No impacts anticipated based on site remediation and because no excavation would occur at the chip yards. However, remediation is ongoing at the site and coordination with ODEQ is recommended.	As of 2015, the site has been mostly cleaned up and only some oil-contaminated soils remaining within the facility, with no to little risk of offsite contamination.

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
450 feet north of Green #1 Pipe Yard	Contamination Site	4968	Douglas	There is no information for this location.	Unknown	No impacts are anticipated due to distance from the pipe yard and as no excavation would occur.	Unknown
800 feet northwest of Green #1 Pipe Yard	McGovern Metals Inc.	1461	Douglas	There is no information for this location.	Unknown	No impacts are anticipated due to distance from the pipe yard and as no excavation would occur.	Unknown
within Winchester Pipe Yard	**Roseburg Forest Products Former Winchester Mill	4441	Douglas	Carbon tetrachloride, trichloroethylene, perchloroethylene, and 1,2-Dichloroethane	Soil	As these contaminants are in the old log pond, and this area would not be disturbed, there would be no impact. However, coordination with ODEQ is required as the site status is unknown.	Unknown
0.24 mile northeast of Winchester Pipe Yard	Underground Storage Tank	1 LUST site	Douglas	Unknown	Unknown	No impacts anticipated based on the distance from the pipe yard and as no excavation would occur,	This site has been remediated and the log files have been closed.
Sites are located from immediately adjacent to the site to within 0.15-mile buffer of the Riddle Pasture and Riddle Main Street Pipe Yard	Contamination Site	5 LUST sites	Douglas	Fuel from gas station	Unknown	No impacts anticipated based on distance from pipe yard and as no excavation would occur.	Four of the sites have been remediated and closed, and one is still open and remediation is ongoing.
Immediately adjacent to Riddle Pasture and Riddle Main Street Pipe Yard	**Tosco Bulk Plant No 0645	2250	Douglas	BTEX and PAH	Soil, groundwater	Site characterization is still underway; coordination with ODEQ is recommended.	Site characterization and remediation is still underway.
Adjacent to Highway 99 Hay Field Pipe Yard	Gas Stations	2 LUST sites	Douglas	Unknown	Unknown	No impacts anticipated as no excavation would occur.	These sites have been remediated and the log files have been closed.
450 feet northwest of Highway 99 Hay Field Pipe Yard	South Umpqua Industrial Park	4351	Douglas	Unknown	Unknown	No anticipated impact.	This location was reported to have no contamination.

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
MP 94.7 (850 feet)	Milo Adventist Academy Underground Storage Tank	LUST 10-90-0054	Douglas	Leaded gasoline	Unknown	Based on the distance from the pipeline and closure of the site, there is no anticipated impact.	ODEQ reports that this site was remediated, and the case log is closed.
MP 122.6 (700 feet north)	Ed's Trail Market Underground Storage Tank	LUST 15-96-0006	Jackson	Unleaded and leaded gas spills	Unknown	Based on the distance from the pipeline, there is no anticipated impact.	ODEQ reports that the site was remediated, and the base log is closed.
Sites are located from immediately adjacent to the site to within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	Underground Storage Tanks	9 LUST sites	Jackson	Diesel, gasoline, and waste oil	Unknown	No impacts anticipated as no excavation would occur.	None of these sites are within the pipe yards, and all of the sites have been remediated and the log files have been closed.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**EF Burrill Lumber Site	3395	Jackson	Unknown	Unknown	Given that the location of this site, status, and nature of contamination are unknown, further coordination with the ODEQ is recommended.	This location is pending further investigation.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**Cascade Wood Products	20	Jackson	Pentachlorophenol	Soil, groundwater, surface water, threat to Rogue River	Given that the location of this site, status, and nature of contamination are unknown, further coordination with the ODEQ is recommended.	Unknown
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**C&R Salvage	1419	Jackson	Oil spills	Soil	Given that the status and location of this site are unknown, further coordination with the ODEQ is recommended.	Further investigation is needed.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**Burrill Ave. G	4146	Jackson	Unknown	Unknown	Given that the status and location of the site is unknown, further coordination with ODEQ is recommended.	Additional investigation is needed, no details.

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**Down River Forest Products Inc.	582	Jackson	Urea resin, old petroleum	Soil	Given that the specific remediation status and location of the site is unknown, further coordination with ODEQ is recommended.	Site has been remediated, and no further action is required.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	Boise Cascade – White City	534	Jackson	Chlorophenate wood treatment	Soil	No impacts anticipated as no excavation would occur.	In January 1982, Boise Cascade re-constructed the old lumber dip system because existing containment measures were considered inadequate in the case of a tank failure. No further remediation is necessary.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**Medite Corp. Stud Mill	2059	Jackson	Benzene, gasoline, lube oil, and dioxins.	Unknown	Given that the specific remediation status and location of the site is unknown, further coordination with ODEQ is recommended.	Site has had some remediation, but ODEQ has determined no additional actions are needed at this time.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**Central Point Auto Wreckers	4720	Jackson	Unknown	Unknown	Given that the location, status, and nature of contamination are unknown, further coordination with the ODEQ is recommended	Site screening is recommended by ODEQ, but no further information is available.
Within 0.25 mile of Burrill Lumber, WC Short, and Ave. F & 11th Street Pipe Yards in White City	**CertainTeed – White City	5131	Jackson	Oil used to lubricate the pressed siding molds	Soil	Given that the status and location of the site is unknown, further coordination with ODEQ is recommended.	Project activities have been closed out at this time.
MP 196.5 (450 feet south)	**Ground Wave Emergency Network	3510	Klamath	There is no information for this site.	Unknown	Given that the status of this site and the nature of contamination are unknown, further coordination with the ODEQ is recommended	Unknown. Additional information to be obtained from ODEQ.
MP 199.1 (1,200 feet north)	J.A. Jones Construction Company Underground Storage Tank	LUST 26-99-0924	Klamath	Heating oil spill	Unknown	No impacts anticipated due to the distance from the pipeline.	ODEQ reports that the site was remediated, and the base log is closed.

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
MP 198.3 (1,100 feet southwest of TEWA)	Collins Products Landfill	3264	Klamath	Wood-waste landfill	Unknown	No impacts anticipated due to distance from the pipeline.	There is no other information available for this location.
343 feet north of K-Falls Memorial Dr. #1 Pipe Yard	Underground Storage Tank	1 LUST site	Klamath	There is no information for this location.	Unknown	No impacts anticipated due to distance from the pipeline and that no excavation would occur.	Unknown
Within K-Falls Memorial Dr. #1 Pipe Yard	**Klamath Basin Pine Mills	5368	Klamath	There is no information for this location.	Unknown	Given that the status of this site and nature of contamination are unknown, further coordination with the ODEQ is recommended	Unknown. Contact ODEQ for additional information on this site.
Sites are located from immediately adjacent to the site to within 0.15-mile Northeast of K-Falls Memorial Dr. #1 Pipe Yard	**Sturdicraft Inc DG Shelter Products Co	2707 2878	Klamath	Unknown	Unknown	Given that the nature of contamination at this site is unknown and a site is located immediately adjacent to a project workspace, further coordination with the ODEQ is recommended	These two locations were entered into the ECSI system for further research by ODEQ, but there is no information or contaminants known for these locations.
1,500 feet north of K-Falls Memorial Dr. #2 Pipe Yard	Underground Storage Tank	1 LUST site	Klamath	Unknown	Unknown	No impacts anticipated due to the distance and that no excavation would occur.	Unknown
440 feet west of K-Falls Memorial Dr. #2 Pipe Yard	McVay Machine Shop	4828	Klamath	Unknown	Unknown	No impacts anticipated due to the distance and that no excavation would occur.	The site is a former machine shop that has also been used for welding and sandblasting. It has been tagged for further investigation by ODEQ.
1,080 feet to the north of K- Falls Memorial Dr. #2 Pipe Yard	PacifiCorp Power and Light	70	Klamath	PCB spill	Unknown	No impacts anticipated due to the distance and that no excavation would occur.	Cleanup is complete.
300 feet north of K-Falls Industrial Oil Pipe Yard	Long-Bell Lumber	5423	Klamath	Unknown	Unknown	No impacts anticipated due to the distance and that no excavation would occur.	This location has no information but has been tagged for further investigation by ODEQ.
880 feet to the east of K-Falls Industrial Oil Pipe Yard	Industrial Oils	1821	Klamath	Chlorobenzene and dichlorobenzene	Groundwater	No impacts anticipated due to the distance and that no excavation would occur.	Unknown

TABLE G-2 (continued)

Identified Cleanup Sites Along the Pacific Connector Pipeline

Milepost Range (Nearest MP)	Project Site Name b/	Site ID	County	Hazardous Substances/ Waste Types a/	Media Contaminated a/	Potential Impact Notes	Investigative Status of Site a/
1,140 feet northwest of K-Falls – Amuchastegui Pipe Yard	Washburn Way & Laverne St. BNSF Midland Market rail yard facility	4452	Klamath	TPH	Soil	No impacts anticipated due to the distance and that no excavation would occur.	BNSF has removed close to 20 tons of soils contaminated with TPH. At this time TPH concentrations are well below environmental health standards, and the site is considered remediated.
440 feet to the north of Merrill Oregon RR Siding Pipe Yard	Tri-Met Merlo Garage	1348	Klamath	BTEX, TPH, and naphthalene.	Soil, water (unspecified)	No impacts anticipated due to the distance and that no excavation would occur.	In 2006, this location was deemed remediated.
490 feet to the northwest of Merrill Oregon RR Siding Pipe Yard	Unocal Bulk Plan – Merrill	2702	Klamath	Unknown	Groundwater	No impacts anticipated due to the distance and that no excavation would occur.	Formal investigations of this site have not occurred, but in 2007 groundwater in the area was tested and results were in compliance with state and EPA requirements.
MP 226.1 (560 feet north)	Malin Substation	LUST 18-93-0020		Unknown	Unknown	No impacts anticipated due to the distance from the pipeline.	Unknown.

a/ Information was obtained from ODEQ and EPA database and entries and are presented to reflect the entries.

b/ Sites for which coordination with ODEQ is recommended are indicated by a double asterisk (**).

LUST – leaking underground storage tank

Sources:

ODEQ. 2017a. GIS Shapefiles sent to Edge Environmental showing cleanup sites (ECSI) and tanks sites (LUST) in Coos, Douglas, Jackson, and Klamath counties. April.

ODEQ. 2017b. Environmental Cleanup Site Information Database (ESCI). Website: http://www.oregon.gov/deq/Hazards-and-Cleanup/env-cleanup/Pages/ecsi.aspx. April.

ODEQ. 2017c. Leaking Underground Storage Tank Cleanup Site Database (LUST). Website: http://www.deq.state.or.us/lq/tanks/lust/LustPublicLookup.asp. April.

ODEQ. 2017d. DEQ Facility Profiler-Lite. Website: http://deq12.deq.state.or.us/fp20/. April.

EPA. 2017. EnviroMapper – Facility Detail Report. April. Website: https://www.epa.gov/emefdata/em4ef.home