Appendix M

Hydrostatic Test Plan

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Hydrostatic Test Plan

Pacific Connector Gas Pipeline Project

(During the previous NEPA process, PCGP submitted a Plan of Development to meet BLM Right-of-Way Grant requirements based on BLM regulations. These plans will be updated in consultation with the Federal land managing agencies [BLM, USFS, and Reclamation] during the current NEPA process).

January 2018

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1.0 INTRODUCTION

In accordance with DOT 49 CFR Part 192, Pacific Connector Gas Pipeline, LP (Pacific Connector) will strength test (or hydrostatic test) the pipeline system (in sections) after it has been lowered into the pipe trench and backfilled. The purpose of the hydrostatic test is to verify the manufacturing and construction integrity of the pipeline before placing it in service to flow natural gas. Should a leak or break occur during the hydrostatic test, the pipeline will be repaired and retested to ensure the required specifications are achieved. Once a segment of pipe has been successfully tested, cleaned, and dried the pipe will be joined to the adjacent pipeline segment. The physical capacity of the pipeline to hold hydrostatic test water is approximately 60.7 million gallons. The actual volume to be used is reduced below the total pipe capacity through the re-use of water by cascading test water from segment to segment as practically achievable. Figure 1 in Attachment D provides an overview of the Project alignment, test segment locations, potential hydrostatic test sources, and the basins crossed by the Project as described in this Plan.

2.0 GENERAL HYDROSTATIC TESTING PROCESS

2.1 Contractor Responsibility

The construction contractor is responsible for implementing Pacific Connector's hydrostatic test design, drawings, and specifications. The contractor is also responsible for following applicable environmental stipulations, right-of-way restrictions and completing the necessary hydrostatic test documentation as required in the construction contract. The construction contractor will then provide Pacific Connector with a specific hydrostatic test plan and schedule detailing the specific methods for cleaning, filling, pressurizing, proof testing, dewatering, and drying of the pipeline during the testing process. The contractor is also responsible to provide all of the necessary equipment, instrumentation, qualified personnel and materials necessary to complete the hydrostatic test plan. Pacific Connector will review and approve the contractors hydrostatic test plan and provide final acceptance of the test.

2.2 Cleaning

As part of the construction process and prior to hydrostatic testing, the pipeline is lowered into the trench and prepared for cleaning. The majority of the pipe should be backfilled and compacted with the exception of valve sites and test header break locations which are left open to access the pipeline during the hydrostatic test process. Pig launchers and receivers are welded onto the test segment and a series of cleaning pigs are pushed through the pipeline with compressed air. All debris removed from the pipeline during the cleaning process is disposed of at an authorized waste disposal facility or other appropriate locations if approved by the landowner. Once the cleaning pig runs are complete, the pig launcher and receiver are removed from the pipeline test segment, and the hydrostatic test headers are welded into place to allow the test segment to be filled with water and tested.

2.3 Filling

Once the contractor has cleaned the pipeline test segment, the contractor uses hoses/hard piping to fill the pipeline with clean test water (see Sections 3.0 and 7.2). Water is pumped via hose from the approved water source site(s) or from the previous test segment into the new test segment. Depending on the proximity of the source water location to the test segment, water trucks may be used to transport the water. All fill lines and water pumps are rated to sustain the

hydrostatic test procedures. Water is pumped into the test segment behind fill pigs to completely fill the test segment with water and to minimize potential air entrainment during the filling process. Fill plugs/pigs are pushed in a controlled manner with pressure during the filling process from one end of the test segment and are received at the other end to ensure all air is removed from the pipeline prior to testing.

2.4 Pressurizing

Calibrated temperature recorders, pressure recorders, and deadweight testers are connected to the hydrostatic test headers to document the test. The contractor secures the test area to prevent all unauthorized personnel from being in the area. Once the test segment is completely filled with water, the fill pump is removed, the pressure pump is connected, and the pipeline test segment pressurization begins. The test pressure is brought to 500 psig and held until the pressure and temperatures are stabilized. All connections are checked for leaks. Providing there are no leaks, the pressure pump raises the internal pipe pressure slowly to 80% of the required test pressure at the low point of the test section. Once the pressure and temperatures stabilize, the stroke count is started and continued until the internal pipe pressure reaches the required test pressure.

2.5 8-Hour Test

The hydrostatic test pressure is maintained on the test section for the duration of the test, which is anticipated to last 8-hours. During the first two hours of the pressure test the time, pipe temperature, ambient temperature, and dead weight pressure readings are recorded. After the second hour, the same readings are taken every half hour for the remainder of the test. Acceptance of the hydrostatic test is done by Pacific Connector's Chief Construction Inspector. If a leak is encountered during the hydrostatic test, the test is stopped, the leak is located, and the pipe is excavated to repair the leak. If at any time during the 8-hour hydrostatic test, the test pressure falls below the minimum test pressure, the test will be unacceptable and test section shall be re-pressurized and the entire test started again.

2.6 Dewatering

At the end of the 8-hour test, the contractor lowers the pipeline pressure by slowing venting water. The water that is vented may be cascaded into the next test section, or into a dewatering structure, or into a frac tank for further testing pending the location and need in the hydrostatic test plan. Test water is only released for land application at previously approved locations through an approved dewatering structure. Where water is being released in an upland area, the contractor is responsible for taking water samples, if required, for analysis. Once the samples have been analyzed and meet the permit requirements, the water may be released through an approved dewatering structure in an upland area.

2.7 Drying

Once the hydrostatic test has been approved and the water removed from the pipeline, the contractor will use dry compressed air to push a series of drying pigs through the pipeline. Pigs will be run until the pipeline is dried to a specified dew point.

2.8 Tie-Ins

Following the pipeline drying, the test segments are welded together. The welds are x-rayed and the pipeline is prepared for service.

3.0 SOURCE WATER

Water for hydrostatic testing will be obtained from commercial or municipal sources, private supply wells, or surface water right owners (see Table 1). Hydrostatic test water for the compressor station will be obtained from nearby municipalities. If water for hydrostatic testing is acquired from public surface water sources, Pacific Connector will obtain all necessary appropriations and withdrawal permits through the Oregon Water Resources Department (OWRD). As part of the application process, OWRD provides the application(s) to the Oregon Department of Environmental Quality (ODEQ) and the Oregon Department of Fish and Wildlife (ODFW) for review. These agencies comment if there are concerns regarding the impacts the withdrawal(s) may have on water quality, or other beneficial uses, and/or fish and wildlife species and their habitat, respectively. OWRD also provides public notice of the application(s) and encourages comments. OWRD then completes its review and issues the permit(s) or denies the application(s). Private owners will be contacted to discuss water acquisition during landowner negotiations in the year prior to construction.

As required by ODFW, pumps used to withdraw surface water will be screened according to NOAA Fisheries' screening criteria to prevent entrainment of aquatic species. When pumping water from a source location, the pump head will be submerged and maintained on average at the center of the water column so as to prevent sucking in sediments and/or algae lying at the water level surface or sediments (i.e. heavy metals) resting on the bed of the waterbody. The targeted ramping rate will be managed such that there is no significant decrease of river flows. Estimated ramping rates will be submitted to ODFW as part of the ODWR permitting process. The only substance that would be added to the hydrostatic test water would be chlorine to prevent the potential transfer of aquatic invasive species, which was a concern for the BLM and Forest Service, as described in Section 7.0

Table 1
Potential Hydrostatic Source Locations

County	MP	Source		Owner	Estimated Withdrawal Requirement *(Longest Test Segment Volume)*[1]
South Coast Basin - Coos Bay Frontal Pacific Ocean (1710030403) - Fifth Field Watershed					
Coos	1.47R	Coos Bay - North Bend Water Board		Coos Bay - North Bend Water Board	4,999,228
South Coast Basin - M. F. Coquille River (1710030501) - Fifth Field Watershed					
Douglas	50.20	Water Impoundment	Kinnan Lake	5-J Limited Partnership, Donald R. Johnson 29080601300	3,315,584
Umpqua Basin - Olalla Creek-Lookingglass Creek (1710030212) - Fifth Field Watershed					
Douglas	55.90	Water Impoundment	Ben Irving Reservoir	Douglas County Public Works/ Looking Glass Olalla Water District/ Winston-Dillard Water District	3,315,584
Douglas	58.75	Looking Glass Olalla Water District (Olalla Creek Crossing)		Looking Glass Olalla Water	3,315,584

County	MP	Source		Owner	Estimated Withdrawal Requirement *(Longest Test Segment Volume)*[1]
				District	
Umpqua Basin - Clark Branch-South Umpqua River (1710030211) - Fifth Field Watershed					
Douglas	71.30	S. Umpqua River Crossing #1		Oregon Department of Water Resources	2,037,230
Umpqua Basin - Days Creek-South Umpqua River (1710030205) - Fifth Field Watershed					
Jackson	94.73	S. Umpqua River Crossing #2		Oregon Department of Water Resources	2,525,177
Rogue Basin - Shady Cove-Rogue River (1710030707) - Fifth Field Watershed					
Jackson	122.5	Rogue River Crossing		Oregon Department of Water Resources	1,951,591
Rogue Basin - Little Butte Creek (1710030708) - Fifth Field Watershed					
Jackson	133.38	Medford Aqueduct		Eagle Point Irrigation	2,256,357
Jackson	146.70	N. Fork Little Butte Creek Crossing		Medford Irrigation District/ Rogue River Valley Irrigation District	2,847,495
Jackson	161.40	Water Impoundment	Fish Lake		2,847,495
Klamath Basin - Fourmile Creek (1801020302) - Fifth Field Watershed					
Klamath	168.90	Water Impoundment	Lake Of The Woods National Forest Lake	United States (Rogue River-Siskiyou NF)	5,565,825
Klamath Basin -John C Boyle Reservoir-Klamath River (1801020602)					
Klamath	184.30	Water Impoundment	John C. Boyle Reservoir	Oregon Department of Water Resources	5,565,825
Klamath Basin -Lake Ewauna-Klamath River (1801020412)					
Klamath	189.00	Water Impoundment	Keno Reservoir	Oregon Department of Water Resources	5,565,825
Klamath	199.20	Klamath River			5,565,825
Klamath Basin -Mills Creek–Lost River (1801020409)					
Klamath	228.1	High Line Canal		Malin Irrigation District	4,560,666
				Total	**N/A** [2]

[1] The volumes in the table represent the estimated withdrawal volume from a potential hydrostatic test source, and, in some cases, multiple sources are identified for the same test segment(s) because water withdrawals would be based on conditions at the time of construction (see Table 2 for potential water sources identified for each test segment).

[2] Totaling the potential withdrawal volumes is not applicable because, as stated in footnote #1, multiple (alternate) sources have been identified for the same test segments. Without cascading (not proposed), the physical volume for all individual test segments would be 60.7 million gallons. With the use of cascading, which is proposed, the minimum test water volume to be withdrawn would be 15,928,725 gallons across all sources. The actual volume will be within this range and is expected to be at the lower end of the range.

4.0 DEWATERING

The pipeline will be tested in approximately 35 sections, each with varying lengths and water volume requirements (see Table 2). The required test pressure ranges, pipe strength (wall thickness and pipe grade), topography (specifically elevation changes), available access and work areas to stage testing equipment, and the availability of test water are used to determine the length of each test segment. During the test, it may be necessary to release some volume of water at each of the section breaks; however, Pacific Connector will conserve water as much as practical and minimize dewatering, where feasible, by cascading, or transferring, water between test sections. If the volume of water required to test the successive segment(s) is less than the preceding test segment, the extra test water may be stored in the previously tested segments or portable tanks and then pumped to subsequent segments for testing as necessary to minimize water withdrawals and potential water hauling requirements. After testing of the segment or series of segments is complete, the hydrostatic test water will be released to an upland area within the basin from which it was withdrawn. The hydrostatic test would be dewatered through a filter bag or straw bale structure to remove particulates and prevent the potential for sediment transport and ground surface erosion (see Attachment A). Pacific Connector does not propose to release hydrostatic test water outside the basin from which it was withdrawn (i.e., South Coast, Umpqua, Rogue, or Klamath). It is expected that the volume of water to be released within a basin would be the largest volume of water associated with the longest test segment within the basin. Table 2 provides the volume of water for each test segment and footnotes the largest volumes for each basin, which are listed below:

- South Coast Basin - 4,990,228 gallons (15.31 ac/ft)
- Umpqua Basin - 2,525,177 gallons (7.75 ac/ft)
- Rogue Basin - 2,847,495 gallons (8.74)
- Klamath Basin – 5,565,825 (17.08 ac/ft)
  Total = 15,928,725 (48.88 ac/ft)

At some locations it may be necessary to locate the dewatering structures outside the construction right-of-way, as allowed under FERC Procedures (IV. A. 1.), to direct water away from the disturbed right-of-way areas. In these locations, small brush or trees may be cleared by a rubber-tired rotary or flail motor (brush hog) or by hand with machetes/chainsaws. No soil disturbance will occur. A rubber-tired or track hoe will be utilized to lay the dewater line and to remove the saturated straw bales or filter bags upon completion of hydrostatic dewatering.

The hydrostatic test dewater locations are shown on the maps provided in Attachment D. The hydrostatic test design was developed from alignment and elevation surveys and detailed pipe design. The design will be provided to construction contractors, once selected. Potential stream flow effects (or ramping rates) from hydrostatic test dewatering are not expected because water will be released to an upland area and through an energy dissipation dewatering structure to promote infiltration into the ground and will not occur within 150 feet of any sensitive wetland (i.e., non-agricultural wetland) or waterbody, where feasible. Further, BMPs, as described in Section 7.0, will be implemented to control dewatering to minimize potential increases in stream flow.

Table 2
Potential Hydrostatic Dewatering (Test Header) Locations within the Construction Right-of-Way

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
Spread - Haynes Inlet												
1	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	0.00 (Private)	6.63R	14,840	735,523 (2.26)	Coos Bay - North Bend Water Board	Private	Coos Bay /Coos River / Jordan Cove (1243397433543)	650	Beg. 43.432564
										Haynes Inlet (1242326434319)	1000	Beg. -124.240191
										Trib to Haynes Inlet (1242017434500)	550	
										Trib to Haynes Inlet (1242011434514)	377	End 43.449395
										Haynes Inlet (1242266434305)	355	End -124.198395
Spread 1												
2	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	6.63R	10.13R	52,760	2,612,411 (8.02)	Coos Bay - North Bend Water Board	Private	Trib. to Stock Slough (1241467433377)	90	43.338261
										Trib. to Stock Slough – Monkey Gulch (1241504433368)	100	-124.147804
3	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	10.13R	17.11B R	38,800	1,922,158 (5.90)	Coos Bay - North Bend Water Board	Private/BLM-Coos	Trib. to Catching Creek (1241615432585)	275	43.255887
										Catching Creek (1241452433077)	575	-124.160713
4	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	E. F. Coquille River 1710030503	17.11B R	35.81	100,760	4,990,228 [4] (15.31)	Coos Bay - North Bend Water Board	BLM-Coos	Tribs. to South Fork Elk Creek (1239351431117 & 1239152431074)	415 650	43.105719
										Trib to Big Creek (1239061430967)	363	-123.912717
5	South Coast	E. F. Coquille River 1710030501	M. F. Coquille River 1710030501	35.81	37.20	7,280	360,166 (1.11)	Coos Bay - North Bend Water Board	BLM-Coos	Big Creek (1240115430262)	400	43.105499
										Tribs to Big Creek (1240115430262, 1238846431056, & 1238882431046)	395 105 375	-123.888347
6	South Coast	M. F. Coquille River 1710030501	E. F. Coquille River 1710030501	37.20	39.20	10,520	520,468 (1.60)	Coos Bay - North Bend Water Board, Kinnan Lake	Private	Tribs. To Camas Creek (1238306431319, 1238519431172 & 1238491431056)	243 350 650	43.104265
										Trib to Sandy Creek (1238500430999)	675	-123.855397
Spreads 1 and 2												
7	South Coast	E. F. Coquille River 1710030501	M. F. Coquille River 1710030501	39.20	51.61	67,000	3,315,584 (10.18)	Coos Bay - North Bend Water Board, or Kinnan Lake, or Looking Glass Olalla Water District(Olalla Creek	Private	Trib to Belieu Creek (1236803430462)	1525	43.050453 -123.658493

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
								Crossing), or Ben Irving Reservoir				
8	South Coast Umpqua (MP 53.16)	M. F. Coquille River 1710030501	Olalla / Lookingglass Creek 1710030212	51.61	58.86	39,320	1,946,641 (5.97)	Looking Glass Olalla Water District(Olalla Creek Crossing)or Ben Irving Reservoir	Private	Olalla Creek (1234905431631)	228	43.073273 -123.531991
9	Umpqua	Olalla / Lookingglass Creek 1710030212	Clark Branch – South Umpqua 1710030211	58.86	66.48	40,320	1,997,530 (6.13)	Looking Glass Olalla Water District(Olalla Creek Crossing)or Ben Irving Reservoir	Private	Tribs. to Willis Creek (1234009430728 & 1233983430694) Tribs. to Rice Creek (1234180430725 & 1234136430721)	420 652 1400	43.072111 -123.40666
10	Umpqua	Clark Branch – South Umpqua 1710030211	Clark Branch – South Umpqua 1710030211	66.48	71.38	26,320	1,302,297 (4.00)	Looking Glass Olalla Water District(Olalla Creek Crossing)or Ben Irving Reservoir, or S. Umpqua River Crossing #1	Private	Tribs to South Umpqua River (1233302430519, 1233289430525 & 1233303430545)	193 83 785	43.054403 -123.329152
10A	Umpqua	Clark Branch – South Umpqua 1710030211	South Umpqua 1710030211	71.38	72.68	6,920	342,765 (1.05)	S. Umpqua River Crossing #1	Private	Tribs to South Umpqua River (1233086430593 & 1233346430680)	345 657	43.062635 -123.309245
11	Umpqua	Clark Branch – South Umpqua 1710030211	Myrtle Creek 1710030210	72.68	75.72	19,800	980,638 (3.01)	S. Umpqua River Crossing #1	Private	Tribs to Biger Creek (1232543430838, 1232534430792, & 1232600430803)	342 512 485	43.08197 -123.257641
12	Umpqua	Myrtle Creek 1710030210	Myrtle Creek 1710030210	75.72	82.32	35,200	1,741,192 (5.34)	S. Umpqua River Crossing #1	Private	Tribs to South Myrtle Creek (1231803430263,1231848430210, 1231837430216, & 1231921430292)	385 545 485 800	43.023663 -123.18033
13	Umpqua	Myrtle Creek 1710030210	Days Creek-South Umpqua River 1710030205	82.32	89.50	41,160	2,037,230 (6.25)	S. Umpqua River Crossing #1	Private	Tribs to Days Creek (Doe Hollow) (1230858429848) Tribs to Days Creek (Bailey Gulch) (1230937429813 & 1231032429810)	1145 1353 992	42.979162 -123.090206
Spreads 2 and 3												
14	Umpqua	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	89.50	94.71	27,720	1,372,593 (4.21)	S. Umpqua River Crossing #1, or S Umpqua River Crossing #2	Private	South Umpqua River (1234460432680) Trib. to South Umpqua River (1230442429313)	140 308	42.932972 -123.039405
15	Umpqua	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	94.71	95.51	4,240	210,102 (0.64)	S. Umpqua River Crossing #2	BLM-Roseburg	Tribs. to South Umpqua (1230357429250 & 1230382429323)	252 775	42.922722 -123.034451
16	Umpqua	Days Creek-South Umpqua	Days Creek-South Umpqua	95.51	100.76	27,560	1,365,564 (4.19)	S. Umpqua River Crossing	Private	Trib to Hatchet Creek (1229971428706)	205	42.870433

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
		River 1710030205	River 1710030205					#2		Trib to East Fork Stouts Creek (1230111428734)	350	-123.003209
17	Umpqua	Days Creek-South Umpqua River 1710030205	Upper Cow Creek 1710030206	100.76	110.36	50,960	2,525,177 [4] (7.75)	S. Umpqua River Crossing #2	USFS-Umpqua	East Fork Cow Creek (1229918428021)	870	42.77114 -122.926565
										Tribs to East Fork Cow Creek (1229258427752 & 1229337427754)	810 830	
18	Umpqua Rogue (MP 111.11)	Upper Cow Creek 1710030206	Trail Creek 1710030706	110.36	113.66	15,600	771,945 (2.37)	Rogue River Crossing	Private	Tribs to Dead Horse Creek (1228736427515 & 1228712427513)	2145 2075	42.74529 -122.885218
										Trib to West Fork Trail Creek (1228839427397)	1270	
19	Rogue	Trail Creek 1710030706	Trail Creek 1710030706	113.67	117.84	22,000	1,088,400 (3.34)	Rogue River Crossing	Private	Trib to Trail Creek (1228449426932)	475	42.693386 -122.885284
										Trib to West Fork Trail Creek (1228571426840)	215	
20	Rogue	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	117.84	122.23	23,080	1,141,707 (3.50)	Rogue River Crossing	Private	Trib to Cricket Creek (1228167426451 & 1228177426455)	55 450	42.645528 -122.817437
										Cricket Creek (1228054426435)	233	
20A	Rogue	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	122.23	122.81	3,200	158,595 (0.49)	Rogue River Crossing	Private	Rogue River (1244292424210)	625	42.645567 -122.805571
20B	Rogue	Shady Cove - Rogue River 1710030707	Shady Cove - Rogue River 1710030707	122.81	124.97	11,280	559,100 (1.72)	Rogue River Crossing	BLM-Medford	Tribs. to Brush Creek (1227674426310 & 1227761426291)	387 400	42.628191 -122.780074
										Trib to Rogue River (1228061426243)	850	
										Trib to Indian Creek (1227770426261)	590	
21	Rogue	Shady Cove - Rogue River 1710030707	Big Butte Creek 1710030704	124.97	132.47	39,440	1,951,591 (5.99)	Rogue River Crossing, or Medford Aqueduct, Eagle Point Irrigation	Private	Trib to Quartz Creek (1226768425794)	232	42.577736 -122.680439
Spread 4												
22	Rogue	Big Butte Creek 1710030704	Little Butte Creek 1710030708	132.47	141.11	45,520	2,256,357 (6.92)	Medford Aqueduct, Eagle Point Irrigation	BLM-Medford	Tribs to Salt Creek (1226086424700 & 1226075424805)	550 220	42.483863 -122.610407
23	Rogue	LittleButte Creek 1710030708	Little Butte Creek 1710030708	141.11	147.75	37,280	1,844,080 (5.66)	Medford Aqueduct, Eagle Point Irrigation, or North Fork Little Butte Creek	Private	Trib to North Fork Little Butte Creek (1225688424078)	490	42.403061 -122.570909
										Trib to South Fork Little Butte Creek (1225728424006)	840	
24	Rogue	Little Butte Creek 1710030708	Little Butte Creek 1710030708	147.75	150.66	12,520	620,533 (1.90)	North Fork Little Butte Creek	BLM-Medford	Trib to North Fork Little Butte Creek (1225334423894,1225327423928 & 1225339423878)	1204 1440 1369	42.383192 -122.539368
										Trib to South Fork	1123	

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
										Little Butte Creek (1225408423780 &1225410423779)	1180	
25	Rogue	Little Butte Creek 1710030708	Little Butte Creek 1710030708	150.66	158.75	42,920	2,126,306 (6.53)	North Fork Little Butte Creek, or Fish Lake	USFS-Rogue River	Trib. to Grizzly Creek (1224112423587) Trib to North Fork Little Butte Creek (1224135423837)	280 5340	42.364171 -122.397398
26	Rogue Klamath (MP 168.00)	Little Butte Creek 1710030708	Spencer Creek 1801020601	158.75	169.51	57,480	2,847,495 [4] (8.74)	North Fork Little Butte Creek, or Fish Lake, or Lake of the Wooks	Private	Trib to Spencer Creek (1222399423006)	1275	42.29569 -122.237525
Spread 5												
27	Klamath	Spencer Creek 1801020601	Lake Ewauna / Upper Klamath River 1801020412	169.51	190.79	112,520	5,565,825 [4] (17.08)	Klamath River, or Lake of the Woods, or Keno Reservoir, or John C Boyle Reservoir	Private	Trib to Klamath River (1219079421383, 1219022421436 & 1218746421442)	2305 470 1750	42.144256 -121.90652
28	Klamath	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	190.79	197.51	29,480	1,459,243 (4.48)	Klamath River, or Keno Reservoir, or John C Boyle Reservoir	Private	Trib to Klamath River (1218411421604)	3740	42.170991 -121.833676
29	Klamath	Lake Ewauna / Upper Klamath River 1801020412	Mills Creek - Lower Lost River 1801020409	197.51	199.16	8,840	438,075 (1.34)	Klamath River, or Keno Reservoir, or John C Boyle Reservoir, or Lake of the Woods	Private	Klamath River (1221913420005)	750	42.171113 -121.805705
30	Klamath	Lake Ewauna / Upper Klamath River 1801020412	Mills Creek - Lower Lost River 1801020409	199.16	210.53	60,000	2,970,150 (9.12)	Klamath River, or High Line Canal	Private	Irrigation Canal – Trib to L Canal (1217128420861 & 1216541420747)	1415	42.067422 -121.660354
31	Klamath	Mills Creek - Lower Lost River 1801020409	Mills Creek - Lower Lost River 1801020409	210.53	210.77	1,280	63,519 (0.20)	Klamath River or High Line Canal	Private	Irrigation Canal – Trib to L Canal (1217128420861 & 1216541420747)	1265 390	42.064856 -121.657176
32	Klamath	Mills Creek - Lower Lost River 1801020409	Mills Creek - Lower Lost River 1801020409	210.77	228.81	92,080	4,560,666 (14.00)	Klamath River, or High Line Canal	Private	High Line Canal (1214066420153)	1785	42.032735 -121.374896
						Total [6]	**60,701,864 (186.29)**					

[1] Mileposts were not calculated from engineering stationing and may not provide a direct correlation between milepost and engineering stationing. "R" represents a revised milepost location based on the incorporation of reroutes into the Proposed Route.
[2] Section length reflects actual footage calculated directly from engineering stationing.
[3] Section volumes were calculated using section length directly from engineering stationing.
[4] Water will be cascaded between test sections, where practical, to minimize test water volume requirements, withdrawals, and potential water hauling. It is expected that the largest volume of water to be released would be associated with the longest test segment within a basin.
[5] Waterbodies were determined from USGS National Hydrography Dataset water course data(http://nhd.usgs.gov/). Distances are between the test break/header location to the closest water course regardless of flow characteristics (*i.e.*, perennial, intermittent, or ephemeral); dewatering structures for the test break/header locations will be located a minimum of 150 feet from waterbodies/wetlands.
[6] Without cascading (not proposed), the maximum test volume for all individual test segments would be 60,701,864 gallons. With the use of cascading, which is proposed, the minimum test water volume to be withdrawn would be 15,928,725 gallons. The actual volume will be within this range and is expected to be at the lower end of the range.

Typical dewatering rates can range from several hundred gallons per minute to several thousand gallons per minute and are dependent on the following, which will be reviewed by the contractor and EI to determine the appropriate dewatering rate prior to construction:

- Length of test section (volume);
- Profile of test section (head);
- Position of dewatering site relative to streams, drainages, roads, housing, cropland;
- Topography (slope);
- Land use (vegetation); and
- Soil type (ability to absorb).

The pipeline test segment(s) will be dewatered once the hydrostatic test has been successfully completed. Dewatering pigs driven by compressed air will be utilized to remove the water. The volumes and rates of dewatering will be determined at the time of construction based on site-specific conditions and released at a rate to prevent scour and erosion (see Section 7.3). Prior to dewatering, water quality will be tested and monitored according to permit conditions to ensure test water meets upland application requirements; however, since the pipe will be internally coated and cleaned prior to filling, the water quality is not expected to differ significantly from the quality of the fill water used. Dewatering to land will follow specific procedures developed to minimize water quality impacts and localized erosion and will comply with hydrostatic test permits and approvals (see Section 7.3). In the unlikely event a testing parameter does not meet the release requirements/limits, Pacific Connector would implement appropriate treatment methods to ensure that the limits are satisfied.

Pacific Connector will implement FERC's Wetland and Waterbody Procedures regarding hydrostatic testing as well as any conditions specified in individual state permits. Pacific Connector will follow FERC's Wetland and Waterbody Procedures (Section VII. C.4.) and will locate all hydrostatic test manifolds/dewatering structures at least 150 feet outside of wetlands and riparian areas to the maximum extent practicable based on engineering test constraints to ensure that water infiltrates into the ground and does not flow into wetlands or waterbodies (see Section 7.3).

5.0 HORIZONTAL DIRECTIONAL DRILL (HDD)/DIRECT PIPE HYDROSTATIC TESTING

Each HDD and Direct Pipe crossing require pre-installation and post-installation hydrostatic testing. Should a leak or break occur, the pipeline would be repaired and retested to ensure the required specifications are achieved. HDD segment testing requires a small volume of water due to the relatively short section of pipe involved.

6.0 TEST FAILURE

As experienced by Pacific Connector on previous pipeline projects and as reported by Kirkwood and Cosham (2000), hydrostatic test failure on new pipeline construction is extremely rare due to modern steel and construction techniques that include better controls, non-destructive testing (e.g., X-Ray or ultrasonic testing), and inspection of the whole pipeline fabrication process. In the unlikely event a failure occurs during hydrostatic testing, water may be released at the point of the failure. The quantity of water released at the point of failure is dependent on the nature and location of the failure; typically a test failure is the result of a small pin hole leak with little water loss. During testing, the contractor's testing engineers and Pacific Connector's inspectors will monitor the testing results for pressure drops. Pacific Connector's EIs will monitor the length

of the test section if a failure occurs to mitigate potential effects from a water release and will implement appropriate BMPs to minimize erosion or sedimentation into sensitive areas. Extra straw bales, silt fencing, stakes, fabric, and other appropriate erosion control devices will be available during the hydrostatic testing process and will be utilized as necessary to control any released water that may seep to the surface and into a sensitive area. As stated above, the water used for the test will be from surface water or municipal sources, permitted as necessary for appropriations and no additives (other than potentially chlorine, see Section 7.2.4) will be included in the water for the testing. If a discharge to surface waters occurred from a hydrostatic test, the appropriate agency would be notified if required by permit conditions. Should a leak or break occur during the hydrostatic test, the pipeline will be repaired and retested to ensure the required specifications are achieved.

7.0 POTENTIAL EFFECTS AND BEST MANAGEMENT PRACTICES

The measures outlined below are to ensure the protection of aquatic and terrestrial resources at water withdrawal and dewatering locations.

7.1 Schedule

It is projected that pipeline construction would be completed in late summer to early fall of the pipeline construction season which will also minimize potential adverse impacts to terrestrial and aquatic ecosystems. The pipeline must be tested immediately following completion of construction so that any failures could be repaired and retested. Also, the hydrostatic test must be completed prior to introducing natural gas into the pipeline system and putting it in-service. Intentionally delaying hydrostatic testing after construction activities until late fall or winter would result in unnecessarily extending the entire construction duration of the project, extending the length the construction contractor remains on-site, continued right-of-way and access disturbance as well as delaying final cleanup and restoration of the right-of-way. Winter testing would be particularly problematic in that much of the right-of-way would be under snow and in wet/muddy condition.

7.2 Water Withdrawal

Water withdrawal requirements for each identified water source are noted in Table 1 in Section 3.0. The construction contractor will filter all water removed from the source locations to ensure clean “debris free” water is used for the hydrostatic testing of the pipeline. There is a potential for transfer of water-borne aquatic pathogens, forest pathogens, and invasive species between watershed drainages. This section outlines the steps Pacific Connector will follow to prevent the potential inter-drainage transfer of pathogens and invasive species of concern of the federal and state agencies.

7.2.1 Waterbody Source Testing

During development of this Plan, Pacific Connector included commitments to test all non-municipal waterbody sources to determine if there is a presence of water-borne aquatic and forest pathogens. The intent of the proposed waterbody testing program was to prevent the potential transfer of these pathogens and invasive species from one watershed to another. However, during a consultation meeting with the federal land-managing agencies and the Center for Lakes and Reservoirs and Aquatic Bioinvasion Research and Policy Institute (Portland State University) on November 19, 2009, it was determined that testing was not a definitive tool to establish the absence of a potential invasive species or forest pathogens in non-municipal source waters. As suggested by Mark Sytsma with Aquatic Bioinvasion

Research and Policy Institute, water testing would only confirm the absence of a potential invasive species in the sample aliquot and therefore would not confirm the potential presence of an invasive species within the entire waterbody source. Because of the lack of certainty in sampling and testing results and the impracticality of testing the entire volume of hydrostatic test water that would be required for the project, it was concluded that Pacific Connector should assume that all non-municipal test water sources could contain a potential invasive species and that water treatment methods should be implemented to prevent the potential spread of aquatic invasive species or forest pathogens.

7.2.2 Invasive Species and Pathogens

Below is a list of invasive species and pathogens that are currently of concern that potentially may occur within identified water sources that have been targeted for treatment in non-municipal test water sources. Attachment B provides current information on the presence of these species in the project area.

- Scotch broom
- Himalayan blackberry
- Yellow starthistle
- Port-Orford-cedar root disease
- Sudden Oak Death
- Quagga mussel
- Zebra mussel
- New Zealand mud snail
- Brackish water snail
- Whirling disease
- Didymo
- Blue-green algae (Cyanobacteria)
- Chytrid fungus
- Freshwater mold
- Other terrestrial and aquatic non-native, noxious weed fragments and seeds that may be identified at the time of construction
- Other forest and fish pathogens that may be identified at the time of construction.

7.2.3 Bio-Invasive Research

Prior to water withdrawal, Pacific Connector will review United States Geological Survey (USGS) biological research division data, as well as other pertinent presence data sources as referenced in Attachment B, to determine where known locations of invasive species and pathogen infestations exist along the project area and at proposed water source locations. Attachment B provides documentation of the presence of the aquatic invasive species and pathogens in Oregon.

Pacific Connector has evaluated the locations where the potential exists for Port-Orford-cedar root disease based on Oregon Department of Forestry statewide forest health survey data available between 2003 and 2008 (http://www.oregon.gov/ODF/privateforests/fh.shtml). Based on this data, Port-Orford-cedar root disease is most prevalent in the project area between about MPs 1.47R and 50.20. The proposed water source for hydrostatic testing between MPs 1.47R and 50.20 (see Table 1) would come from a treated municipal source (i.e., Coos Bay – North Bend Water Board). Therefore, the risk of spreading Port-Orford-cedar root disease or any other invasive species or pathogens from hydrostatic test dewatering from this source is avoided.

Other potential water sources for hydrostatic testing include Kinnan Lake located in the Middle Fork Coquille watershed which is crossed by the project between MPs 35.81 and 52.91. According to the Oregon Department of Forestry annual survey data between 2003 and 2008, Kinnan Lake is located above Port-Orford-cedar root disease infestations in the Middle Fork Coquille watershed. Ben Irving Reservoir, a potential hydrostatic test water source in the Olalla Creek-Lookingglass Creek Watershed, which is crossed by the project between MPs 52.91 and 62.41, does not have recorded infestations of Port-Orford-cedar root disease nor does any other watershed east of MP 62.41 (based on Oregon Department of Forestry survey data 2003 through 2008). Therefore, the potential for transmission of this pathogen should be low.

As noted in Attachment B, currently there are no quagga or zebra mussels known to occur in Oregon. Although both New Zealand mud snails and brackish water snails are known to occur in the Coos Bay Estuary, hydrostatic test water sources for the project between MPs 1.47R and 50.20 would be from a municipal source and would not occur from the bay, preventing the potential spread or transfer of these invasive species.

Whirling disease is known to occur in the South Umpqua Watershed (Montana Water Center, 2010); however, the potential risk of transferring or spreading this disease is low because the principle vector for the spread of whirling disease is contaminated fish parts, and according to BLM (2009), this disease is typically not spread through water withdrawal activities. The proposed treatment BMPs outlined in Section 7.2.4 are designed to minimize the potential pathways through which this disease is known to spread.

Currently, in Oregon there have been no nuisance blooms of didymo (Draheim, 2009). Blue-green algae (Cyanobacteria) blooms are commonly found in many freshwater systems across the world and also occur in many lakes, rivers and reservoirs in Oregon. The Oregon Department of Human Services (2009a) monitors harmful algae blooms across Oregon, and Pacific Connector would verify that no health advisories have been posted[1] for a proposed hydrostatic test water source prior to withdrawal to prevent potential transfer of high levels of toxins. To date there have been no health advisories posted for any of the proposed hydrostatic test water sources posted by the Oregon Department of Human Services (2009a).

As noted in Attachment B, both chytrid fungus and freshwater mold (Saprolegnia) likely occur in the project area, but specific locations are not known from the literature Pacific Connector has reviewed. The proposed water treatment BMPs outlined in Section 7.2.4 are intended to minimize the potential spread of these species, if present.

7.2.4 Waterbody Source Best Management Practices

Pacific Connector will implement the following BMPs to avoid the potential spread of the aquatic invasive species and pathogens of concern:

- If determined to be feasible for hydrostatic testing requirements, return all water back to its withdrawal source location after use; however, cascading water from one test section to another to minimize water withdrawal requirements may make it impractical to release water within the same fifth field watershed where the water was withdrawn. Pacific Connector will return or release all water from the same basin from which it was withdrawn (i.e., South Coast, Umpqua, Rogue or Klamath).

[1] http://www.oregon.gov/DHS/ph/hab/advisories.shtml

- Because of the BLM and Forest Service concern regarding the potential for the spread of aquatic invasive species and pathogens, if hydrostatic test water cannot be returned to the same fifth field watershed from where it was withdrawn, Pacific Connector would employ an effective and practical water treatment method described below. The hydrostatic test water would be treated after it is withdrawn and prior to hydrostatic testing.

Pacific Connector researched various water treatment methods to disinfect non-municipal surface water sources that might harbor potential aquatic invasive species and pathogens. The potential treatment methods considered were previously identified and discussed with the land-managing agencies during the development of this Plan and included: various filtrations/screening treatment methods, UV treatment, Acrolein and Chlorine treatment. It was noted during the agency conversations that only chlorine has been approved for use as treatment for disinfection purposes on BLM-managed lands. The Forest Service also noted that a Pesticide Use Proposal would need to be prepared prior to the use of any chemical to treat/disinfect water on NFS lands. A Pesticide Use Proposal form is provided in Appendix 3 of the Integrated Pest Management Plan which is included as Appendix N to the POD.

The use of ultraviolet irradiation (UV) was initially considered as a potential treatment method because it is used extensively in municipal and industrial water treatment applications and is well known to be effective against a wide range of microganisms, including viruses and cysts (Lloyd's Register, 2007). However, it was concluded during the consultation meeting held on November 19, 2009, that because there is limited information available regarding the rate/dose and effectiveness of UV treatment on the various invasive species and pathogens (OSU, 2009; EPA, 1999; and Bettina, et al., 2000) that potential UV treatment methods would not be considered further at this time. UV treatment was not effective on chytrid fungus (Johnson et al., 2003). Currently, UV disinfection treatment technologies are being employed in some marine ballast water treatment applications (Lloyd's Register, 2007). Pacific Connector may consider this treatment technology in the future if additional information is available regarding its effectiveness on the aquatic invasives and pathogens of concern and if it is a cost effective and efficient treatment method.

Pacific Connector also concluded during the consultation meeting held on November 19, 2009, that while Acrolein (Magnacide H Aquatic Herbicide) is a registered aquatic herbicide for the control of invasive aquatic plants in canals, this potential treatment method would be dropped from further consideration because of its extreme toxicity to humans and fish species (Baker Hughes, 2009 and EPA, 2009). Baker Hughes, the manufacturer of Magnacide H Aquatic Herbicide, provides that fish are very sensitive to this herbicide and that fish are killed at concentrations less than those required for aquatic weed control and that as a rule, MAGNACIDE H Herbicide should not be used where fish are considered a resource (Baker Hughes, 2009).

Chlorine, an oxidizing agent, is approved for use in drinking water and is effective in disinfecting a number of aquatic invasive species. Chlorine is one of the most widely used drinking water disinfectants in the world (Oregon Department of Human Services, 2009b). Chlorine guidelines have been established to treat waterborne diseases such as cholera, typhoid, and dysentery. Chlorine also eliminates slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks. To disinfect drinking water, chlorine is applied as either elemental chlorine (chlorine gas) or through the use of chlorinating chemicals such as calcium hypochlorite (tablets or granules) or solutions of sodium hypochlorite (liquid bleach or Clorox®) (World Chlorine Council, 2008). On federal lands, Clorox® bleach is

registered for Port-Orford-cedar root disease management activities (Forest Service and BLM, 2004). Diluted bleach solutions are used to disinfect equipment, shoes, and boots when working in areas infested with Sudden Oak Death (California Oak Mortality Task Force, 2006) and to treat irrigation water in nurseries that grow *Phytophthora*-susceptible plants (for Port-Orford-cedar root disease and Sudden Oak Death) (OSU, 2009). Because of chlorine's use as a disinfectant for drinking water and vehicles and equipment potentially contaminated with various aquatic invasive and pathogens (see Attachment B), it was determined during the November 19, 2009 consultation meeting that chlorine treatment should be considered as a practical water treatment method for all non-municipal surface water sources that would be utilized for hydrostatic testing purposes.

Best Management Practices to Treat Non-Municipal Surface Water Sources Used for Hydrostatic Testing

Pacific Connector would implement a three-step BMP treatment process to prevent the potential spread of invasive species and forest pathogens from non-municipal surface water sources used during hydrostatic testing. The hydrostatic test water treatment process would incorporate screening/filtration during water withdrawal, chlorine treatment, and upland dewatering at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) or waterbodies, where feasible, with no dewatering to these features. Further, all hydrostatic dewatering locations would be monitored after construction to ensure noxious weeds have not established. Any weed populations would be treated as described in the Integrated Pest Management Plan (see Appendix N to the POD). This hydrostatic test water treatment process has been developed based on the invasive species and pathogens of concern and the management information available for their control (see Attachment B). A summary of and rationale for the proposed treatment process is described below:

1. **Screening/filtering.** Hydrostatic test water withdrawal from non-municipal surface water sources would be screened during the initial intake process. The screening/filtration process would meet NOAA[2] and ODFW[3] criteria to prevent the entrainment of small fish. These screening requirements would prevent the potential transfer of the noted noxious weeds of concern listed in Section 7.2.2 and Attachment B as the maximum screen mesh size (i.e., 2.38 mm) required by NOAA and ODFW is smaller than the smallest seed size documented for these weeds in Attachment B (i.e., 1/8 inch or about 3mm for seeds of yellow starthistle). Therefore, the screening/filtering requirements should prevent the potential transfer of noxious weed seeds and other weed propagules (i.e., rhizomes, roots, stems) from hydrostatic test dewatering.

   There are other types of industrial screening technologies that exceed ODFW and NOAA fish screening criteria that Pacific Connector would also employ to further remove solids and organics from non-municipal surface water sources. These types of filters include media or sand filters, bag filters[4], or various types of cartridge or screen filters[5]. These filters can remove solids and organic materials from water significantly smaller than 1 millimeter in size with some types having a submicron filter rating or capacity. However, smaller filtering capacities (i.e., < 100-200 µm) may not be practical because

[2] http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish_Passage_Design.pdf
[3] http://www.dfw.state.or.us/fish/screening/docs/pumpcert.pdf
[4] http://www.rainforrent.com/products/filters.htm
[5] http://www.rainforrent.com/products/filters.htm

of required hydrostatic testing pumping requirements. Depending on the filter technology selected, any potential disposal, cleaning, or backwashing of the filters would be conducted in a manner to prevent contamination of surface waters. Further, any necessary disposal of filtered materials or medium would occur to an approved disposal area or landfill.

Although currently there are no known infestations of quagga or zebra mussels in Oregon, micro filtration has been shown to be effective in preventing the potential spread of these mussels, as well as New Zealand mud snails downstream of research facilities (Cope, et al. 2002) or into hatcheries (Oplinger et al. 2009).

The principle vector for the spread of whirling disease is contaminated fish parts, and according to BLM (2009), this disease is typically not spread through water withdrawal activities. Although spores may reside in organics and mud (BLM, 2009), as noted in Section 3.0, when pumping water from a source location, the pump head will be submerged and maintained on average at the center of the water column so as to prevent sucking in organic materials, sediments and/or algae lying on the surface or in sediments resting on the bed of the waterbody. Therefore, Pacific Connector's proposed screening procedures should prevent the potential transfer of this disease.

2. **Chlorine Treatment.** As shown in Attachment B, chlorine disinfection is effective for most aquatic invasive species and forest pathogens of concern. However, most of the disinfection guidelines in the literature are for preventative treatments used on equipment, boats, boots/waders, etc. that may be infected from working or recreating in waters; they are not developed for treating entire waterbody sources. According to Oregon State University (2009), chlorine injection (Sodium hypochlorite) at a maximum concentration of 2 ppm for a contact time of at least 10 minutes is used to treat irrigation water in nurseries to kill *Phytophthora (*Port-Orford-cedar root disease and Sudden Oak Death*)*.

   For treating potentially contaminated materials and equipment, chlorine treatments as low as 0.5 ppm have also been shown to be an effective control on *Dreissenia* spp. mussels (quagga and zebra mussels) (Utah Division of Wildlife Resources, 2009; Brooks, 1993). Although higher concentrations of chlorine (i.e., 1 percent solutions) are recommended for disinfecting equipment or flushing tanks to prevent the potential spread of whirling disease, a type of zooplankton (BLM, 2009), ballast water research indicates most zooplankton are killed with filtration and chlorine treatments of 0.5 ppm (USGS, 2006). Chlorine treatments of 0.5 ppm and above have been shown to be effective in destructing cyclic peptides (toxin) of cyanobacteria, a blue-green algae (Hoeger, et. al., 2002). According to the World Health Organization (1999), chlorine is used mainly for control of algae in water treatment works but is also known to have been employed in reservoir situations. The effective dose rates are dependent on the chlorine demand of the water, but most algae are reported to be controlled by residuals of free chlorine between 0.25 and 2.0 mg/L.

   Using bleach to disinfect field equipment of chytrid fungus requires a minimum exposure of 10 minutes using a concentration of 0.4 percent sodium hypochlorite (Johnson, et al, 2003). Chlorine treatment is expected to be effective on Saprolegnia, a freshwater mold, known primarily to be problematic in fish hatcheries. Oregon Department of Human Services (2009b) requires chlorinated water systems to provide a minimum free chlorine

residual of 0.2 mg/L with a detention time of 30 minutes before reaching the first point of use.

Proposed Treatment Dose. Based on the various chlorine treatments methods for the various aquatic invasive species and pathogens that potentially may occur within identified water sources, Pacific Connector proposes to use a treatment of 2 ppm or 2 mg/L of free chlorine residual with a detention time of 30 minutes to treat all non-municipal surface waters that would be used as a water source for hydrostatic testing purposes. Higher chlorine treatment concentrations (i.e., 1 percent solutions), such as those suggested to treat potential contaminated equipment for whirling disease (zooplankton), are not proposed because, as noted by the BLM (2009), the principle vector for the spread of whirling disease is contaminated fish parts, not water withdrawal activities. Further, as noted by the USGS (2006), filtration and 0.5 ppm chlorine is shown to be effective in killing most zooplankton in ballast water research. The higher chlorine concentrations recommended to decontaminate equipment for didymo (1 minute of 2 percent bleach) are also not proposed because currently there are no nuisance blooms reported in Oregon (Draheim, 2009) and all dewatering of hydrostatic test water would occur to an upland area at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) and waterbodies, where feasible, with no discharge to features.

3. **Upland Dewatering.** During the hydrostatic testing process, all hydrostatic test water will be released to an upland area through a dewatering device such as a straw bale structure or sediment bag, in a manner to promote inflation. All dewatering devices will be at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) and waterbodies, where feasible, and dewatering will not occur to these features, as described in Section 7.3 below. The hydrostatic test dewatering BMPs are important measures to prevent the potential spread of aquatic invasives. As noted in Section 7.3 below, chlorinated water would be released according to the Oregon Department of Environmental Quality criteria to prevent water quality impacts, potential effects to aquatic species, and to minimize potential impacts to sensitive areas . Additionally, as described in Section 8.0 below, all dewatering locations will be monitored after construction for potential noxious weed establishment and treated if necessary.

After hydrostatic test water withdrawal, all equipment used in the withdrawal process would be cleaned and sanitized to prevent the potential spread of aquatic invasives and pathogens from the use of this equipment in other waterbody sources. Attachment C provides equipment cleaning and sanitization procedures.

These hydrostatic test water treatment BMPs are intended to ensure the prevention of invasive species and pathogen transfer between watershed drainages. The final design of the treatment BMPs will be completed once Pacific Connector has finalized the design of the pipeline and prepared the preliminary hydrostatic test plan and has selected the construction contractors for the project. Prior to implementing the final BMP treatment design, Pacific Connector would notify and receive appropriate approvals from federal land-managing agencies and state agencies.

7.2.5 Temperature and Flow Effects

Based on data from the USGS National Water Information System, anticipated average flow rate of the Rogue River near the proposed crossing location (near Dodge Bridge) is 1330 cubic feet per second (cfs). Anticipated withdrawal volumes from the Rogue for hydrostatic testing will

be approximately 800 gallons per minute (gpm) (1.78 cfs) which will have an immeasurable impact on the flow rate and temperature of the crossing at the time (average daily temperatures ranges from 68-71.6 degrees Farenheight).

Based on the estimated size of Fish Lake (483 acres of surface area and average depth ranging from 18 – 31 feet), the proposed withdrawal of approximately 8.7 acre-feet will have an immeasurable effect on lake levels and temperatures.

The one-time withdrawal of approximately 17.1 acre-feet of water from the Lake of the Woods for hydrostatic testing will likely occur in the late summer/early fall. Based on the estimated size of Lake of the Woods of just less than 1,200 acres of surface area and average depth of 27 feet, this withdrawal will have an immeasurable effect on lake levels and temperature.

Considering that water is essentially a non-compressible material, temperature increases from pressurization during hydrostatic testing is negligible. During the hydrostatic testing phase of the project, the pipeline will already be buried and is therefore not exposed to potential solar heating, except for a small area (approximately 200 feet) at either end of the test segment where the hydrostatic test headers are located. Therefore, the test water is at ground temperature and the potential to increase water temperatures during hydrostatic testing is inconsequential.

Where water source locations are proposed to be withdrawn from waterbodies, Pacific Connector's Environmental Inspectors (EIs) will monitor the streamflows prior to withdrawal to ensure that aquatic biota within the streams are not adversely affected.

7.3 Dewatering – Land Application

Hydrostatic test water will be released at a rate to prevent scour, erosion, and sediment migration to sensitive resources such as wetlands and waterbodies. The test water will be released into a dewatering device such as a straw bale structure or sediment bag to minimize possible peak flow effects by dissipating the energy of the test water flow, filter the test water to avoid sedimentation, and by allowing release of the test water as sheet flow onto the ground (see Attachment A - Drawing 3430.34-X-0012 (Sheets 1-3) and Drawing 3430.34-X-0013 (Sheets 1 of 3 and 3 of 3)). The dewatering will occur to an appropriately sized dewatering structure based on the expected quantity of water. Hydrostatic test water will be released in upland areas through a dewatering structure prior to entering the ground at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) and waterbodies, where feasible. The hydrostatic test water will not be allowed to discharge to wetlands or waterbodies.

The hydrostatic test dewatering will be conducted utilizing dewatering structures that dissipate the velocity of the release and filter out any potentially-present dirt, grit or oxidation that would be present collectively as total suspended solids (see Attachment A). All bales used to construct straw bale structures will be certified weed free. On federally managed lands, straw bales are required to consist of an annual variety of straw such as annual wheat, rye, or rice straw. The dewatering structures will be placed in upland locations that are topographically appropriate to allow the flow to "pool" and dewater uniformly through the structure to promote infiltration of the water. The water is not released at any appreciable pressure regardless of site location as the test pressure is bled off prior to dewatering the test segment. Flow rates to the dewatering structure can be controlled using the dewatering valve to ensure flows do not exceed the carrying capacity of the structure(s). Additionally, dewatering rates/volumes can be controlled by releasing the water into a central tank and then pumping the water to multiple

dewatering structures concurrently or successively (one then the other) to promote infiltration, minimize overland flow, and to prevent overland flow to waterbodies (see Attachment A - Drawing 3430.34-X-0012 (Sheets 1-3) and Drawing 3430.34-X-0013 (Sheets 1 of 3 and 3 of 3)). Pacific Connector's EIs will be responsible for monitoring dewatering activities (rate and quantity) and making appropriate adjustments to facilitate proper infiltration through the dewatering structures to stay in compliance with permit conditions. Pacific Connector's EIs will also monitor the structures to prevent any potential failures or "break outs" from occurring to the structure during dewatering activities by adding additional straw bales, fabric, or stakes as needed. The success rate of straw bale structures is solely dependent on the construction, inspection, monitoring, and maintenance of each structure. Pacific Connector's EIs will ensure all structures meet the performance standard of 100%.

If chlorinated municipal water or non-municipal treated water (see Section 7.2.3 above) is used, dewatering will be treated, if necessary, according to Oregon Department of Environmental Quality criteria to prevent water quality impacts, potential effects to aquatic species, and to minimize potential impacts to sensitive areas . It is not expected that contamination of the hydrostatic test water with oil and grease will occur during hydrostatic testing because the test will be conducted on a new pipeline system constructed with new pipe. Pacific Connector's EIs will also ensure that all threaded valves and fittings that may be used on the hydrostatic test headers are cleaned of potential incidental oil and grease before the hydrostatic operations are conducted to minimize the potential for oil and grease contact from these potential incidental sources. Straw bales have been effective in removing oil and grease from test water (Tallon et al., 1992).

In addition, the EIs will ensure that turbid water is not discharged to waters of the state. If an inadvertent discharge to a surface water occurs, the dewatering operations would be immediately halted and modified to ensure that the discharge to surface water is stopped and/or minimized and water quality standards are not exceeded.

Permission to release the hydrostatic test water through land application will be applied for through ODEQ.

8.0 MONITORING

After project construction, Pacific Connector's operations personnel will be responsible for inspecting the right-of-way for a period of three to five years in areas where noxious weeds were identified prior to construction and were previously mapped to ensure that potential infestations do not reestablish and spread. Monitoring will also occur in areas along the right-of-way where equipment cleaning stations and hydrostatic dewatering sites were located to ensure that infestations at these locations do not occur. If necessary, Pacific Connector will contract with local weed control boards, qualified biologists, or agronomists to conduct these operations. All areas of the right-of-way will be monitored by Pacific Connector's staff over the operational life of the pipeline. Pacific Connector will fulfill easement obligations with all landowners crossed by the project during the life of the project including weed control. As stated in Section 3.0 in the Integrated Pest Management Plan (Appendix N to the POD), herbicides may be used to control weeds, if necessary, based on integrated weed management principles and landowner requirements.

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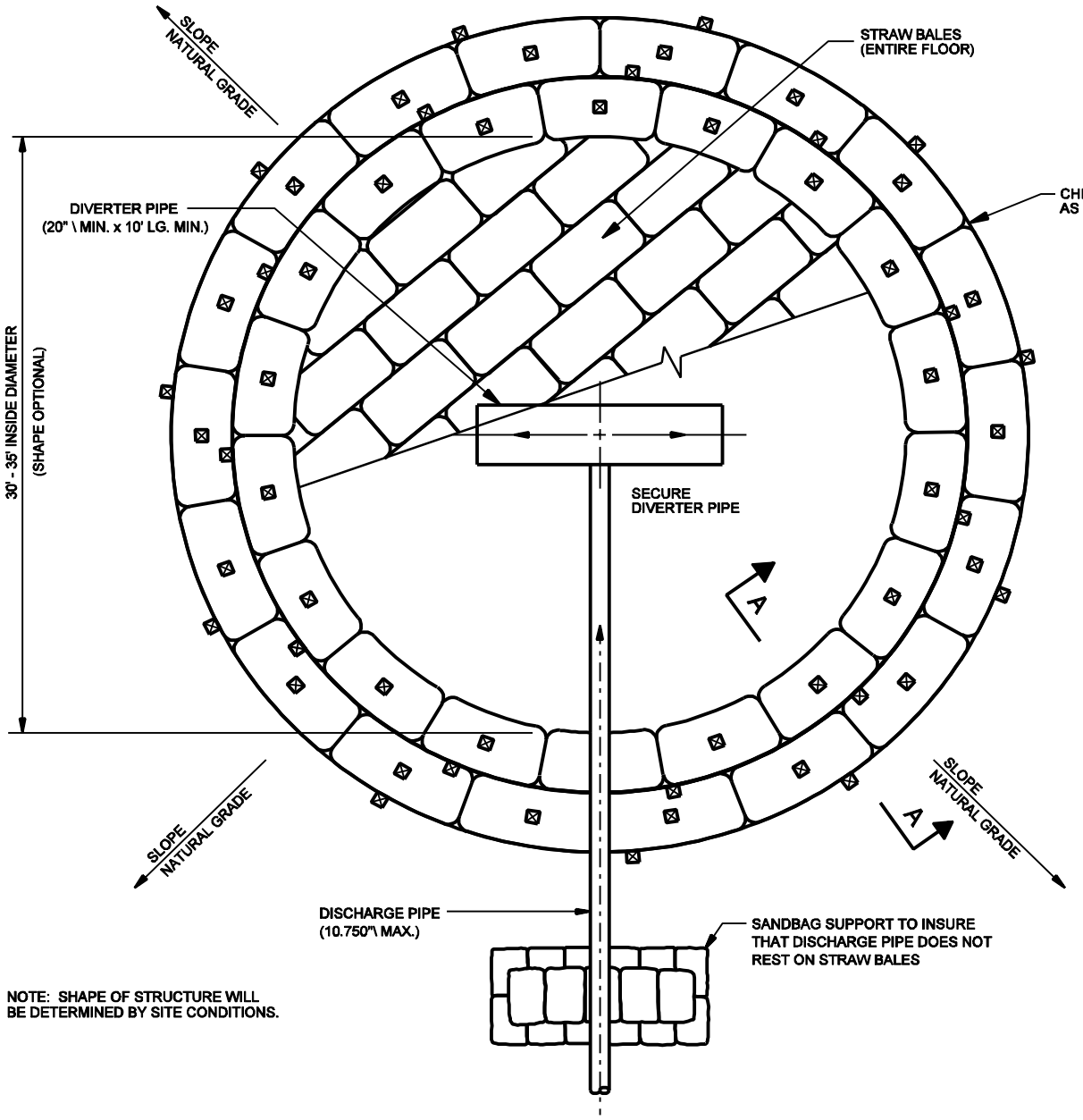
Attachment A

Hydrostatic Test Dewatering Structure Typicals

Drawing 3430.34-X-0012 (Sheets 1-3) and Drawing 3430.34-X-0013 (Sheets 1 of 3 and 3 of 3)



HYDROSTATIC TEST DEWATERING STRUCTURE

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL HYDROSTATIC TEST
DEWATERING STRUCTURE
HDW

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE		
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:			
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0012	SHEET 1 OF 3		
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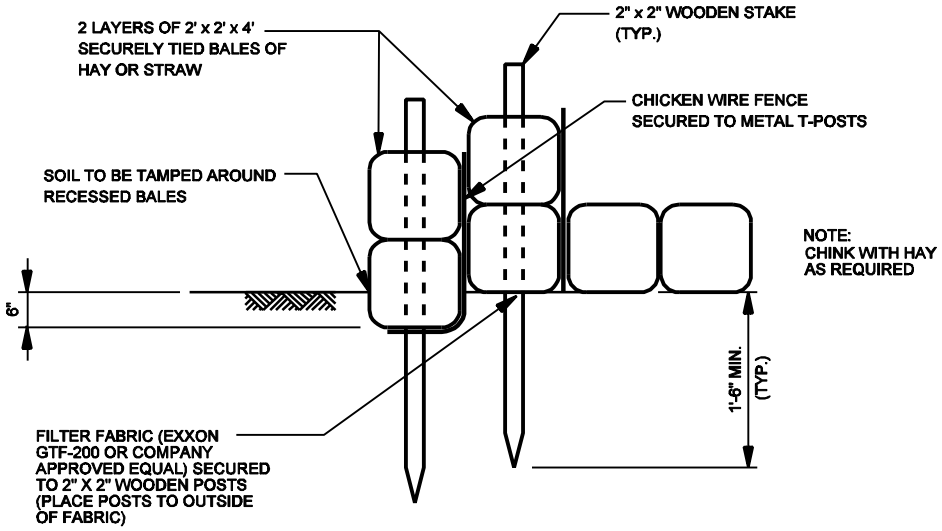

SECTION A-A

NOTE:
STAKES SECURING FILTER FABRIC AND CHICKEN WIRE FENCE ARE NOT SHOWN FOR CLARITY

NOTES:

1. STRUCTURE SHALL BE PLACED ON A LEVEL WELL VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM STRUCTURE AND ANY WORK AREAS.
2. FLOW RATES THROUGH DISCHARGE AND DIVERTER PIPES SHALL BE SUCH THAT STRUCTURE WILL NOT OVERFLOW.
3. WHERE CONDITIONS WARRANT A 30' x 30' RECTANGULAR STRUCTURE MAY BE SUBSTITUTED FOR THE CIRCULAR CONFIGURATION SHOWN.
4. DIMENSIONS SHOWN ARE THE MINIMUM ACCEPTABLE VALUES AND MAY BE VARIED DEPENDING UPON SPECIFIC LOCATION.
5. CONTRACTOR SHALL USE CERTIFIED NOXIOUS WEED FREE HAY OR STRAW FOR STRUCTURE.

HYDROSTATIC TEST DEWATERING STRUCTURE

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL HYDROSTATIC TEST
DEWATERING STRUCTURE

HDW

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DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0012	SHEET 2 OF 3
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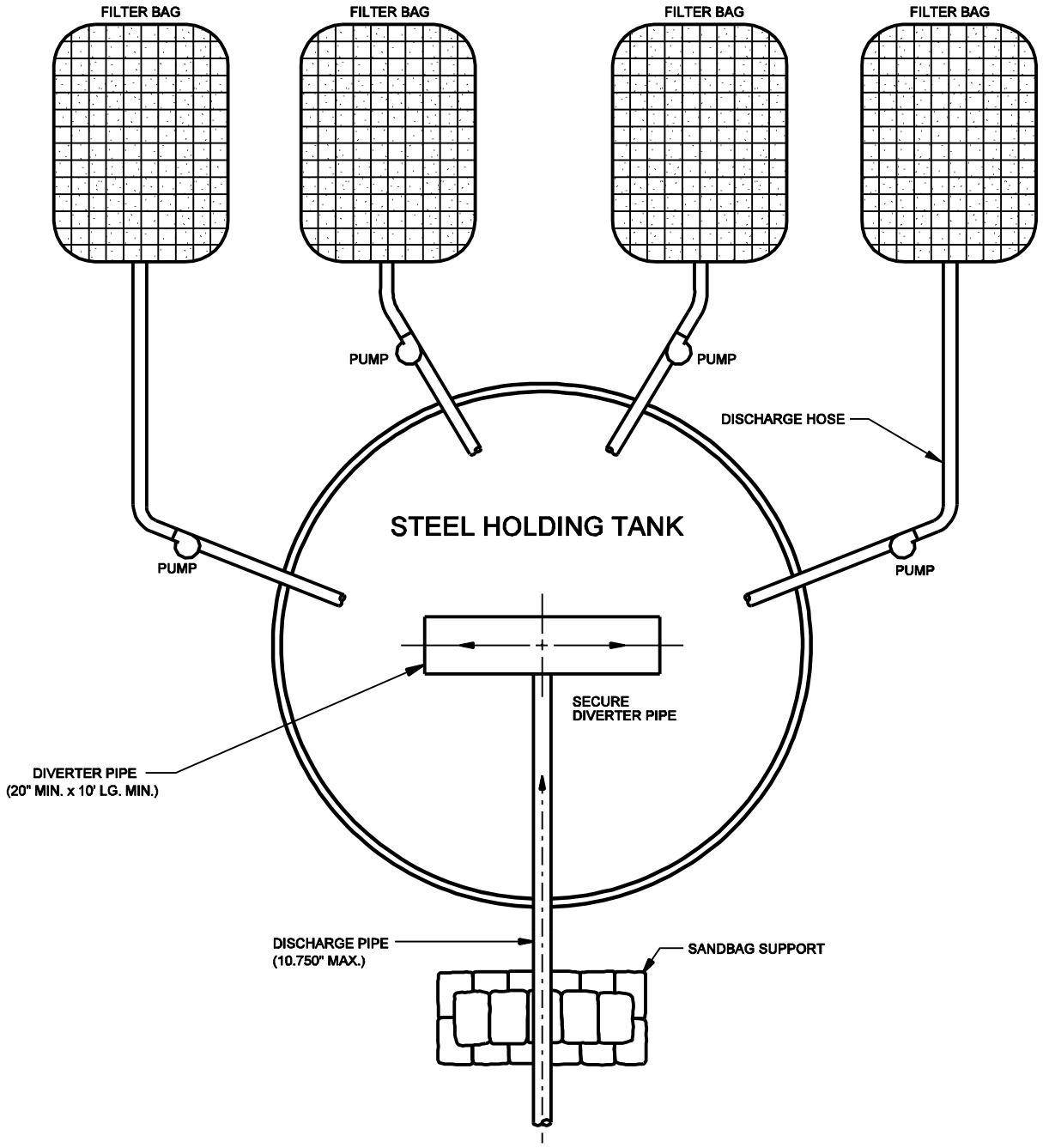

HYDROSTATIC TEST DEWATERING STRUCTURE

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL HYDROSTATIC TEST
DEWATERING STRUCTURE

HDW

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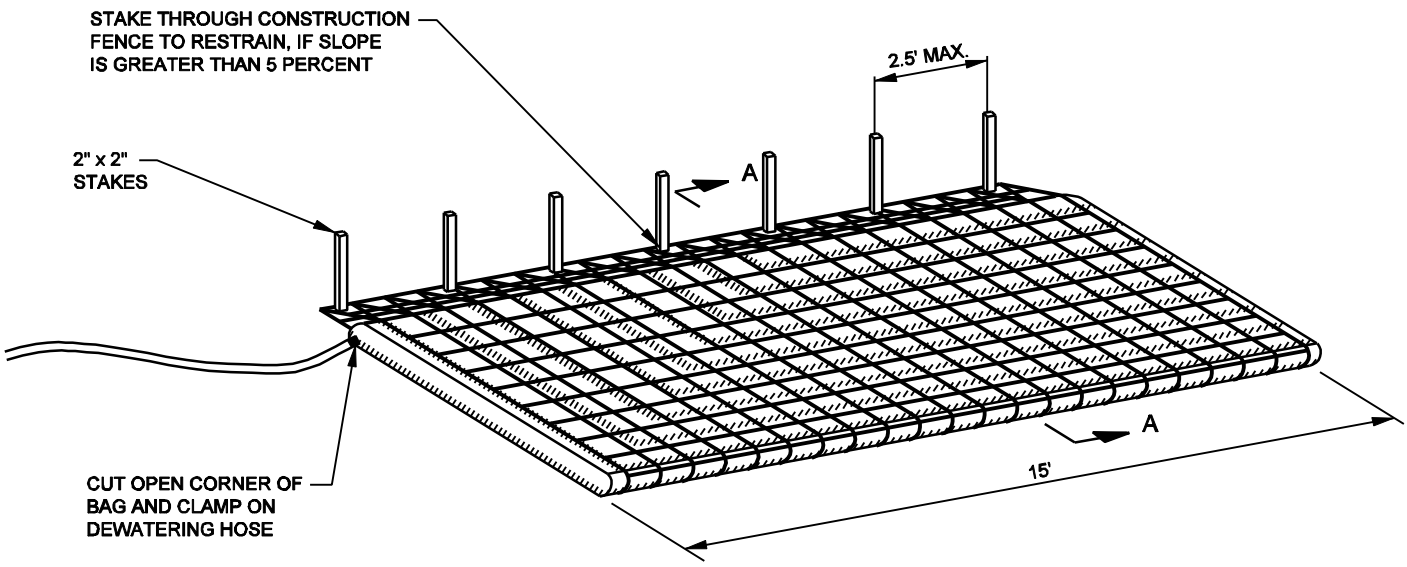

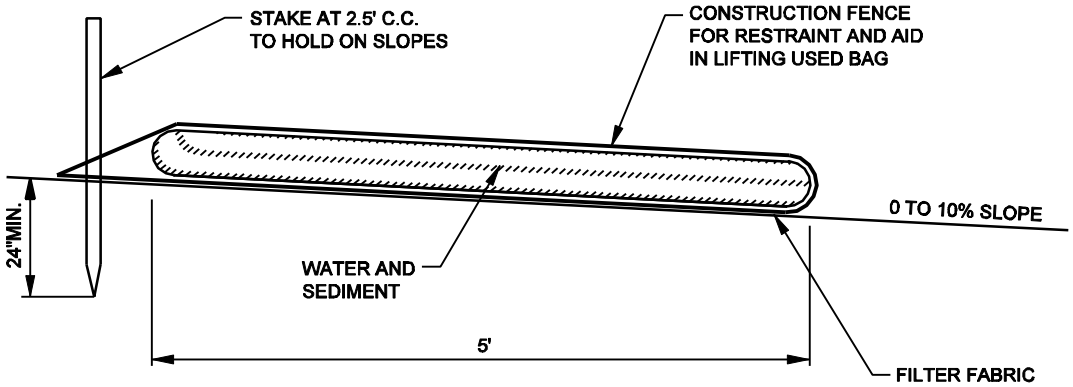

SECTION A-A

NOTES:

1. FILTER BAG SHALL BE PLACED ON A GENTLY SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE, ANY WORK AREAS, WATERBODIES OR WETLANDS.
2. THE FILTER BAG MUST BE STAKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE.
3. FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.
4. DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.

TRENCH DEWATERING

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL
TRENCH DEWATERING
TDW

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
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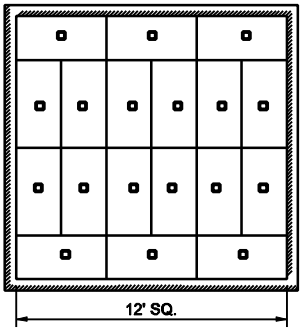
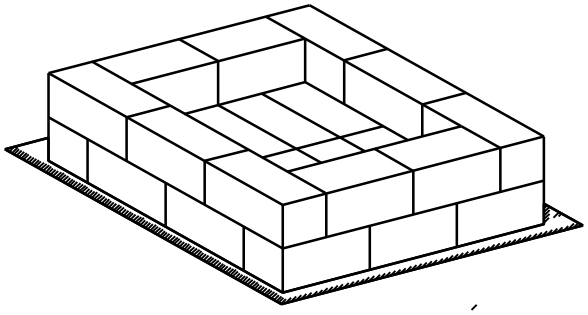


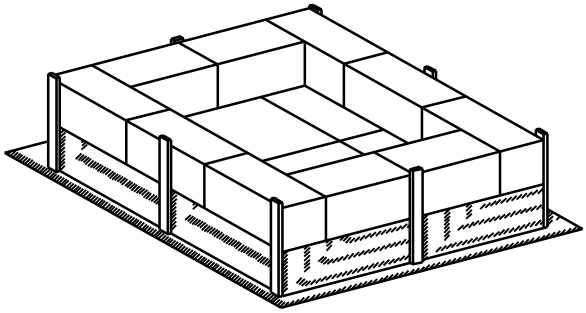
STEP 1

ARRANGE HAY BALES OVER FILTER FABRIC ON LEVEL LAND TIGHTLY PACKED AS SHOWN TO COVER AN AREA APPROXIMATELY 12' x 12'. SECURE EACH HAYBALE IN PLACE BY DRIVING REBAR OR A WOODEN STAKE THROUGH EACH OF THE HAY BALES



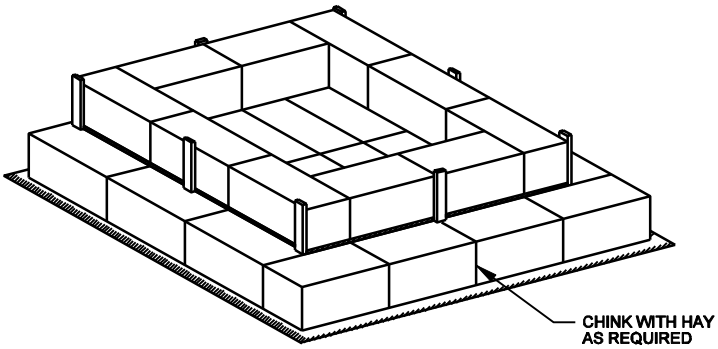
STEP 2

INSTALL ANOTHER LAYER OF HAY BALES ON THE OUTER EDGE AS SHOWN



STEP 3

INSTALL FILTER FABRIC ALL AROUND HAY BALE STRUCTURE AS SHOWN



STEP 4

INSTALL ANOTHER LAYER OF HAY BALES ON THE OUTSIDE OF THE FILTER FABRIC AND SECURE IN PLACE BY DRIVING REBAR OR A WOODEN STAKE THROUGH EACH OF THE OUTER HAY BALES

NOTES:

1. WHERE POSSIBLE STRUCTURE SHALL BE PLACED ON A LEVEL, WELL VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM STRUCTURE AND ANY WORK AREAS, WATERBODIES OR WETLANDS.
2. THIS MEASURE SHALL BE REMOVED UPON COMPLETION OF THE PROJECT. REMOVAL IS NOT CONTINGENT UPON ESTABLISHMENT OF PERMANENT VEGETATION. MATERIAL FROM BALES MAY BE SCATTERED ON RIGHT-OF-WAY.
3. CONTRACTOR SHALL USE CERTIFIED NOXIOUS WEED FREE HAY OR STRAW FOR STRUCTURE.

TRENCH DEWATERING

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL
TRENCH DEWATERING
TDW

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0013	SHEET 3 OF 3
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Attachment B

Potential Treatment Matrix

Attachment B
Treatment Matrix

Invasive Species (*Scientific Name*)	Occurrence in the Project Area	Individual Size	Effectiveness of Potential Treatment Methods		
			Filter Intake (NOAA/ODFW Criteria) with Discharge to Upland Straw Bale Structure for Infiltration. Implement Integrated Pest Management BMPs	Chlorine Treatment	Secondary Filtration: Media, Bag or Cartridge (filter limits to 100 µm- required pumping rate will limit filter size).
Weeds					
Scotch broom (*Cytisus scoparius*)	Yes-Coos, Douglas & Jackson counties (PCGP, 2009 & ODA)	Plant produces a 2-5 cm long pea-pod-like fruit (Peterson and Prasad 1998). Seed size 5 mm diameter (Myers, J.H, and D. Bazely, 2003),	Yes	No data	Yes
Himalayan blackberry (*Rubus discolor*)	Yes- All Project counties (PCGP, 2009 & ODA)	Fruit: up to 0.8 in (2 cm) long, with large succulent drupelets (California Invasive Plant Council)	Yes	No data	Yes
Yellow starthistle (*Centaurea solstitialis*)	Yes- All Project counties (PCGP, 2009 & ODA)	Seeds 1/8 inch long; Fruits 2-4 mm long (California Invasive Plant Council)	Yes	No data	Yes
Forest Pathogens					
Port Orford cedar root disease (*Phytophthora lateralis*)	Yes – Coos County; three locations in Douglas County distant from project area & outside crossed watersheds (PCGP, 2009 & ODF)	Zoospores form cysts, 10–12 µm diameter which germinate to produce hyphae; resting spores 50 µm diameter (CAB International, 1998). (note: 1 µm = 1 x 10-6 m)	No	Yes Treatments for cleaning equipment/potentially contaminated materials: Clorox® Ultra Institutional (1 gallon of Clorox® to each 1,000 gallons of water) (BLM, 2003) Chlorine injection to treat irrigation water to kill *Phytophthora*. Sodium hypochlorite is injected, at a maximum concentration of 2 ppm, for a contact time of at least 10 minutes (Oregon State University, 2009). In California, the registration rate for the treatment of drafted water with Ultra Clorox in areas of Phytophthora is 1 gallon infestation of Ultra Clorox Bleach per 10,000 gallons of water (California Oak Mortality Task Force, 2006).	Sand filtration is suggested to use with other treatments but typical nursery irrigation pumping rates/volumes limit use (i.e., 250-300 GPM per acre) (Oregon State University, 2009). Sand filtration is effective at reducing chlorine demand by removing organics from source waters, which improves treatment.
Sudden Oak Death (*Phytophthora ramorum*)	Outside project area - nine sites totaling less than 40 acres in Curry County (USDA, 2010 & California Oak Mortality Task Force, 2006)	Sporangia are oval-shaped, 30-90 µm (Global Invasive Species Database, 2009)	No	Yes Chlorine injection to treat irrigation water to kill *Phytophthora*. Sodium hypochlorite is injected, at a maximum concentration of 2 ppm, for a contact time of at least 10 minutes (Oregon State University, 2009). In California, the treatment of drafted water with Ultra Clorox is similar to the recommended water treatment for *P. lateralis*, which causes Port-Orford Cedar Root Disease. The registration rate is 1 gallon of Ultra Clorox Bleach per 10,000 gallons of water (California Oak Mortality Task Force, 2006)	Sand filtration is suggested to use with other treatments but typical nursery irrigation pumping rates/volumes limit use (i.e., 250-300 GPM per acre) (Oregon State University, 2009). Sand filtration is effective at reducing chlorine demand by removing organics from source waters, which improves treatment.
Aquatic Invasives					
Mollusks					
Quagga Mussels (*Dreissena rostriformis bugensis)*	None in OR (USGS, 2009)	Microscopic to about two inches long (U.S. Fish & Wildlife Service, 2007). Dreissena mussel larvae (planktonic veligers) are approximately 40µm in length for one to two weeks. Within two to five weeks, the larvae become too large (200 µm) and heavy to freely swim and settle out of the water column (Nichols and Black, 1994).	Yes – (i.e., upland discharge, no direct discharge to waterbodies). Current Risk = low	Yes Treatment to disinfect contaminated equipment with a bleach rinse ranging between 0.5 mg/L to 250 mg/L (Cope et al., 2003 & Utah Division of Wildlife Resources, 2009) and 3 oz of bleach to 5 gallons of water for 1hr (U.S. Fish & Wildlife Service, 2007)	No data but expected to be similar to effectiveness for zebra mussels

Invasive Species (*Scientific Name*)	Occurrence in the Project Area	Individual Size	Effectiveness of Potential Treatment Methods		
			Filter Intake (NOAA/ODFW Criteria) with Discharge to Upland Straw Bale Structure for Infiltration. Implement Integrated Pest Management BMPs	**Chlorine Treatment**	**Secondary Filtration: Media, Bag or Cartridge (filter limits to 100 µm- required pumping rate will limit filter size).**
Zebra Mussels (*Dreissena polymorpha)*	None in OR (USGS, 2009)	Microscopic to about two inches long. Dreissena mussel larvae (planktonic veligers) are approximately 40µm in length for one to two weeks. Within two to five weeks the larvae become too large (200 µm) and heavy to freely swim and settle out of the water column (Nichols and Black, 1994).	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Treatment rates to prevent fouling of water intakes was 0.5 ppm for 24 hours (Brooks, 1993) Treatment to disinfect contaminated equipment with a bleach rinse ranging between 0.5 mg/L to 250 mg/L and 3 oz of bleach to 5 gallons of water for 1hr (Cope et al., 2003; U.S. Fish & Wildlife Service, 2007; Cope, et al. 2002 & Utah Division of Wildlife Resources, 2009)	Yes - Containment procedures commonly used at facilities conducting zebra mussel research have included filtration or disinfectant treatments to remove or kill potential zebra mussels before water is discharged. Filtration of outflow water through small mesh bags (100 µm or smaller), chlorine treatment tanks and sand filters (Cope, et al., 2002)
New Zealand mud snails (*Potamopyrgus antipodarum)*	Yes –Coos Bay Estuary & Lower Coos River (USGS, 2009 & Montana State University, 2009)	Sexually mature females (3-6 months old); size from 3 mm long in western Montana & Idaho; average length 4-5 mm in western US, maximum 11 mm in New Zealand. Embryos born live with 3 mm shell length (US Army Corps of Engineers)	Yes (i.e., upland discharge, no direct discharge to waterbodies) No hydrostatic test water will be acquired from the Coos Bay Estuary or Lower Coos River. Municipal water is proposed for use in Coos County.	Not Effective (BLM, 2009) Ely (2009) indicated that chlorine bleach solutions were not effective on adult snails and provided a recommendation of 1 tablespoon bleach /gallon water (i.e., 0.5 oz/gallon) for cleaning equipment for zebra and quagga mussels as a minimum.	Yes - According to Oplinger et al (2009), filtration of incoming water to a hatchery is a controlling option for New Zealand mud snails. Hydrocyclones have been successfully used to remove drifting New Zealand mud snails from hatchery inflow and noted that media filters (e.g., sand) and membrane filters could also be used.
Brackish water snail *(Assiminea parasitologica)*	Yes – Including Coos Bay Estuary (USGS, 2009 & Carlton, J., 2008)	Mature snails up to 4-6 mm (Carlton, J., 2008).	Yes (i.e., upland discharge, no direct discharge to waterbodies)	No data, but assumed to be effective based on results with Quagga and Zebra mussels.	No data but expected to be similar to effectiveness for zebra mussels
Zooplankton					
(Whirling Disease - *Myxobolus cerebralis*)	Present in Oregon and in South Umpqua HUC (Montana Water Center, 2010)	Microscopic myxozoan; myxospores produced in salmonids are 7-10 µm long; infectious triactinomyxon spores are 150 µm long with three tails each 200 µm long (US Army Corps of Engineers)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes The principle vector for spread of whirling disease is contaminated fish parts; it is not typically spread through fire water withdrawal activities. Avoiding and removing organics (the spores reside in mud), power washing, and flushing will greatly reduce or eliminate spores on external gear surfaces. 10 minutes with 1 percent bleach (e.g., Clorox – 6 percent sodium hypochlorite (NaClO)) is recommended for washing equipment or flushing tanks (BLM, 2009). Whirling disease and New Zealand mud snails are the most difficult organisms to kill. Treatment for these species will be effective for all other species as well. Ballast water research results from experiments with filtration and chlorine are most promising: 0.5 ppm chlorine with filtration killed most of the zooplankton (USGS, 2006)	Expected to be effective since, as noted by (BLM, 2009), the principle vector for spread of whirling disease is contaminated fish parts.

Invasive Species (*Scientific Name*)	Occurrence in the Project Area	Individual Size	Effectiveness of Potential Treatment Methods		
			Filter Intake (NOAA/ODFW Criteria) with Discharge to Upland Straw Bale Structure for Infiltration. Implement Integrated Pest Management BMPs	**Chlorine Treatment**	**Secondary Filtration: Media, Bag or Cartridge (filter limits to 100 µm- required pumping rate will limit filter size).**
Algae					
Didymo (*Didymosphenia geminate*)	No nuisance blooms in Oregon reported (Draheim, 2009)	Cell ≈70 µm (Spaulding and Elwell, 2007)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Decontaminate equipment for 1 minute in 2 percent bleach solution (BLM, 2009 & Spaulding and Elwell, 2007). Also indicated that the treatment for whirling disease may apply to this species (BLM, 2009)	No data
Cyanobacteria - blue-green algae	Yes – Cyanobacteria are commonly found in many freshwater systems across the world and blooms occur in many lakes, rivers, and reservoirs across Oregon. No health advisories have been posted for any of the proposed test water sources. (Oregon Department of Human Services, 2009a).	Anabaena spp. akinetes cells 6-13 microns (µm) diameter, 20-50 µm long; heterocysts are 7-9 µm diameter, 6-10 µm long, for example (Washington State Department of Health, 2009)	Yes (i.e., upland discharge, no direct discharge to waterbodies) Pacific Connector would also review Oregon Department of Human Services, 2009a health advisories to ensure harmful algae bloom have not been posted for proposed water sources.	Yes To be effective, a residual of ≥ 0.5 Cl2 mg/l with at least a 30-minute contact time is required to destruct cyanobacteria cyclic peptides (toxin) (Hoeger, et. al., 2002). Chlorine is used mainly for control of algae in water treatment works but is also known to have been employed in reservoir situations. The effective dose rates are dependent on the chlorine demand of the water, but most algae are reported to be controlled by free chlorine residual rates between 0.25 and 2.0 mg/L (WHO, 1999).	Not effective (Bettina, et al., 2000)
Fungi/Mold					
Chytrid fungus (*Batrachochytrium dendrobatidis*)	Yes (Pearl et. al., 2009)	Disease-causing zoospores are 3- 5 µm with a single flagellum 19-20 µm long; zoosporangian ~30 µm across (Johnson and Speare, 2003)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Bleach, was rapidly effective for disinfecting equipment at concentrations of 1 percent sodium hypochlorite and above. At 0.4 percent, it required a minimum exposure time of 10 minutes to kill Chytrid fungus. (Johnson et al., 2003) Spraying down equipment with 409 cleaner and then letting it dry in the sun also effectively kills the spores (Utah Division of Wildlife Resources, 2009)	No data
Water Mold (*Saprolegnia*)	Likely (Kiesecker, et al., 2001) Aquatic fungi (Saprolegniales) are ubiquitous in natural waters supplies of fish hatcheries (Schreck et al., 1993)	5 – 100 (µm) Spores, Oospore Mycellum and Zoosporangia (Mayer Kent, 2000)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Chlorine guidelines have been established to treat waterborne diseases such as cholera, typhoid, and dysentery. Chlorine also eliminates slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks (World Chlorine Council, 2008). Oregon Department of Human Services (2009) requires chlorinated water systems to administer a minimum free chlorine residual of 0.2 mg/L with a detention time of 30 minutes before reaching the first point of use in the system (Oregon Department of Human Services. 2009b)	No data

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Attachment C

Hydrostatic Test Water Withdrawal Equipment Cleaning and Sanitizing Procedures

Cleaning and Sanitizing Procedures[1]

1) All hydrostatic test water withdrawal equipment and waterbody crossing equipment or materials that come into contact with raw water (non-municipal surface water) should be sanitized. Aquatic invasive species and pathogens can be transported in tanks, buckets, hoses, screens, bilges, flume pipe(s) and any other construction equipment or materials that hold water or aquatic plant or substrate materials.

2) Drying alone may be effective in some situations, depending upon the target species, types of equipment, temperature, and relative humidity; however, precautionary cleaning and/or sanitization should be performed.

3) Clean and/or sanitize all equipment and materials before moving from one location to another or when moving between watersheds. Cleaning and sanitizing equipment, as described here, will be necessary before use as well as after use if equipment has been obtained from a source where sanitizing history is unknown.

4) Pacific Connector's Environmental Inspector (EI) will establish sanitation areas where there is no potential for runoff into storm drains, waterways, or sensitive habitats. The EI will ensure that wash water will not contaminate another water source.

5) Remove all visible plant parts, soil, and other materials from external surfaces of equipment and gear. Powerwash all accessible surfaces with clean, hot water (≥140^{o}F, if possible). Powerwashing with hot water will greatly reduce the likelihood that aquatic invasive species are present, and chemical sanitation of external surfaces would not be necessary (BLM, 2009).

6) Intake hoses, pumps, screens, and tanks can become contaminated with infected water or by sucking the organisms up from the bottom of a stream or pond. Disinfect tanks after each incident, and disinfect tanks before use if previous sanitation of the equipment has not occurred or is unknown. Set up a portable disinfection tank (e.g. fold-a-tank, 55-gallon barrel, 5-gallon bucket, etc., depending on the cleaning capacity needed) using a 1 to 2 percent bleach solution.

   Pump cleaning solution through portable pumps for 10 minutes. Pump the solution through the hose and then rinse with water. Discharge used cleaning solution back into the disinfection tank for re-use. Alternatively, use a 5% cleaning solution of quaternary ammonium compound. This is a common cleaning agent used in homes, swimming pools, and hospitals, and is safe when used at the recommended concentration (BLM, 2009).

Disposal

Use caution when disposing of the used cleaning solution and follow all federal, state, and local regulations. Do not dump cleaning solution into any stream or lake or on areas where it can migrate into any stormdrain, waterbody, or sensitive habitat. Chlorinated water may be released according to ODEQ criteria. Small quantities may be disposed of down sanitary drains into a municipal sewer system. Larger quantities may need to be transported to a municipal wastewater treatment facility.

[1] Developed from:

Bureau of Land Management. 2009. Interagency Guidance. Preventing Spread of Aquatic Invasive Organisms Common to the Southwest Region. Technical Guidelines for Fire Operations. Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, Arizona Game and Fish Department, and New Mexico Department of Game and Fish.

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Attachment D

Maps

(forthcoming)

Attachment E

Hydrostatic Test Plan Impacts Assessment

GeoEngineers

Memorandum

Plaza 600 Building, 600 Stewart Street, Suite 1700, Seattle, Washington 98101, Telephone: 206.728.2674, Fax: 206.728.2732 www.geoengineers.com

To:	Randy Miller, PCGP
From:	Jonathan Ambrose, Associate Hydrologist
Date:	December 1, 2015
File:	16724-001-10
Subject:	Hydrostatic Test Plan Impacts Assessment

INTRODUCTION

This memo is prepared in response to questions posed to Pacific Gas Connector Project (PCGP) by Oregon Department of Environmental Quality (ODEQ) in the October 7, 2015 Data Request II related to potential impacts associated with water withdrawals for hydrostatic testing. The proposed hydrostatic testing plan is fully documented in the Hydrostatic Test Plan document (PCGP, October 2015).

Limited licenses for water withdrawals are proposed for four water body types to fill the pipeline for pressure testing: natural streams, managed canals, natural lakes, and reservoirs. The methods used to evaluate the impacts to each water body type is outlined below.

NATURAL STREAMS CHANNELS

The United States Geological Survey's (USGS) Stream Segment Temperature Model (SSTEMP) v.0.8 was used to estimate the potential thermal impacts of water withdrawals from the six natural channel crossing locations proposed for water use: Olalla Creek (MP 58.75), South Umpqua River Crossing #1 (MP 71.30), South Umpqua River Crossing # 2 (MP 94.73), Rogue River (MP 122.5), North Fork Little Butte Creek (MP 146.70), and Klamath River (MP 199.20). Models were run to simulate water withdrawals in mid-November, the expected period of use for the limited withdrawal permits. Each site was modeled for two conditions, to analyze thermal impacts at both 0.02 miles and 0.1 mile downstream of the withdrawal location.

SSTEMP is a mechanistic, one-dimensional heat transport model that predicts the daily mean and maximum water temperatures as a function of stream distance and environmental heat flux. Net heat flux is calculated as the sum of heat to or from long-wave atmospheric radiation, direct short-wave solar radiation, convection, conduction, evaporation, streamside vegetation (shading), streambed fluid friction, and the water's back radiation. The heat flux model includes the incorporation of groundwater influx. The heat transport model is based on the dynamic temperature-steady flow equation and assumes that all input data, including meteorological and hydrological variables, can be represented by 24-hour averages.

Model manipulations may include reservoir discharge and release temperatures, irrigation diversion, riparian shading, channel alteration, or thermal loading. The model was used in this study to help assess the effects of flow diversion on stream temperature.

Model Assumptions

Ambient Flow Conditions were modeled using a 50 percent exceedance value for the site based on flow data from the USGS StreamStats Oregon program. Ambient thermal data was derived from historic measurements during the specified period. Channel geometry data was provided through site survey completed by PCGP and/or light detection and ranging (LiDAR) data. The estimated withdrawal rates are based on typical pumping rates for commonly available pumps. Total pump duration is not required for thermal modeling, but the total potential volumes are identified in the Hydrostatic Test Plan. Tables 1 and 2 summarize the key model assumptions.

TABLE 1. MODELED FLOWS AT TIME OF LIMITED WATER WITHDRAWALS

Stream Name	Ambient Flow Rate (cfs) (50% Exceedance, Nov)	Withdrawal Rate (cfs)	Downstream Flow Rate (cfs)
Olalla/Lookingglass Creek	22	4.4	18
South Umpqua #1	925	11	914
South Umpqua #2	440	11	429
Rogue River	1130	11	1119
North Fork Little Butte Creek	28	4.4	24

TABLE 2. DATA SOURCES FOR SSTEMP PARAMETERS

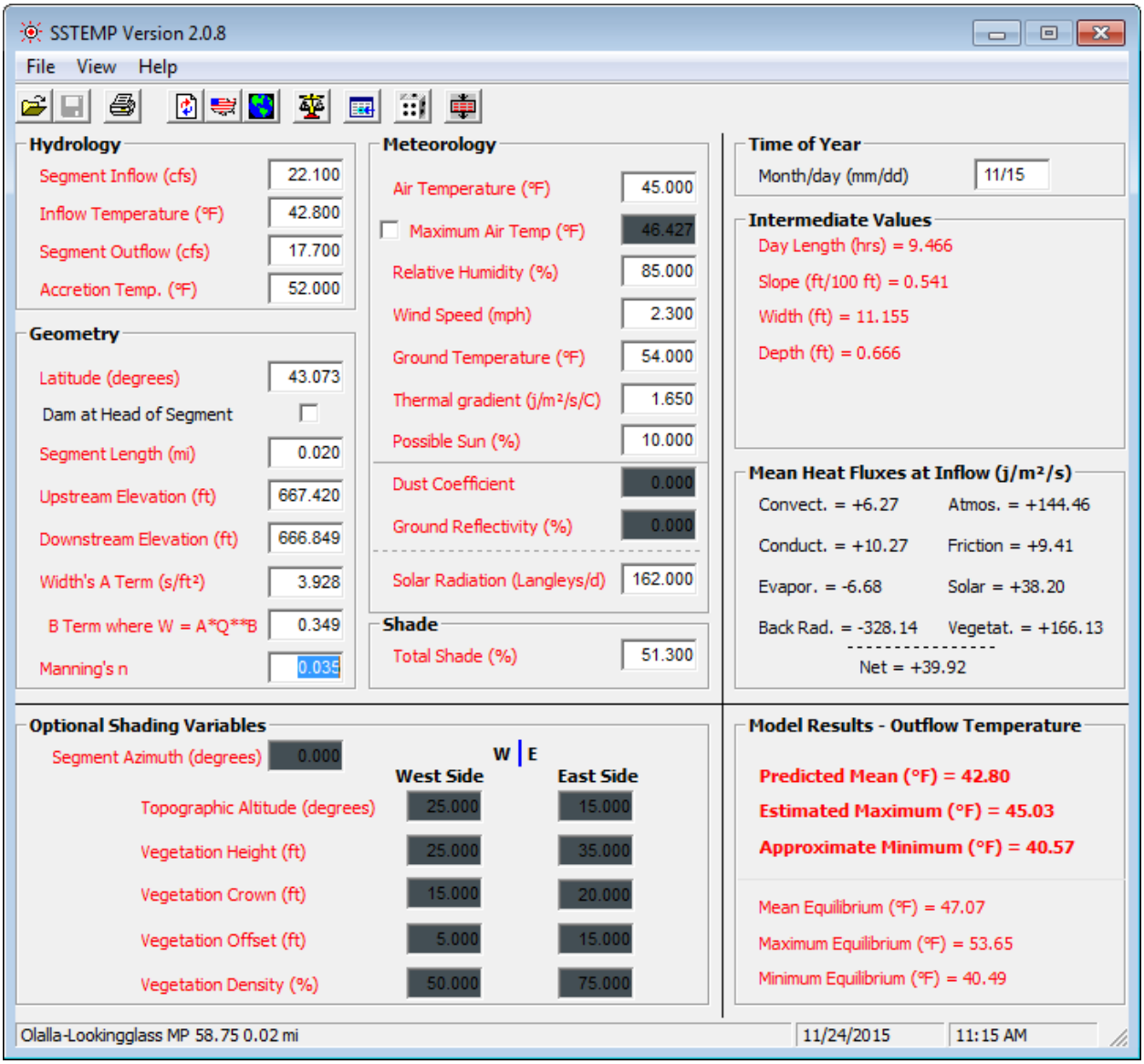
Data	Source
Flow Data	USGS StreamStats for Oregon
Stream Temperature	https://weatherspark.com/
Accretion Temperature	Olalla/Lookingglass Watershed Assessment and Action Plan
Latitude	GIS
Elevation and Slope	GIS; 10m USGS DEM
Widths A and B terms	Utilized Federal Highways Administration's Hydraulic Toolbox 4.2 and Microsoft Excel. Channel Geometry for use in the tool was obtained from previous hydraulic models generated for a site or from most recent survey of the crossings.

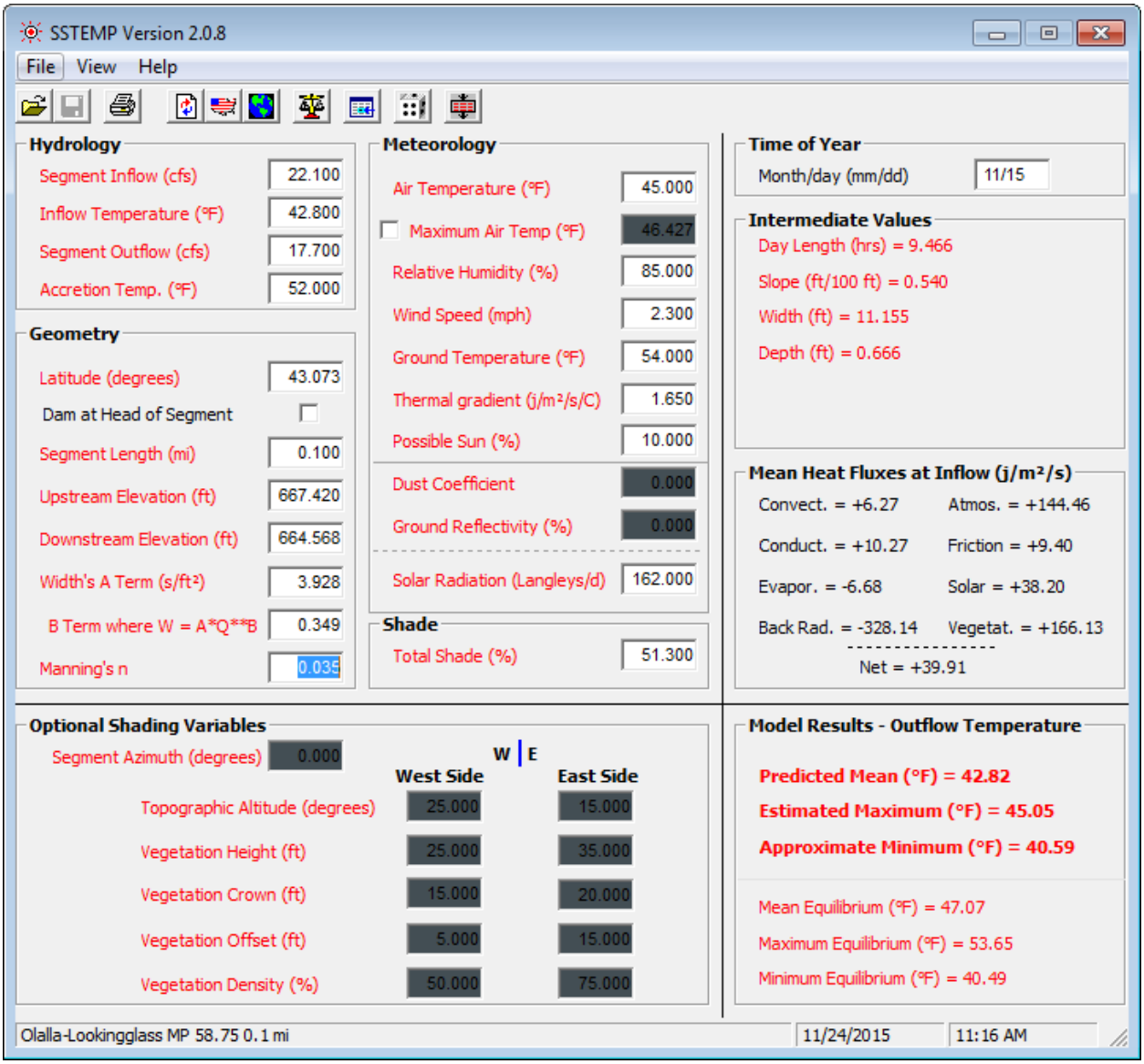
SSTEMP Model Results

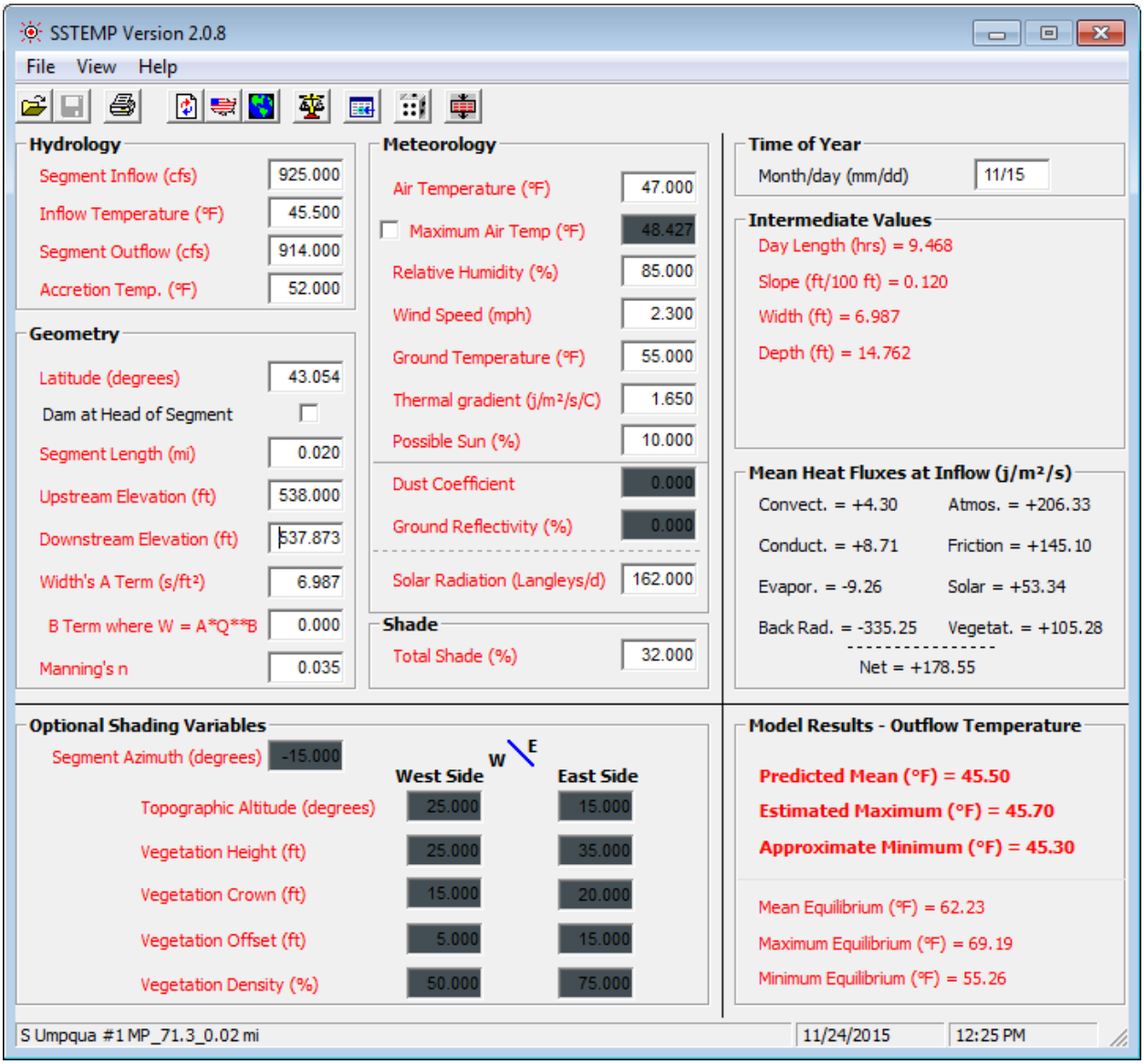
SSTEMP thermal predictions resulting from the five proposed withdrawals from natural channels are presented in Table 3 and the screenshots below. Each crossing is modeled for two runs, at 0.02 and 0.1 miles downstream of the proposed withdrawal location. Model results are provided in terms of a predicted mean, maximum, and minimum outflow temperature. The stream and model run are shown in the bottom left corner of each screen shot. Results show little predicted thermal effects of limited withdrawals during the expected season of use (mid-November), at the 50% exceedance flows for each stream at the diversion location.

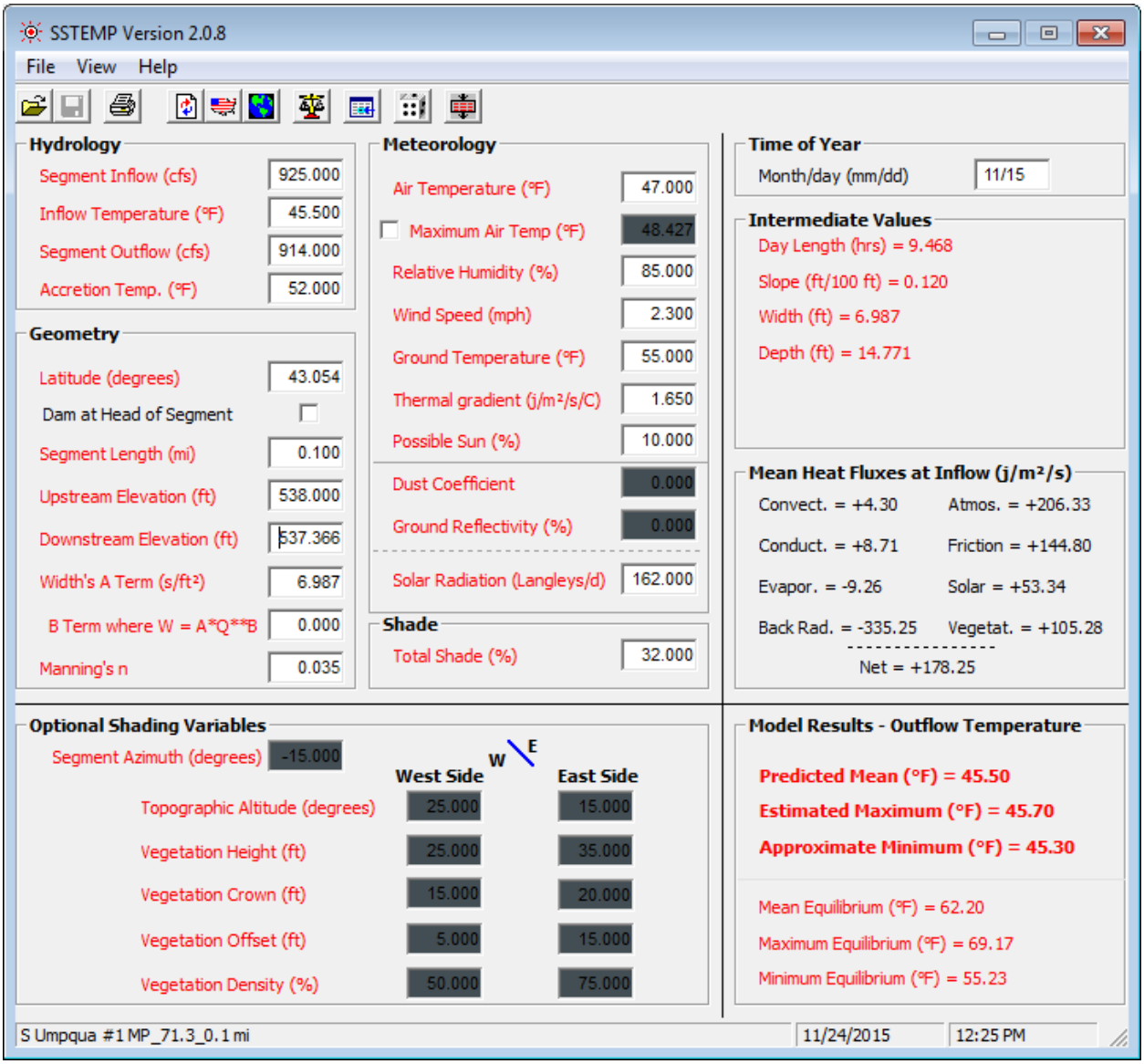
TABLE 3. SSTEMP RESULTS: ESTIMATED THERMAL EFECTS OF STREAM CHANNEL WATER WITHDRAWALS

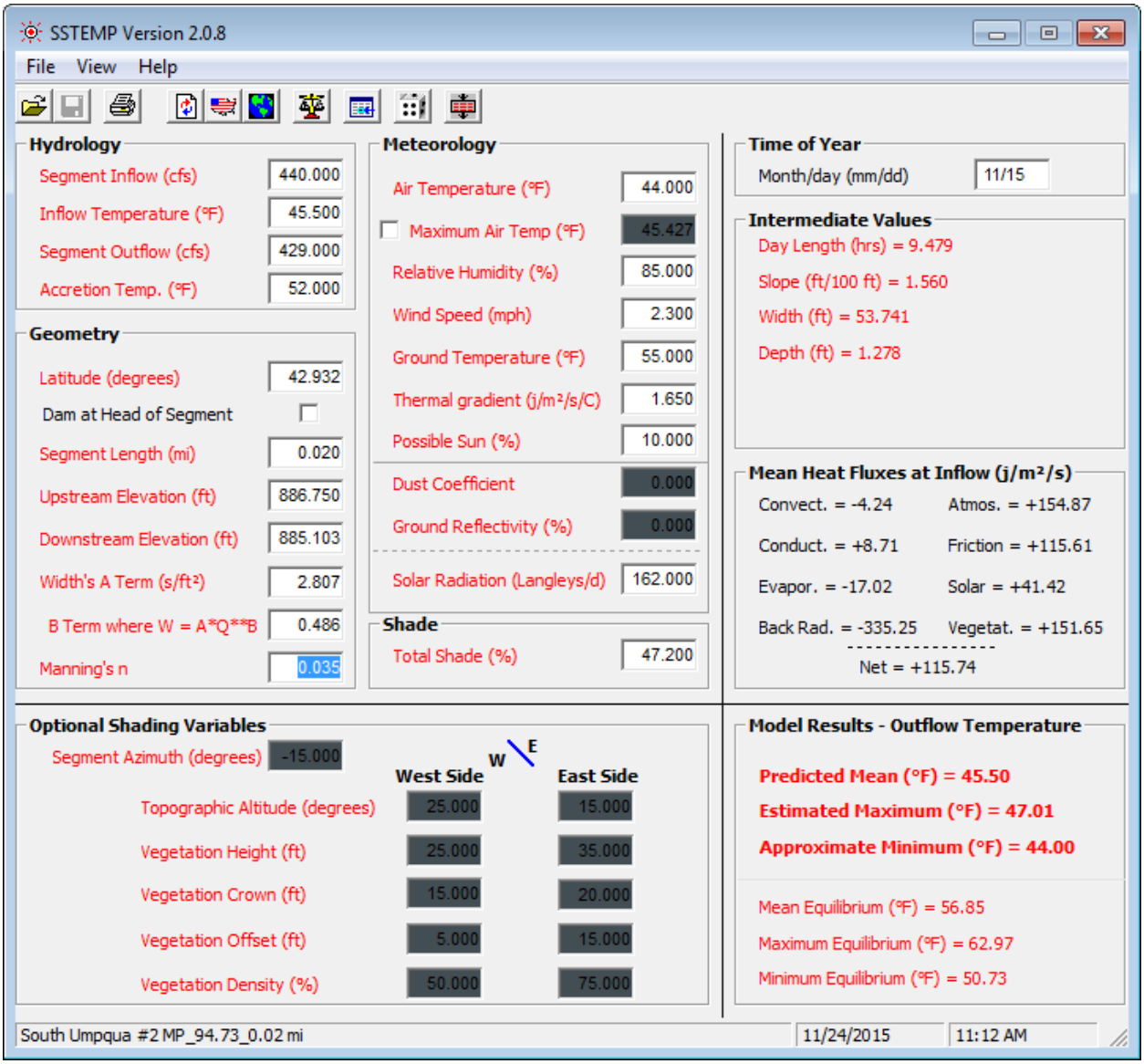
Stream Name	Estimate of Ambient Stream Temperature at time of Withdrawal (°F)	Distance Downstream of Withdrawal (mi)	Predicted Mean (°F)	Estimated Maximum (°F)	Approximate Minimum (°F)
Olalla/Lookingglass Creek	42.8	0.02	42.80	45.03	40.57
	42.8	0.10	42.82	45.05	40.59
South Umpqua #1	45.5	0.02	45.50	45.70	45.30
	45.5	0.10	45.50	45.70	45.30
South Umpqua #2	45.5	0.02	45.50	47.01	44.00
	45.5	0.10	45.51	47.02	44.01
Rogue River	44.2	0.02	44.20	44.86	43.54
	44.2	0.10	44.21	44.86	43.55
North Fork Little Butte Creek	42.8	0.02	42.80	45.40	40.21
	42.8	0.10	42.81	45.41	40.22

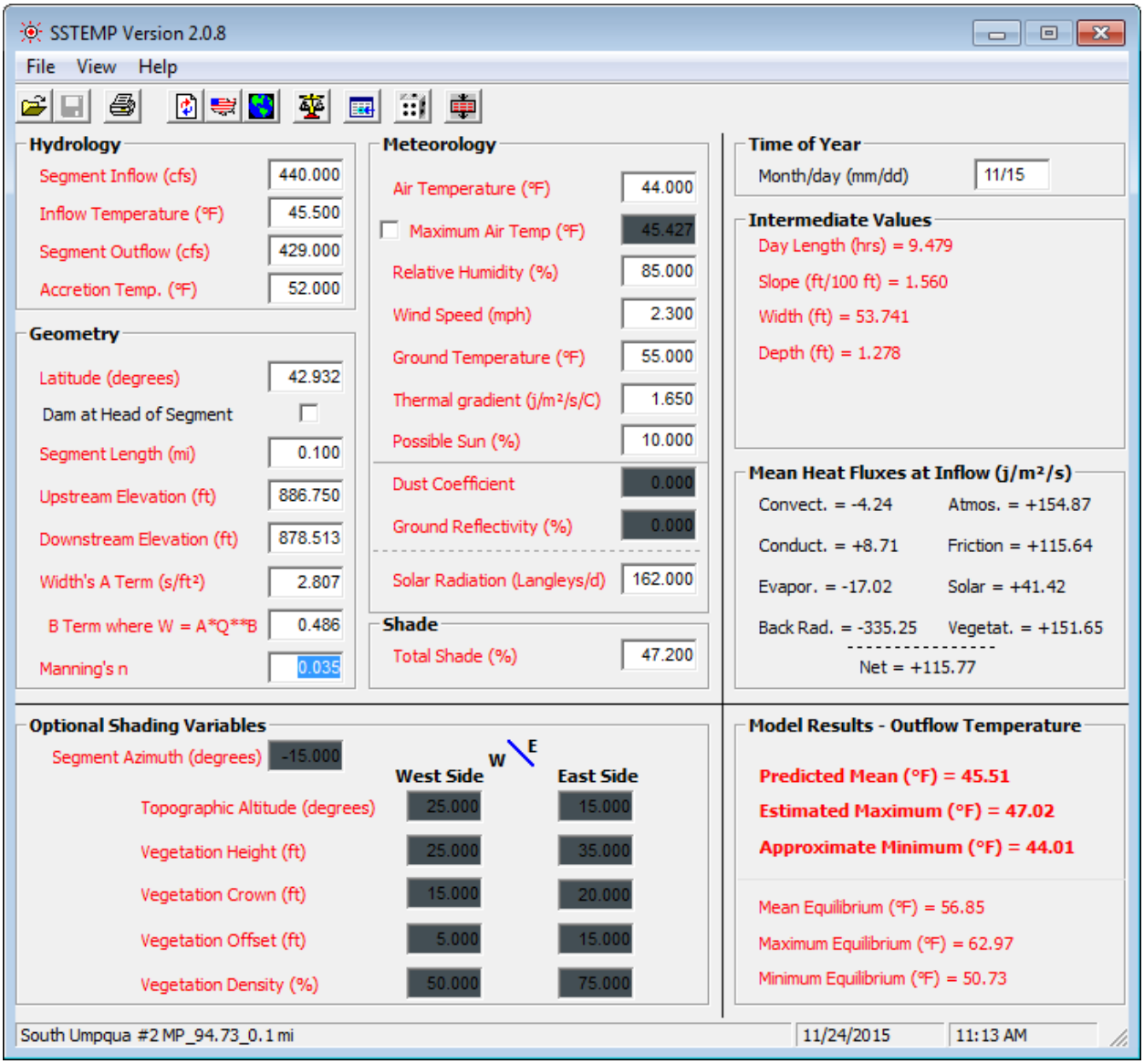


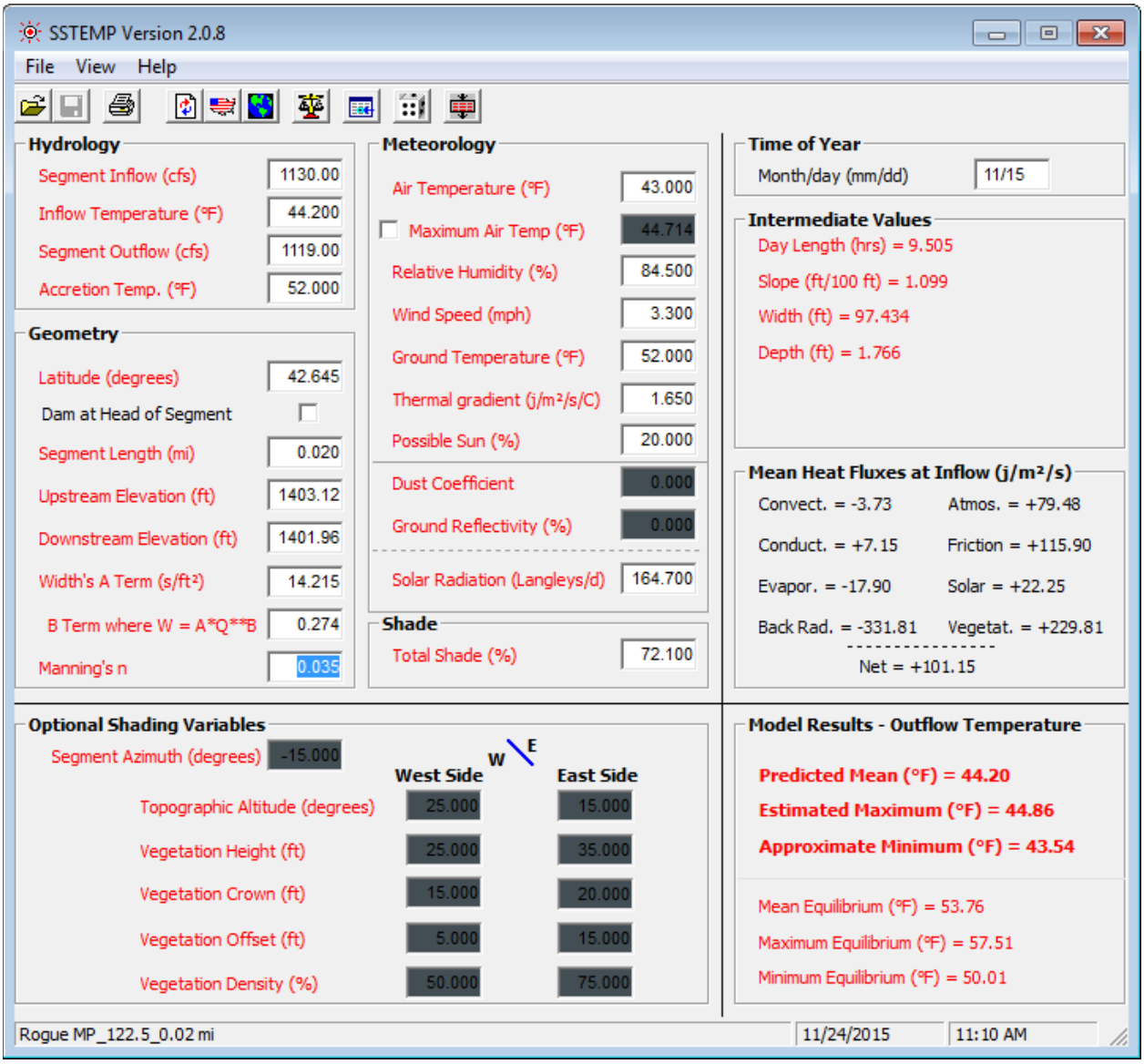


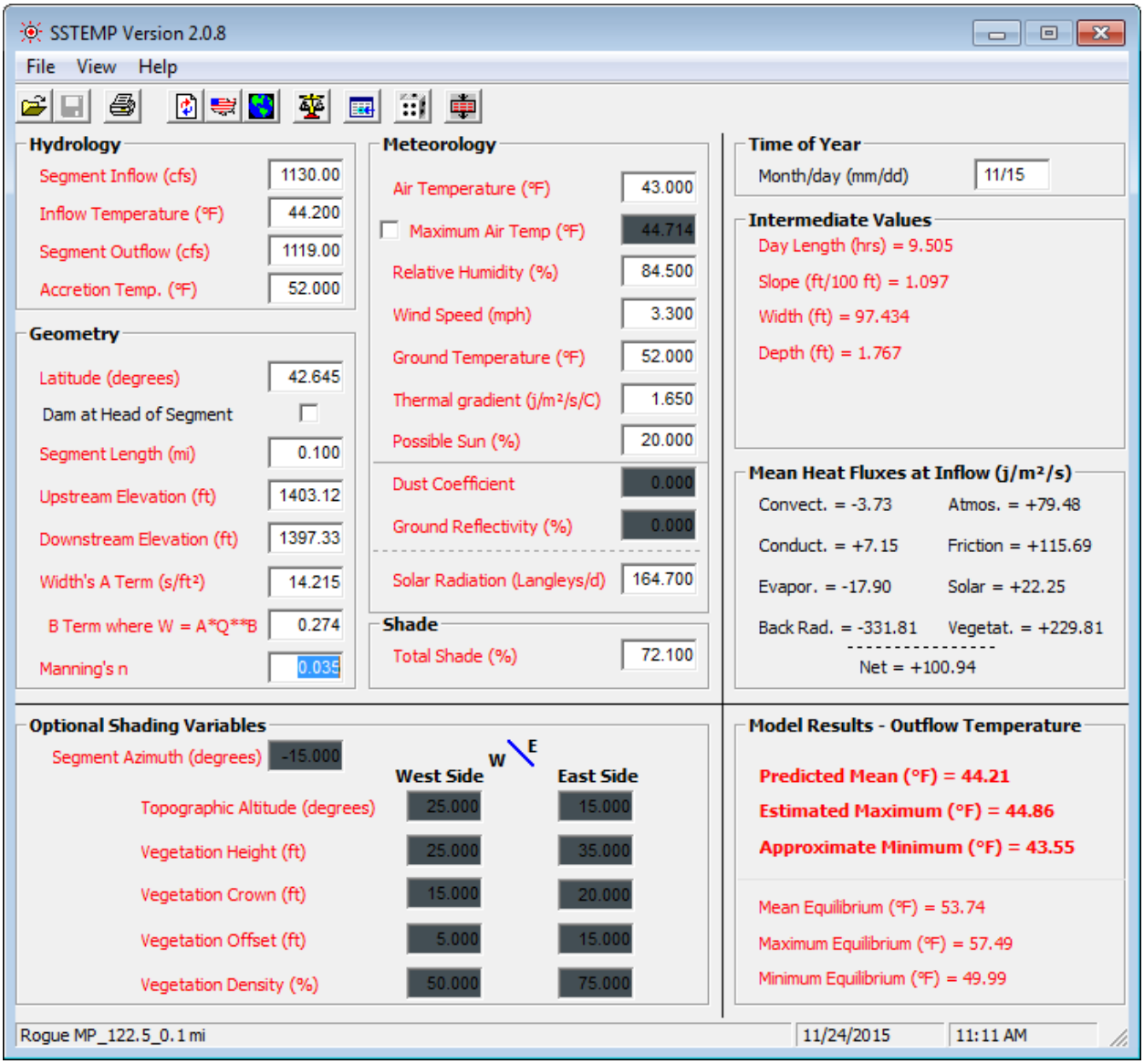


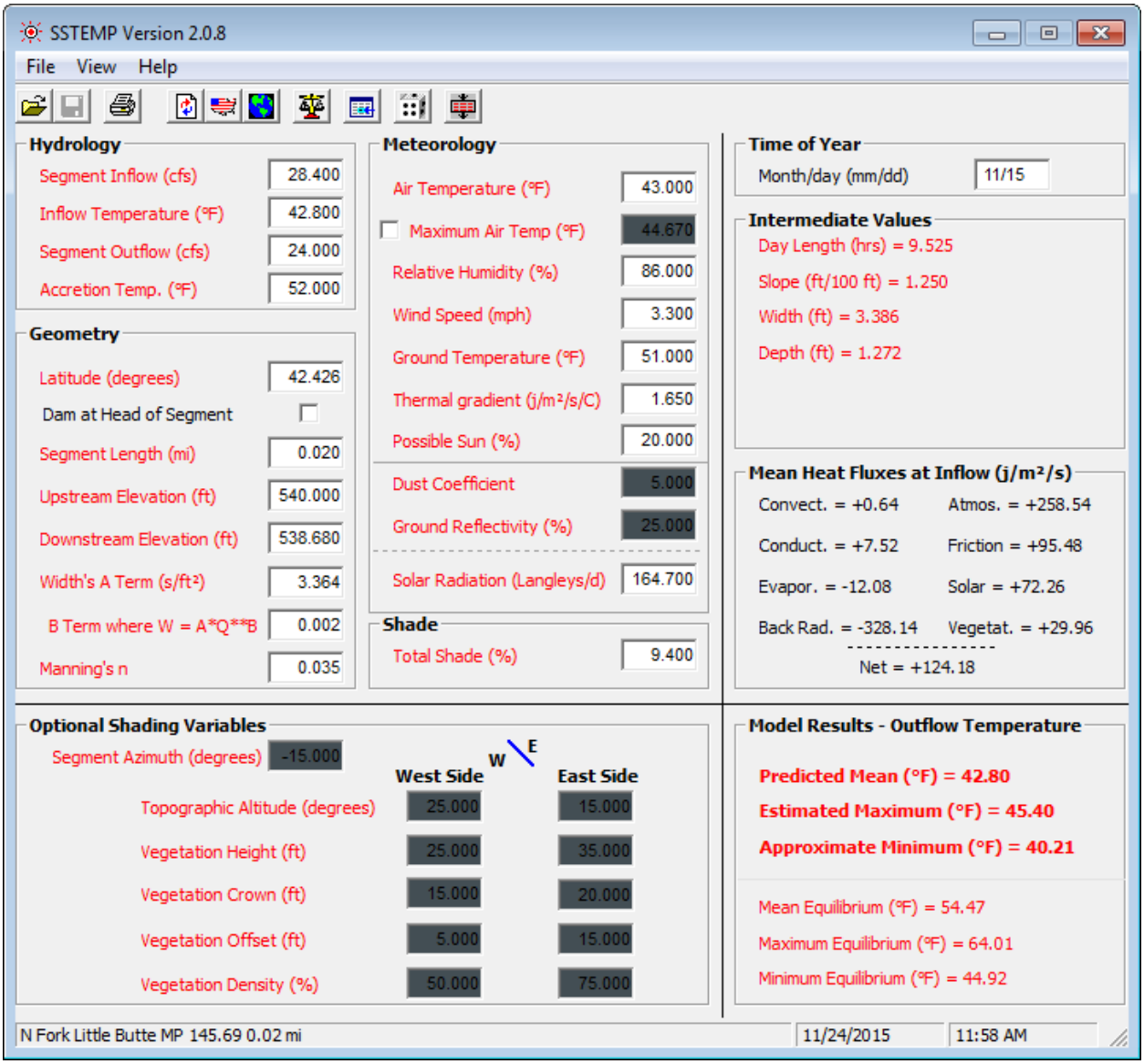


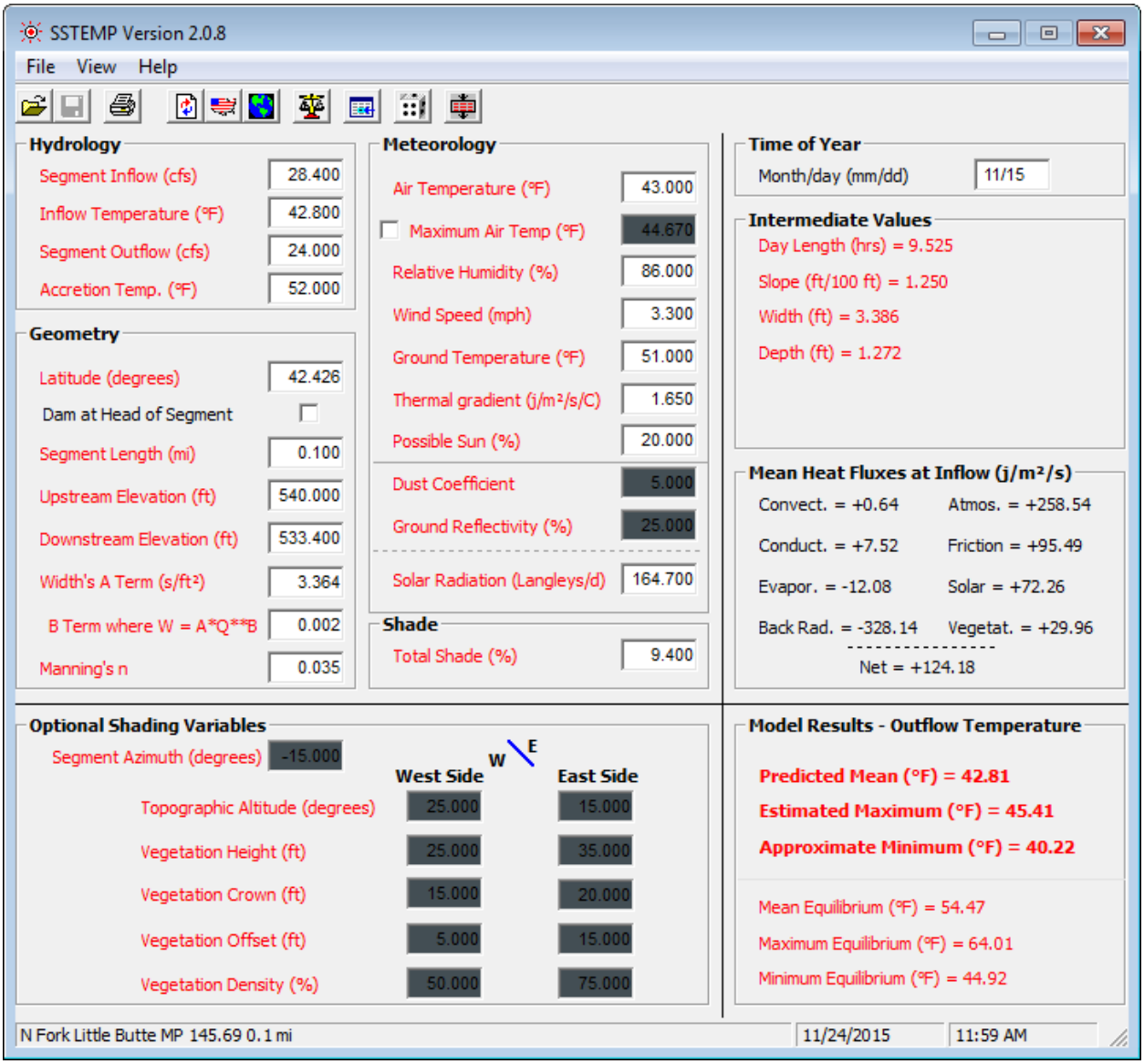












MANMADE CHANNELS/CANALS

Two manmade channels are proposed for limited withdrawal permits, the Medford Aqueduct (MP 133.38) and the Highline Canal (MP 228.1). Both water sources are owned and operated by Irrigation Districts. Fish access to both water bodies is controlled by fish screens. The water that flows through each of these water bodies is managed by water calls, the water is fully allocated to patrons/users. Withdrawal of water from these sources is their sole function. Any potential downstream thermal effects associated with a limited withdrawal permit by PCGP of allocated water would be similar to those effects experienced under the current condition as users put their water to beneficial use.

OPEN WATER BODIES

Six open water bodies are proposed for limited withdrawal permits to aid in hydrostatic testing of the pipeline. Thermal analysis was not completed to evaluate impacts to open water bodies as thermal modeling of lakes requires substantially more data input than for streams. In addition, the relative quantities of withdrawals in the open water bodies is insignificant and not expected to have thermal or other impacts beyond that experienced by typical lake level fluctuations during the period of use.

Water Body	Estimated Total Withdrawal Requirement (gallons)	Estimated Total Withdrawal Requirement (acre-feet)	Effects Evaluated in Hydrostatic Test Plan (Y/N)	Estimated Volume (acre feet)	Volumetric Impact Potential Resulting from Withdrawal (%)	Estimated Surface Area (acres)
Kinnan Lake	3,315,584	10.2	N	395	2.6	23.5
Ben Irving Reservoir	3,315,584	10.2	N	11,250	0.09	100
Fish Lake	2,847,495	8.7	Y	7,836	0.1	483
Lake of the Woods	5,565,825	17.1	Y	30,942	0.05	1,146
John C Boyle Reservoir	5,565,825	17.1	N	4,200	0.4	381
Keno Reservoir	5,565,825	17.1	N	18,500	0.09	25.7

REFERENCES

PCGP, Hydrostatic Testing Plan. October, 2015.

United States Geological Survey, Stream Segment Temperature Model (SSTEMP). Version 2.0.8

Appendix N

Integrated Pest Management Plan

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Integrated Pest Management Plan (Noxious Weeds, Forest Pathogens, and Soil Pests)

Pacific Connector Gas Pipeline Project

January 2018

Table of Contents

List of Appendices

1.0 INTRODUCTION

Pacific Connector Gas Pipeline, LP (PCGP) has prepared this Integrated Pest Management Plan (IPM) for the pipeline it proposes to construct from interconnections with the Ruby pipeline and the Gas Transmission Northwest pipeline near Malin, Oregon (Pipeline) to a proposed liquefied natural gas terminal to be built on the North Spit of Coos Bay, Oregon by Jordan Cove Energy Project, LP. This IPM will provide PCGP's management and staff with the necessary Best Management Practices (BMPs) to address the control of noxious weeds, invasive plants, forest pathogens, and soil pests across the route of the Pipeline. The BMPs have been created to minimize the potential spread of invasive species and minimize the potential adverse effects of control treatments. The IPM provides BMPs and decision-making tools PCGP's managers and staff during both the construction and operational phases of the Pipeline and includes logical and easily accessible references for the protection of sensitive resources along the Pipeline route or near associated facilities.

The Oregon Department of Agriculture (ODA) (Butler, 2017), Bureau of Land Management (BLM), and USDA Forest Service (Forest Service) have been consulted for recommendations to prevent the introduction, establishment, or spread of noxious weeds, soil pests, and forest pathogens. In general, these agencies have recommended that reconnaissance surveys be conducted along the Pipeline alignment to determine the presence of noxious weeds, other invasive plants and forest pathogens so that appropriate BMPs can be developed and applied prior to and during construction to prevent the introduction or establishment of weeds and forest pathogens. Additionally, these agencies have recommended that construction equipment and vehicles be cleaned to remove all soil, mud, oil, grease, plant material or other substances that could contain weed seeds prior to moving them onto the construction right-of-way to prevent the import and spread of weeds and that vegetation clearing and grading equipment be cleaned if they pass through known noxious weed infestations. Disturbed areas will be promptly replanted as described in the Erosion Control and Revegetation Plan (ECRP) (Appendix I to the POD) with appropriate seed mixtures to help prevent noxious weed infestation. All disturbed areas of the construction right-of-way including temporary extra work areas (TEWAs), uncleared storage areas (UCSAs), temporary access roads, and road improvement areas will be monitored after construction, and any noxious weed infestations will be controlled in accordance with the requirements of the applicable permit and any conditions agreed to with landowners.

The following section describes in more detail the measures that will be implemented by PCGP during construction and operation to minimize the potential spread of noxious weeds, invasive plants, soil pests, and forest pathogens. Where treatment of weeds is required, BMPs are described that would minimize the potential effects to sensitive resources and the environment. PCGP has developed a Hydrostatic Test Plan that is included as Appendix M to the POD which describes the BMPs that would be implemented to minimize the potential spread, or introduction of noxious or invasive weeds, forest pathogens and aquatic invasive species from the Pipeline's hydrostatic testing operations. The BMPs described in the Hydrostatic Test Plan are not included or repeated in this document. Section 6.0 of this IMP includes measures that may be used to control rodents at the Pipeline's aboveground facilities (compressor station and meter stations), if necessary. All of the aboveground facilities are located on private lands.

2.0 PREVENTION AND DETECTION

Prevention and detection is a crucial component of integrated weed management principles. Early detection and proper identification of weed infestations are critical to successful weed

management (or maintenance of land health). PCGP has completed initial reconnaissance weed surveys and will complete preconstruction weed surveys to determine potential pretreatment requirements and construction practices that would be implemented during clearing and grading activities to minimize and avoid the potential spread of weeds and forest pathogens.

2.1 Reconnaissance Surveys

The ODA Noxious Weed Control Program and the Oregon State Weed Board (OSWB) maintain the State Noxious Weed List, which covers all lands within the State of Oregon. Noxious weeds are defined under ORS 569.175 as non-native, aggressive and invasive plants (terrestrial, aquatic, or marine) designated by the State Weed Board (OSWB) to be a menace to public welfare. The OSWB also classifies noxious weeds as any plant that has detrimental effects to agricultural economy and natural resources, endangers native flora and fauna, affects recreation, or is injurious or harmful to humans and/or animals (ODA, 2017). The ODA Noxious Weed Control Classification System establishes three categories for weeds within, or having potential habitat, in Oregon. The three ODA noxious weed classes are described below with ODA's recommended control actions.

- Class "A" weeds—a weed of known economic importance which occurs in the state in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states make future occurrence in Oregon seem imminent.

  Recommended action: Infestations are subject to eradication or intensive control when and where found.

- Class "B" weeds—a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties.

  Recommended action: Limited to intensive control at the state, county or regional level as determined on a site-specific, case-by-case basis. Where implementation of a fully integrated statewide management plan is not feasible, biological control (when available) shall be the primary control method.

- Class "T" weeds—a designated group of weed species that is selected and will be the focus for prevention and control by the Noxious Weed Control Program. Action against these weeds will receive priority. T designated noxious weeds are determined by the Oregon State Weed Board, which directs ODA to develop and implement a statewide management plan. "T" designated noxious weeds are species selected from either the "A" or "B" list.

PCGP conducted initial reconnaissance weed surveys concurrently with wetland and waterbody inventories during the summer and fall of 2006 and 2007. Additional reconnaissance weed surveys were conducted during biological surveys in 2007 and 2008 and various supplemental surveys through 2017. These surveys were conducted by local biologists who are familiar with priority listed noxious weeds. The results of these inventories are provided in Table 1-1 of Appendix 1, which also provides the state classification. Table 1-1 includes potential ODA listed

weeds that may occur in the counties crossed by the Pipeline according to ODA Weedmapper[1]. PCGP will complete additional preconstruction surveys for noxious weeds prior to Year One construction and will use biologists or botanists that are familiar with the noxious weeds that may occur within the Pipeline area. On federal lands, preconstruction weed surveys will be conducted to identify current ODA-listed weeds, as well as invasive weeds listed, for each National Forest, BLM, or Bureau of Reclamation (Reclamation) district. The preconstruction surveys will assist in determining where management or pretreatment may be necessary prior to construction to prevent the spread of noxious weeds. After the preconstruction surveys have been completed on federal lands, PCGP will update Table 1-1 of Appendix 1 and prepare a summary report to review the results of these surveys with the authorized agency representative. The results of these surveys would be used to determine appropriate actions to take during pre-construction weed management, clearing and grading activities as well as monitoring treatment efforts after construction (see Sections 2.2, 2.4, 2.7, and 3.0). Table 1-1 provides the weeds that are subject to control by the BLM and Forest Service. Further, the EI will be responsible for uniquely flagging and signing these weed populations and providing the preconstruction weed survey location information to all project personnel so that they are aware of the weed locations and do not inadvertently drive through and potentially spread the species.

During timber cruises that will be necessary for timber appraisals and landowner agreements prior to construction, surveys will be conducted to identify potential forest pathogens within the construction footprint (i.e., right-of-way or TEWAs). These forest pathogen surveys will help assess silvicultural treatments that may be required during clearing operations to minimize the spread of forest pathogens. Table 1-2 in Appendix 1 provides forest pathogens (tree insect and disease infestation) that have been documented in the vicinity of the Pipeline by the Oregon Department of Forestry. Current forest pathogen data provided by the Oregon Department of Forestry[2] would be reviewed again prior to timber cruises/surveys to assist in assessing forest pathogens in the vicinity of the Pipeline.

2.2 Pre-Project Weed Management

Preconstruction weed treatment will primarily be accomplished through mechanical treatment appropriate for the weed species. Hand-pulling methods may also be utilized if the area of infestation is small or where mechanical methods are not feasible. Infested areas will be cleared in a manner to minimize transport of weed seed, roots, and rhizomes or other vegetative materials and soil from the site along the construction right-of-way and to minimize sediment delivery to waterbodies. Spot treatments with appropriate herbicides will also be conducted where applicable depending on the specific weed and site-specific conditions using integrated weed management principles. Spot herbicide treatment would only be utilized when it is likely to be effective (i.e., where plant phenology and effective herbicide treatment windows coincide) prior to construction. Any herbicide treatment would be conducted by a licensed applicator using herbicides labeled for the targeted species and registered for the use. PCGP would only use herbicides where approved by the land-managing agency or landowner. If ODA A listed weeds are present within the construction work limits, they will be controlled by eliminating all visible plants prior to seed development and prior to construction activities.

On federal lands, PCGP would consult with the authorized agency representative on the specific method that would be used to eliminate any A listed weeds. Other Priority weeds that will be considered for pretreatment will include ODA T and some B listed weeds based on site-specific

[1] http://www.oregon.gov/ODA/programs/Weeds/Pages/WeedMapper.aspx
[2] http://www.oregon.gov/ODF/ForestBenefits/Pages/ForestHealth.aspx

conditions and direction provided by the BLM, Forest Service, Reclamation, or private landowner. Table 1-1 includes the B listed weeds noted by the BLM and Forest Service that are subject to control. On federal lands, after the preconstruction weed surveys have been completed, PCGP would consult with the authorized agency representative to determine appropriate pre-project weed control measures that would be implemented. Pretreatment consideration will be based on consultation with the landowner or land-managing agency and specific conditions on the construction right-of-way. Appendix 1 provides the ODA-listed weeds by class (A, B, and T) that may occur in the Pipeline area and lists the locations of these species where they were identified during the project reconnaissance weed surveys during 2006, 2007, and 2008, and various supplemental surveys through 2017.

Table 2-1 in Appendix 2 lists the herbicide active ingredients that are approved for use on public lands managed by the BLM and Forest Service based on their vegetation management/invasive species program Environmental Impact Statements and Records of Decision (USDI, 2010, and USDA, 2005). . The BLM released a *Final Vegetation Treatments Using Herbicides on BLM Lands in Oregon* Environmental Impact Statement (EIS) in July 2010 and released the Final EIS and Record of Decision (ROD) in October of 2010[3]. PCGP would use only herbicides registered in Oregon and on federal lands only those herbicides approved for use based on existing or current management direction. Table 2-2 lists the current 2017 registered herbicides in Oregon for use on utility and road rights-of-way. The data in Table 2-2 was queried using Washington State University Pesticide Information Center Online (PICOL) Databases as directed by ODA (Riley, 2009)[4]. The PICOL database can also be queried to determine the pest (weeds) species for which specific herbicides are registered. PCGP's licensed applicators would ensure that all herbicides and adjuvants[5] would be registered for the applicable use. PCGP would obtain applicable approvals or permits for use of herbicides on federal lands prior to use/treatment. On NFS and BLM-managed lands PCGP would submit a Pesticide-Use Proposal for agency approval prior to herbicide use. A Pesticide - Use Proposal (FSM-2150) for National Forest lands is provided in Appendix 3; this form or a similar form would also be submitted to the BLM. BMPs that would be implemented to minimize potential adverse effects of herbicide treatment are discussed below in Section 3.0.

2.3 Equipment Inspection

Prior to transporting construction equipment to the construction right-of-way, all equipment will be inspected to ensure that it is clean and free of potential weed seed or propagules (i.e., soil roots or rhizomes) and power washed, if necessary, as determined by PCGP's Environmental Inspectors (EIs). In addition, initial inspections of all inspected vehicles and construction contractor vehicles will also be performed prior to being allowed on the construction right-of-way. This does not apply to local service vehicles that will stay on the existing roadway, traveling frequently in and out of the Pipeline area. The EI or PCGP's authorized representative will be responsible for performing inspections and registering or tagging the equipment prior to being transported or moved to the construction right-of-way. To ensure the equipment is thoroughly inspected, the EI or authorized representative will use the inspection checklist provided in Appendix 4. The inspection checklist included in Appendix 4 will also be used during the operations phase of the Pipeline to ensure that all maintenance equipment is cleaned of potential weed seed or propagules prior to entering the construction right-of-way on federal

[3] https://permanent.access.gpo.gov/gpo2685/gpo2685/www.blm.gov/or/plans/vegtreatmentseis/documents.php.htm
[4] http://cru66.cahe.wsu.edu/LabelTolerance.html
[5] Adjuvant(s) are substances added to the pesticide formulation to enhance the toxicity of the active ingredient or to make the active ingredient easier to handle.

lands. PCGP will inform contractors to clean equipment and vehicles in the contractor yards prior to moving to the construction right-of-way on federal lands. The EIs would conduct environmental training at the beginning of the project, informing all contractor personnel and PCGP's inspectors about the BMPs to prevent the potential spread of noxious weeds and how to complete vehicle and equipment inspections and cleaning on a regular basis during construction. PCGP's EIs would also be responsible for random verification inspections during construction to ensure all equipment and vehicles are clean of noxious weeds.

2.4 Clearing and Grading

In areas where infestations have been identified or noted in the field from preconstruction surveys (see Section 2.1), the contractor will stockpile cleared vegetation and salvage topsoil or graded material adjacent to the area from which they are stripped to eliminate the transport of soil-born noxious weed seeds, roots, or rhizomes. Where practical and feasible, construction right-of-way grading activities will occur toward any known areas of infestation to minimize the potential spread of noxious weeds or forest pathogens. During reclamation, any graded materials and vegetative material will be returned to the infestation sites from which they were stripped or moved. Clearing equipment that is used in areas of priority A and T listed weeds, as well as selected B listed weeds, will be cleaned by hand, blown down with air, or pressure washed prior to leaving the site, as determined necessary by the EI based on the specific weed infestation, level of infestation, and stage of growth of the weed. On federal lands equipment cleaning would occur as described below (see Federal Lands). Equipment cleaning on the construction right-of-way will occur in an approved cleaning station such as that shown on Drawing 3430.34-X-0020 in Attachment C of the ECRP (Appendix I to the POD). The EI will approve the appropriate cleaning station location(s) and will be responsible for determining the effective cleaning method for the grading/clearing equipment (including power washing). Infested areas and cleaning station locations will be mapped to ensure that these areas are monitored during construction and to ensure that these weeds are controlled and not spread. PCGP would monitor these sites after construction as described in Section 2.6.

Federal Lands. Because of the contiguous pattern of NFS Lands crossed by the Pipeline, equipment will be inspected and cleaned at cleaning stations located at the borders of each National Forest prior to clearing and grading activities. Because the BLM-managed lands crossed by the Pipeline are not contiguous and are spread out in a checkerboard pattern, it is not practical to set up inspection and cleaning stations at each entry point. However, where BLM lands are contiguous to NFS Lands, the cleaning station will be located to include the adjacent BLM lands. Additionally, equipment will be inspected and cleaned at cleaning stations located adjacent to mapped noxious weed infestation areas that were identified during preconstruction surveys (see Section 2.1) on federal lands and where a treatment plan has been developed in consultation with the agency authorized representative. The cleaning station(s) will be located and approved by the EIs and authorized agency representative. The cleaning station location(s) will also be mapped for future monitoring efforts to determine if potential infestations occur at these sites and, if they do, to ensure that appropriate control treatments are applied. Timeframes for monitoring these sites are described in Section 2.7.

2.5 Weed-Free Materials

PCGP will use certified weed-free seed during seeding operations. In addition, PCGP will use certified weed-free straw for mulch and sediment barriers, dewatering structures, or other uses along the construction right-of-way, or may utilize other mulch materials that are weed free such as hydromulch or erosion control fabrics. The EI or PCGP's authorized representative will be

responsible for ensuring that all straw hauled to the construction yards will be certified weed-free and is stored so that it remains weed free. ODA has a certification process through their Weed Free Forage Program and maintains a database of weed free forage providers[6]. If other vendors are used to supply straw, PCGP's EI will insure that before straw is delivered to the right-of-way documentation from straw producers/vendors is provided which indicates the straw was produced from certified weed-free fields, or the straw can be inspected by the ODA, county extension agent or qualified conservation district personnel. Where straw is to be used on federal lands, the authorized agency representative may also inspect and approve straw materials to verify that the straw is weed-free. If gravel or other fill materials are used on Forest Service or BLM-managed lands, they will be from a weed-free source and approved by the Forest Service's or BLM's authorized representative. Where feasible, PCGP would provide the locations of potential gravel sources, including commercial sources that may be used on federal lands, in advance so that these sites can be inspected during the growing season by the authorized agency representative.

2.6 Restoration

PCGP has developed the ECRP in cooperation with the FERC, Forest Service, BLM, and Natural Resource Conservation Service (NRCS). The revegetation measures outlined in the ECRP have been prescribed to stabilize disturbed areas and to revegetate the construction right-of-way to a condition which supports the preconstruction land use (i.e., forest lands, rangelands, croplands, hayfields, and pasturelands) as quickly as possible following construction. Promptly replanting disturbed areas with appropriate seed mixtures will help prevent noxious weed establishment. The ECRP details the measures that will be implemented to restore all disturbed areas.

2.7 Monitoring

After construction and restoration, PCGP will monitor all disturbed areas of the construction right-of-way including TEWAs, UCSAs, temporary access roads, and road improvement areas for infestation of noxious and invasive weeds. Special consideration for monitoring noxious and invasive weeds will be taken in the areas where noxious weeds were identified prior to construction and were previously mapped to ensure that potential infestations do not recur and spread. Special consideration will also occur in areas along the construction right-of-way where equipment cleaning stations and hydrostatic dewatering sites were located to ensure that infestations at these locations do not occur. Monitoring in these areas will occur for a period of 3 to 5 years on federal lands; in areas where treatment is required, monitoring will occur for 3 years following the presumed eradication date. Monitoring report forms (see Appendix 5) would be submitted to the appropriate federal land-managing agency annually. PCGP's operational staff or their contractors will be responsible for these monitoring efforts. If weeds are observed during these monitoring efforts on federal lands, agency siting forms would be completed and submitted to the appropriate agency, if the report forms provided in Appendix 5 are not sufficient. PCGP may also enter into cost-recovery agreements with federal land-managing agencies to conduct or participate in monitoring efforts along the construction right-of-way on federal lands including monitoring during regular intervals during the life of the Pipeline. Payments under any cost-recovery agreements would be made to the appropriate land managing agencies and included in the annual Right-of-Way Grant payments as per payment stipulations listed in the Grant. If infestations occur in any of the disturbed areas of the construction right-of-way including TEWAs, UCSAs, temporary access roads, and road

[6] http://www.oregon.gov/ODA/programs/MarketAccess/MACertification/Pages/WeedFreeForage.aspx

improvement areas, PCGP would make an assessment of the source of the infestation, the potential of the infestation to spread to other adjacent areas, and develop a treatment plan to control the infestation. Where infestations occur on federal lands, this assessment and treatment plan would be developed cooperatively with these agencies. The treatment plan would be developed using integrated weed management principles, and if herbicides are used, all applicable approvals would be obtained prior to their use including landowner approvals. PCGP would consult with the ODA Noxious Weed Control Program, local County Weed Program, or land-managing agency for additional support regarding noxious weed control issues that may occur during operation of the pipeline. PCGP may also contract with county or local conservation districts or Watershed Associations to conduct any necessary weed treatment programs that may arise after construction.

Monitoring of all disturbed areas of the construction right-of-way including TEWAs, UCSAs, temporary access roads, and road improvement areas where noxious weeds were not known to occur prior to construction will occur as an ongoing function of PCGP's operational personnel during the life of the Pipeline. PCGP's operational staff would also investigate noxious weed issues raised by landowners and land-managing agencies during operation of the Pipeline. In these situations, PCGP would conduct a site assessment (see Appendix 5) of the potential weed issue and would provide a proposed treatment plan to the extent the noxious weeds are attributable to actions of PCGP (to the landowner or land-managing agency), if necessary.

3.0 WEED CONTROL

Where weed control is necessary, PCGP's first priority will be to employ hand and mechanical methods (pulling, mowing, biological, disking, etc,) applicable to the species to prevent the spread of potential weed infestations, where feasible. To determine if an herbicide is to be used over other control methods, PCGP will base the decision on weed characteristics and integrated weed management principles (USDA, 2005 and USDI 2010b). Decisions will be made based on whether other methods or combinations of methods are known to be effective on the species in similar habitats. If herbicides are selected as the weed control method, the choice of herbicides will be based on the invasive species, how it reproduces, its seed viability, the size of its population, site conditions (such as proximity to waterbodies), known effectiveness under similar site conditions, and the ability to minimize effects on non-target species.

Weed infestations that will be controlled include all ODA A and T listed weeds. If these weeds are present within the Pipeline's construction work limits, all visible plants will be eliminated and eradication will be initiated prior to seed development. Other priority weeds that will be considered for treatment will include some B listed weeds in areas where they are not significantly established off of the construction right-of-way. On federal lands, treatment of B listed weeds will be made based on consultation with the agency regarding the specific weed and the site conditions. The priority weeds that are subject to control on federal lands are included in Table 1-1 in Appendix 1. This table will be updated as necessary to include additions and changes in ODA or County noxious weed lists. On federal lands, where significant infestations occur off of the construction right-of-way on adjacent lands, where PCGP has no authority to operate or is not responsible for weed control efforts, PCGP would notify the agency of the known infestation and collaborate with the federal agency to develop a cooperative weed control program. This cooperative weed control program may include PCGP contributing funds to the BLM, Forest Service or Reclamation to implement a broader weed control program that would treat both the construction right-of-way and adjacent weed infestation off of the construction right-of-way. Where noxious weed infestations occur off of the construction right-of-way on private lands, PCGP may also fund the local county weed control

boards, soil and water conservation districts, Cooperative Weed Management Area, or watershed associations that are authorized to control weeds in the specific county.

In most cases, if an herbicide is used for control, it would be used in combination with other methods. For example, initial treatment of an invasive species may be done using a manual or mechanical method followed by an herbicide treatment, and then manual or mechanical methods may be implemented as maintenance treatments over the long-term. If herbicides are used to control noxious weed infestations, they would be used when they are the most appropriate treatment method. Spot treatments and the use of selective herbicides would be utilized to minimize impact to native or non-target species. Where applicable, seeding may be necessary to revegetate the site promptly and prevent the opportunity for weeds to become reestablished. PCGP will employ a state or federally-licensed herbicide applicator to ensure that the appropriate herbicides are utilized for the targeted weed species during its proper phenological period and at the specified rate. The applicator will ensure that the herbicides and any adjuvants are used according to the labeling restrictions, and warnings, following all applicable laws and conforming to the appropriate land managing agency decision documents (see Tables 2-1 and 2-2 in Appendix 2 and USDI 2010b). The applicator will also ensure that the herbicides that are used are registered for their intended use. Permits or approvals for the use of herbicides and adjuvants on federal lands would be obtained prior to use/treatment (see Section 2.2 and Appendix 3 for requirements for Pesticide – Use Proposal on federal lands). On federal lands PCGP would utilize the appropriate Standard Operating Procedures and Mitigation Measures when applying herbicides on the right-of-way, as outlined in the USDI 2010a Attachment A.

The applicator will confirm that the herbicides are applied according to their labels to ensure effectiveness and to minimize drift to non-targeted areas. Herbicides will not be applied during precipitation events or when precipitation is forecast within 24 hours or as specified on the label, whichever is more restrictive. The licensed applicator will complete a Herbicide or Pesticide Application Record (PAR) within 24 hours (see Appendix 6) when herbicides are applied on federal lands. Copies of all PARs will be provided to the land management agency within a month of application. PCGP will maintain these records for a minimum of three years. PCGP will not utilize herbicides on the construction right-of-way without landowner consent/approval and will use wicking, wiping, injection, or spot spraying as permitted by product labels. PCGP will not use aerial herbicide applications and will not use herbicides for general brush/tree control within the 30-foot maintained easement.

Weed Control near Sensitive Areas and Habitats. Herbicides will not be used within 100 feet of a wetland or waterbody, unless allowed by the appropriate agency. PCGP and its licensed applicators will follow prescribed mitigation measures to prevent impact to sensitive species known to occur in the construction right-of-way or adjacent areas identified during biological surveys. To ensure sensitive species/habitats are not adversely impacted by the Pipeline's weed control activities, Table 7-1 in Appendix 7 provides the various sensitive species and/or associated buffers that are crossed or in the vicinity of the Pipeline, and it will be updated prior to construction. This table was developed from the Pipeline's biological surveys and includes sensitive species proposed and/or listed under the Endangered Species Act and federal (BLM and Forest Service) and state sensitive species. (i.e., botanical species, Marbled Murrelet (MAMU), Northern Spotted Owl (NSO), waterbody crossings, big game winter range, etc.). If noxious weed infestations occur in the vicinity of sensitive sites, the proper treatment buffers will be applied to avoid potential adverse impacts to non-targeted species. In these areas, site-specific controls will be designed (e.g. application rate and method, timing, wind speed and direction, nozzle type and size, buffers, etc.) to mitigate the potential for adverse disturbance

and/or contaminant exposure. PCGP would also implement the appropriate Conservation Measures, as outlined in Attachment B of the BLM's 2010 Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in Oregon (USDI 2010a) to protect Special Status Species.

Table 7-1 in Appendix 7 will also assist PCGP and/or its licensed applicator in applying applicable buffers or timing restrictions where appropriate for the specific species and activity. As an example, PCGP would apply daily timing restrictions (DTRs) during weed control activities within ¼-mile buffers of MAMU and NSO stands or nest patch. However, seasonal timing restrictions for these species would not be applied because the seasonal timing restrictions (March 15 - July 15 for NSO and April 1 - August 5 for MAMU) would prohibit successful weed control efforts since the active plant growing season, when most weeds should be treated, would be missed. Furthermore, disturbance to these species or other raptor species from weed control activities are expected to be inconsequential because they are short-term activities lasting only a few hours, are only conducted periodically at specific spot locations along the construction right-of-way, and are implemented by only one or two individuals.

4.0 SOIL PESTS

In the Klamath Basin there are two organisms of regulatory concern. These include *Verticillium* (fungus), which is a concern in mint and potato fields, and *Meloidogyne chitwoodii* (nematode), which is a concern in potatoes. Both of these organisms inhabit the soil and can be easily spread on tires, boots, or other soil-moving mechanisms. To minimize the potential spread of these organisms, PCGP will wash all equipment and vehicles before entering or leaving any mint or potato field crossed by the proposed Pipeline. Further, contractor personnel and inspectors will wash boots of soil or mud prior to entering and leaving mint and potato fields.

5.0 FOREST PATHOGENS AND INSECTS

As stated in Section 2.1 (and repeated here), during timber cruises for timber appraisals and landowner agreements prior to construction; surveys will be conducted to identify potential forest pathogens within the construction footprint (i.e., right-of-way or TEWAs). These forest pathogen surveys will help assess silvicultural treatments that may be required during clearing operations to minimize the potential spread of forest pathogens. Current on-line forest pathogen data provided by the Oregon Department of Forestry would be reviewed prior to timber cruises/surveys to assist in assessing forest pathogens in the vicinity of the Pipeline. Table 1-2 in Appendix 1 provides the existing tree insects and disease infestations that are documented in the vicinity of the Pipeline from the Oregon Department of Forestry survey data.

BMPs to Minimize the Spread of Forest Pathogens and Insects. To minimize or prevent the spread of Port-Orford-cedar root disease (*Phytophthora lateralis)* within the Pipeline area, PCGP will implement the following in areas with Port-Orford-cedar (POC) whether stands are infested or not (adapted from BLM, 1994 and USDA, 2004): 1) pressure wash equipment, vehicles and boots with non-infested water prior to entering uninfested POC areas and prior to departure of infested POC areas; 2) limit ground-disturbing construction and maintenance activities to the dry season, if feasible; 3) designate access and egress routes and parking areas in POC infested areas; 4) where possible, schedule clearing/grading activities in uninfested areas prior to infested areas; and 5) prevent use of right-of-way in POC areas from OHV recreationists by blocking access. Additionally, within areas of POC infestations impacted by the Pipeline, PCGP would ensure that excavated materials from trenching or any necessary grading activities are confined to the local area of the POC infection and not spread down the

construction right-of-way or moved to other areas. Stumps or other large woody debris from any POC infected areas would be left onsite within the infected area and not moved to other areas along the construction right-of-way or offsite such as for use in OHV barriers or habitat structures to minimize the potential spread of P. lateralis infection. PCGP will also revegetate using POC-resistant strains of seedlings if recommended and available for the seed zone affected by the Pipeline. PCGP's Hydrostatic Test Plan, included as Appendix M to the POD, also describes the BMPs that would be implemented to minimize the potential spread of forest pathogens, including Port Orford cedar root disease and Sudden Oak Death (*Phytophthora ramorum)* from the Pipeline's hydrostatic testing operations. The BMPs described in the Hydrostatic Test Plan are not included or repeated in this document since they are specific to the testing operations and the potential transfer of aquatic invasives from hydrostatic test water sources.

During timber cruising prior to Year One construction, sites infected with annosus root and butt disease will be documented. Management to reduce tree loss from the annosus root rot pathogen (*Heterobasidion annosum*) varies depending on tree species affected. To reduce the spread of annosus root rot in the project area overall, dry borax could be applied, if directed by land-managing agencies to freshly cut stumps and wounds on trees adjacent to the construction right-of-way in areas identified with infestations of annosus root rot, especially when true firs are the tree species present.

A naturally occurring beetle repellent, methylcyclohexenone (MCH), can be applied to downed logs or standing green trees to prevent Douglas-fir beetle attacks (EPA, 1999). In areas within the Pipeline right-of-way where Douglas-fir beetle infestations have been documented, PCGP could apply MCH capsules, if directed by the land-managing agencies, to Douglas-fir trees on the edges of the construction right-of-way and any Douglas-fir down logs within that area before beetle flight in April to preserve the remaining standing trees from infestation and prevent an increase in beetle infestation.

When clearing the construction right-of-way within true fir stands, PCGP will utilize the standard logging practices that directionally fall timber into the construction right-of-way, as well as store logs away from trees adjacent to the construction right-of-way to minimize or prevent damage to standing trees by fir engraver, western pine beetles, flatheaded borer, and mountain pine beetle. Additionally, fresh slash greater than 4 inches provides breeding material for the beetles and can contribute to outbreaks. PCGP will utilize the BLM and Forest Service fuel loading specifications outlined in Section 10.2 of the ECRP to minimize slash accumulations.

Thinning overstocked ponderosa pine stands and removing trees infested with western pine beetles will help reduce the hazard of additional attacks. In overstocked, infested stands, PCGP will remove infested trees before beetle emergence in early June (outside the ¼-mile buffer of NSO nest patches) to reduce potential for infestation, if feasible. If a mature ponderosa pine tree is identified with western pine beetle infestation within, but on the immediate edge of the construction right-of-way and will not pose a safety or construction hazard, it will be retained for future snag recruitment to benefit wildlife.

Flatheaded borer outbreaks are usually associated with dead or severely damaged trees, especially after disturbance events such as drought, storm damage, or fire. PCGP will take standard precaution to minimize damage to adjacent trees when clearing and maintaining the construction right-of-way, including felling trees within the construction right-of-way away from adjacent, standing trees, reducing risk of infection by flatheaded borer.

The most effective method for managing dwarf mistletoe is harvesting, burning, and/or girdling infected trees, because this parasite needs a live host. Roads, treeless ridgetops, and openings can serve as potential barriers to dwarf mistletoe spread. All branches with witches' brooms should be cut and nearby branches pruned because they most likely would be infected. If mistletoe is identified within the Pipeline Project area, PCGP will implement recommended BMPs following consultation and recommendation by agency staff.

Aboveground Facility Interiors. Rodent populations inside facilities such as the Klamath Compressor/Meter Stations (MP 228.13), and the Jordan Cove Meter Station at MP 0.00, which are all located on private lands, can pose a human health risk and may damage components of the facilities (control panels, wiring, etc.). Therefore, rodent control may be required in these aboveground facilities. If necessary, PCGP would implement rodent control in facility interiors using non-restricted rodenticides and trapping (e.g., snap traps).

6.0 REFERENCES

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USDI, 2010a. Record of Decision, Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in Oregon. October, 2010.

USDI, 2010b. Final Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in Oregon. Oregon State Office. , 2010.

Other Resource links:

CDMS Applied Intelligence Agro-chemical database product search, allow search of registrant company specific product labels (http://www.cdms.net/Label-Database).

Extension Toxicology Network (EXTOXNET) Pesticide Information Profiles. Cooperative effort of University of California-Davis, Oregon State University, Michigan State University, Cornell University and University of Idaho through Oregon State University, Corvallis, Oregon. (http://extoxnet.orst.edu/pips/ghindex.html).

Pesticide Fact Sheets. National Pesticide Information Center. (http://npic.orst.edu/npicfact.htm).

Appendix 1

Table 1-1
Oregon State Listed Noxious Weeds that Could Occur or Are Documented in the Vicinity of the Pipeline Project

Table 1-2
Tree Insect and Disease Infestation Documented within 0.5 Mile of the Pipeline Project

Table 1-1
Oregon State Listed Noxious Weeds[1] that Could Occur or Are Documented within the Vicinity of the Pipeline Project

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Oregon A-Listed Weeds							
Plumeless thistle *Carduus acanthoides*	Found in pastures, valleys, fields, roadsides, and open native habitats.	Douglas[6] Klamath (L)		RO-D LV-D	A	Yes	
Woolly distaff thistle *Carthamus lanatus*	Invades pasture and range; difficult to eliminate because of persistent seedbank.	Douglas (L) Jackson[6]		RO-D MD-D	A	Yes	Three locations documented in 2004 near MP 66.9 in ROW and within 30 feet of ROW/TEWA; Six sites identified N/S of ROW near MP 71.6 in 2004
Squarrose knapweed *Centaurea virgata*	A rangeland and pasture invader, rendering these areas unsuitable for productive grazing. Spreads fastest in sheep rangeland	Klamath [6]		MD-D LV	A	Yes	
Paterson's curse *Echium plantagineum*	Invades oak woodland, native prairie, dry upland slopes; spreads rapidly; seeds spread by vehicles, humans, animal, water, wind, contaminated commercial seed.	Douglas (L)			A	Yes	
Orange hawkweed *Hieracium (Piolsella) aurantiaca*	Occurs in native meadows, gravel pits, forest openings, permanent pastures, roadsides, and hayfields.	Coos (L) Klamath (L)			A	Yes	
Matgrass *Nardus stricta*	Occurs in damp areas near swamps, estuaries, and watercourses; found in seasonally saturated mountain meadows.	Klamath (L)		CB	A	Yes	
Yellow floating heart *Nymphoides peltata*	Aquatic plant that grows on slow-moving rivers, lakes, reservoirs, and ponds.	Douglas (L) Jackson (L)	UMP-D RRS-D		A	Yes	
Taurian thistle *Onopordium tauricum*	Most often occurs in rangeland and openings in ponderosa pine forests; reproduces from seed.	Klamath (L)			A	Yes	
Smooth cordgrass *Spartina alterniflora*	Perennial aquatic grass; ≤ 5 ft.; grows on intertidal mud or sand flats with minimal wave action	Coos (H)			A	Yes	

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Dense-flowered cordgrass *Spartina densiflora*	Well adapted to lower to middle salt marsh areas where it aggressively out competes native grasses, sedges and Salicornia stands	Coos (L)			A	Yes	
Oregon B-Listed Weeds							
Velvetleaf *Abutilon theophrasti*	Commonly found in cultivated fields, gardens, fencerows, and waste aresas; spread by seed.	Coos (L) Douglas (L) Jackson (L)		CB-D LV-D	B	No	Crosses ROW at MP 18.4BR
Biddy-biddy *Acaena novae-zelandiae*	Prefers open, disturbed, well-drained sites, including stable dunes, open scrub, grassy areas, and trampled sites in coastal habitats.	Coos (L)	RRS-NF	CB-D	B	No	Along EARs 31.51, 32.10, 31.69-31.81; ROW MP 31.68-31.82
Russian knapweed *Acroptilon repens*	Infests native range and irrigated croplands; spread by rootstocks and seed.	Douglas (L) Jackson (L) Klamath (L)	FW-D	MD-D LV-D	B	No	
Pheasant's eye *Adonis aestivalis*	Prefers moist, well-drained soils but is adapted to seasonally dry soils.	Klamath (L)		LV-D	B	No	
Jointed goatgrass *Aegilops cylindrical*	Grows in cultivated fields; invades grasslands; introduced as contaminant in equipment and seed.	Jackson (L) Klamath (L)	–	MD-D	B	No	
Tree-of-heaven *Ailanthus altissima*	Creates problems in natural systems by forming large thickets via root suckering. Riparian areas are especially affected.	Douglas (L) Jackson (L)		RO-D MD-D	B	No	
Garlic mustard *Alliaria petiolata*	Displaces native forest under story species; frequenly invades forest opening edges, roads, streamsides, trails, and agricultural land. Thrives in partial shade of oak savanna.	Jackson (L)		MD-D	B	Yes	
Ragweed *Ambrosia artemisiifolia*	Found along ditches and waste areas.	Coos (L) Douglas (L) Jackson (W)		MD-D	B	No	
False brome *Brachypodium sylvaticum*	Grows in a variety of habitats and competes for early season moisture; threat to natural areas and commercial timber production.	Coos (L) Douglas (L) Jackson [6]	UMP-D RRS-D	CB-D RO-D MD-D	B	No	Along EAR 24.36; ROW at MP 24.37
Butterfly bush *Buddleja davidii*	Pioneering species that dominates open habitats, such as meadows, open slopes and dunes, and	Coos (W) Douglas (L) Jackson (L)		CB-D	B	No	Adjacent to Menasha and K-2 Pipeyards; Along

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
	reforested sites.						EARs 31.51, 32.10, 31.69-31.81; ROW MP 31.68-31.82
Lens-podded whitetop *Cardaria chalapensis*	Very invasive weed forms dense patches that can completely dominate meadows and fields, restricting the growth of other species and degrading pastures.	Coos (L) Jackson (L) Klamath (L)		LV-D	B	No	
Musk thistle *Carduus nutans*	Found in pasture, range and timberlands; spreads by seeds, taking advantage of human disturbance; prolific in moist condition; commonly infests ditch banks, roadsides, and cereal fields.	Jackson (L) Klamath (W)	Yes FW-D	MD-D LV-D	B	No	Near MP 174.28; in ROW near MP 204.65; EAR 209.00, 221.92 near ROW
Italian thislte *Carduus pycnocephalus*	Infests roadsides and waste areas; spreads rapidly; replaces desirable forage species.	Coos (W) Douglas (W) Jackson (L)	UMP-D RRS-D	RO-D MD-D	B	No	MP 70.79
Slender-flowered thistle *Carduus tenuiflorus*	Infests roadsides and waste areas; outcompetes more desireable forage vegetation.	Coos (W) Douglas (W) Jackson			B	No	
Diffuse knapweed *Centaurea diffusa*	Grow in dense stands in a variety of open land, excluding more desirable forage species.	Douglas (L) Jackson (L) Klamath (L)	Yes UMP-D RRS-D FW-D	RO-D MD-D LV-D	B	No	
Spotted knapweed *Centaurea maculosa*	Form dense stands on any open ground, eliminating more desirable forage.	Coos (L) Douglas (L) Jackson (L) Klamath (W)	Yes UMP-D RRS-D	MD-D LV-D	B	Yes	MP 39.78; EAR 39.60-39.72; MP 89.97; EAR 23.42BR-23.53BR; MPs 23.51-23.54BR; EAR to Starveout Creek comm site; MP 157.88; near MP 187.44/PAR 187.46; adjacent to K-Falls Memorial Drive 2 Pipe Yard

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Meadow knapweed *Centaurea pratensis*	In moist roadsides, sand or gravel bars, river banks, irrigated pastures, moist meadows, forest openings.	Coos (L) Douglas (W) Jackson (W) Klamath (H)	UMP-D RRS-D FW-D	CB-D RO-D MD-D	B	No	54.3, ≈56.3, 56.75, 56.8-57.4, 57.6, 57.7-57.9, 119.25; TEWA 160.54-W (RRS); ROW MP 23.52BR and along EAR 23.42BR-23.53BR; along EARs 31.51, 32.10, 31.69-31.81; ROW MP 31.68-31.82; EAR to Starveout Creek comm site
Yellow starthistle *Centaurea solstitialis*	In dry slopes, grasslands, overgrazed rangelands, pastures, edges of cropland, roadsides, and disturbed areas; toxic to horses.	Coos (L) Douglas (W) Jackson (W) Klamath (L)	Yes UMP-D RRS-D FW-D	MD-D LV-D	B	No	MPs 67.17-67.28, 67.85, 67.95-68.03, 68.25, 68.5, 68.55, 69, ≈69.1, 70.8, 80.43, 80.5, 80.6-80.82, 121.99, 126.3-126.5, 128.5-128.7, 141.65-141.9, 142.1-144, 150.16, 160.7, 224.78, 224.87, 224.94; LTM, Inc. Pipe Yard; Winchester Pipe Yard; Umpqua River; Access Roads; MP 150.82-150.9; TEWA 142.02-W; EAR 141.80; MP 126.47; EAR 126.27-126.59; near MP 151.3; EARs 89.50, 19.89-80.42; UCSA 79.17-W.

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Rush skeletonweed *Chondrilla juncea*	In rangeland and cropland.	Douglas (W) Jackson (W) Klamath (L)	UMP-D RRS-D FW-D	RO-D MD-D LV	B	Yes	63.55-63.8, 64.1-64.2, 67.17-67.28, 67.95, 69, ≈69.1, 70.23-70.3, 76.36, 94.7, 98.3-98.4, 102.2, MP 104.2/EAR 104.24; EAR 138.63; EAR to Starveout Creek comm site
Canada thistle *Cirsium arvense*	Found in cultivated fields, riparian areas, pastures, rangeland, forests, lawns, gardens, roadsides, and waste areas; most commonly spread by root tillage.	Widespread throughout Oregon	Yes FW-D	CB-D RO MD-D LV-D	B	No	MPs 37.65-38.9, 47-47, 48.27-48.4, 55.1, 78.4, 91.1-91.6, 93.4-93.4, 96.7-96.9, 105.7, 109.8, 109.9, 199.57, 203.95; EARs 24.37BR, 23.32BR, 24.10, 24.36, 24.55, 26.95; EARs 150.43-150.65, Starveout Ceek Rd; EARs 46.51, 91.19-91.74, 206.50; TEWA 152.85-N; near MP 91.54; near MP 191.47, 200.37, 201.0 (in ROW); near TEWA 201.01-W; along State Highway 39
Bull thistle *Cirsium vulgare*	Found in pastures, rangelands, and newly logged sites; replaces native grasses and forbs.	Widespread throughout Oregon	Yes UMP-D RRS-D	CB-D	B	No	Numerous EARs along BR route; EAR 24.10; EAR 24.55; EAR 115.36; near MP 149, 195.56

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Old man's beard *Clematis vitalba*	A "creeper" found along roadsides, river banks, gardens, hedges, shelter belts, disturbed forest, and forest edges.	Coos (L) Douglas (L)	RRS-D	CB-D MD-D	B	No	
Poison hemlock *Conium maculatum*	Grows in pastures, streams, and irrigation ditches; extremely poisonous.	Widespread throughout Oregon	FW-D	MD-D LV-D	B	No	Near MP 195.56; adjacent to K-Falls Memorial Drive 2 Pipe Yard
Field bindweed *Convolvulus arvensis*	Competitive crop weed.	Coos (W) Douglas (W) Jackson (W) Klamath (W)	FW-D	CB-D RO-D MD-D LV-D	B	Yes	
Jubata grass *Cortaderia jubata*	Found within coastal regions in forests.	Coos (L) Douglas (L)	RRS-D(?)	CB-D	B	No	
Dodder *Cuscuta spp.*	Parasite on agricultural crops; drastically reduces yield.	Douglas (L) Jackson (L)	FW-D	MD-D	B	No	
Houndstongue *Cynoglossum officinale*	Highly invasive; significantly reduce forage; toxic to cattle and horses.	Jackson (L) Klamath (L)	Yes RRS-D FW-D	CB-D MD-D LV-D	B	No	FW: MP 171.4-171.6; near MP 171.38
Yellow nutsedge *Cyperus esculentus*	Invades cultivated agricultural lands.	Coos (W) Douglas (W) Jackson (W)			B	No	
Scotch broom *Cytisus scoparius*	Pioneer species which invades disturbed sites, natural areas, dunes, forestlands; prolific seed producer; costly to control.	Coos (W) Douglas (W) Jackson (W) Klamath (L)	Yes UMP-D RRS-D	CB-D RO MD	B	No	47.3-47.3, 52.15-52.15, 53.65, 55.1, 56.1, 63.65, 82.94, 90.35, 94.7, 95.54; LTM, Inc. Pipe yard; Access Roads; MPs 36.2, 37.02, 38.64, 39.5; TEWA 38.86-W; TEWA 40.24-N; MP 44.84; along numerous EARs in CB, RO, and MD BLM; near MP 54.24; MP 64.25; MP 78.4; TEWA 79.85-N; MP

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
							80.13; MP 91.55; adjacent to K-Falls Memorial Drive 2 Pipe Yard
Portuguese [Striated] broom *Cytisus striatus*	Prolific in savannahs, scrubs, and open forests; highly competitive in commercial timberlands with canopies up to 20 feet across.	Douglas (L)	UMP-D	RO-D MD-D	B	Yes	
Spurge laurel *Daphne laureola*	Prefers better-drained clay loams and forest loams with neutral to acidic soils. Escaped populations form dense stands mostly under tree canopies.	Douglas (L)		RO-D MD-D	B	No	
Cutleaf teasel *Dipsacus laciniatus*	Invasive in grasslands, savannahs, and waste areas.	Jackson (L) Klamath (L)	RRS-D	CB-D MD-D	B	No	EAR 23.32BR; EAR 24.36; EAR 26.95; EAR 20.05BR
South American waterweed *Egeria (Elodea) densa*	Aquatic herb that grows under water; invades new aquatic environments, impedes waterways, increases flooding.	Coos (W) Douglas (W) Jackson (L)			B	No	
Spanish heath *Erica lusitanica*	Found along utility rights-of-ways, riparian areas, and roadsides; spread rapidly by seed.	Coos (L)			B	No	
Leafy spurge *Euphorbia esula*	Invades disturbed sites, including roadsides, prairies, savannahs, pastures, and abandoned fields; difficult to control.	Coos[5] Jackson (L) Klamath (L)	FW-D	CB-D MD-D LV-D	B	Yes	
Myrtle spurge *Euphorbia nyrsinites*	Displaces desirable native species; caustic to human skin.	Jackson (L) Klamath (L)			B	No	
French broom *Genista monspesslana*	Aggressive pioneer species of land disturbances; costly to control because of persistence.	Coos (W) Douglas (W)	UMP-D RRS-D	CB-D RO-D MD-D	B	No	Multiple EARs in CB BLM (23.42BR-23.53BR, 28.50; 24.36); MP 23.48; MP 23.52; EARs 51.54 (SH 42), 79.89-80.42; MP 98.13

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Herb Robert *Geranium robertianum*	Habitats that have been opened up through weed control activities	Douglas (L)	RRS-D	CB-D RO-D MD-D	B	No	
English ivy *Hedera helix*	Very invasive west of cascades; displaces native vegetation on forest floors.	Coos (W) Douglas (W) Jackson (W)	UMP-D RRS-D	CB-D RO-D MD-D	B	No	≈69.1; EAR 24.37BR; EAR 16.97BR-18.14BR; MP 16.97BR-17.02BR
St. Johnswort *Hypericum perforatum*	Invades rangelands to open timber; rapidly spreads on well-drained, disturbed sites; poisonous to livestock.	Widespread throughout Oregon	Yes UMP-D RRS-D FW-D	CB-D RO-D MD-D LV-D	B	No	102.3, 104.2, 106.8, 108.1-108.4, 108.9, 168.3, 168.5-168.8, near MP 170.56, 170.7, 174.6, 174.85, 180.55, 180.87, 186.26, 186.47, 186.96; TEWA 168.85; TEWA 168.59/MP 168.69; along EAR 168.84; near TEWA 174.52-W; EAR 119.03; MP 176.56; EAR 209.00
Policeman's helmet *Impatiens glandulifera*	Forms dense stands in riparian areasand moist lowlands, excluding native forbs.	Coos (L)			B	No	
Yellow flag iris *Iris pseudacorus*	Invades riparian, open water features, irrigation ditches; can reduce the carrying-capacity of wetlands for waterfowl and disrupt other ecological relationships; can restrict flow in waterways; difficult and expensive to control.	Coos (L) Douglas (W) Klamath (L)	FW-D	CB-D RO-D MD-D	B	No	
Dyers woad *Isatis tinctoria*	Occurs in rangeland, grain fields, pastures, waste areas, roadsides, and fencerows. Also found in orchards aind cultivated crops.	Douglas (L) Jackson (L) Klamath (L)	RRS-D FW-D	MD-D LV-D	B	No	

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Kochia *Kochia scoparia*	Invades a wide variety of dry habitats; resistent to many herbicides.	Jackson (W) Klamath (W)			B	No	
Perennial peavine *Lathyrus latifolius*	Occurs on rights-of-ways, forested regions, and other natural areas.	Coos (L) Douglas (W) Jackson (L) Klamath (L)	UMP-D RRS-D	CB-D RO-D MD-D	B	No	MP 16.98BR; EARs 20.05BR, 24.37BR, 16.97BR-18.14BR; EAR 49.76
Whitetop (hoary cress) *Lepidium draba*	Common weed species on alkaline soils, but is not restricted to them.	Coos (L) Jackson (L) Klamath (L)	Yes	MD-D	B	No	
Perennial pepperweed *Lepidium latifolium*	Found in disturbed areas or bare soil (i.e., agriculture, rangeland, roadside ditches; degrades nesting habitat for wildlife; colonizes rapidly.	Jackson (L) Klamath (W)	FW-D	LV-D	B	Yes	Along State Highway 39 near MP 211.43
Hairy whitetop *Lepidium pubescens*	Common on alkaline soils, but is not restricted to them. Forms dense patches that can completely dominate sites.	Coos (L) Jackson (L) Klamath (L)			B	No	
Dalmation toadflax *Linaria dalmatica (L. genista)*	Out-competes desirable forage plants for moisture and nutrients; thrives in arid rangelands, pastures, and railways.	Coos (L) Douglas (L) Jackson (L) Klamath (W)	Yes UMP-D RRS-D FW-D	MD-D LV-D	B	Yes	160.37-160.42; TEWA 160.54-W; near MP 174.28
Yellow toadflax *Linaria vulgaris*	Aggressive weed in rangeland where it quickly replaces grasses and herbs.	Douglas (L) Jackson (L) Klamath (L)	UMP-D RRS-D FW-D	MD-D LV-D	B	No	
Waterprimrose *Ludwigia hexapetala, peploides*	Perennial occurring in marshes, swamps, ditches, ponds, and around lake margins, where they form dense floating mats up to 3 feet tall, crowding out native species.	Jackson (L)		MD-D	B	Yes	
Purple loosestrife *Lythrum salicaria*	Crowds out marsh vegetation required by wildlife for food and shelter; found along shorelines of shallow ponds, streams, and wetlands.	Coos (W) Douglas (W) Jackson (W) Klamath (L)	RRS-D	CB-D RO-D MD-D	B	No	MP 69
Parrot's feather *Myriophyllum aquaticum*	Aquatic plant found in freshwater lakes, ponds, streams, and canals; generally slower moving water.	Coos (W) Douglas (W) Jackson (L)		RO-D MD-D	B	No	

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Eurasian watermilfoil *Myriophyllum spicatum*	Adverse impact to fish habitat; expensive to control.	Coos (L) Douglas (L) Jackson (L)			B	No	
Scotch thistle *Onopordum acanthium*	Inhabits moist sites or drainages in dry locations.	Douglas (L) Jackson (L) Klamath (W)	Yes FW-D	CB-D MD-D LV-D	B	No	Along EAR 206.50, 209.00, 217.67; Along EAR 228.36 adjacent to TEWA 228-01-N (Klamath Compressor Station)
Common reed *Phragmites australis*	Grows in sites that hold shallow water, including roadside ditches, marshes, swamps, brackish estuaries, and alkaline wetlands.	Klamath (L)			B	No	
Japanese knotweed *Polygonum cuspidatum*	Grows vigorously along roadsides, waste areas, streams, ditches; rapidly establishes on scoured shorelines, islands, and adjacent forested areas.	Coos (L) Douglas (W) Jackson (L)	Yes UMP-D RRS-D	CB-D RO-D MD-D	B	No	≈MP 69.1
Himalayan knotweed *Polygonum polystachyum*	Rapidly colonize scoured shores and islands; threat to riparian areas.	Coos (L) Douglas (L)		CB-B	B	No	
Giant knotweed *Polygonum sachalinense*	Prevents streamside regeneration in riparian areas.	Coos (L) Douglas (L)	UMP-D	CB-D RO-D MD-D	B	No	
Sulphur cinquefoil *Potentilla recta*	In disturbed areas (i.e., roadsides, pastures, abandoned fields).	Douglas (L) Jackson (L) Klamath (L)	UMP-D RRS-D FW-D	MD	B	No	MP 160.0/EAR 159.99-160.62
Himalayan [Armenian] blackberry *Rubus armeniacus (R. procerus, R. discolor)*	Aggressively displaces native vegetation; dominates most riparian habitat; costly to manage.	Coos (W) Douglas (W) Jackson (W) Klamath (L)	Yes UMP-D RRS-D FW-D	CB-D RO MD	B	No	53.55, 53.65, 54-54.2, 54.3, 55.1, ≈56.3, ≈56.55, 56.75, 57.6-59.5, 59.6-60.1, 60.5, 62.5-63.9, 63.9-64.9, 65.5-65.6, 65.8, 70.2-70.45, 78.4, 78.5, 78.6, 79.9, 80, 80.1, 80.2, 80.3, 80.4,

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
							84.2, 89.9-90, 90.22-90.45, 95.54, 102.6-102.82, 105.9, ≈119.2-119.7, 133.2, 142.1-145.5, 147.4, 149.6-149.7, 149.8, 150.25-150.3, 151.6; near 152.5 and 153.03; along numerous access roads in CB, RO, and MD BLM
Mediterranean sage *Salvia aethiopis*	In rangeland, alfalfa, and wheat on dry, south-facing slopes.	Jackson (L) Klamath (W)	FW-D	LV-D	B	No	Adjacent to K-Falls Industrial oil Pipe Yard
Tansy ragwort *Senecio jacobaea*	Prolific in pastures, clearcuts, and disturbed roadside areas; toxic to cattle and horses.	Coos (W) Douglas (W) Jackson (L) Klamath (H)	Yes UMP-D RRS-D FW-D	CB-D MD-D RO-D LV-D	B	Yes	31.58-32.5; 36.5-38.95; 47.7-47.7, 48.27-48.4, 51.5-51.5, 75.4, 79.6-80.70; 90.33, 91.5-91.7, 93-93, 93.4-93.5, 97.1-97.7, 98.6-99.3, 102.3/EAR 102.30, 105.7-105.8, 108.13/EAR 108.32, 109.8, 110.2
Milk thistle *Silybum marianum*	Infests roadsides, waste and disturbed areas, grazing lands; poisonous to livestock.	Coos (W) Douglas (W) Jackson (L)		RO-D MD-D	B	No	
Buffalobur *Solanum rostratum*	Drought-resistant; survives in disturbed, dry areas (i.e., meadows, dry rangelands, pastures, roadsides, waste areas).	Coos (H) Douglas (L) Jackson (L) Klamath (L)			B	No	
Johnsongrass *Sorghum halepense*	Extremely competitive weed of corn.	Douglas (L) Jackson (L)			B	No	

Common Name Scientific Name	Characteristics	Occurrence/Subject to Control			Oregon DOA Class	Oregon DOA Target "T" Weed	Documented Occurrence in Vicinity of Pipeline [5]
		County [2]	Forest Service [3]	BLM Districts [4]			
Spanish broom *Spartium junceum*	Grows in drier sites; costly to control because of persistent seed bank (> 80 years).	Douglas (L) Jackson (L)	RRS-D	RO-D MD-D	B	No	
Medusahead rye *Taeniatherum caput-medusae*	Outcompetes other grasses by extracting moisture before native perennial grasses begin to grow.	Coos (L) Douglas (W) Jackson (W) Klamath (L)	Yes UMP-D RRS-D FW-D	RO-D MD-D LV-D	B	No	MP 129.05-129.1 and adjacent
Saltcedar *Tamarix ramosissima*	Occurs along streams, canals, and reservoirs.	Jackson (L) Klamath (L)		LV-D	B	Yes	
Puncturevine *Tribulus terrestris*	Infests pastures, ditches, fields, and roadsides; seeds easily spread by animals, humans, and vehicles.	Douglas (L) Jackson (W) Klamath (L)	RRS-D	RO-D MD-D LV-D	B	No	Along State Highway 39 near MP 211.15; adjacent to Merrill Oregon RR Siding Pipe Yard
Gorse *Ulex europaeus*	Persistent pioneer species adapted to a variety of habitats; plant growth and stand density increase rapidly; persistent seed bank.	Coos (W) Douglas (L)	UMP-D RRS-D	CB-D RO-D MD-D	B	Yes	Adjacent to Coquille Yard; MP 21.4 BR; MP 21.97BR; MP 22.08BR; EAR 20.95BR; near TEWA 25.72-W; several EARs in CB BLM; MP 47.74
Spiny cocklebur *Xanthium spinosum*	In highly disturbed waste areas and barnyards; surrounds small reservoirs; seeds and seedlings are poisonous.	Coos (L) Douglas (L) Jackson (L) Klamath (L)		MD-D LV-D	B	No	

[1] Sources: ODA, 2017a; Forest Service, 2017c.
[2] Letter in parenthesis indicates distribution within the county (ODA 2017a): L = Limited, W = Widespread, and H = Historic. If there is not a letter, ODA (2017a) did not indicate the species was located in counties crossed by the Proposed Route.
[3] Forest Service Codes ("D"=documented in National Forest, although not always in County crossed by Pipeline; Forest Service 2005 and 2017b): UMP-Umpqua N.F., RRS-Rogue River-Siskiyou N.F., FW- Fremont-Winema N.F. "Yes" indicates that it is documented or suspected to occur in USDA-FS Region 6 but not necessarily within forests crossed by the Pipeline and subject to control if located in the Forest (Forest Service, 2005).
[4] BLM District Codes ("D"=documented in BLM District, although not always in County crossed by Pipeline; BLM 1995a, 1995b, 1995c, 1995d, and 2017b): CB-Coos Bay BLM, RO-Roseburg BLM, MD-Medford BLM, LV- Lakeview BLM.
[5] Documented within 100 feet of Pipeline project during survey efforts for the Pipeline by Siskiyou BioSurvey, LLC from 2007 through 2017, or included in data provided to PCGP (Forest Service, 2017b; BLM, 2017b; ODA 2018).
[6] BLM District (BLM 2017b) indicated that this species is found in the listed county.

Table 1-2
Tree Insect and Disease Infestation Documented within 0.5 Mile of the Pipeline

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
MP 6.7R– MP 22.0	Along ROW. Common throughout entire west coast forest.	Swiss Needle Cast	U	2007-2017	BLM/PV
	0.2 mi S of MP 1.23	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2008	PV
	0.3 mi N of MP 2.3	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2010	PV
	0.1 mi N of MP 2.43	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2009	PV
	near Kentuck Slough; 0.4 mile NE of MP 6.4R	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2014	PV
	0.3 mi W of MP 7.2R	Douglas-fir Beetle	2	2012	PV
	0.04 mi N of MP 9.57R	Douglas-fir Beetle	1	2017	PV
	0.3 mi W of MP 10.19R	Douglas-fir Beetle	1	2017	PV
	0.1 mi S of MP 13.6BR	Douglas-fir Beetle	1	2017	BLM
	0.7 mi W of MP 14.4BR	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	0.9 acre	2017	PV
	0.7 mi W of MP 15.2BR	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	0.99 acre	2011	PV
	0.1 mi W of MP 15.8BR	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2.5 acres	2010	PV
	0.3 mi E of MP 20.9BR	Douglas-fir Beetle	1	2015	BLM
	0.9 mi W of MP 21.7BR	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	0.5 acre	2010	PV
	0.5 mi E of MP 22.8BR	Flatheaded Borer	0.5 acre	2008	BLM
	0.1 mi W of MP 25.2BR	Douglas-fir Beetle	1	2014	BLM
	0.2 to 0.5 mi SW of MP 21.8	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	5	2012, 2015	BLM
	0.3 mi SW of MP 22.3	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2013	PV
	0.2 mi SW of MP 22.45	Flatheaded Borer	1	2007	PV
MP 23.1	Construction ROW	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2013	PV
	0.1 mi SW of MP 23.2	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2015	PV
	0.3 mi SW of MP 23.2	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2014	BLM
	0.05 mi S of MP 23.46; 0.2 mi SE of MP 23.53	Douglas-fir Beetle	2	2006, 2008	BLM
	SW of ROW near MP 23.46	Flatheaded Borer	1	2008	BLM

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.13 mi W of MP 23.8	Douglas-fir Beetle	1	2017	BLM
	0.4 mi NE of MP 25.1	Flatheaded Borer	2	2009	BLM
	0.2 mi SW of MP 25.3	Flatheaded Borer	2	2009	PV
	0.3 mi NE of MP 26.9	Douglas-fir Beetle	2	2010	PV
	0.2 mi E of MP 27.0	Douglas-fir Beetle	2	2015	BLM
	0.1 mi E of MP 30.2	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2014	PV
	0.3 mi E of MP 30.5	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2014	BIA
MP 30.44 – MP 30.50	Construction ROW	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	11	2004, 2011	PV
	0.3 mi E of MP 30.5	Flatheaded Borer	1	2016	BIA
MP 30.51 – MP 30.55	Construction ROW	Flatheaded Borer	3	2007	PV
MP 30.84 – MP 30.89; TEWA 30.86	Construction ROW	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2011	PV
	0.3 mi S of MP 31.0	Fir Engraver	1	2007	BLM
MP 32.14 – MP 32.20	Construction ROW	Douglas-fir Beetle	1	2010	BLM
	0.3 mi SW of MP 33.6	Flatheaded Borer	2	2008	BIA
	0.4 mi SW of MP 33.6	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2010	BIA
	0.4 mi SW of MP 33.8	Flatheaded Borer	2	2008	BIA
	0.3 mi SW of MP 34.86	Flatheaded Borer	4	2006	PV
	0.3 mi SW of MP 34.7	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2008	BIA
	0.3 mi N of MP 34.9	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	10	2008, 2009	PV
MP 35.62 – MP 35.67	Construction ROW	Flatheaded Borer	1	2008	BLM
	0.3 mi SE of MP 36.4	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2012	BLM
	0.5 mi S of MP 35.81	Douglas-fir Beetle	5	2006	PV
	0.1 mi S of MP 36.75	Fir Engraver	5	2005	BLM
	0.1 mi NW of MP 37.3	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2012	PV
	0.07 mi S of MP 37.42	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	1	2011	BLM
	0.3 mi SE of MP 37.4	Douglas-fir Beetle	2	2015	BLM
	0.2 mi S of MP 37.5	Flatheaded Borer	2	2016	BLM
	0.2 mi N of MP 37.6	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2011	BLM
	0.4 mi S of MP 39.4	Port-Orford-Cedar Root Disease (*Phytophthora lateralis*)	2	2016	PV

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
MP 39.65	Construction ROW	Root disease	10	2016	PV
	0.3 mi NE of MP 40.0	Douglas-fir Beetle	2	2015	BLM
TEWA 40.87-N	TEWA	Flatheaded Borer	1	2007	BLM
	NE of ROW near MP 48.04	Douglas-fir Beetle	1	2010	PV
	0.3 mi NE of MP 42.7	Douglas-fir Beetle	2	2015	BLM
	0.3 mi NE of MP 43.3	Flatheaded Borer	2	2014	BLM
	0.3 to 0.5 mi NE of MP 43.4	Flatheaded Borer	8	2016	BLM
	0.4 mi S of MP 45.2	Douglas-fir Beetle	2	2010	BLM
	0.3 mi S of MP 45.3	Douglas-fir Beetle	2	2010	BLM
	0.1 mi S of MP 45.6	Flatheaded Borer	2	2016	BLM
	0.3 mi S of MP 46.0	Flatheaded Borer	2	2009	PV
	0.4 mi SW of MP 47.1	Mountain Pine beetle, Sugar Pine	2	2015	BLM
	0.4 mi SW of MP 47.2	Flatheaded Borer	2	2015	BLM
	0.02 mi N of MP 48.18	Douglas-fir Beetle	2	2010	PV
	0.02 mi S of MP 48.3	Douglas-fir Beetle	2	2010	PV
	0.04 mi S of MP48.29	Douglas-fir Beetle	1	2010	BLM
MP 48.29 – MP 48.44	Construction ROW	Fir Engraver	20	2005	BLM
	0.04 mi N of MP 48.61	Flatheaded Borer	1	2007	PV
	0.3 mi S of MP 49.77	Flatheaded Borer	10	2005	PV
	0.2 mi N of MP 50.48	Flatheaded Borer	2	2007	PV
	0.3 mi N of MP 50.7	Flatheaded Borer	4	2007	PV
MP 50.88 – MP 51.1	Construction ROW	Flatheaded Borer	6	2007, 2008	BLM
	0.2 mi N of MP 50.9	Flatheaded Borer	2	2016	PV
	0.3 mi N/NE of MP 51.1	Flatheaded Borer	4	2016	PV
	0.2 mi S of MP 51.12	Fir Engraver	5	2005	BLM
	0.2 mi SW of MP 51.4	Flatheaded Borer	2	2007	BLM
	0.02 mi N of MP 51.61	Fir Engraver	10	2005	BLM
	0.4 mi N of MP 52.15	Fir Engraver	5	2005	BLM
	0.4 mi S of MP 52.2	Flatheaded Borer	2	2008	PV
	0.3 mi N of MP 53.3	Flatheaded Borer	2	2015	PV
	0.2 mi SW of MP 53.5	Flatheaded Borer	3	2016	PV
	0.2 mi N of MP 54.3	Flatheaded Borer	34	2016	PV
	0.3 mi NW of MP 54.9	Flatheaded Borer	4	2012	PV
	0.3 mi N of MP 56.6	Flatheaded Borer	8	2016	PV
	0.3 mi S of MP 58.0	Pine Engraver	2	2015	PV
	0.3 mi S of MP 58.3	Pine Engraver	4	2015	BLM
	0.3 mi S of MP 59.0	Flatheaded Borer	2	2012	BLM
	0.05 mi N of MP 59.50	Flatheaded Borer	1	2007	PV
	S of ROW near MP 59.90	Flatheaded Borer	1	2007	PV
	0.4 mi S of MP 60.4	Flatheaded Borer	1	2013	PV
	0.03 mi N of MP 61.14	Flatheaded Borer	2	2010	BLM
	0.2 mi SW of MP 61.4	Douglas-fir Engraver	5	2007	PV
	0.1 mi N of MP 61.9	Western Pine Beetle	5	2014	PV

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.4 mi S of MP 62.7	Douglas-fir Beetle	3	2015	PV
	0.2 mi SW of MP 63.6	Flatheaded Borer	10	2016	PV
	0.4 mi NE of MP 63.8	Flatheaded Borer	2	2016	PV
	0.4 mi NE of MP 64.2	Flatheaded Borer	2	2016	BLM
	0.3 mi S of MP64.8	Flatheaded Borer	2	2012	PV
	0.3 mi S of MP 65.07	Douglas-fir Engraver	5	2006	PV
	0.1 mi S of MP 65.7	Flatheaded Borer	2	2012	PV
	0.1 mi S of MP 67.3	Flatheaded Borer	2	2010	PV
	0.1 mi SW of MP 68.6	Flatheaded Borer	1	2017	PV
	0.01 mi N of MP 72.81	Flatheaded Borer	2	2011	PV
	0.4 mi S of MP 73.7	Flatheaded Borer	2	2013	BLM
	0.3 mi E of MP 73.8	Flatheaded Borer	2	2016	BLM
	0.3 mi E of MP 73.9	Flatheaded Borer	2	2010	BLM
	0.4 mi SE of MP 74.5	Flatheaded Borer	2	2011	BLM
MP 74.9-75.2	0.0 to 0.04 mi N of MPs; 0.5 mi S of MPs	Flatheaded Borer	5	2017	BLM
	0.4 mi SW of MP 76.8	Fir Engraver	15	2016	PV
	0.3 mi N of MP 77.0	Flatheaded Borer	24	2016	PV
	0.4 mi NE of MP 77.7	Flatheaded Borer	2	2008	BLM
	0.2 mi NE of MP 78.3	Flatheaded Borer	2	2009	BLM
	0.4 mi NE of MP 78.4	Pine Engraver	3	2016	BLM
	0.6 mi N of MP 79.41	Flathead Borer	1	2009	PV
	0.3 mi NE of MP 79.8	Flatheaded Borer	2	2013	BLM
	0.45 mi W of MP 80.7	Flatheaded Borer	9	2017	BLM
MP 82.00 – MP 82.31	Construction ROW	Fir Engraver	10	2005	BLM
	0.4 mi N of MP 82.5	Flatheaded Borer	2	2017	BLM
	0.4 mi NE of MP 82.9	Flatheaded Borer	2	2016	PV
	0.1 mi NE of MP 83.3	Flatheaded Borer	2	2016	BLM
	0.2 mi NE of MP 84.6	Flatheaded Borer	2	2016	PV
	0.3 mi SE of MP 84.7	Flatheaded Borer	1	2016	BLM
	0.2 mi S of MP 84.9	Flatheaded Borer	1	2016	BLM
MP 84.34 – MP 84.47	Construction ROW	Fir Engraver	5	2005	PV
	0.1 mi SW of MP 85.0	Flatheaded Borer	1	2016	BLM
	0.1 mi N of MP 85.31	Fir Engraver	20	2004	BLM/PV
	0.1 mi N of MP 85.2	Flatheaded Borer	4	2016	PV
	0.1 mi N of MP 85.7	Fir Engraver	3	2015	PV
	0.1 mi N of MP 86.0	Fir Engraver	3	2015	BLM
	0.1 mi NE of MP 86.52	Fir Engraver	20	2004	BLM
	0.2 mi W of MP 86.6	Flatheaded Borer	1	2016	PV
	0.4 mi W of MP 86.7	Flatheaded Borer	1	2016	PV
	W of ROW near MP 86.72	Mountain Pine Beetle, Sugar Pine	1	2009	BLM
	0.1 mi E of MP 86.98	Fir Engraver	30	2004	BLM
	0.5 mi W of MP 86.8	Douglas-fir Beetle	10	2011	PV
	0.1 mi E of MP 86.8	Douglas-fir Beetle	1	2014	PV
	0.1 mi NE of MP 87.6	Flatheaded Borer	1	2015	BLM
	0.06 mi SW of MP 89.08	Flatheaded Borer	1	2010	PV

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.4 mi NE of MP 89.0	Flatheaded Borer	4	2017	PV
	0.3 mi W of MP 89.5	Flatheaded Borer	1	2014	PV
	0.4 mi W of MP 89.7	Flatheaded Borer	2	2009	PV
	0.2 mi SW of MP 90.5	Flatheaded Borer	2	2016	BLM
	0.4-0.5 mi NE of MP 93.0	Flatheaded Borer	2	2017	BLM, PV
	0.2 mi W of MP 93.4	Pine Engraver	30	2016	PV
	0.4 mi W of MP 94.7	Flatheaded Borer	10	2010	BLM
	0.2 mi S of MP 94.7	Flatheaded Borer	10	2010	BLM
	0.1 mi E of MP 94.27	Flatheaded Borer	5	2005	PV
	0.3 mi W of MP 94.3	Western Pine Beetle	1	2015	PV
95.2-95.5	0.04-0.2 mi E of MPs	Flatheaded Borer	6	2017	BLM
	0.3 mi W of MP 95.3	Needle Cast in Ponderosa	Medium	2014	PV
	0.4 mi E of MP 95.6	Mountain Pine Beetle, Sugar Pine	1	2007	BLM
	0.04 mi NE of MP 96.07	Flatheaded Borer	1	2009	PV
	0.14 mi S of MP 97.45	Mountain Pine Beetle, Sugar Pine	1	2017	BLM
MP 96.88 to 109.00 below areas:	Stout's Crk bridge at Milo south to 109.000 on FS.	Burned	Majority of vegetation inside and within varying distances of the ROW.	2015	FS, BLM, PV
MP 96.88 – MP 97.04	Construction ROW	Western Pine Beetle	5	2005	PV
	0.3 mi SW of MP 98.1	Douglas-fir Beetle	3	2010	BLM
	0.4 mi NE of MP 98.2	Douglas-fir Beetle	2	2010	BLM
	0.2 mi SW of MP 98.3	Douglas-fir Beetle	3	2010	BLM
	0.4 mi E of MP 98.37	Douglas-fir Beetle	5	2006	FS
	0.2 mi E of MP 98.40	Fir Engraver	10	2004	FS
MP 98.43 – MP 98.50	Construction ROW	Douglas-fir Beetle	3	2010, 2012	BLM
	0.03 mi W of MP 98.62	Douglas-fir Beetle	3	2010	BLM
	0.03 mi E of MP 99.12	Douglas-fir Beetle	5	2010	PV
	0.05 mi W of MP 99.55	Flatheaded Borer	1	2009	FS
	0.3 mi E of MP 99.7	Douglas-fir Beetle	5	2010	FS
	0.2 mi E of MP 100.12	Fir Engraver	no data	2004	FS
	0.3 mi E of MP 100.12	Fir Engraver	10	2005	FS
MP 100.26	Construction ROW	Flatheaded Borer	1	2007	BLM
MP 100.31 – 100.38	Construction ROW	Douglas-fir Beetle	5	2010	BLM
MP 100.52 – MP 100.59	Construction ROW; 0.13 W of MP 100.57; 0.07 E of MP 100.57	Douglas-fir Beetle	15	2010	BLM/FS
	0.2 mi W of MP 100.72	Fir Engraver	5	2005	BLM/PV
	0.4 mi E of MP 101.1	Flatheaded Borer	2 - Fire	2017	FS
	0.2 mi W of MP 101.7	Douglas-fir Beetle	1	2013	BLM
MP 101.84–MP 101.90	Construction ROW	Douglas-fir Beetle	1	2012	FS
	0.2 mi NW of MP 101.9	Douglas-fir Beetle	2	2010	BLM
	0.06 mi SE of 101.92	Flatheaded Borer	2	2009	FS
	NW of ROW near MP	Douglas-fir Beetle	2	2010	BLM

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	102.01				
	0.3 mi W of MP 102.0	Western Pine Beetle	2	2017	BLM
TEWA 102.19-N	TEWA near MP 102.21	Douglas-fir Beetle	5	2010	BLM
	0.4 mi SE of MP 102.25	Douglas-fir Beetle	5	2006	FS
	0.01 mi E of MP 102.47	Douglas-fir Beetle	2	2010	FS
	0.2 mi E of MP 102.6	Flatheaded Borer	1 - Fire	2017	FS
	0.3 mi SW of MP 103.11	Pine Engraver	5	2004	FS/PV
	0.2 mi SW of MP 103.1	Douglas-fir Beetle	1	2015	PV
	0.3 mi SW of MP 103.2	Fir Engraver	1	2015	PV
	0.2 mi SW of MP 103.2	Douglas-fir Beetle	1	2015	PV
	0.2 mi SW of MP 103.4	Fir Engraver	1	2015	PV
	0.1 mi E of MP 103.5	Flatheaded Borer	2	2014	PV
MP 103.92 – MP 104.22	Construction ROW	Fir Engraver	35	2004	FS/PV
MP 104.36 – MP 104.41	Construction ROW	Flatheaded Borer	1	2007	FS
	0.3 mi SW of MP 104.96	Mountain Pine Beetle, Sugar Pine	1	2004	FS
	0.02 mi S of MP 105.07	Douglas-fir Beetle	2	2010	FS
	0.2 mi NE of MP 105.4	Western Pine Beetle	1 - Fire	2017	FS
	0.2 mi E of MP 105.9	Fir Engraver	1	2015	FS
	0.07 mi W of MP106.10	Douglas-fir Beetle	4	2010	FS
	0.2 mi E of MP 106.2	Fir Engraver	1	205	FS
	W of MP 106.32	Douglas-fir Beetle	4	2011	FS
	0.4 mi W of MP 103.4	Flatheaded Borer	1	2016	FS
	0.04 mi W of TEWA 106.46; 0.1 mi SW of MP 106.42	Douglas-fir Beetle	4	2010	FS
	0.2 mi W of MP 106.8	Needle Cast in Ponderosa	Medium	2016	FS
MP 107.00 – MP 108.6	Construction ROW / 0.07 mi E of MPs	Flatheaded Borer	1, 5-Fire	2015, 2017	FS
	E of MP 107.79	Mountain Pine Beetle, Sugar Pine	1	2011	FS
	0.5 mi SE of MP 108.6	Flatheaded Borer	2	2017	FS
MP 110.16 – MP 110.69	Construction ROW	Fir Engraver	no data	2004	FS
	0.1 mi W of MP 110.1	Flatheaded Borer	1	2015	FS
	0.04 mi SW of MP 110.21	Flatheaded Borer	1	2007	FS
MP 110.28 – MP 110.34	Construction ROW	Flatheaded Borer	2	2010	FS
	0.4 mi SW of MP 110.3	Flatheaded Borer	1	2013	FS
	0.5 mi SW of MP 110.4	Flatheaded Borer	1	2017	FS
	0.06 mi S of MP 111.14	Flatheaded Borer	2	2010	FS
	0.3 mi N of MP 111.24	Fir Engraver	5	2004	FS
	0.05 mi NE of MP 111.37	Flatheaded Borer	2	2010	FS

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.1 mi SW of MP 111.5	Flatheaded Borer	9	2016	FS
	MP 112 to 113	Douglas-fir Beetle	157 acres	2010	FS
MP 112.27 - MP 112.33	Construction ROW	Mountain Pine Beetle, Sugar Pine	1	2005	FS
	0.1 mi SW of MP 112.4	Flatheaded Borer	2	2016	FS
	0.4 mi NE of MP 112.54	Mountain Pine Beetle, Sugar Pine	1	2004	FS
	0.4 mi NE of MP 112.54	Fir Engraver	5	2005	FS
MP 113.40 – MP 113.66	Construction ROW	Fir Engraver	0.25 acres	2010	PV
	0.1 mi NE of MP 113.8	Fir Engraver	8 acres	2016	PV
	0.45 mi NE of MP 114.2	Fir Engraver	10	2017	BLM
MP 116.58 – MP 116.65	Construction ROW	Western Pine Beetle	1	2013	BLM
MP 116.99 – MP 117.12	Construction ROW	Western Pine Beetle	6	2005	BLM
	0.3 mi W of MP 117.4	Western Pine Beetle	1	2015	BLM
	0.4 mi W of MP 117.6	Western Pine Beetle	1	2015	BLM
	0.3 mi W of MP 118.3	Flatheaded Borer	2	2016	BLM
	0.02 mi W of MP 119.1	Western Pine Beetle	2	2017	BLM
MP 119.10 – MP 119.15	Construction ROW	Flatheaded Borer	1	2015	BLM
	0.2 mi E of MP 119.3	Western Pine Beetle	1	2013	PV
	0.2 mi W of MP 119.6	Flatheaded Borer	1	2017	BLM
	0.3 mi SW of MP 119.8	Western Pine Beetle	2	2016	PV
	0.2 mi SW of MP 119.97	Western Pine Beetle	5	2004	BLM
MP 120.25 – MP 120.31	Construction ROW	Western Pine Beetle	2	2008	BLM/PV
	0.2 mi SW of MP 120.5	Flatheaded Borer	1	2015	PV
	0.2 mi E of MP 121.0	Flatheaded Borer	2	2017	PV
	0.1 mi W of MP 121.81	Western Pine Beetle	5	2004	PV
	MP 32.1	Flatheaded Borer	4 acres	2016	PV
	0.05 mi NE of MP 123.2	Flatheaded Borer	6	2016	PV
	0.4 mi SW of MP123.2	Flatheaded Borer	12	2016	PV
	0.05 mi SW of MP 123.0	Flatheaded Borer	6	2016	BLM
	0.14 mi S of MP 123.2	Flatheaded Borer	2 acres	2017	BLM
	0.3 mi SW of MP 123.9	Flatheaded Borer	19 acres	2016	BLM
	0.05 mi SW of MP 124.0	Flatheaded Borer	8 acres	2016	BLM
	0.07 mi NE of MP 124.01	Flathead Borer	5	2011	BLM
MP 124.15 – MP 124.23	Construction ROW	Flatheaded Borer	9 acres	2016	BLM
	0.4 mi NE of MP 124.31	Western Pine Beetle	10	2005	BLM
	0.34-0.45 mi NE/E of MP 124.3	Flatheaded Borer	2 acres	2017	BLM
	0.1 mi NE of MP 124.3	Flatheaded Borer	8 acres	2016	BLM/PV
	0.5 mi SW of MP 125.24	Western Pine Beetle	2	2005	PV

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.4 mi NE of MP 125.41	Western Pine Beetle	10	2005	BLM
	0.1 mi NE of MP 125.42	Pine Engraver	5	2014	BLM
MP 125.4-126.1	0.01-0.3mi N of MPs	Flatheaded Borer	11 acres	2017	BLM
	0.3 mi NE of MP 125.5	Western Pine Beetle	1	2013	BLM
	0.2 mi S of MP 125.72	Flatheaded Borer	1	2017	BLM
MP 125.62 – MP 125.72	Construction ROW	Flatheaded Borer	9 acres	2016	PV
MP 125.71 – MP 125.76	Construction ROW	Western Pine Beetle	3	2008	PV
	0.4 mi NE of MP 125.83	Flathead Borer	5	2004	BLM
MP 125.87 – MP 125.93	Construction ROW	Western Pine Beetle	8	2005	PV
	0.2 mi E of MP 126.54	Western Pine Beetle	10	2005	BLM/PV
	0.2 mi SW of MP 126.1	Flatheaded Borer	6.5 acres	2016	BLM
	0.2 mi NE of MP 126.2	Pine Engraver	3	2014	PV
	0.3 mi NE of MP 126.2	Flatheaded Borer	9 acres	2016	BLM
	0.4 mi NE of MP 126.3	Western Pine Beetle	5	2015	BLM
	0.3 mi NE of MP 126.3	Pine Engraver	3	2014	BLM
	0.3 mi NE of MP 126.4	Flatheaded Borer	25	2016	BLM
MP 126.64 – MP 126.72	Construction ROW	Flatheaded Borer	22 acres	2016	PV
TEWA 126.73-N	near 126.76	Pine Engraver	1	2010	PV
	0.1 mi E of MP 126.8	Flatheaded Borer	1	2016	PV
	0.2 mi E of MP 126.8	Western Pine Beetle	2	2012	PV
	0.3 mi E of MP 126.8	Western Pine Beetle	3	2014	PV
	0.3 mi W of MP 127.0	Flatheaded Borer	2	2016	BLM
MP 127.06 – MP 127.15	Construction ROW	Western Pine Beetle	10	2005	BLM/PV
	0.2 mi SW of MP 127.5	Flatheaded Borer	10	2016	BLM
	0.5 mi SW of MP 127.8	Western Pine Beetle	1	2012	BLM
	0.2 mi SW of MP 127.8	Western Pine Beetle	1	2015	BLM
	0.1 mi NE of MP 127.8	Western Pine Beetle	2	2015	BLM
	0.2 mi NE of MP 127.84	Pine Engraver	5	2005	BLM
	0.2 mi SW of MP 127.84	Western Pine Beetle	5	2005	BLM
	0.1 mi W of MP 128.46	Pine Engraver	15	2004	PV
	0.4 mi W of MP 128.61	Western Pine Beetle	5	2005	PV
MP 128.75 –MP 128.82	Construction ROW	Flatheaded Borer	2	2016	BLM
	0.2 mi SW of MP 128.80	Pine Engraver	10	2005	BLM/PV
	MP 128.9	Western Pine Beetle	1	2013	BLM
	0.1 mi NE of MP 129.0	Flatheaded Borer	2	2016	BLM
MP 129.6 – MP 129.7	Construction ROW	Flatheaded Borer	2	2016	BLM
	0.05 mi N of MP 130.40	Flatheaded Borer	2	2011	PV
MP130.52-MP 130.59	Construction ROW	Flatheaded Borer	2	2011	PV
	0.01 mi N of MP 131.07	Flatheaded Borer	2	2011	PV
	0.2 mi S of MP 131.14	Western Pine Beetle	5	2005	BLM
	0.3 mi NE of MP 131.39	Flatheaded Borer	5	2004	PV
	0.04 mi SW of MP 131.75	Western Pine Beetle	1	2008	BLM/PV

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
MP 131.78 – MP 131.82	Construction ROW	Flatheaded Borer	3	2016	BLM
	0.1 mi E of MP 131.80	Western Pine Beetle	5	2005	BLM/PV
	0.1 mi W of MP 132.9	Western Pine Beetle	1	2015	PV
	0.3 mi W of MP 133.0	Western Pine Beetle	1	2015	PV
	0.3 mi W of MP 134.1	Flatheaded Borer	24.5 a	2016	BLM
	0.3 mi SW of MP 134.1	Western Pine Beetle	1	2015	PV
	0.3 mi W of MP 135.2	Flatheaded Borer	50 acres	2016	PV
	W of MP 135.56	Western Pine Beetle	1	2008	PV
	0.2 mi NE of MP 135.8	Flatheaded Borer	42 acres	2016	BLM
	0.4 mi NE of MP 138.3	Flatheaded Borer	1	2013	BLM
MP 139.32 – MP 139.38	Construction ROW	Flatheaded Borer	3	2014	PV
	0.2 mi NE of MP 139.3	Flatheaded Borer	9 acres	2016	PV/BLM
	0.4 mi NE of MP 139.3	Flatheaded Borer	4	2016	BLM
MP 139.95 – MP 140.10	Construction ROW	Western Pine Beetle	10	2005	BLM
	0.4 mi E of MP 140.7	Flatheaded Borer	1	2015	BLM
MP 140.10 – MP 140.17	Construction ROW	Flatheaded Borer	5	2004	BLM
	0.2 mi E of MP 142.5	Western Pine Beetle	1	2015	PV
	0.03 mi NE of MP 142.93	Flatheaded Borer	2 acres	2017	PV
	0.4 mi NE of MP 143.0	Flatheaded Borer	1	2015	BLM
	0.3 mi NE of MP 143.2	Flatheaded Borer	1 acre	2017	BLM
	0.4 mi NE of MP 143.2	Flatheaded Borer	15 acres	2016	BLM
MP 143.47 – MP 143.51	Construction ROW	Western Pine Beetle	5	2009	PV
	0.1 mi SW of MP 143.5	Flatheaded Borer	1	2015	PV
	0.3 mi NE of MP 143.7	Flatheaded Borer	10 acres	2016	PV
	0.2 mi SW of MP 144.5	Flatheaded Borer	1	2015	PV
	0.3 mi W of MP 145.7	Flatheaded Borer	1	2015	PV
	0.4 mi SE of MP 146.82	Western Pine Beetle	25	2005	PV
MP 147.73 – MP147.78	Construction ROW	Western Pine Beetle	10	2005	PV
MP 148.12 – MP148.38	Construction ROW	Flatheaded Borer	60 acres	2016	BLM/PV
MP 148.42 – MP 148.52	Construction ROW	Flatheaded Borer	0.25 acres	2011	BLM
	Adjacent to MPs 148.6-148.8	Flatheaded Borer	2 acres	2017	BLM
	0.1 mi NE of MP 148.95	Flatheaded Borer	25	2005	BLM/PV
	0.1 mi S of MP 148.81	Western Pine Beetle	5	2006	BLM
	0.06 mi E of MP 149.29	Flatheaded Borer	1	2008	BLM
	0.07 mi N of MP 149.95	Flatheaded Borer	2 acres	2017	BLM
	0.3 mi SW of MP 150.11	Western Pine Beetle	5	2005	BLM
	0.3 mi SW of MP 150.1	Flatheaded Borer	5 acres	2017	BLM
	0.1 mi SW of MP 150.2	Flatheaded Borer	65 acres	2016	BLM/PV
	0.3 mi NE of MP 150.62	Western Pine Beetle	15	2005	BLM
	0.1 mi NE of MP 151.24	Western Pine Beetle	3	2005	BLM

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.5 mi NE of MP 151.3	Flatheaded Borer	2	2012	BM
	0.4 mi N of MP 151.5	Flatheaded Borer	0.5 acre	2017	BLM
	0.3 mi SW of MP 151.58	Western Pine Beetle	25	2005	BLM
MP 151.69 – MP 151.77	Construction ROW	Western Pine Beetle	3	2015, 2016	PV
	0.2 mi N of MP 151.9	Fir Engraver	60 acres	2016	BLM/PV
	0.4 mi N of MP 151.9	Fir Engraver	37 acres	2015	BLM/PV
	0.4 mi SW of MP 151.9	Fir Engraver	8 acres	2016	BLM
	0.4 mi N of MP 152.15	Fir Engraver	25	2005	BLM/PV
	0.05 mi N of MP 152.20	Flatheaded Borer	20	2004	BLM
MP152.24 – MP 152.27	Construction ROW	Western Pine Beetle	1	2014	BLM
MP 152.34 – MP 152.55; MP 152.95 – MP 153.22	Construction ROW & north	Fir Engraver	80	2004	BLM
	0.4 mi S of MP 152.37	Fir Engraver	10	2005	BLM
	N of MP 153.35	Flatheaded Borer	0.25 acres	2007	BLM
	0.3 mi NE of MP 153.8	Flatheaded Borer	12 acres	2015	FS
MP 153.86 – MP 153.99	Construction ROW	Flatheaded Borer	10	2010	FS
MP 153.92 – MP 153.98	Construction ROW	Western Pine Beetle	2	2009, 2010	FS
MP 153.92 – MP 153.98	Construction ROW	Fir Engrave	2	2014	FS
	0.4 mi NE of MP 154.0	Fir Engraver	22 acres	2016	FS
MP 154.2–MP 154.26	Construction ROW	Flatheaded Borer	2	2012	FS
MP 154.25 - MP 154.5	Area has perimeter radius of +/- 375 ft of this ROW segment.	Laminated root rot	550-700	2015	FS
Mp 154. 25-154.7	0.03-0.12 mi N and S of MPs	Flatheaded Borer		2017	
	0.3 mi S of MP 154.3	Western Pine Beetle	2	2014	FS
	0.4 mi S of MP 154.3	Fir Engraver	2	2014	FS
MP 154.35 – MP154.47	Adjacent to and within Construction ROW	Fir Engraver	28 acres	2016	FS
	0.03 mi N of MP 154.53	Flatheaded Borer	2	2011	FS
	0.4 mi N of MP 154.5	Flatheaded Borer	5	2015	FS
	0.2 mi N of MP 154.5	Flatheaded Borer	5	2015	FS
	0.3 mi SW of MP 154.7	Flatheaded Borer	1	2015	FS
	0.4 mi SW of MP 154.7	Fir Engraver	2	2014	FS
	0.2 mi S of MP 154.9	Flatheaded Borer	2	2012	FS
MP 154.84 – MP 154.92	Construction ROW	Flatheaded Borer	2	2011	FS
	0.02 mi S of MP 155.30	Fir Engraver	25	2004	FS/PV
	0.3 mi N of MP 155.42	Fir Engraver	15	2004	FS
	0.4 mi SE of MP 155.66	Fir Engraver	5	2006	FS
MP 155.87 – MP 156.3	Construction Row	Fir Engraver	30	2004, 2017	FS
	0.3 mi N of MP 156.2	Flatheaded Borer	2	2012	FS
	0.02 mi N of MP 156.48	Fir Engraver	10	2005	FS

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.3 mi S of MP 156.5	Flatheaded Borer	1	2014	FS
	0.1 mi N of MP 156.6	Fir Engraver	6	2016	FS
	0.4 mi S of MP 156.6	Western Pine Beetle	4	2016	FS
MP 156.64 – MP 156.70	Construction ROW	Fir Engraver	0.25 acres	2007	FS
MP 156.65 – MP 156.81	Construction ROW	Flatheaded Borer	25	2010	FS
	0.08 mi N of MP 156.66	Western Pine Beetle	0.25 acres	2007	FS
	0.1 mi N of MP 156.67	Flatheaded Borer	2	2014	FS
	N of MP 157.30	Mountain Pine Beetle, Sugar Pine	1	2007	FS
MP 157.14 – MP 157.27	Construction ROW	Flatheaded Borer	10	2010	FS
MP 157.44 – MP 157.67	Construction ROW	Fir Engraver	no data	2004	FS
	0.02 mi NE of MP 157.78	Flatheaded Borer	10	2010	FS
MP 158.01 – MP 158.07	Construction ROW	Flatheaded Borer	2	2010	FS
	0.2 mi SW of MP 157.99	Mountain Pine Beetle, Sugar Pine	1	2004	FS
	0.1 mi S of MP 158.09	Mountain Pine Beetle, Sugar Pine	1	2005	FS
	0.2 mi N of MP 158.1	Flatheaded Borer	18 acres	2014	FS
	0.3 mi S of MP 158.1	Fir Engraver	2	2013	FS
MP 158.17 – MP 158.31	Construction ROW	Fir Engraver	no data	2004	FS
MP 158.6 – MP 159.35	Construction ROW	Fir Engraver	226 acres	2014, 2017	FS
MP 159.5-160.0	Construction ROW	Mountain Pine Beetle in Ponderosa	5	2017	FS
	0.03 mi N of MP 160.15	Flatheaded Borer	3	2010	FS
	0.1 mi N of MP 160.64	Fir Engraver	5	2004	FS
	0.4 mi S of MP 161.0	Needle Cast in Ponderosa	60 acres	2014	FS
	N of MP 161.07	Flatheaded Borer	1	2009	FS
	0.4 mi N of MP 161.3	Fir Engraver	14 acres	2016	FS
	0.3 mi S of MP 161.53	Fir Engraver	5	2006	FS
MP 161.46 – MP 161.61	Construction ROW	Needle Cast in Ponderosa	18 acres	2016	FS
	0.4 mi N of MP 161.6	Western Pine Beetle	308 acres	2014	FS
	0.3 mi NE of MP 162.3	Needle Cast in Ponderosa	78 acres	2014	FS
	0.3 mi NE of MP 162.3	Needle Cast in Ponderosa	57 acres	2015	FS
	0.4 mi NE of MP 162.6	Needle Cast in Ponderosa	166 acres	2014	FS
	0.2 mi E of MP 162.67	Needle Cast, Lodgepole Pine	no data	2005	FS
	0.3 mi NE of MP 162.7	Fir Engraver	2	2012	FS
	0.2 mi E of MP 163.2	Fir Engraver	2	2012	FS

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
	0.3 mi SW of MP 163.8	Needle Cast in Ponderosa Pine	79 acres	2015	FS
	0.3 mi W of MP 163.9	Needle Cast in Ponderosa Pine	79 acres	2015	FS
	0.3 mi SW of MP 164.12	Mountain Pine Beetle, Sugar Pine	2	2006	FS
MP 164.05 – MP 164.35	Construction ROW	Needle Cast in Ponderosa Pine	74 acres	2014, 2016	FS
	0.04 mi NE of MP 164.6	Fir Engraver	1	2012	FS
MP164.42 – MP165.1	Construction ROW	Needle Cast in Ponderosa Pine	no data	2013, 2016	FS
	0.1-0.3 mi NE of MP 165.1	Fir Engraver	1	2012, 2017	FS
MP165.12 – MP 165.2	Construction ROW	Fir Engraver	no data	2016	FS
	0.1 mi S of MP 165.18	Needle Cast, Lodgepole Pine	no data	2004	FS
	0.3 mi SW of MP 165.3	Fir Engraver	no data	2016	FS
MP 165.8 – MP165.9	Construction ROW	Needle Cast, Lodgepole Pine	11 acres	2016	FS
MP 165.88 – MP 166.06	Construction ROW	Needle Cast in Ponderosa Pine	63 acres	2014	FS
	0.4 mi N of MP 165.94	Fir Engraver	5	2005	FS
MP 166.35-166.8	Construction ROW	Fir Engraver	2	2017	FS
	0.1 mi N of MP 166.63	Fir Engraver	20	2005	FS
	0.1 mi NE of MP 167.2	Needle Cast in Ponderosa Pine	20 acres	2012	FS
	0.07 mi N of MP 167.21	Needle Cast, Lodgepole Pine	Medium	2010	FS
	0.1 mi SW of MP 167.75	Fir Engraver	5	2004	FS
MP 168.43 –168.75	Construction ROW	Needle Cast in Ponderosa Pine	114 acres	2016	FS
MP 168.77 –MP 169.50	Construction ROW	Mountain Pine Beetle, Lodgepole Pine	400 acres	2013-2016	FS
	0.02 mi SW of MP 168.84	Mountain Pine Beetle, Western White Pine	1	2008	FS
MP 170.63 – MP 171.17	Construction ROW	Fir Engraver	0.5 acres	2010-2011	FS
MP 170.68 – MP 171.17	Construction ROW	Mountain Pine Beetle, Lodgepole Pine	194 acres	2012-2017	FS
	S of MP 171.97	Fir Engraver	3 acres	2007-2011	FS
MP 171.7 – MP172.63	Construction ROW	Mountain Pine Beetle, Lodgepole Pine	no data	2012-2017	FS
	0.3 mi NE of MP 172.7	Mountain Pine Beetle, Lodgepole Pine	no data	2014	FS
	0.1 mi S of MP 171.4	Mountain Pine Beetle, Lodgepole Pine	416 acres	2012-2013	FS
MP 173.05 – MP 175.29	Construction ROW	Mountain Pine Beetle, Lodgepole Pine	no data	20012-2017	FS
MP 173.20 – MP 173.80	Construction ROW	Mountain Pine Beetle, Lodgepole Pine	0.5 acres	2007, 2010	FS
	0.1 mi NW of MP 176.5	Mountain Pine Beetle, Ponderosa Pine	2	2016	FS
	0.4 mi NW of MP 176.5	Mountain Pine Beetle, Ponderosa Pine	2	2016	FS
	0.3 mi N of MP 176.5	Mountain Pine Beetle,	2016	FS	

Milepost (if crossed by Pipeline)	Location Within Vicinity of Pipeline	Identified Insect or Disease	Number of trees, if known	Year	Land Owner
		Ponderosa Pine			
MP 177.65 – MP 177,72	Construction ROW	Fir Engraver	5	2011	PV
	0.4 mi NE of MP 178.1	Fir Engraver	102 acres	2016	PV
	0.4 mi NE of MP 179.1	Fir Engraver	29 acres	2015	BLM/PV
	0.2 mi SW of MP 179.4	Fir Engraver	44 acres	2015	BLM/PV
TEWA 179.67-N	MP 179.7	Fir Engraver	2	2012	BLM
	0.3 mi SW of MP 179.8	Fir Engraver	134 acres	2016	BLM
	0.4 mi NE of MP 180.8	Mountain Pine Beetle, Ponderosa Pine	2	2013	PV
	0.4 mi S of MP 182.0	Fir Engraver	2	2016	PV
	0.3 mi S of MP 182.1	Fir Engraver	2	2016	PV
	0.4 mi N of MP 182.3	Fir Engraver	2	2016	PV
	0.4 mi N of MP 182.3	Fir Engraver	6.5 acres	2015, 2017	PV
	0.3 mi SW of MP 183.1	Fir Engraver	2	2016	PV
	0.2 mi SW of MP 185.7	Mountain Pine Beetle, Ponderosa Pine	1	2013	PV
	0.4 mi SW of MP 189.6	Fir Engraver	1	2014	PV
	0.3 mi NE of MP 189.7	Mountain Pine Beetle, Ponderosa Pine	1	2015	PV
	0.2 mi NE of MP 189.9	Mountain Pine Beetle, Ponderosa Pine	1	2015	PV
	0.3 mi SW of MP 190.0	Fir Engraver	1	2014	PV
	0.06 mi NE of MP 190.83	Western Pine Beetle	1	2009	PV
MP 224.25 – MP 224.35	Construction ROW	Mountain Pine Beetle, Ponderosa Pine	37 acres	2011; 2013-2105	BLM/PV
MP 224.69 – MP 224.89	Construction ROW	Mountain Pine Beetle, Ponderosa Pine	15 acres	2013	BLM/PV
Source: ODF, 2018 (ODF 2004 through 2017 aerial GIS data).					

Appendix 2

Table 2-1
Herbicides Approved for Use on Public and Private Lands in Oregon

Table 2-2
Herbicide Products Registered in Oregon for Use of Rights-of-Ways

Table 2-1
Herbicides Approved for Use on Public and Private Lands in Oregon

Herbicide (Active Ingredient) [1, 2]	Herbicide Characteristics and Target Vegetation	BLM & FS Approved [1, 2] Registered in OR (Current 2017) [3]	Areas where Registered Use Is Appropriate [2]				
			Rangeland	Forestland	Riparian and Aquatic	Oil, Gas and Minerals	ROW
2,4-D	Selective; foliar absorbed; postemergent; annual/perennial broadleaf weeds. Key species treated include kochia, mustard species, and Russian thistle.	BLM (W &E) BOR [4] OR	●	●	●	●	●
Bromacil	Non-selective; inhibits photosynthesis; controls wide range of weeds and brush. Key species treated include annual grasses and broadleaf weeds, kochia, and Russian thistle.	BLM (E) OR				●	●
Chlorsulfuron	Selective; inhibits enzyme activity; broadleaf weeds and grasses. Key species treated include biennial thistles and annual and perennial mustards.	BLM (E) FS OR	●			●	●
Clopyralid	Selective; mimics plant hormones; annual and perennial broadleaf weeds. Key species treated include knapweeds, Canada thistle, and starthistle and other thistles.	BLM (W&E) FS OR	●	●		●	
Dicamba	Growth regulator; annual and perennial broadleaf weeds, brush, and trees. Key species treated include knapweeds, kochia, and Russian thistle and other thistles.	BLM (W&E) OR	●			●	●
Diuron	Preemergent control; annual and perennial broadleaf weeds and grasses. Key species treated include annual grasses and broadleaf weeds, kochia, and Russian thistle. The primary use for diuron would be on communications sites or similar facilities where no vegetation is desired.	BLM (W&E) OR				●	●
Glyphosate	Non-selective; annual and perennial grasses and broadleaf weeds, sedges, shrubs, and trees. Key species treated include annual, biennial, and perennial grasses and broadleaf	BLM (W&E) FS, BOR [4] OR	●	●	●	●	●

Herbicide (Active Ingredient) [1, 2]	Herbicide Characteristics and Target Vegetation	BLM & FS Approved [1, 2] Registered in OR (Current 2017) [3]	Areas where Registered Use Is Appropriate [2]				
			Rangeland	Forestland	Riparian and Aquatic	Oil, Gas and Minerals	ROW
	weeds and woody shrubs.						
Hexazinone	Foliar or soil applied; inhibits photosynthesis; annual and perennial grasses and broadleaf weeds, brush, and trees. Key species treated include African rue, .	BLM (W&E) OR	●	●		●	●
Imazapyr	Non-selective; preemergent and postemergent uses; absorbed through foliage and roots; annual and perennial broadleaf weeds, brush, and trees. Key species treated include African rue, Japanese knotweed, and leafy spurge.	BLM (W&E) FS BOR [4] OR	●	●	●	●	●
Metsulfuron methyl	Selective; postemergent; inhibits cell division in roots and shoots; annual and perennial broadleaf weeds, brush, and trees. Key species treated include annual and perennial mustards biennial thistles and blackberries.	BLM (W&E) FS OR	●	●		●	●
Picloram	Selective; foliar and root absorption; mimics plant hormones; certain annual and perennial broadleaf weeds, vines, and shrubs. Key species treated include knapweeds, leafy spurge, and starthistle.	BLM (W&E) FS BOR [4] OR	●	●		●	●
Sulfometuron methyl	Broad-spectrum pre- and post-emergent control; inhibits cell division; grasses and broadleaf weeds. Key species include downy brome, mustards, and medusahead.	BLM (W&E) FS OR		●		●	●
Tebuthiuron	Relatively non-selective soil activated herbicide; pre- and post-emergent control of annual and perennial grasses, broadleaf weeds, and shrubs. Key species treated include oak, Russian olive, and sagebrush (thinning).	BLM (E) OR	●			●	●
Triclopyr	Growth regulator; broadleaf weeds and woody plants. Key species treated include	BLM (W&E) FS	●	●	●	●	●

Herbicide (Active Ingredient) [1, 2]	Herbicide Characteristics and Target Vegetation	BLM & FS Approved [1, 2] Registered in OR (Current 2017) [3]	Areas where Registered Use Is Appropriate [2]				
			Rangeland	Forestland	Riparian and Aquatic	Oil, Gas and Minerals	ROW
	mesquite and tamarisk, Russian olive, blackberries, brooms	OR					
Sethoxydim	Post-emergent control of annual and perennial grass weeds in broadleaf crops.	FS OR					●
Herbicides Proposed for Use on Public Lands							
Dicamba + Diflufenzophyr	Postemergent; inhibits auxin transport; broadleaf weeds. Key species treated include knapweeds, kochia, and Russian thistle and other thistles.	BLM (E&W)	●			●	●
Fluridone	Aquatic herbicide to control submersed aquatic plants. Key species treated include hydrilla and watermilfoils.	BLM (E&W)			●		
Imazapic	Selective postemergent herbicide; inhibits broadleaf weeds and some grasses. Key species treated include downy brome, leafy spurge, medusahead, and mustards.	BLM (E&W) BOR [4] FS OR	●	●		●	●

[1] USDA, 2005. Pacific Northwest Region, Invasive Plant Program, Preventing and Managing Invasive Plants, Record of Decision, Forest Service, Pacific Northwest Region. States of Oregon and Washington, Including Portions of Del norte and Siskiyou Counties in California, and Portions of Nez Perce, Salmon, Idaho and Adams Counties in Idaho. October, 2005. Portland, Oregon.

[2] USDI, 2010a. Record of Decision, Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in Oregon. The USDI 2010a ROD makes available 14 herbicides west of the Cascades (2,4-D, clopyralid, dicamba, dicamba + diflufenzopyr, diuron, fluridone, glyphosate, hexazinone, imazapic, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, and triclopyr) and 17 herbicides east of the Cascades (bromacil, chlorsulfuron, tebuthiuron, and the 14 herbicides available west of the Cascades). W = West of the Cascades; E = East of the Cascades.

[3] http://cru66.cahe.wsu.edu/LabelTolerance.html

[4] United States Bureau of Reclamation. 2007. Statement of Work-General Specifications for Lost River Weed Control. Bureau of Reclamation Klamath Basin Area Office, Klamath Falls, Oregon.

● = Areas where USEPA approved registration exists and the BLM has approval or proposes to use on public lands.

Table 2-2
(Excel Spread Sheet – ROW_OR)

Appendix 3

Pesticide – Use Proposal (FSM 2150) for Use on National Forests Lands

PESTICIDE - USE PROPOSAL (Reference FSM 2150)	DEPARTMENT/AGENCY		CONTACT/PHONE NO.
	REGION	FOREST	DATE SUBMITTED

1) OBJECTIVE
   a) Project No.
   b) Specific Target Pest
   c) Purpose

2) PESTICIDE
   a) Common Name
   b) Formulation
   c) % AI,AE,or lb / Gal.
   d) Registration No.

3) a) Form Applied
   b) Use Strength (%) or Dilution Rate
   c) Diluent

4) Lbs. AL per Acre or Other Rate

5) APPLICATION
   a) Method
   b) Equipment

6) a) Acres or Other Unit to be treated
   b) Number of Applications
   c) Number of Sites
   d) Specific Description of Sites

7) a) Month(s) of Year
   b) States

8) SENSITIVE AREAS
   a) Areas to be avoided
   b) Areas to be Treated with caution

9) REMARKS
   a) Precautions to be taken
   b) Use of Trained/ Certified Personnel

c) State and Local Coordination	
d) Other Pesticides being applied to Same Site	
e) Monitoring	
d) Other	

Approval (Signatures of Approving Official)	Date (mm/dd/yy):

Instructions for completing Form FS-2100-2, Pesticide Use Proposal

Heading - Provide requested information.

OBJECTIVE (Block 1)

a) Project Number - Assign in accordance with field IPMWG procedures.

b) Specific Target Pest - Identify the target pest by common and scientific name. Identify life cycle stage for animals or stage of growth for plants (e.g. emergent or pre-emergent, seedling, sapling, etc.)

c. Purpose - State exact purpose of pesticide use.

PESTICIDE (Block 2)

a) Common name of active ingredient(s) as indicated on the pesticide label. When a combination of pesticides are to used on a single pest, use the word "AND" in listing the pesticide names. When alternate materials are proposed, use the word "OR" in listing the names.

b) Indicate product formulation (i.e., amine, ester, emulsifiable concentrate, granules, solution, etc.).

c) Percentage active ingredient, acid equivalent, or pounds per gallon (as indicated on the pesticide label).

d) List the EPA registration number from the pesticide label.

PESTICIDE - continued (Block 3)

a) Form Applied - e.g., dust, granule, emulsion, bait, solution, gas, etc.

b) Use strength or Dilution Rate - List the quantity of concentrate mixed with the quantity of diluent or indicate the percentage strength of the formulation.

c) Diluent - Identify the pesticide carrier, i.e., water, oil, talc, kerosene, etc.

PESTICIDE - continued - (Block 4)

Pounds of Active Ingredient Per Acre or Other Rate - State pounds of active ingredient per acre to be applied, unless some other unit is indicated. If reporting in acreage is not appropriate, indicate units used. Indoor applications of residual sprays may be expressed as percent of actual ingredient in the prepared spray in gallons per M (1,000) square feet. Point of runoff, which may appear on a label is generally considered to be 1 gallon per 1,ooo square feet on most indoor surfaces. If dusts are used instead of sprays, express as ounces or pounds of prepared dust per M (1,000) square feet. Treatment of trees is listed by number of trees or is application is by hydraulic sprayer, is expressed as pounds or quarts of concentrate per 100 gallons of diluent - oil or water, whichever is used. If the pesticide for trees or brush is applied by air or mist blower, express as pounds of active ingredient per acre. Fumigants or inside aerosols are expressed as pounds of the fumigant or aerosol per M (1,000) cubic feet. Rodent baits should be listed as ounces or pounds of the prepared bait per bait station. Treatments in water may be expressed in parts per million (ppm) by weight or volume - specify. In spot applications, the rate of application is expressed in pounds or gallons per 1,000 square feet indoors or pounds per acre of active ingredient outdoors applied to the spot area treated.

APPLICATION - (Block 5)

Indicate as specifically as possible the method (i.e., aerial, ground, etc.) of application and the type of equipment such as helicopter, hand compression sprayer, mist-dust blower, hydraulic sprayer, injector, etc.

APPLICATION - (Block 6)

a) Acres or Other Unit to be Treated. State in terms of acres, unless otherwise indicated. Some projects may require repeat applications. Report only the units to be treated for the first application.

b) Number of Applications - For projects that require repeat applications to the same area, indicate their estimated

number and their timing.

c) Number of Sites - If the reported figures are a consolidation from several locations, indicate the number of locations.

d) Specific Descriptions of Sites - Indicate the type of area and pertinent portion of the area to be treated; such as ditchbank, rangeland, powerline right-of-way, tree nursery, etc. Specify if pesticide is to be applied in or around water and whether it will be applied directly to water or to the shore. Where applicable, indicate the slope of the treated area. For aquatic use, indicate water quality (hardness and pH) if available or applicable.

APPLICATION (Block 7)

a) Month(s) of Year - State month(s) of year.

b) State(s) - Indicate State and other designation that identifies the area geographically.

SENSITIVE AREAS (Block 8)

a) Areas to be Avoided - Identify sensitive areas to be avoided. Indicate if the area is subject to inadvertent treatment as a result of drift. Describe fully in "remarks" (Block 9) what protective measures are to be taken.

b) Areas to be Treated with Caution - Identify sensitive areas to be treated with special precautions to avoid contamination.

REMARKS (Block 9)

Use this line for information which will be helpful to the field IPMWG in evaluating the project.

a) Precautions to be Taken - Describe specific precautions be taken to protect sensitive areas; for example, no application within 100 feet of streams.

b) Use of Trained / Certified Personnel - Provide information on the status of training and/or certification of personnel doing the actual work and of those supervising. Has project been reviewed by a field biologist, agronomist, entomologist, or other appropriate subject matter specialist?

c) State and Local Coordination - Indicate coordination on the project at a State or local level.

d) Other Pesticides Being Applied to Same Site - Indicate what other pesticides are being or will be applied on the same site within the year.

e) Monitoring - Describe any monitoring of the operation be to conducted. Indicate effectiveness of prior projects and mention undesirable side effects observed.

f) Other - Indicate if the project is to be accomplished by contract.

Environmental analyses (EA's and/or EIS's) may be referred for additional information.

APPROVAL (Block 10)

a) Signature of Approving Official

b) Date of Signature

Appendix 4

Equipment Cleaning Checklist

EQUIPMENT CLEANING CHECKLIST

The purpose of this checklist is to provide guidance to appropriate PCGP staff in the cleaning of equipment, to control or prevent the spread of invasive plants, noxious weeds and *Phytopthera lateralis* (PL). This is a guide to direct attention to specific areas on equipment that are likely to accumulate soil and organic material. On-site judgments still need to be made about overall equipment cleanliness.

1) Does the equipment appear to have been cleaned?
2) Is the equipment clean of clumps of soil and organic matter?

Rubber-Tired Vehicles:

- □ Tires
- □ Wheel Rims (underside and outside)
- □ Axles
- □ Fenders/wheel wells/trim
- □ Bumpers

Track-Laying Vehicles:

- □ Tracks
- □ Road Wheels
- □ Drive Gears
- □ Sprockets
- □ Roller Frame
- □ Track Rollers/Idlers

All Vehicles as Appropriate:

- □ Frame
- □ Belly Pan (inside)
- □ Stabilizers (jack pads)
- □ Grapple and Arms
- □ Dozer Blade or Bucket and Arms
- □ Ripper
- □ Brush Rake
- □ Winch
- □ Shear Head
- □ Log Loader
- □ Water Tenders (empty or with treated water)
- □ Trailers (Low-boys)
- □ Radiator/grill
- □ Air filter/pre-cleaner
- □ Struts/Spring/Shocks
- □ Body seams

Other Materials

- □ Equipment Mats / Temporary Bridge Materials

Appendix 5

Weed Monitoring Report Form

Pacific Connector Weed Monitoring Report Form

Date: _____

Monitoring Year [1]: _____

Observer: _____

Pacific Connector Monitoring Report Form			
Monitoring location [2]	**Mileposts/Stations:**	**Alignment Sheets:**	
Project Component [3]			
County			
Landowner/Jurisdiction			
Legal Location	**1/4/1/4 & Section (s)**	**Township**	**Range**
Infestation Number or Site Number (if previously recorded)			
UTM – Zone 10 NAD 83 (Or substitute Latitude and Longitude for UTM Coordinates)	**UTM Easting/(Longitude)**	**UTM Northing/(Latitude)**	
Attach copy of location map [4]			
Access Routes [5]			
Weed Observations			
Common Weed Name (scientific name/code)			
Weed Infestation Condition			
General Abundance [6]			
Estimated # Individuals			
Size of Infestation (sq. ft/acres)			
Infestation Pattern (patchy, continuous, etc.)			
Notes on Previous Treatment success (if applicable)			
Potential for Infestation to Spread to Adjacent Areas & Recommended Actions			
Other Site Conditions Notes			

[1] First, second, third year etc. following construction/restoration or after weed treatment. Or if during routine operations monitoring.

[2] Provide area of weed surveyed (PCGP milepost/engineering station range).

[3] Indicate if equipment/weed cleaning station, hydrostatic test water discharge location, construction right-of-way, temporary extra work areas or temporary access roads or road improvement areas.

[4] Attach copy of map (alignment sheet) identifying infestation.

[5] Provide Road Names/Numbers and Transportation Map Drawing Numbers.

[6] Weed Abundance Chart.

Abundance Rating	Indicators of Abundance
Few	Weeds found, but only after much searching
Common	Weeds easily found during typical searching
Abundant	Weeds found in large numbers obvious without searching.
Innumerable	Weeds extremely numerous obvious without searching.

Appendix 6

Herbicide Application Record for BLM-Managed and NFS Lands

Components in Spreadsheet for Pesticide Reporting

The Pesticide Application Record spreadsheet will contain the data fields listed below. This information should be completed at the time of the application. The spreadsheet will contain a new entry for each herbicide application.

Infestation Number or Site Number: Needed when List A, T, or List B species are inventoried and treated. This is the unique number or code associated with each weed infestation.

Pesticide-Use Proposal Number (see Appendix 3)

Reference or EA Number

Date: Date of the weed inventory and/or treatment.

Application timing: Include beginning and ending time of application

Applicator (Appl): Person applying the herbicide.

Weed Name: Common name of the weed that is primarily being targeted.

UTM Easting (UTM E), Northing (UTM N) and Zone (Z) (should always be in NAD 83) or use Lat and Long if preferred. Be consistent with which one is used.

Infested Acres: List how many acres are covered with the weed.

Density (Dens) i.e. Cover: L= Low (less than 5% total canopy cover)
M = Moderate (5% - 25% canopy cover)
H = High (more than 25% canopy cover)

Surface ownership (Own): BLM, FS, or private. For federal managed lands included Forest Name, BLM District and Resource Area.

Herbicide Trade Name (Tr Name) and Treatment Method – The formulation name on the herbicide container (e.g. Accord or Weedone). Treatment method (e.g. spot spray with backpack sprayer, truck or atv mounted sprayer; wicking; wiping; hack and squirt). Include description of the type of equipment used during application. .

Chemical Names (Chem Name) – Common name of all herbicide active ingredients used (e.g. Glyphosate or 2,4-D)
Pesticide manufacturer (PM)

Pesticide Form: include if liquid or granular formulation

Adjuvant(s) are substances added to the pesticide formulation to enhance the toxicity of the active ingredient or to make the active ingredient easier to handle. List any used and include application rate.

Application Rate (Pounds Active Ingredient (A.I.)/Acre): For those formulations or tank mixes with multiple active ingredients, multiple columns for the application rates are provided. Application rates should be entered in the same order chemical names are entered. For

example, for Sahara DG, the A.I./acre of imazapyr would be entered in the first Application Rate (AR #1) column. The A.I./acre of diuron would be entered in the second Application Rate (AR #2) column. If an additional chemical was used in the mix it would be entered in the third Application Rate (AR #3) column.

Total Pounds Active Ingredient (A.I.) Applied: For those herbicides with multiple chemicals, multiple columns for the pounds of A.I. are provided. Pounds of A.I.. should be entered in the same order chemical names are entered. For example, for Sahara DG, the pounds of A.I. of imazapyr would be entered in the first Total Pounds A.I. . (AI #1) column. The pounds of A.I. of diuron would be entered in the second Total Pounds A.I./. (AI #2) column. If an additional chemical was used in the mix, it would be entered in the third Total Pounds A.I./ (AI #3) column.

Volume of output per acre (Vol):

Acres Treated: This should equal the Total Pounds A.I. divided by the Application Rate in Pounds A.I..

Stage of Pest Development (Pest Stage): Provide descriptions of the phonological stage of the weed being treated at the time of treatment.

Site Treated: include description of the site such as native vegetation, seeded vegetation and briefly describe site such as road right-of-way, meadow, forests, etc.

Weather Conditions (Weather): provide weather conditions during application including wind velocity, wind direction, temperature, cloud cover

Other. If necessary, provide other observations or notes relevant to application conditions

Pesticide Application Record [1]

Infestation Number or Site Number		**Pesticide-Use Proposal Number**	
Reference or EA Number			
Date of Inventory and/or Treatment			
Application Time	**Beginning of Application**	**End of Application**	
Applicator (name of person applying herbicide)			
Common Weed Name			
UTM & Zone	**UTM Easting**	**UTM N**	**Zone in NAD 83**
Infested Acres		**Infestation Density**	
Ownership	**BLM**	**Forest Service**	**Private**
Herbicide Trade Name		**Treatment Method**	
Chemical Name	**Manufacturer**	**Form**	

Adjuvant(s) Name		Application Rate	
Application Rates	**AR #1**	**AR #2**	**AR #3**
Active Ingredients (total pounds)	**AI #1**	**AI #2**	**AI #3**
Volume of Output Per Acre		**Acres Treated**	
Stage of Pest Development			
Site Treated			
Weather Conditions	**Wind Velocity**	**Wind Direction**	**Temperature**	**Cloud Cover**
Other Observations				

[1] Adapted from Noxious and Invasive Weed Management Plan for Oil and Gas Operators, BLM Glenwood Springs Energy Office, March 2007.

Appendix 7

Table 7-1
Sensitive Species or Habitats Crossed or in the Vicinity of the Pipeline Project
(To Be Updated)

Appendix O

Klamath Project Facilities Crossing Plan

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Klamath Project Facilities Crossing Plan

Pacific Connector Gas Pipeline Project

January 2018

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1.0 INTRODUCTION

The Klamath Project Facilities Crossing Plan (Crossing Plan) identifies the locations within Klamath County, Oregon where the Pacific Connector Gas Pipeline (Pipeline or Pipeline Project) alignment crosses facilities within the Klamath Project that are administered by the Klamath Basin Area Office of the U.S. Bureau of Reclamation (Reclamation) and the methods proposed to construct the Pipeline Project across Reclamation facilities. These facilities comprise a portion of the Reclamation irrigation infrastructure and include canals, laterals, and drains. The Pipeline will cross Reclamation facilities at 20 locations. These locations are listed in Table 1 and are shown on the crossing maps and individual plan and profile drawings included in Attachment 1.

The Pipeline Project is within the boundaries of five irrigation districts in the Klamath Basin. All 20 Reclamation facilities crossed by the Pipeline Project are in the Klamath Irrigation District (KID). All of the 20 facilities are proposed to be crossed by boring. This trenchless crossing method is further described in Section 2.0.

PCGP is working with all affected irrigation districts in the Klamath Basin to address their specific concerns relative to the proposed pipeline installation. Below is a complete list of affected irrigation districts in the Klamath Basin:

- Pioneer District Improvement Company (no Reclamation facilities crossed)
- Plevna District Improvement Company (no Reclamation facilities crossed)
- Klamath Irrigation District
- Van Brimmer Ditch Company (no Reclamation facilities crossed)
- Shasta View Irrigation District (SVID, no Reclamation facilities crossed)

2.0 PIPELINE CROSSING METHODS

The Pipeline Project has been routed to minimize impacts to Reclamation facilities by avoiding or minimizing the number of facility crossings whenever possible. This was generally accomplished by locating the Pipeline on highlands and avoiding drainages to the extent practicable. Due to the topography within the Klamath Valley and the linear nature of Reclamation facilities, complete avoidance is impossible and Reclamation facility crossings are necessary (see Resource Report 10 Section 10.4.3.8 and Figure 10.4-7).

PCGP proposes to install the pipeline with a minimum of five feet of cover across Reclamation facility crossings. Five feet of cover is consistent with industry standards and has been proven sufficient to protect against scour and third-party damage. Cover depth exceeding five feet would require additional construction measures and excessive land disturbance associated with dramatically increased excavation volumes and dewatering efforts. Proposed crossing methods, peak/average winter and summer flows, location coordinates, and underlying landowner information are provided in Table 1. Site photos of the majority of the crossing locations are available in Attachment 2. A brief explanation of trenchless crossing methods provided below.

2.1 Trenchless Installation

This method is completed using a boring machine to bore/auger a hole under a feature facilitating pipe installation without any surface disturbance. This is accomplished by excavating a large pit on either side of the crossing at a depth sufficient to accommodate the boring machine and achieve the required crossing depth. The excavation length is governed by the bored crossing length and must accommodate the length of the pipe to be installed. The

excavation depth is approximately one to two feet below the bottom of pipe elevation at the crossing. A boring machine is assembled in the entry pit and is used to advance an auger or cutter and temporary steel casing beneath the crossing area. After the auger and casing are advanced to the exit pit, the auger assembly is removed leaving the casing pipe in place. The product pipe is then welded to the casing and is either pushed or pulled through the bored hole completing the installation. In some geologic conditions, the product pipe may be installed without the use of a temporary steel casing. A typical drawing of this crossing method is available in Attachment 3.

All Reclamation canal and drain crossings will be completed using trenchless conventional bore methodology. Crossing the canals and drains using trenchless methodology will preserve the existing canal and drain embankments and avoid disruption of the underlying hardpan.

2.2 Compliance with Reclamation Requirements

All crossings of Reclamation facilities in the Klamath Project will be constructed in accordance with Reclamation's *Engineering and O&M Guidelines for Crossings,* December 2014 edition (Guidelines). PCGP will also implement the Guidelines for pipeline installation in each of the affected irrigation districts.

Compliance with the majority of the requirements in the Guidelines has been demonstrated on the drawings in Attachment 1. The following bullets provide additional clarification of PCGP's compliance. The section number of each bullet item references the corresponding section in the Guidelines.

- **Section 4.6.3 #1** – Facility crossings will be made nearly perpendicular (between 70 and 90 degrees) to the axis of the channel. Some exceptions exist due to adherence to FERC guidelines that emphasize co-location with existing utilities when siting new utilities. In these locations where the crossing angle is less than 70 degrees, the alignment is co-located (parallel) with existing high voltage transmission lines, or was aligned based on other routing constraints or based on landowner requests. Modifying the crossing angle would increase project disturbance, landowner encumbrances, and eliminate the benefit of co-location.
- **Section 4.6.3 #5** – Plans for the bored crossings will be prepared once the services of a qualified drilling contractor have been procured. Plans will be submitted to Reclamation for approval prior to the commencement of any drilling work.
- **Section 4.6.3 #10b** – At the conclusion of construction and prior to placing the pipeline in-service, PCGP will conduct a strength test as required by CFR Title 49, Part 192.505. All crossings of Reclamation facilities are in Class 1 areas.
- **Section 4.6.3 #10f** – Because the welded, steel pipeline will be buried in a predominantly linear alignment and will be carrying compressible natural gas at a nearly steady state temperature, expansion and contraction of the pipe are not significant risks to Reclamation facilities. If any crossings require pipeline fittings be installed in close proximity to Reclamation embankments to obtain the required depth of cover across short distances, adequate padding will be used around the fittings to ensure movement of the fitting will be minimal.
- **Section 5.0** – PCGP will install an impressed current cathodic protection (CP) system in compliance with CFR Title 49, Part 192, as opposed to Part 195 as mentioned in the Guidelines. However, the CP system may not be installed until up to one year after installation of the pipeline. This allows for accurate soil resistivity readings along the

alignment, to adequately design the CP system for pipeline protection. No CP infrastructure will be installed within Reclamation easements.

2.3 Specifications

PCGP will design, construct, and operate all pipeline and facilities in compliance with the Code of Federal Regulations Title 49, Part 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards and all industry standards referenced therein. Part 192 addresses specific questions raised by Reclamation during collaboration with PCGP, such as surveillance (192.613), emergency response (192.615), and public awareness (192.616). Although 192.707 indicates installing aboveground line markers at waterway crossings is not required for buried pipelines, PCGP has committed to install them at all aboveground and buried crossings of Reclamation facilities, as seen in the General Notes on each of the drawings in Attachment 1.

2.4 Approval of Crossing Plans

As specified by the Reclamation Guidelines, PCGP will submit this Crossing Plan and the associated design package (joint submittal of the Crossing Plan and design package hereafter referred to as Design Submittal) for approval of the Klamath Basin Area Office. PCGP's Design Submittal will follow the Reclamation *Mid-Pacific Region Guidelines for the Review of Design Drawings and Specification and Oversight of Related Activities on Transferred Works*, April 2014. As requested by the Klamath Basin Area Office, all PCGP Design Submittals will utilize Reclamation form MP-620 – *Request for Review and Acceptance of Design Drawings and Specifications*. Submittal of the final Design Submittal will not occur until PCGP has contracted with an engineering, procurement, and construction contractor (EPC Contractor), who will be responsible for all final designs and submittals.

This Design Submittal and pending approval are not intended to satisfy the requirements of Section 2.0 of the Guidelines, which requires applicants obtain a written land use authorization for Reclamation crossings. It is expected that Reclamation will authorize the Pipeline Project by issuing a memorandum to the Bureau of Land Management (BLM) State Director acknowledging concurrence with the BLM Record of Decision and subsequent issuance of a Right of Way Grant and Temporary Use Permit to cross lands under federal jurisdiction and/or easements. In order to maintain the schedule for issuance of the Record of Decision, a conditional approval by Reclamation of PCGP's Design Submittal will be necessary. The conditional approval should address any outstanding items required of PCGP to satisfy Reclamation requirements. This same procedure was used by Reclamation to authorize the Ruby Pipeline Project in the formal concurrence memorandum to the BLM State Director dated July 9, 2010.

3.0 KLAMATH FACILITY CROSSING LOCATIONS

The proposed Reclamation facility crossing locations are listed in Table 1, along with other pertinent information. Additional location and design information are provided on the individual drawings in Attachment 1.

Table 1
Klamath Project Facility Crossing Locations

Crossing ID Number	Facility	Index No	2009 Proposed Crossing Method	Proposed Crossing Method	PCGP Drawing Number	PCGP Milepost	Township	Range	Section	QQ	Winter Peak/Avg Flow (cfs)	Summer Peak Flow/Avg Flow (cfs)	Irrigation District	Reclamation Type of Rights	How Acquired by Reclamation	Grantor, Grantee
NA	C-4-E Lateral	KO-20-080	Dry Open Cut	Not Crossed	3430.5-X-117	NA	39S	9E	20	SWNE	NA	NA	KID	NA	NA	NA
NA	Withdrawn Land	KO-20	Dry Open Cut	Not Crossed	3430.5-X-117	NA	39S	9E	20	SWNE	NA	NA	KID	NA	NA	NA
1	No. 1 Drain	KO-20-276	Dry Open Cut	Bore	3430.5-X-117	200.54	39S	9E	20	SWNE	20 / 2	15 / 8	KID	Perpetual, reserved	Patents	USA, Heater, and USA, Parker
2	C-4-E Lateral	KO-20-164	Dry Open Cut	Bore	3430.5-X-118	201.63	39S	9E	28	NENW	2 / < 1	20 / 10	KID	Perpetual, fee	Bargain and Sale instrument	Miller, USA
3	C-4 Lateral	KO-09-013	Dry Open Cut	Bore	3430.5-X-119	204.13	40S	9E	3	NWNE	5 / < 1	50 / 70	KID	Canal Act 1890, reservation	Patent	USA, Melhare
4	C-4-F Lateral	KO-09-013	Dry Open Cut	Bore	3430.5-X-120	204.33	40S	9E	3	NWNE	1 / < 1	20 / 10	KID	Canal Act 1890, reservation	Patent	USA, Melhare
5	No. 3 Drain	KO-09-014	Dry Open Cut	Bore	3430.5-X-121	204.74	40S	9E	2	NWNW	4 / < 2	5 / 2	KID	Canal Act 1890, reservation	Patent	USA, Sayres
6	C-4-C Lateral	KO-09-018	Dry Open Cut	Bore	3430.5-X-122	205. 50	40S	9E	2	SWNE	2 / < 1	15 / 7	KID	Perpetual, fee	Bargain and Sale instrument	Carolan, USA
7	C Canal	KO-09-027	Bore	Bore	3430.5-X-123	205.96	40S	9E	1	NWSW	5 / < 1	270 / 200	KID	Canal Act 1890, reservation	Patents	USA, Manning, and USA, Koontz
8	D-2 Lateral	KO-09-050	Dry Open Cut	Bore	3430.5-X-124	206.51	40S	9E	12	NWNE	< 1 / < 1	7 / 4	KID	Perpetual, fee	Warranty Deed	Johnson, USA
9	5-A-1 Drain	KO-09-053	Dry Open Cut	Bore	3430.5-X-125	207.11	40S	9E	12	NESE	3 / < 1	2 / 1	KID	Perpetual, easement	Bargain and Sale instrument	Case
10	5-A Drain	KO-09-054	Dry Open Cut	Bore	3430.5-X-126	207.26	40S	9E	12	NESE	5 / < 1	5 / 2	KID	Canal Act 1890, reservation	Patent	USA, Shaw
11	C-4-7 Lateral	KO-10-031	Dry Open Cut	Bore	3430.5-X-127 &128	207.4	40S	10E	7	NWSW	< 1 / < 1	25 / 15	KID	Perpetual, fee	Bargain and Sale instrument	Kershner, USA
12	5-A Drain	KO-10-032	Dry Open Cut	Bore	3430.5-X-127 &128	207.42	40S	10E	7	NWSW	5 / < 1	5 / 2	KID	Perpetual, fee	Quitclaim	Cheyne, USA
13	5-A Drain	KO-10-032	Dry Open Cut	Bore	3430.5-X-129	207.6	40S	10E	7	SWSW	7 / < 1	6 / 3	KID	Perpetual, fee	Quitclaim	Cheyne, USA
14	5-A Drain	KO-10-034	Dry Open Cut	Bore	3430.5-X-130	207.98	40S	10E	18	NENW	7 / < 1	6 / 3	KID	Canal Act 1890, reservation	Patent	USA, Uerling
15	5-A Drain	KO-10-034	Dry Open Cut	Bore	3430.5-X-131	208.18	40S	10E	18	SENW	7 / < 1	6 / 3	KID	Canal Act 1890, reservation	Patent	USA, Uerling

Crossing ID Number	Facility	Index No	2009 Proposed Crossing Method	Proposed Crossing Method	PCGP Drawing Number	PCGP Milepost	Township	Range	Section	QQ	Winter Peak/Avg Flow (cfs)	Summer Peak Flow/Avg Flow (cfs)	Irrigation District	Reclamation Type of Rights	How Acquired by Reclamation	Grantor, Grantee
16	5-K Drain	KO-10-048	Dry Open Cut	Bore	3430.5-X-132	209.02	40S	10E	18	SESE	2 / < 1	5 / 2	KID	Canal Act 1890, reservation	Patent	USA, Steele
17	C-9 Lateral	KO-10-047	Dry Open Cut	Bore	3430.5-X-133	209.15	40S	10E	20	NWNW	1 / < 1	10 / 6	KID	Perpetual, fee	Warranty Deed	Henley, USA
18	No. 5 Drain	KO-10-061	Dry Open Cut	Bore	3430.5-X-134	210.26	40S	10E	20	SESE	40 / < 5	40 / 15	KID	Canal Act 1890, reservation	Patent	USA, Crawford
19	5-H Drain	KO-10-074	Dry Open Cut	Bore	3430.5-X-135	210.85	40S	10E	28	SWNW	5 / < 1	5 / < 2	KID	Perpetual, easement	Bargain and Sale instrument	Bunnell/O'Connor, USA
23	G Canal	KO-10-086	Bore	Bore	3430.5-X-140	213.87	40S	10E	26	SESE	50 / < 1	200 / 200	KID	Canal Act 1890, reservation	Patent	USA, Hill

4.0 RECLAMATION BRIDGES AND CULVERTS

PCGP conducted a review of potential crossings of Reclamation bridges and culverts and determined that two bridges and sixteen culverts could potentially be crossed by construction traffic, as listed in Table 2. Each potential crossing is also depicted in the crossing map in Attachment 1, labeled with the Object ID and Feature Crossed. All crossing locations except the private bridge over G Canal (Object ID 399) are along public roadways, and PCGP's construction contractor will comply with state and county load requirements. The private bridge over G Canal is a wooden structure that will not support heavy equipment loads. If PCGP's construction contractor determines that crossing this bridge with heavy loads is necessary, plans for bridge upgrade or replacement will comply with Reclamation Guidelines, Section 4.1. A design package will be submitted to Reclamation for review and approval prior to the commencement of any bridge work.

Table 2
Klamath Project Culvert and Bridge Crossings

Object ID	Facility Type	Feature Crossed	Road	Reclamation ID Number	Township	Range	Section
4	Culvert	A3 Lateral	Tingley Lane		39S	9E	16
5	Culvert	A3 Lateral	Tingley Lane		39S	9E	16
6	Culvert	No. 1 Drain	Midland Highway		39S	9E	20
18	Culvert	A3 Lateral	Villa Drive		39S	9E	11
19	Culvert	A3 Lateral	Summers Lane		39S	9E	15
20	Culvert	A3 Lateral	Anderson Avenue		39S	9E	15
22	Culvert	A3 Lateral	Ditch Rider Road		39S	9E	16
25	Culvert	Drain Ditch	Joe Wright Road		39S	9E	20
26	Culvert	Drain Ditch	Joe Wright Road		39S	9E	20
39	Culvert	Irrigation Canal	Old Midland Road		40S	9E	4
40	Culvert	Irrigation Canal	Anderson Road		41S	10E	2
49	Culvert	G-3 Lateral	Hill Road	KLAM-160	40S	10E	25
50	Culvert	J-1 Lateral	State Line Road (Hwy 161)		48N	4E	18
53	Culvert	Irrigation Canal	Old Midland Road		40S	9E	4
54	Culvert	Drain Ditch	State Line Road (Hwy 161)		48N	3E	13
113	Culvert	A3 Lateral	Southside Expressway (Hwy 140)		39S	9E	16
399	Bridge	G Canal	Private	KLAM-117	40S	10E	27
432	Bridge	D Canal	North Malin Road (6th Street)	KLAM-146	41S	12E	15

5.0 TEMPORARY EQUIPMENT CROSSINGS

To maintain the movement of equipment along the construction corridor and reduce impacts to Reclamation roads, bridges, and public roads, it will be necessary for PCGP's construction contractor to install temporary equipment bridges across Reclamation facilities. The need for installation and the type and length of these bridges are independent of the bored pipeline crossing method. These bridges will be placed without impact to the canal or drain embankments. Any bridge abutments necessary to install the bridge will be placed so as not to transfer load to the facility embankments. All temporary bridges will be removed following construction. A typical drawing of a temporary equipment bridge is provided in Attachment 3.

6.0 ENVIRONMENTAL CONSIDERATIONS

PCGP will follow the procedures outlined in the pertinent Plans of Development to ensure environmental compliance and conformance with the federal right-of-way grant. These plans primarily include:

- Air/Noise and Fugitive Dust Control Plan
- Environmental Briefings Plan
- Erosion Control and Revegetation Plan
- Environmental Response Plan
- Fire Prevention and Suppression Plan
- Integrated Pest Management Plan
- Right-of-Way Marking Plan
- Safety and Security Plan
- Sanitation and Waste Disposal Management Plan
- Spill Prevention, Containment, and Countermeasures Plan
- Transportation Management Plan
- Unanticipated Discovery Plan

Although not expected because of the trenchless crossing method, any sensitive fish species discovered in Reclamation facilities potentially impacted by construction of the Pipeline Project will be handled in accordance with the Fish Salvage Plan (see Appendix L to the POD). PCGP will retain contracted fish removal and handling personnel authorized to conduct the fish removal operations in coordination with Reclamation and the Klamath Falls U.S. Fish and Wildlife Service office. During construction, PCGP will provide weekly schedules to Reclamation indicating projected or anticipated work that would occur on or near Reclamation facilities for the following week. PCGP will also provide Reclamation a 48-hour notice prior to conducting work on a Reclamation facility that would require fish removal.

ATTACHMENT 1

Klamath Project Facilities Crossing Location Map and Site-Specific Drawings

20180123-5100 FERC PDF (Unofficial) 1/23/2018 2:12:09 PM

Legend

- Klamath Project Facilities
- Milepost
- PCGP Filed Route
- Reclamation Culverts
- Reclamation Bridges
- Klamath Irrigation District
- Pioneer Dist Improv Co
- Plevna Dist Improv Co
- Shasta View Irrigation District
- Van Brimmer Ditch Co

0 4,250 8,500 17,000 25,500 34,000 Feet

REFERENCE DRAWINGS	
DRAWING NO.	TITLE

REVISIONS					
NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK. APP.
A	12-06-2017	EE	MISC. REVISIONS		

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
KLAMATH PROJECT FACILITIES CROSSING MAP
M.P. 200 TO M.P. 214
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

DRAWN BY: EE	DATE: 12-06-2017	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: KLAMATH CROSSING MAP	SHEET 1 OF 2

Document Path: P:\PCGP_JCLNG\ArcMap\POD\Crossings-MP_200-214_Sheet 1.mxd

MP 218
MP 219
MP 220
MP 221
MP 222
MP 223
MP 224
MP 225
MP 226
MP 227
MP 228

KLAMATH COMPRESSOR STATION SITE

SCHAUPP RD
UNNAMED STREET
HARPOLD RD
Buck Butte
Harpold Reservoir
Smith Reservoir
Captain Jack Lake
Lone Pine Reservoir
Long Lake
WOBLOW MEADOW
PATRICIA LN
HOLLOW
DODDS HOLLOW RD
TAYLOR RD
POPE RD
TRANSFORMER RD
FEED LOT RD
MICKA RD
OLD MALIN HWY
JELINEK RD
DE MERRITT RD
KLAMATH FALLS MALIN HWY
PAYGR RD
WILSON RD
ADAMS POINT RD
GAINES RD
SUTY RD
MCCULLEY RD
MC CULLEY RD
DEPOT LOT RD
MALIN DUMP RD
MAUPIN RD
DRAZIL RD
MALIN RD
MORE LOCK RD
LOUDER RD
MALIN LOOP RD
MORELOCK RD
WASHINGTON AVE
RAJNUS RD
STASTNY RD
MALIN DEPOT RD
HIGHWAY 50
TULE LAKE VALLEY
STATE LINE RD
(432)D,Canal
Hatfield
OREGON
CALIFORNIA
KLAMATH CO
SISKIYOU CO
MODOC CO

N

Legend

- Klamath Project Facilities
- Milepost
- PCGP Filed Route
- Reclamation Culverts
- Reclamation Bridges
- Klamath Irrigation District
- Pioneer Dist Improv Co
- Plevna Dist Improv Co
- Shasta View Irrigation District
- Van Brimmer Ditch Co

0 3,000 6,000 12,000 18,000 24,000 Feet

Document Path: P:\PCGP_JCLNG\ArcMap\POD\Crossings-MP_200-214_Sheet 2.mxd

REFERENCE DRAWINGS

DRAWING NO.	TITLE

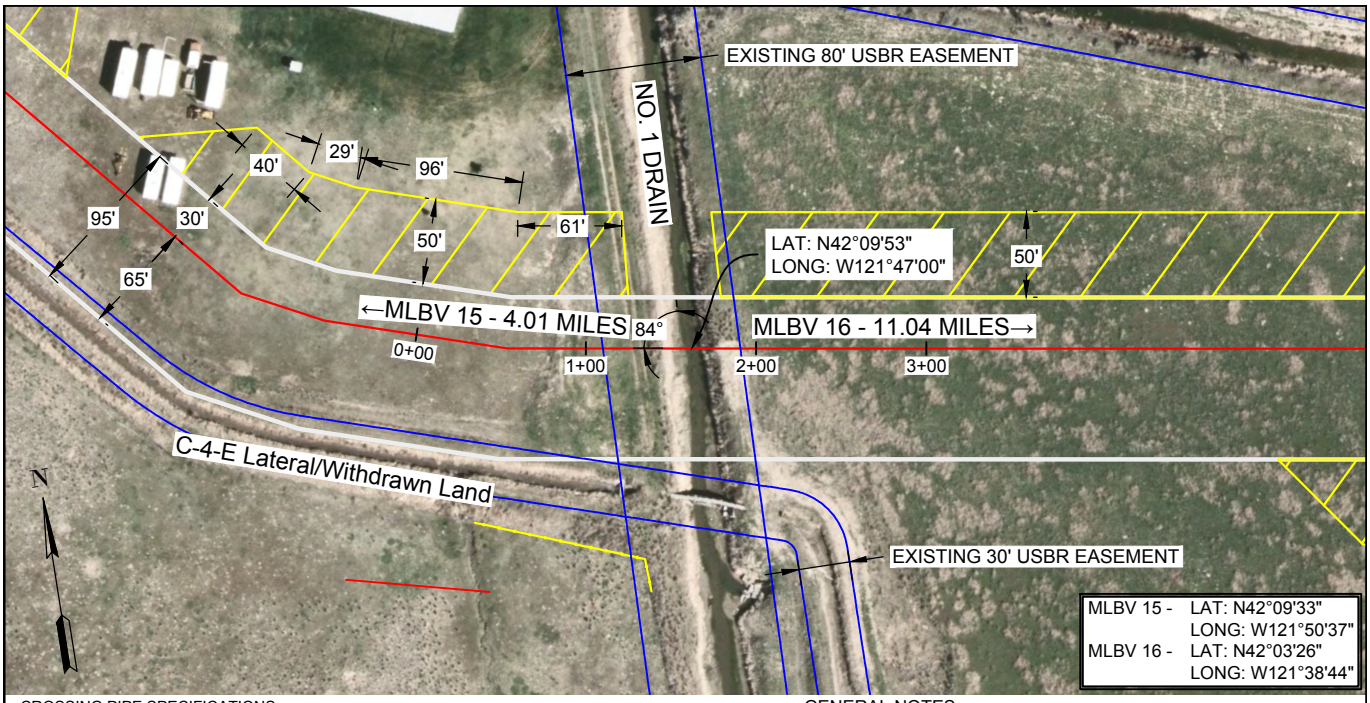
REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
A	12-06-2017	EE	MISC. REVISIONS			

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
KLAMATH PROJECT FACILITIES CROSSING MAP
M.P. 200 TO M.P. 214
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

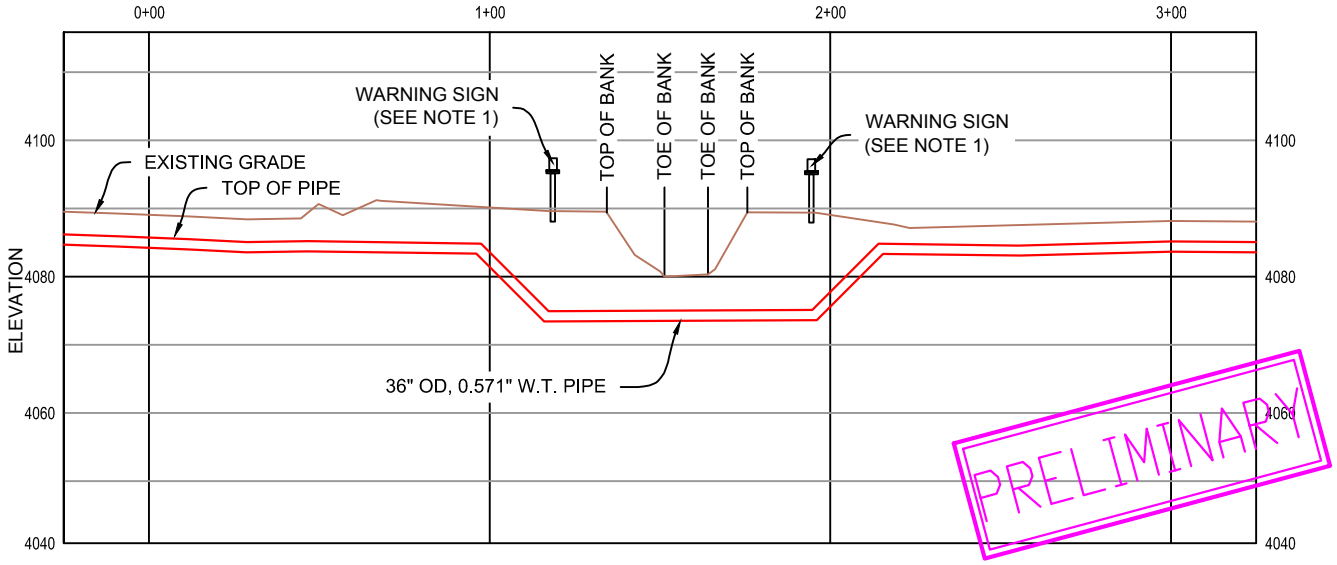
DRAWN BY: EE	DATE: 12-06-2017	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: KLAMATH CROSSING MAP	SHEET 2 OF 2



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE AND 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

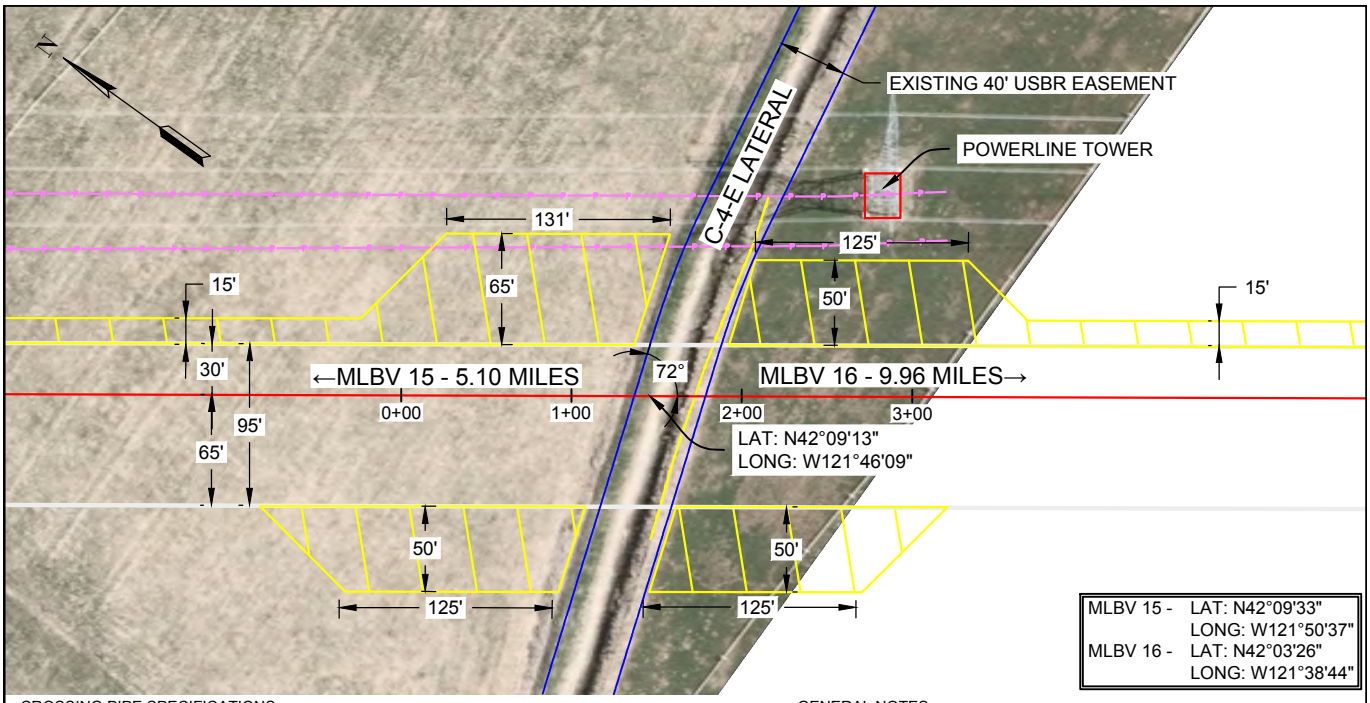
PACIFIC CONNECTOR TGAS PIPELINE PROJECT
KLAMATH PROJECT FACILITY CROSSING PLAN/PROFILE
CROSSING ID #1 - NO. 1 DRAIN - PCGP M.P. 200.54
SEC 20, T-39-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
8	9-29-2016	JCP	REVISED ROW WIDTH FOR BOR	1026555	KLL	BAB
9	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-117	SHEET 1 OF 1

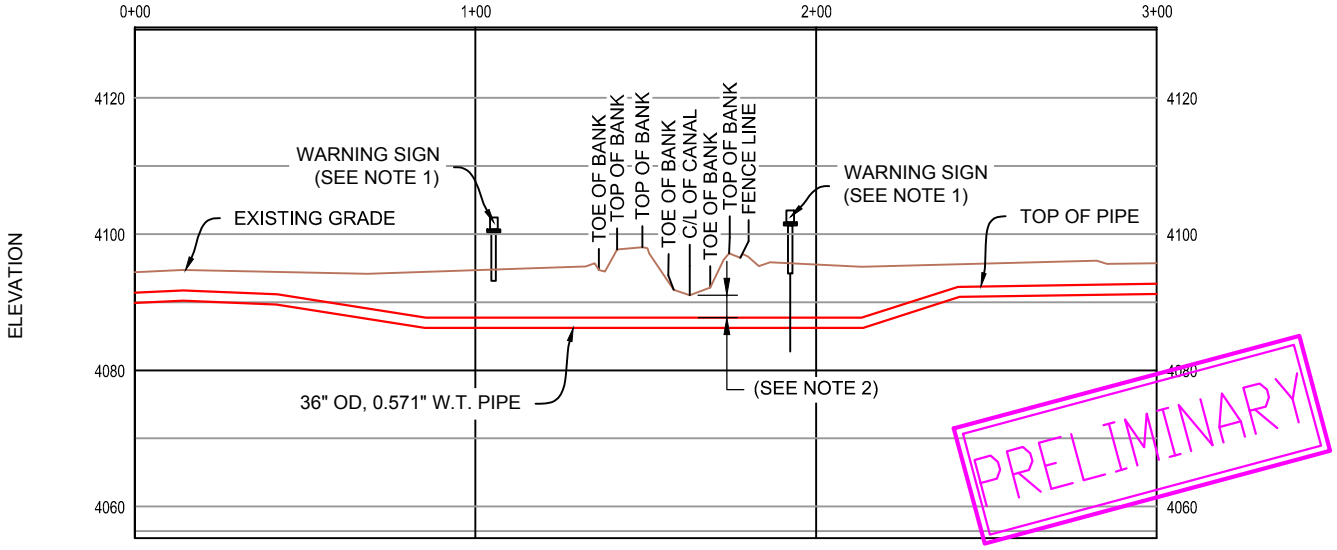


MLBV 15 -	LAT: N42°09'33"
	LONG: W121°50'37"
MLBV 16 -	LAT: N42°03'26"
	LONG: W121°38'44"

CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

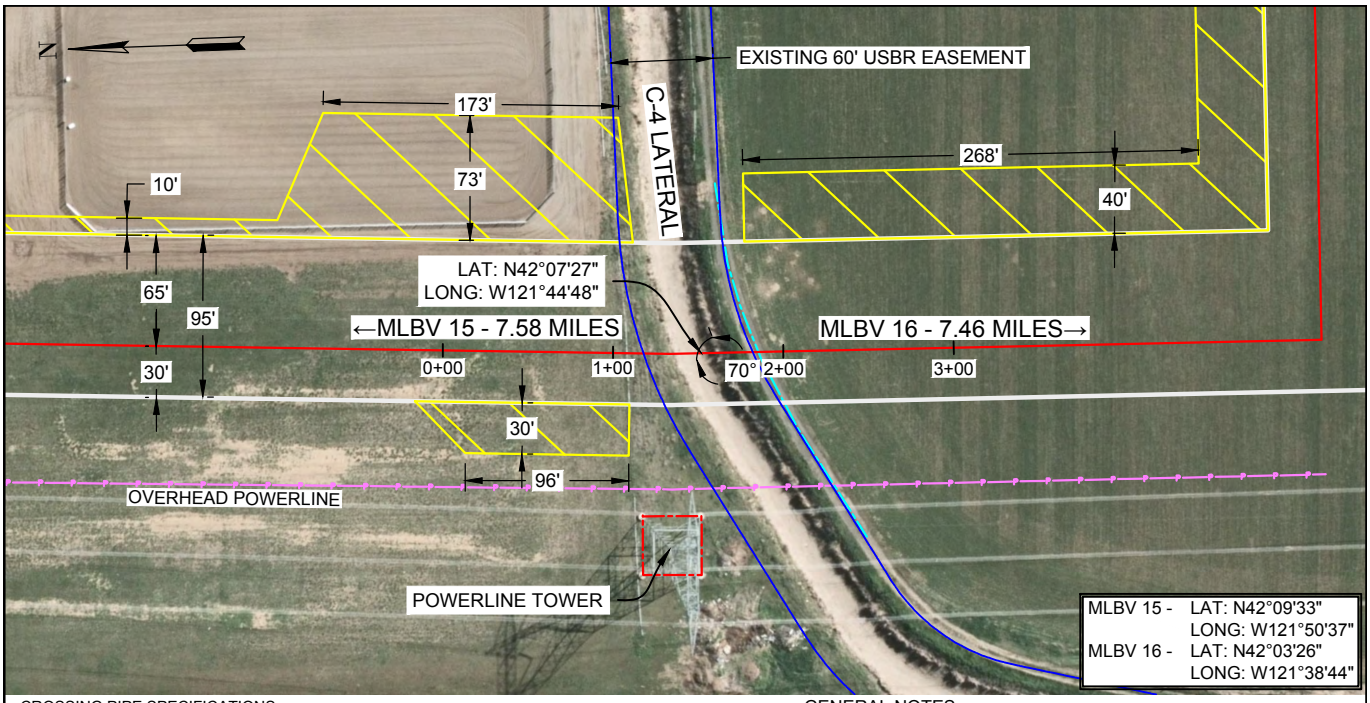
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #2 - C-4-E LATERAL - PCGP M.P. 201.63
SEC 28, T-39-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
7	03-30-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
8	12-08-2017	AWL	UPDATED PIPE DATA		JW	TB

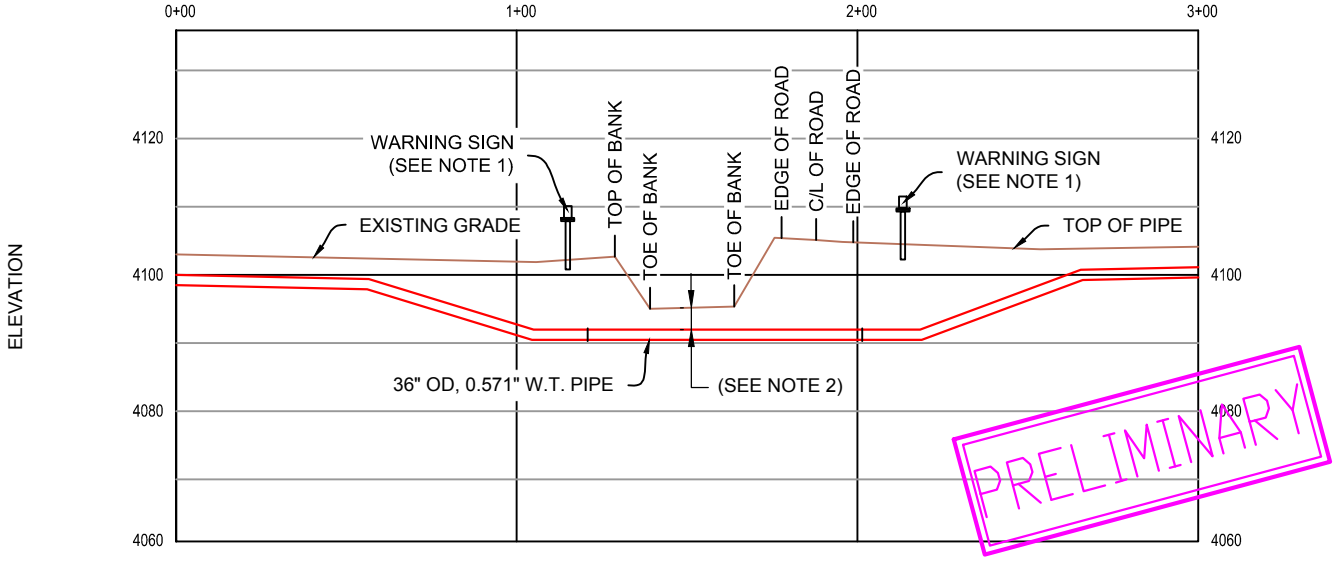
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-118	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #3 - C-4 LATERAL - PCGP M.P. 204.13
SEC 3, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
7	10-22-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
8	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
9	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE	
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:		
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-119	SHEET 1	
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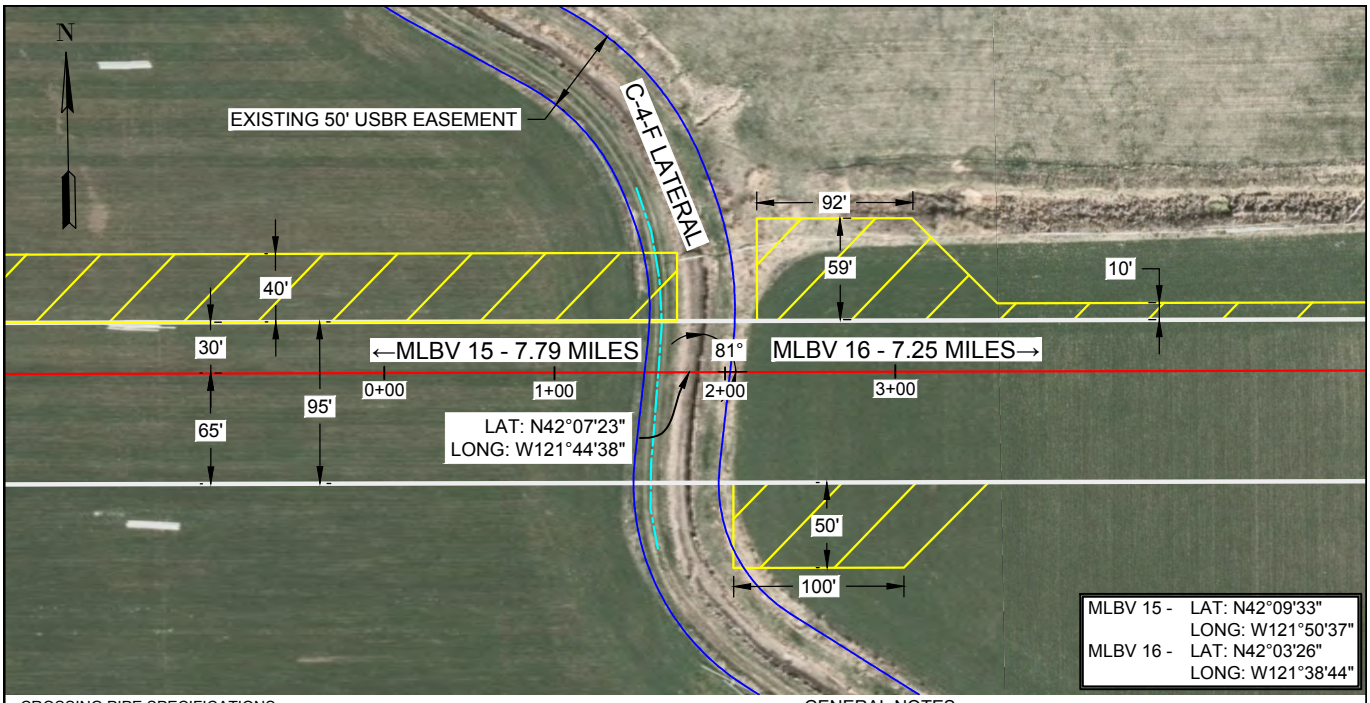

CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

GENERAL NOTES:
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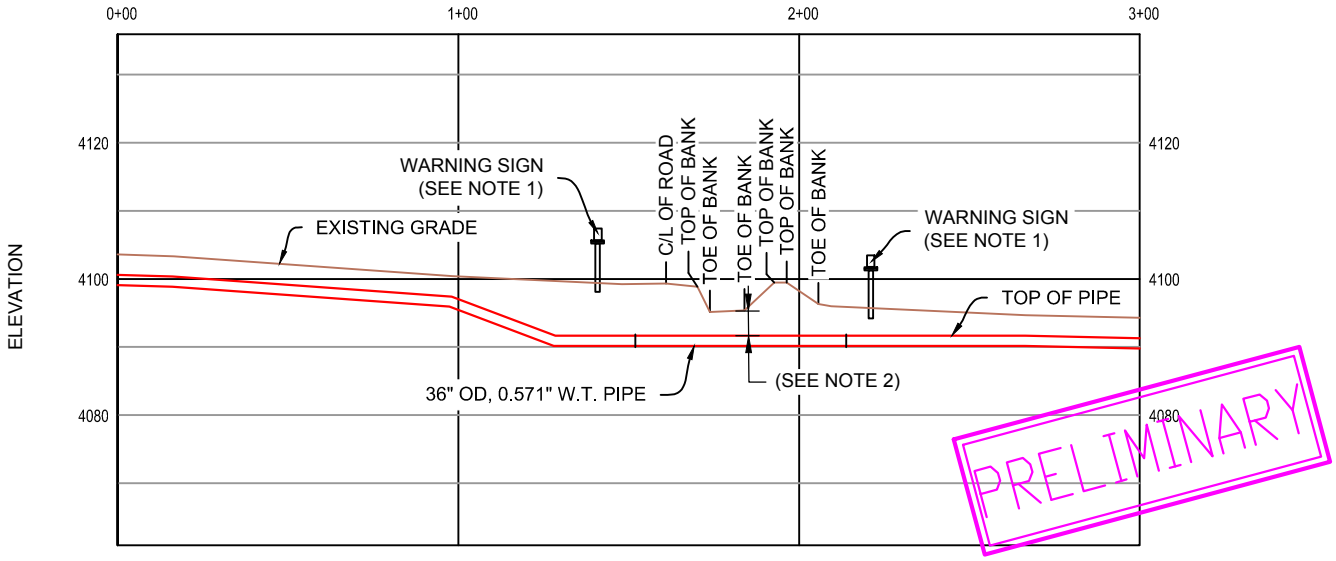
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS	
DRAWING NO.	TITLE

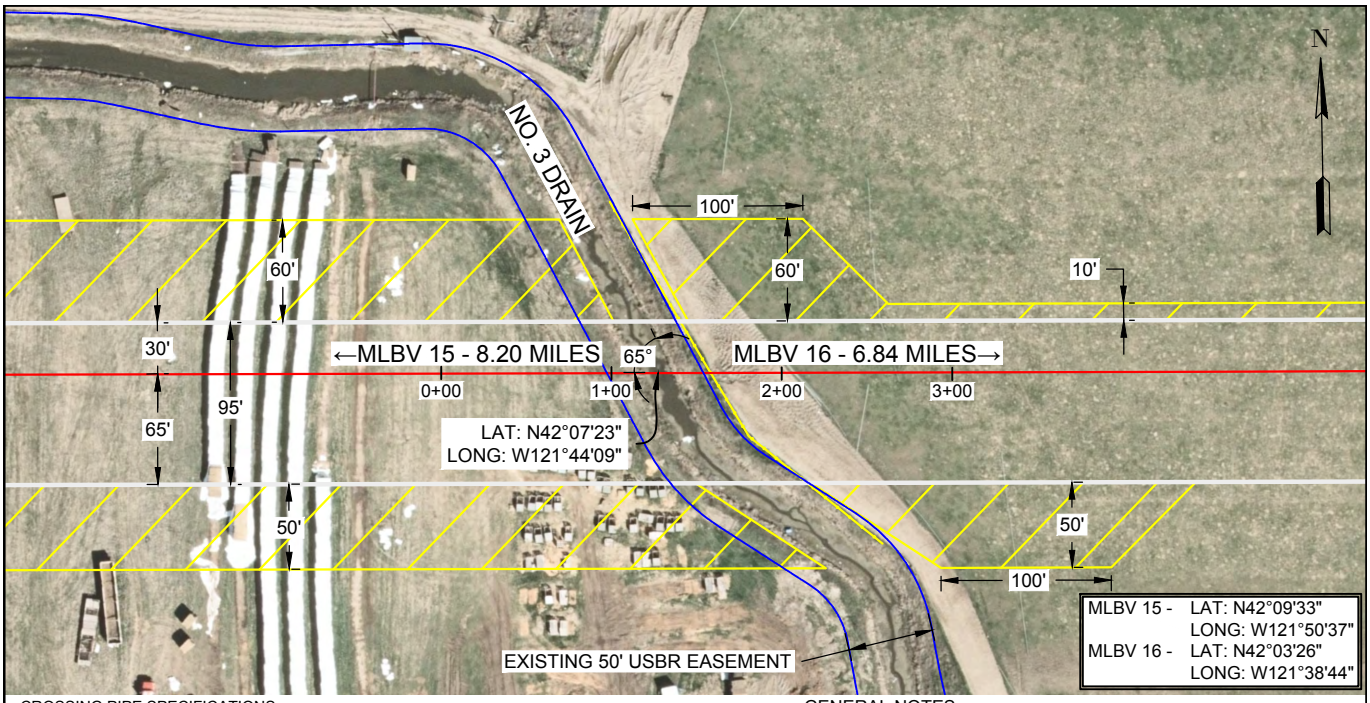
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #4 - C-4-F LATERAL - PCGP M.P. 204.33
SEC 3, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	10-22-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
7	01-22-2016	JTS	REISSUED FOR PERMIT	1026555	TEG	TEG
8	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-120	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
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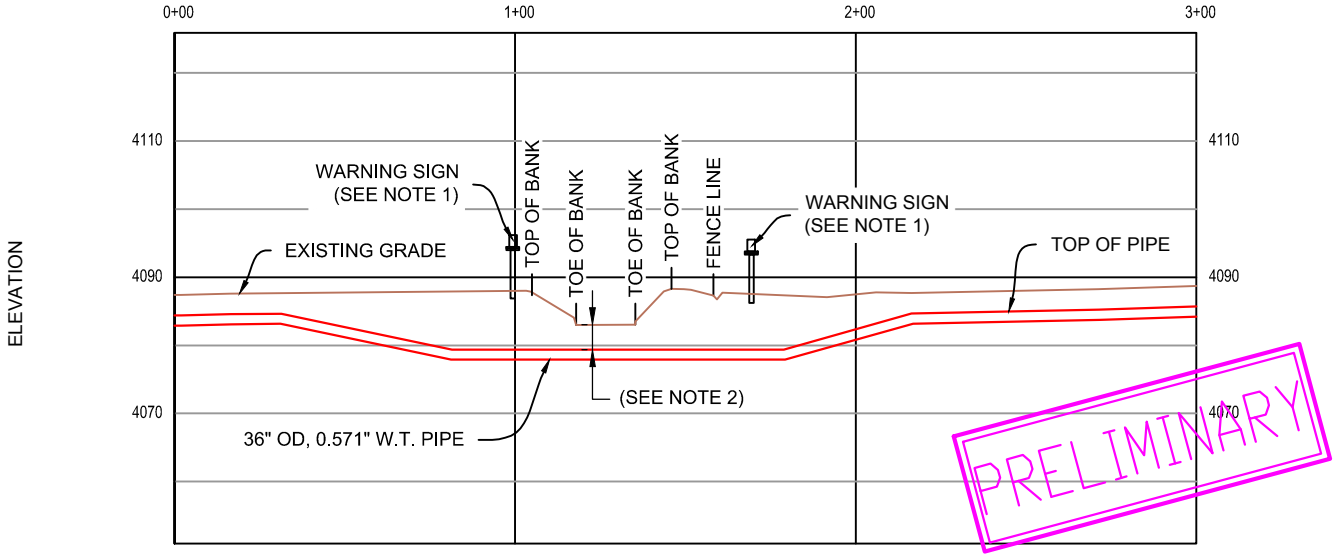
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

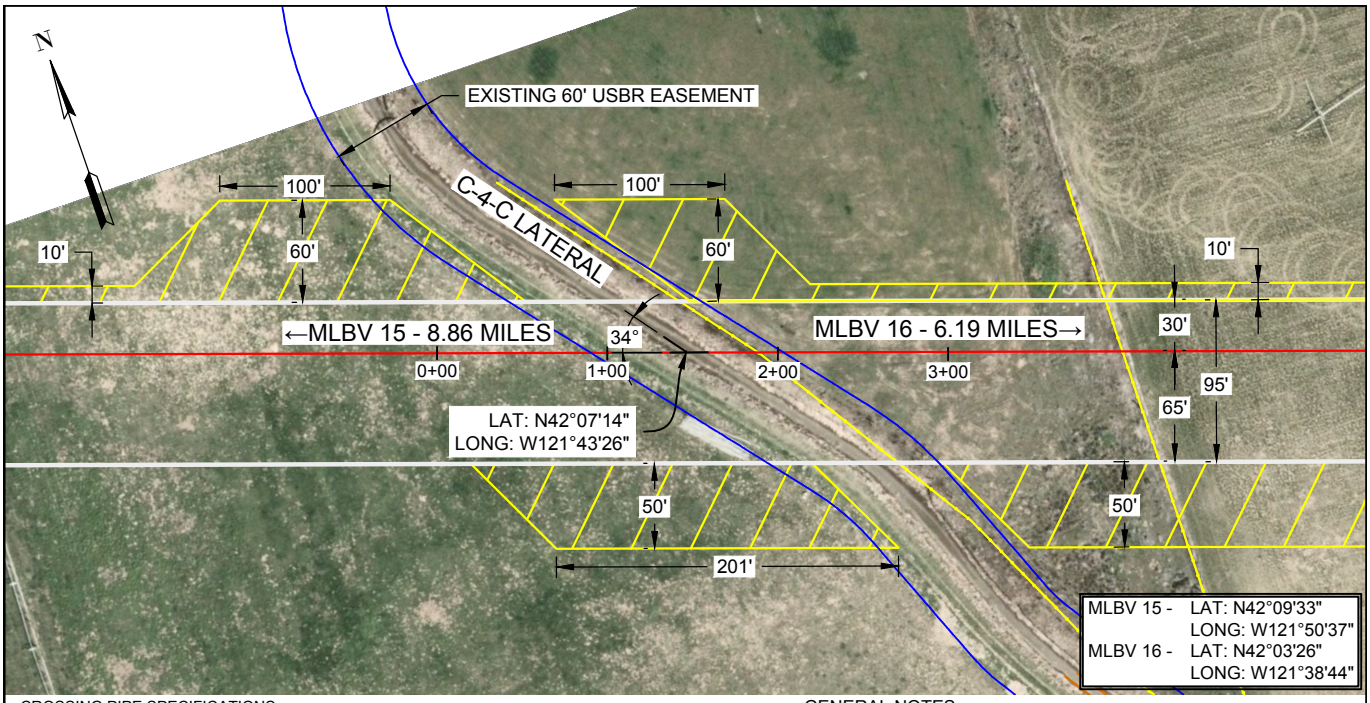
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #5 - NO. 3 DRAIN - PCGP M.P. 204.74
SEC 2, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
7	9-29-2016	JCP	REVISED ROW WIDTH FOR BOR	1026555	KLL	BAB
8	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB
9	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE			

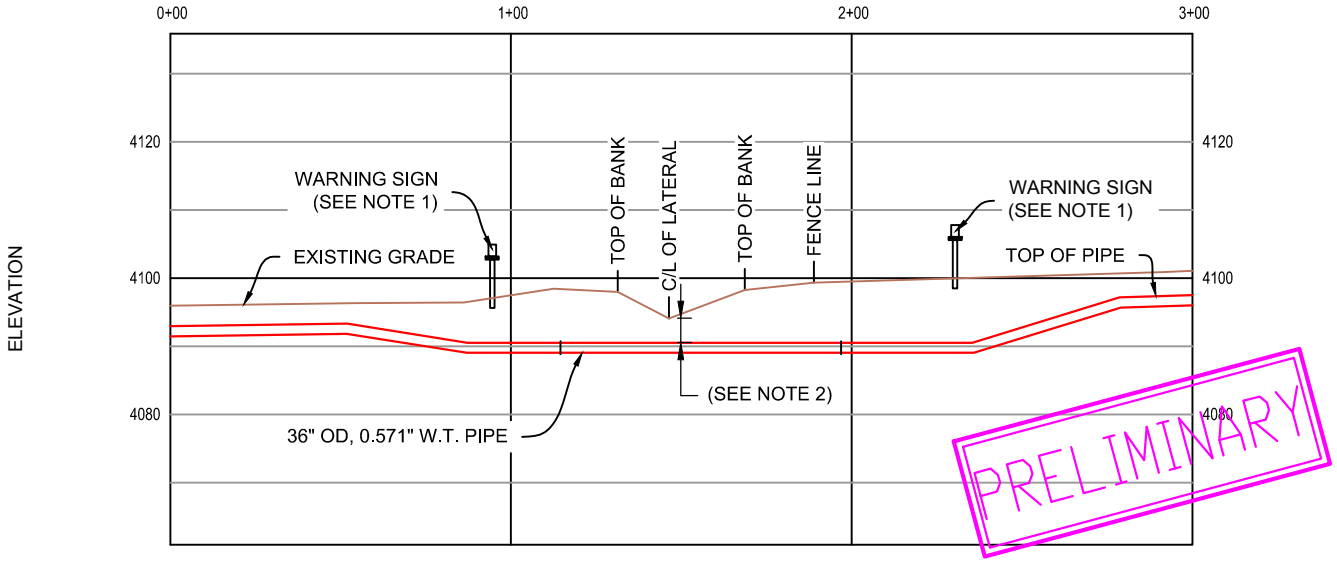
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-121	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

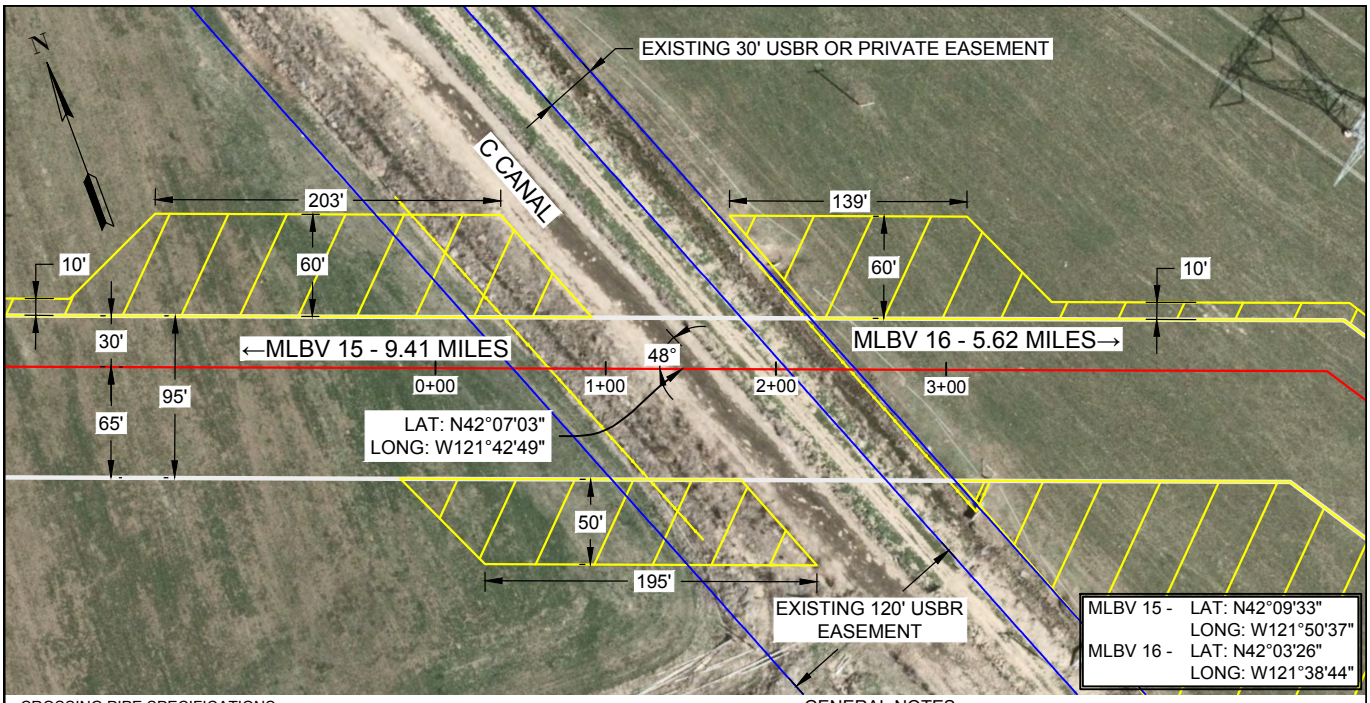
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #6 - C-4-C LATERAL - PCGP M.P. 205.5
SEC 2, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	10-22-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
7	01-22-2016	JTS	REISSUED FOR PERMIT	1026555	TEG	TEG
8	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

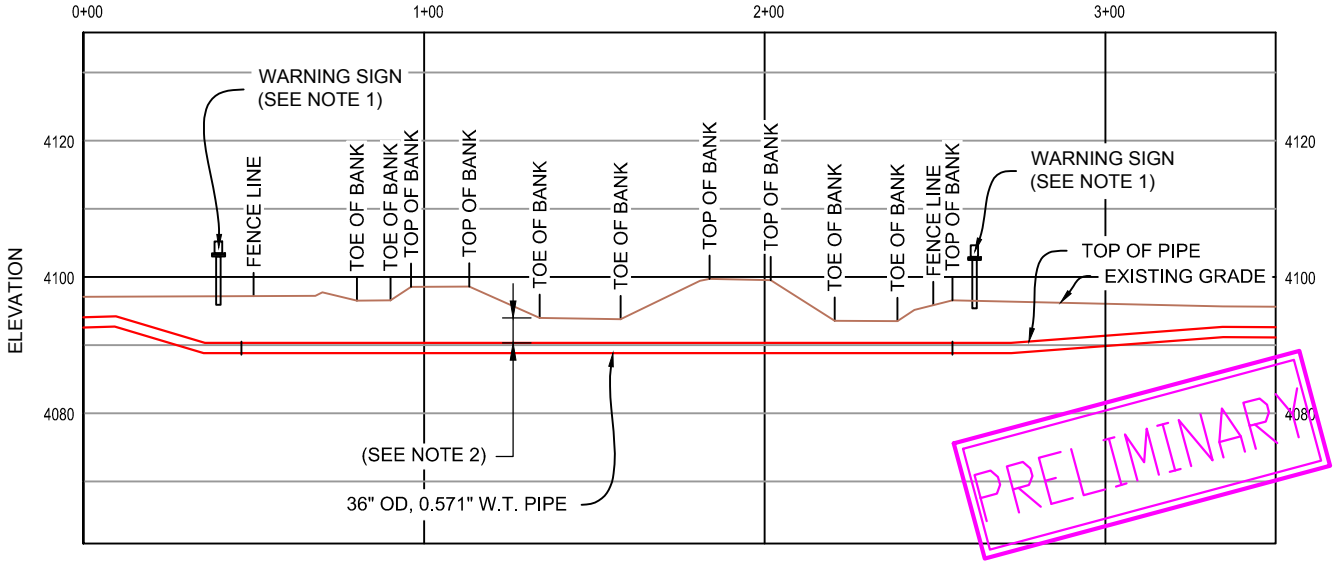
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-122	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

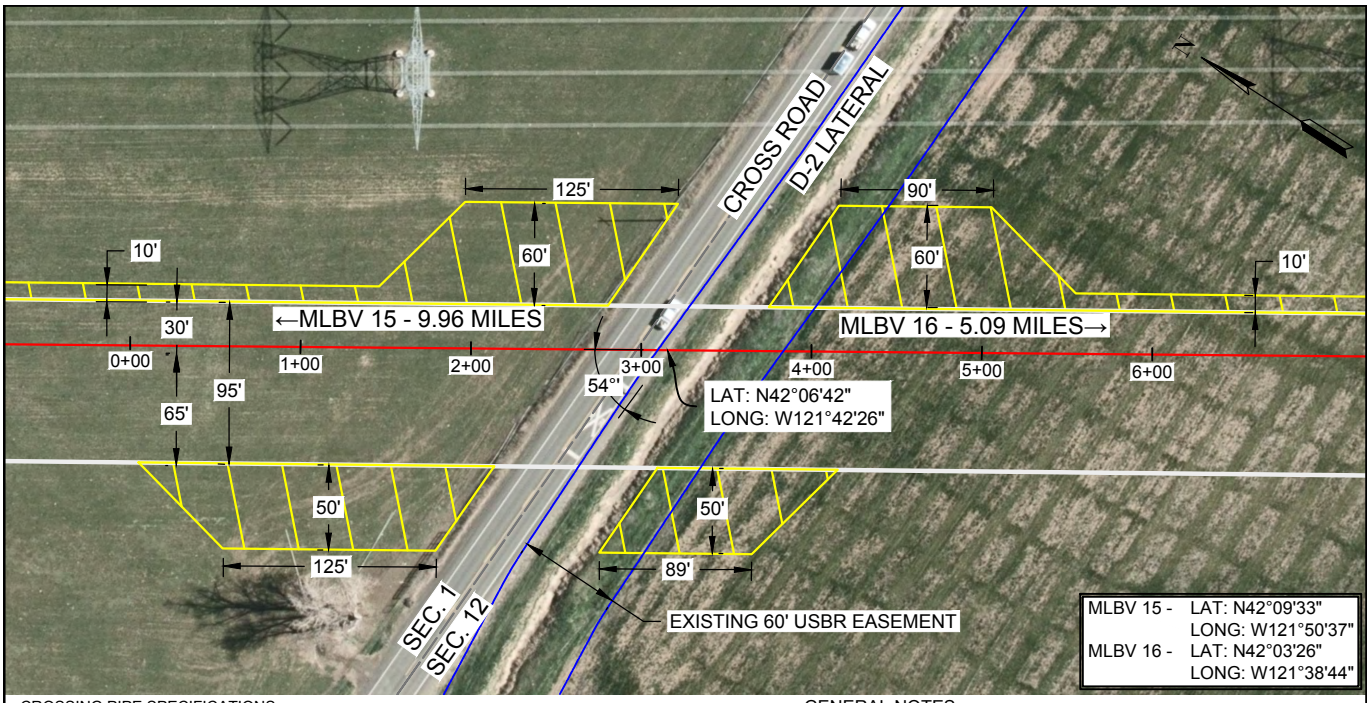
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #7 - C CANAL - PCGP M.P. 205.96
SEC 1, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	10-22-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
7	01-22-2016	JTS	REISSUED FOR PERMIT	1026555	TEG	TEG
8	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

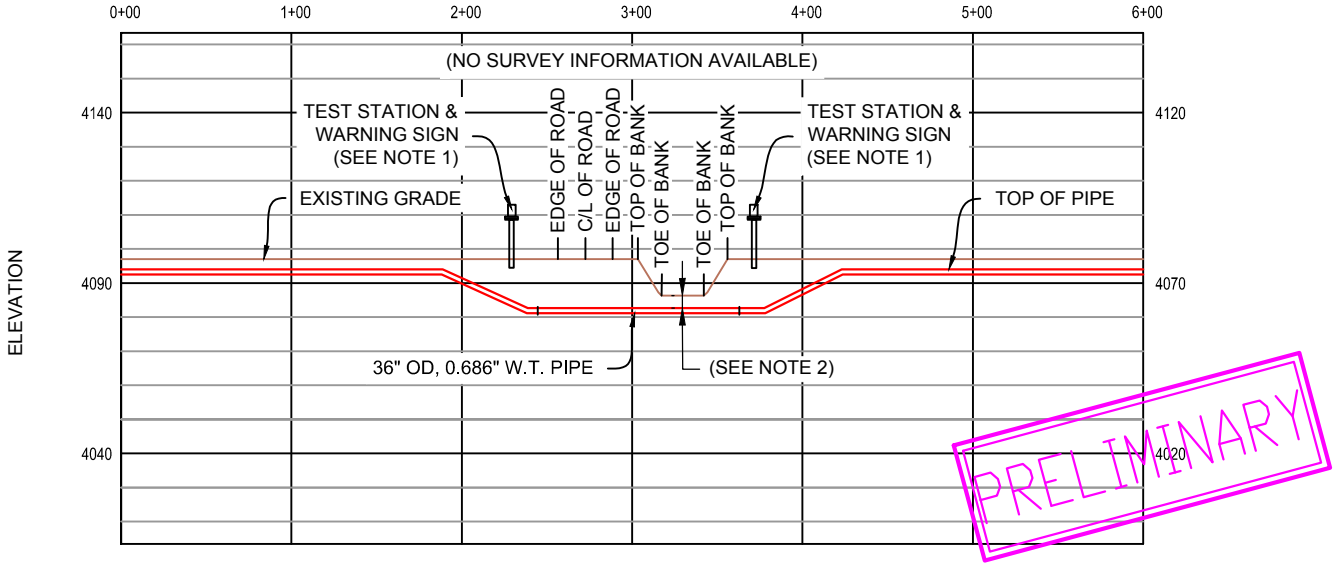
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-123	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.686" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.6
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

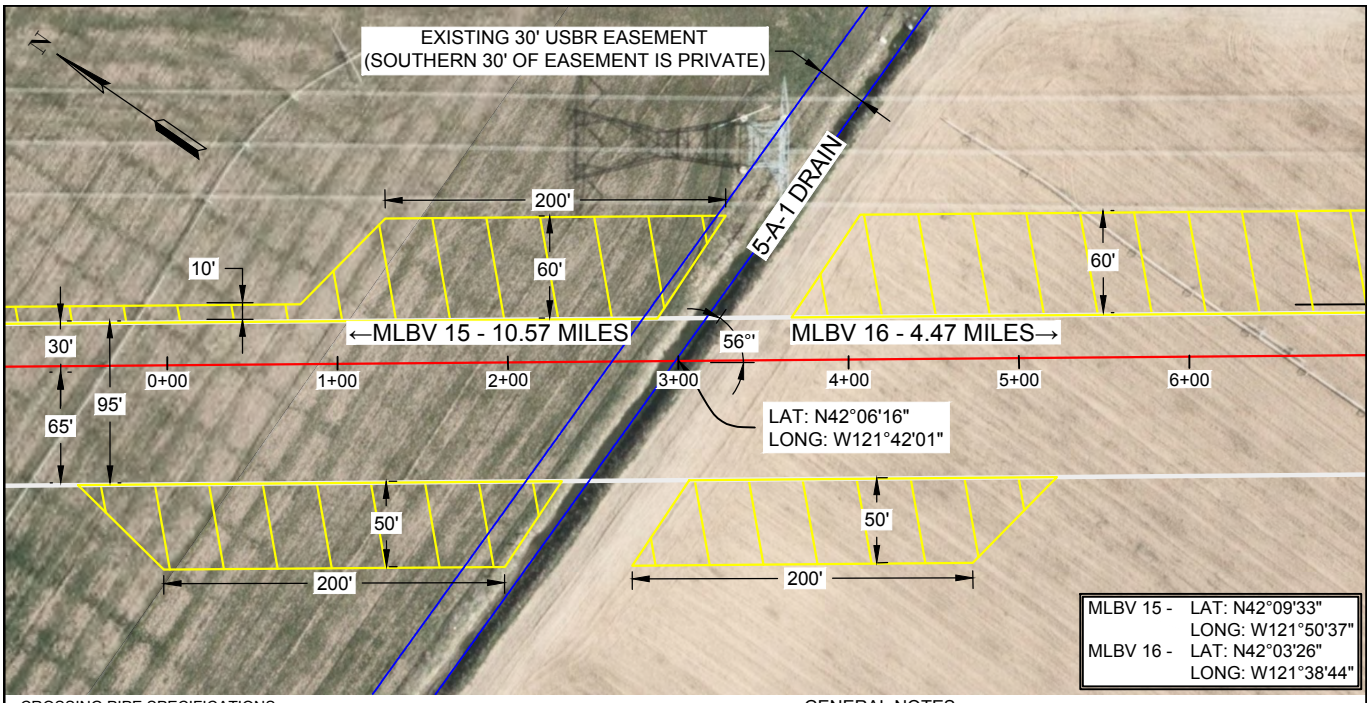
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #8 - D-2 LATERAL - PCGP M.P. 206.51
SEC 12, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
4	10-27-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
5	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
6	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

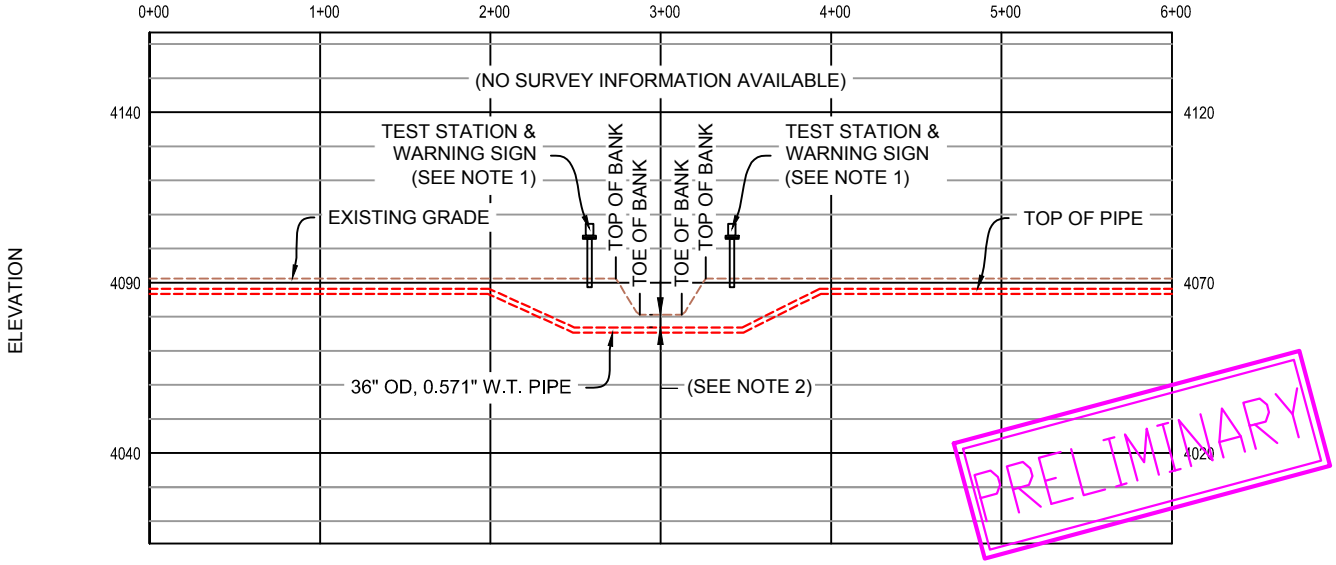
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: NJL	ISSUED FOR CONSTRUCTION:	
APPROVED BY: BSB	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-124	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

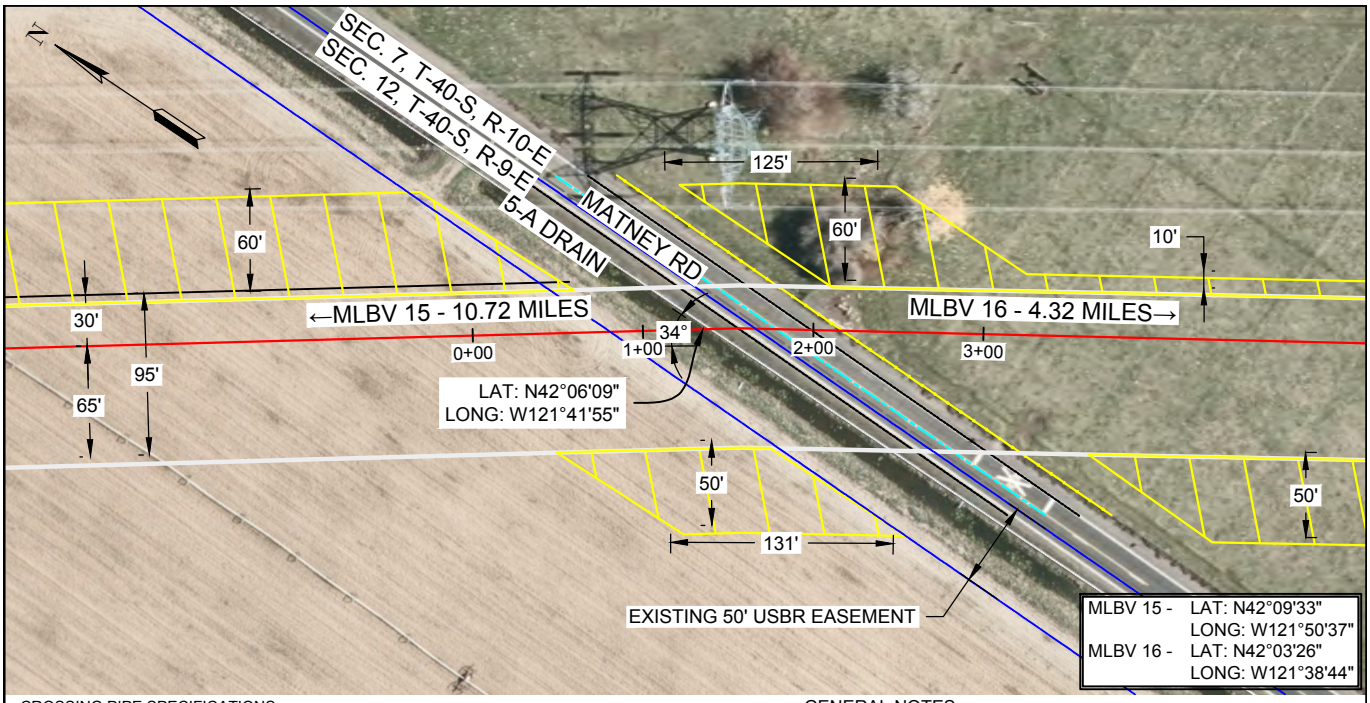
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #9 - 5-A-1 DRAIN - PCGP M.P. 207.11
SEC 12, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
4	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
5	12-08-2017	AWL	UPDATE PIPE DATA	1026555	JW	TB
6	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE		JW	TB

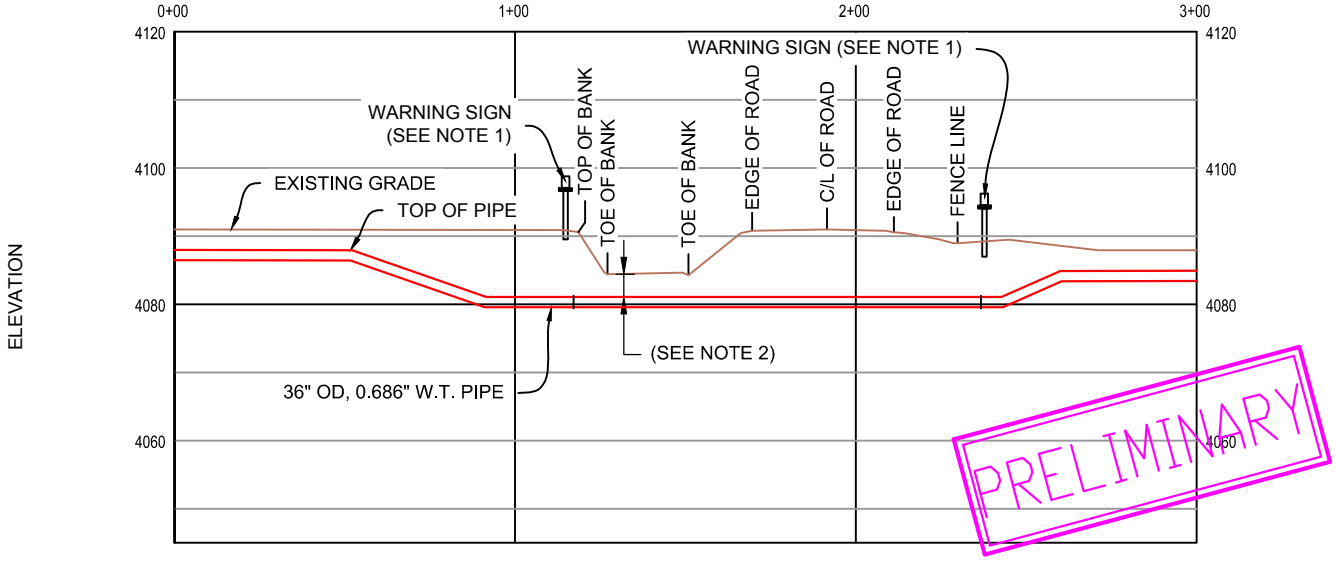
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-125	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.686" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.6
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

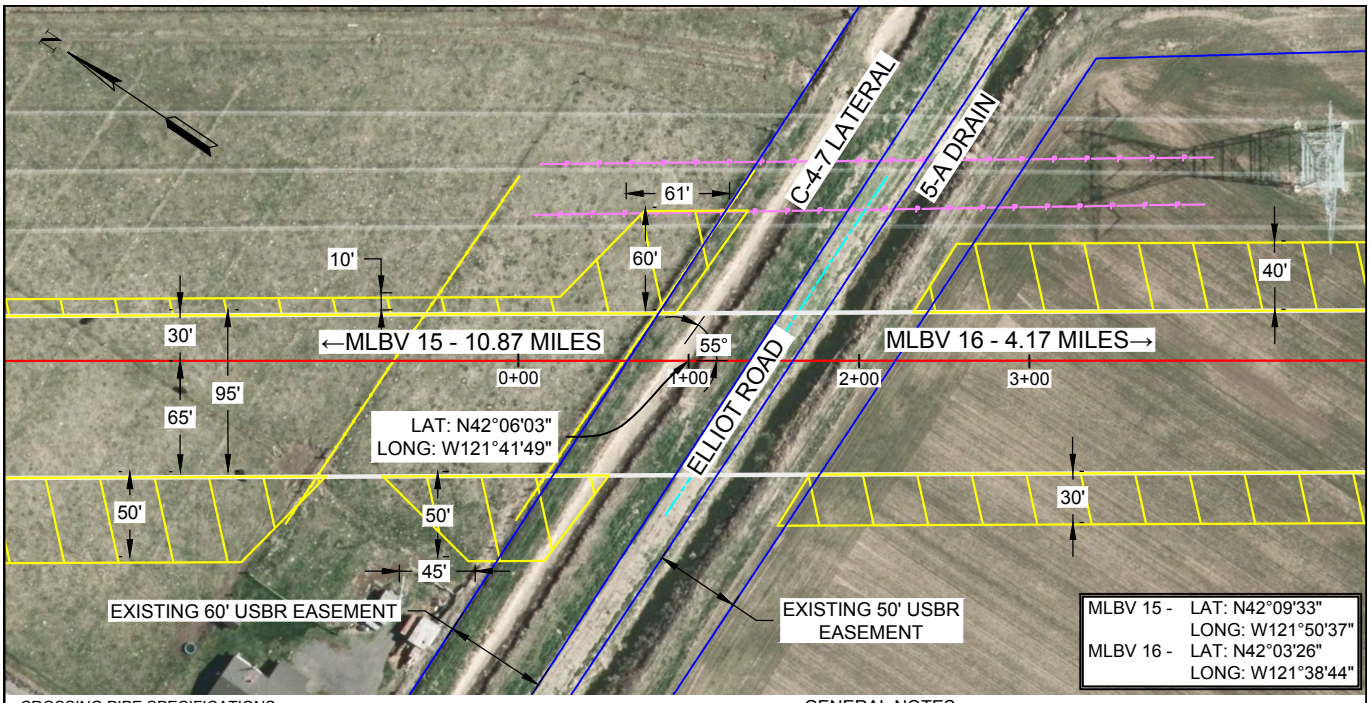
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #10 - 5-A DRAIN/MATNEY ROAD - PCGP M.P. 207.26
SEC 12, T-40-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
5	10-27-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
6	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
7	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

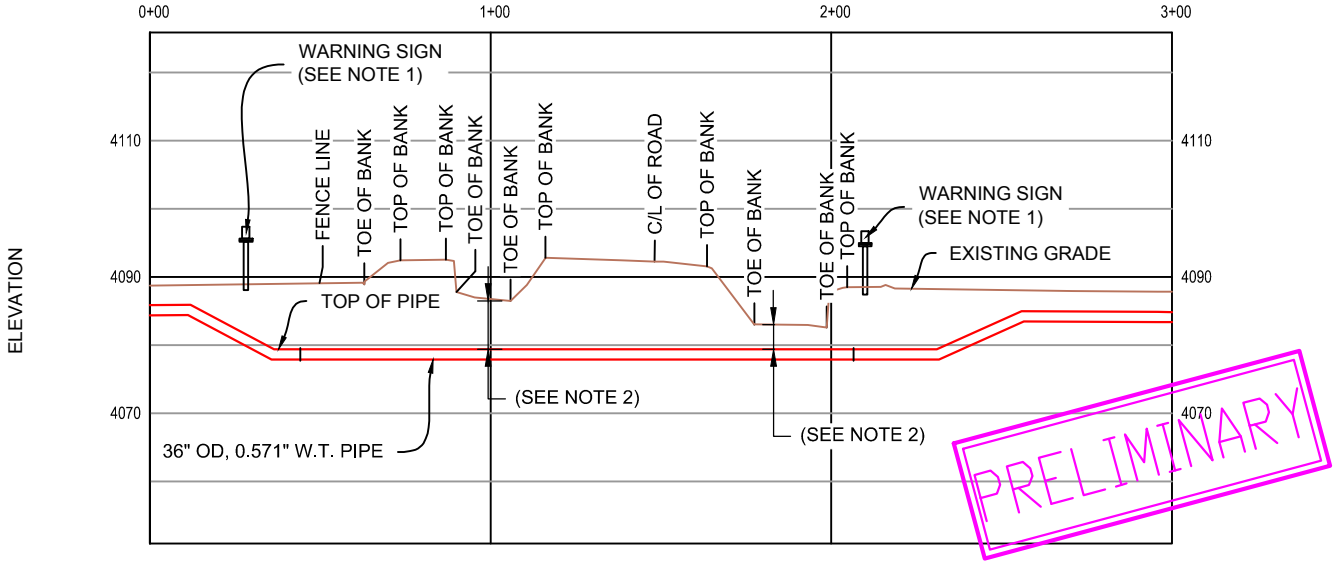
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-126	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

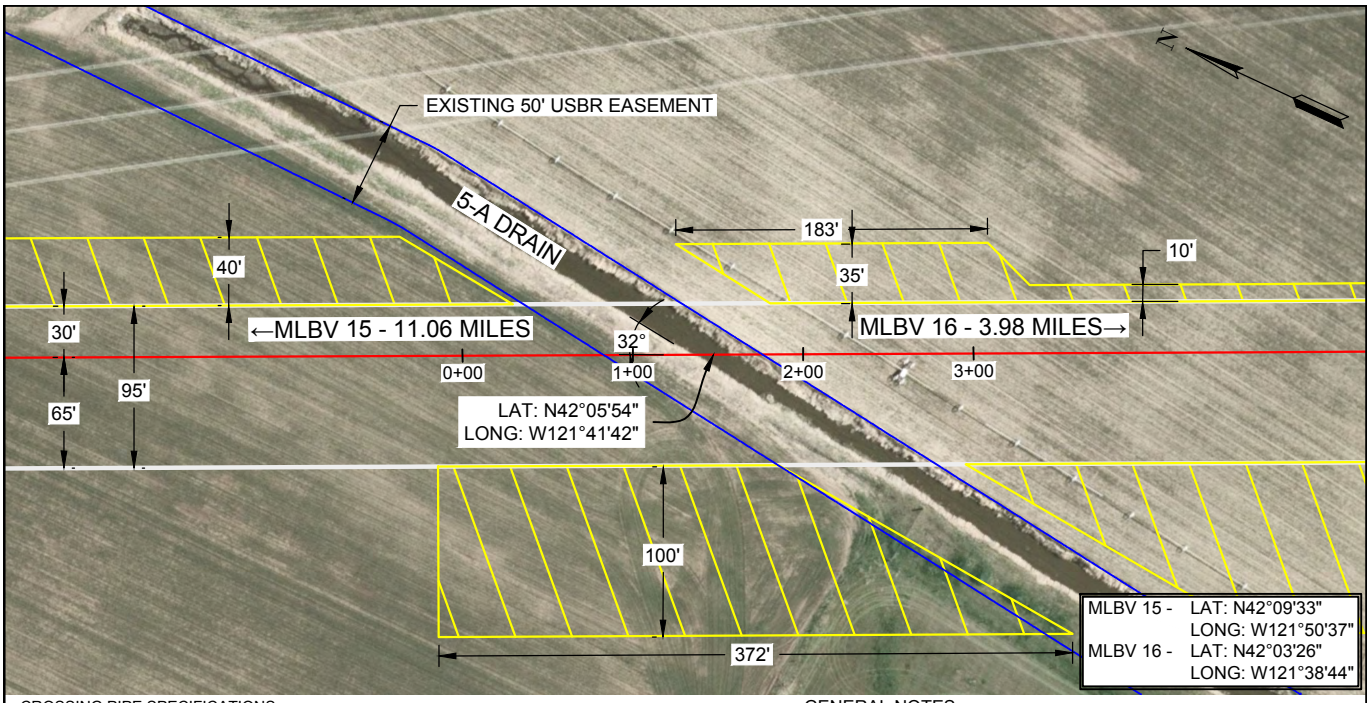
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #11/12 - C-4-7 LATERAL/5A DRAIN - PCGP M.P. 207.40
SEC 7, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
8	9-27-2016	JCP	ADDED ELLIOT ROAD TEXT	1026555	KLL	BAB
9	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

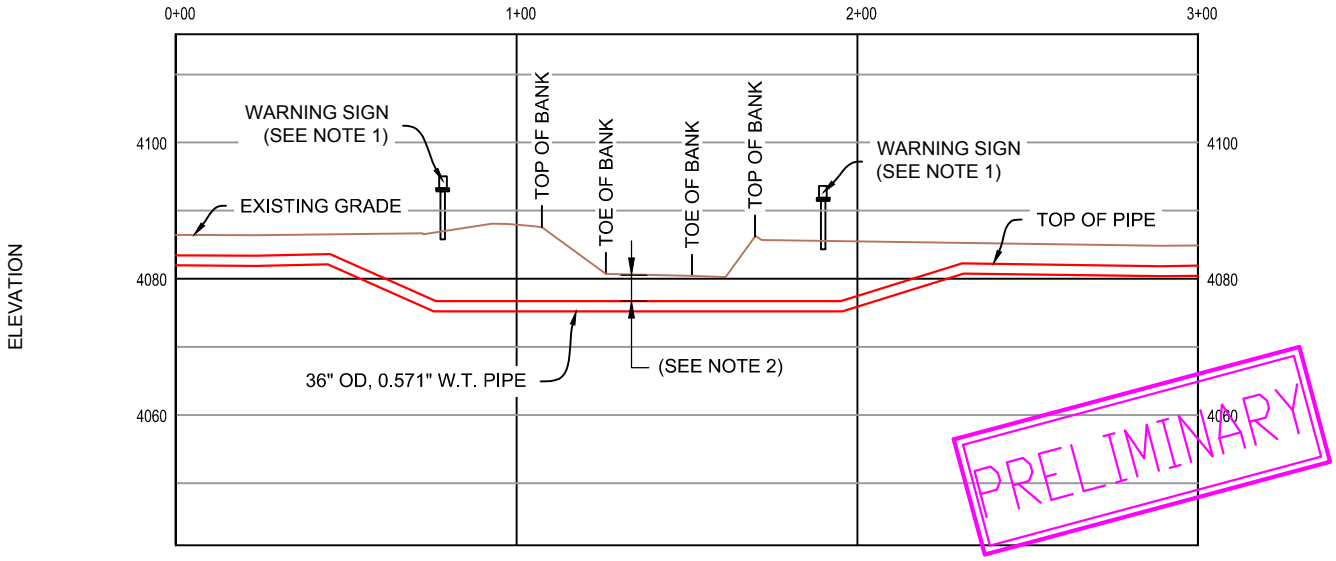
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-127 & 128	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

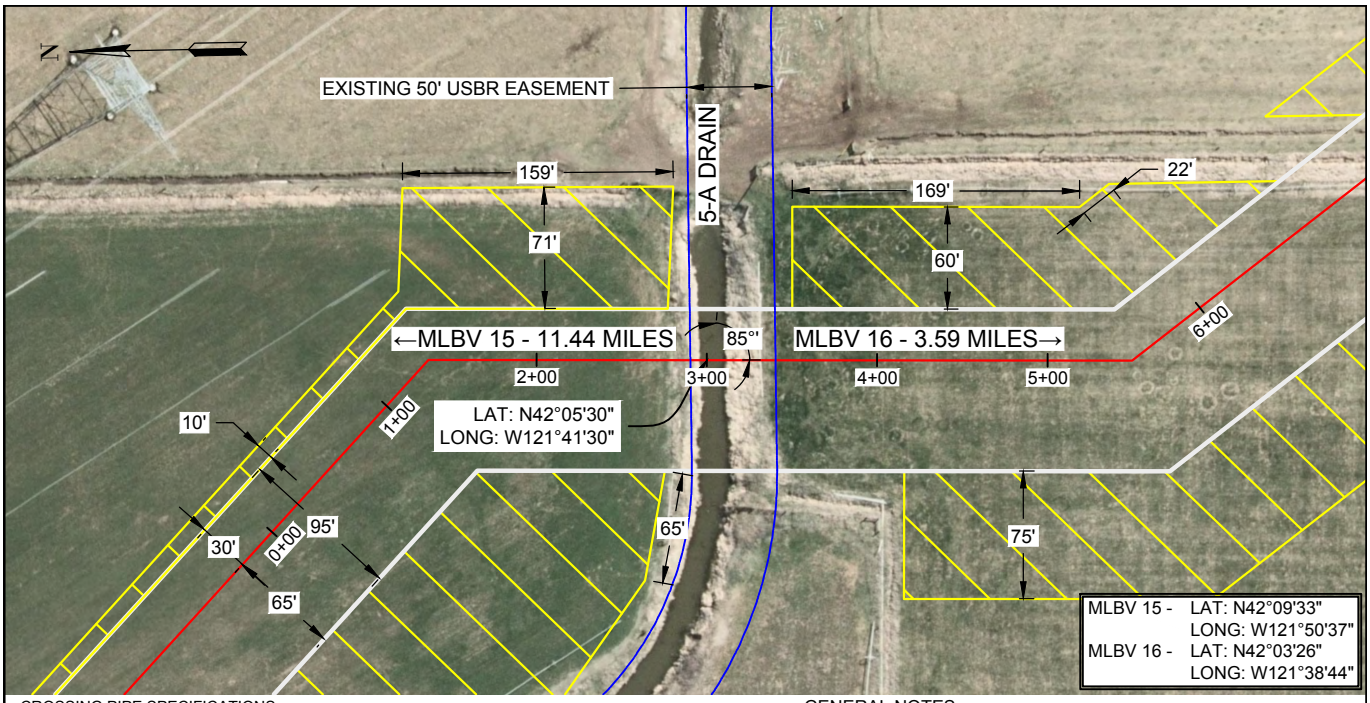
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #13 - 5-A DRAIN - PCGP M.P. 207.60
SEC 7, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
7	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB
8	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE		JW	TB

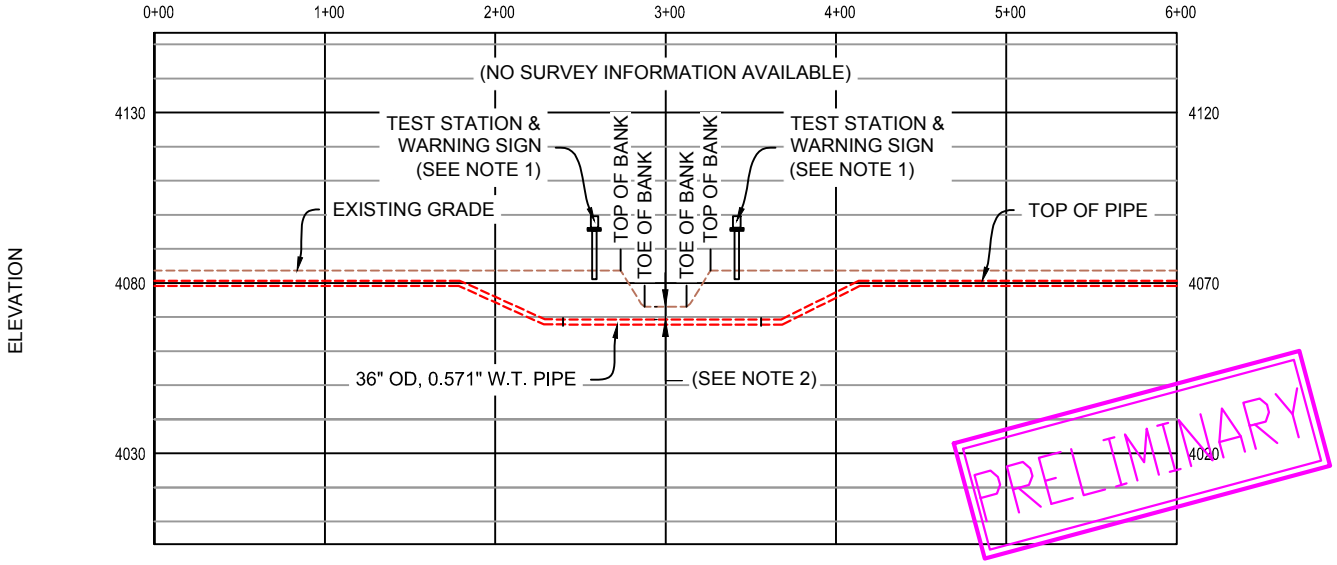
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-129	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

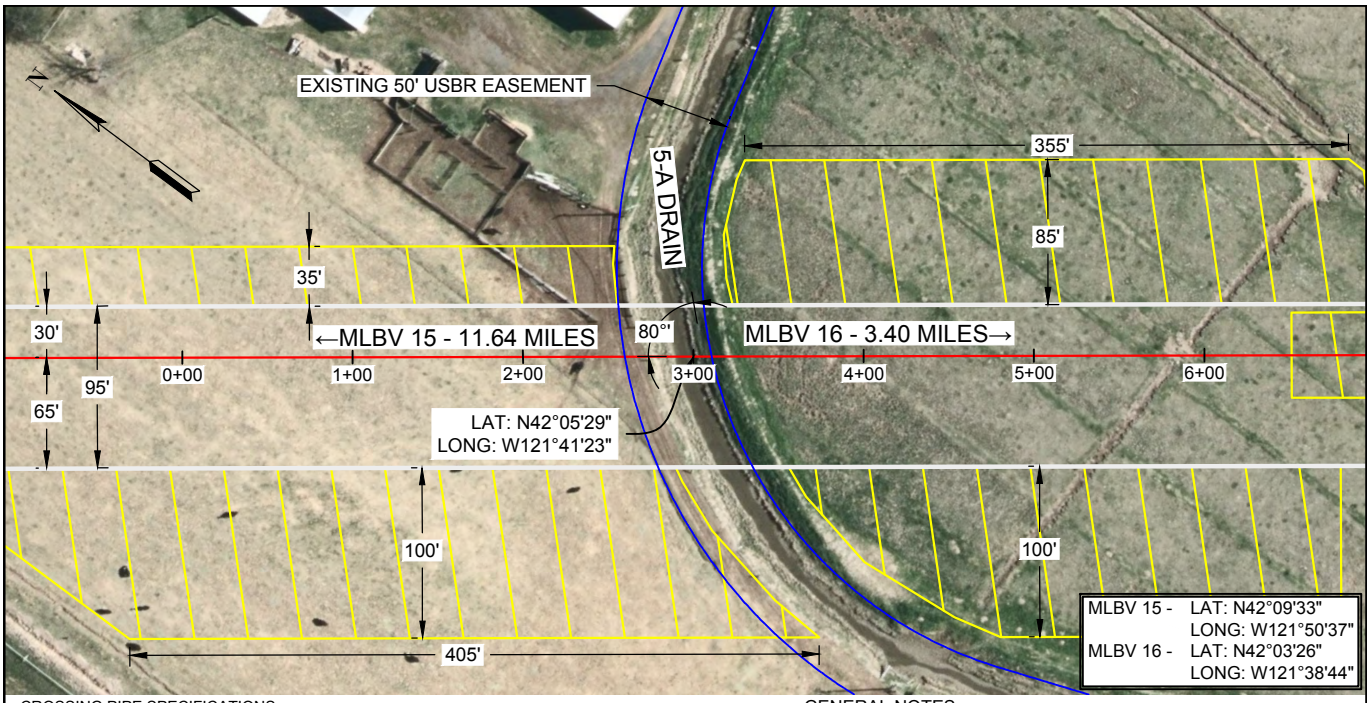
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #14 - 5-A DRAIN - PCGP M.P. 207.98
SEC 18, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	03-30-2016	JTS	REISSUED FOR PERMIT	1026555	TEG	TEG
7	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB
8	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE		JW	TB

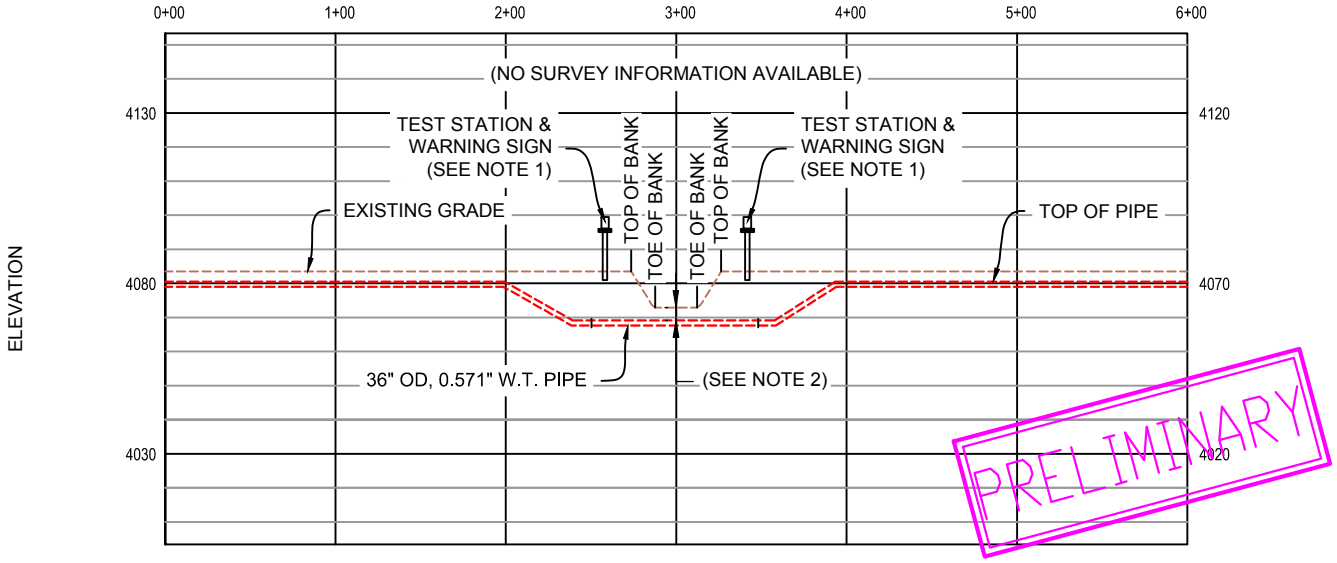
DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-130	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
2.) DEPTH OF COVER SHALL BE NO LESS THAN 5' AT THE LOWEST ELEVATION WITHIN RECLAMATION EASEMENT.
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

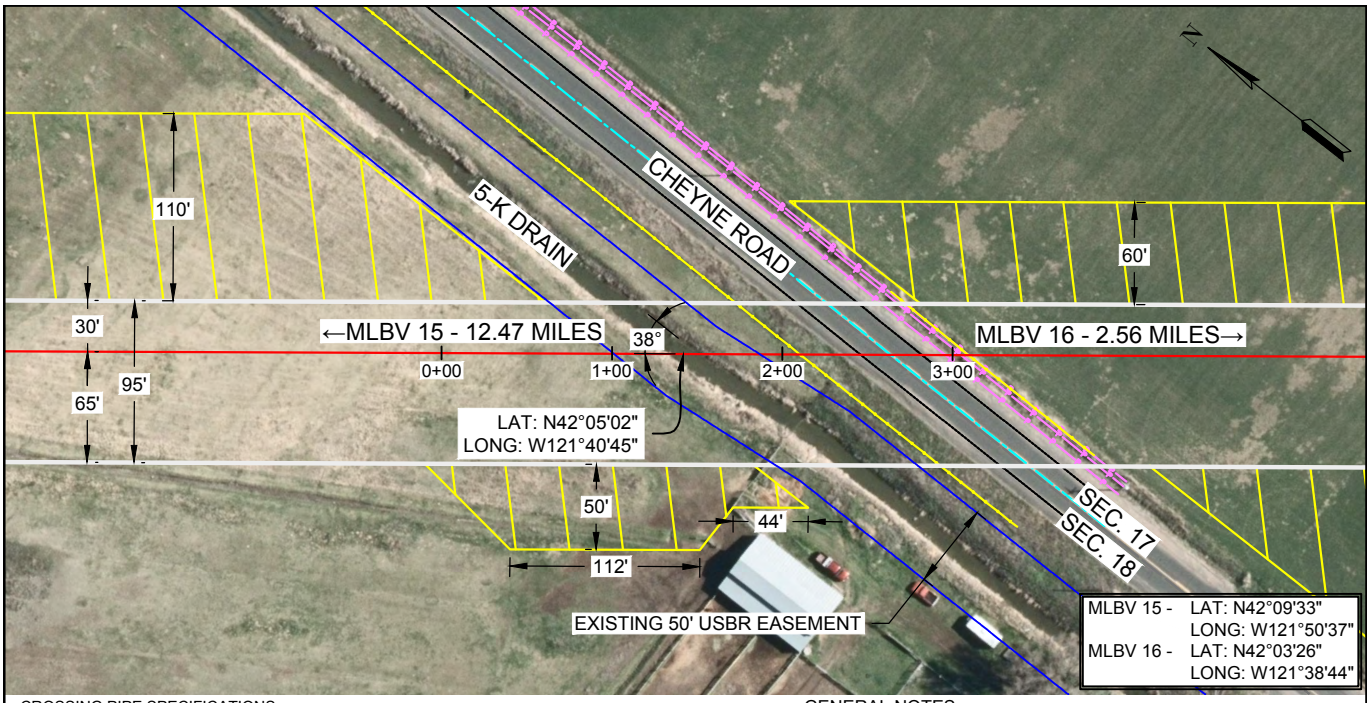
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #15 - 5-A DRAIN - PCGP M.P. 208.18
SEC 18, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
5	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
6	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB
7	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-131	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.686" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.60
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
1.) INSTALL PIPELINE MARKER SIGNS ON BOTH SIDES OF CROSSING AT FENCE LINE OR EASEMENT BOUNDARY.
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3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
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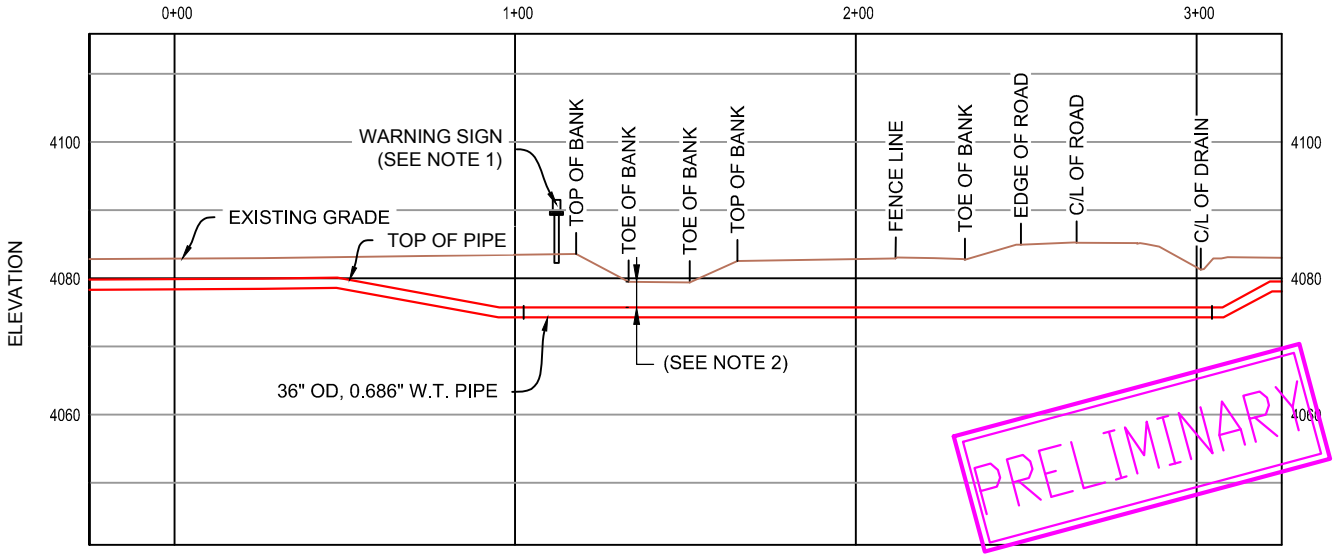


REFERENCE DRAWINGS

DRAWING NO.	TITLE

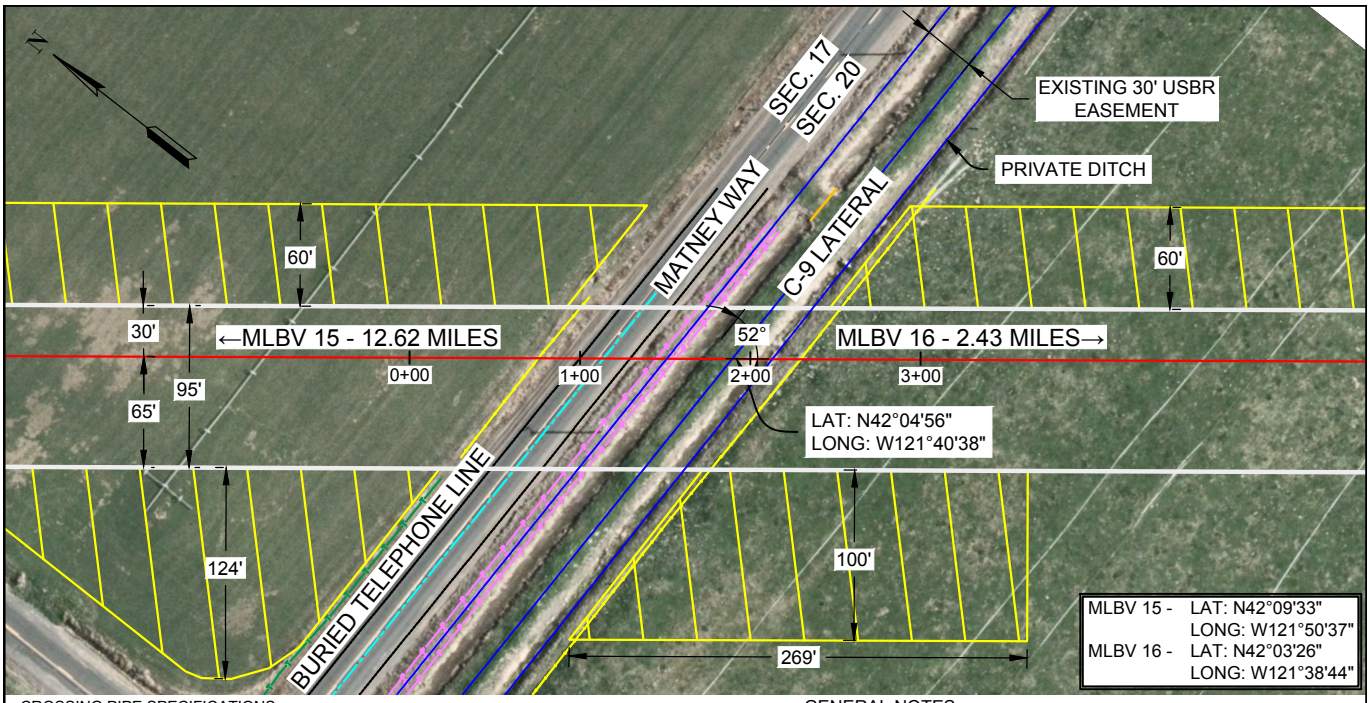
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #16 - 5-K DRAIN - PCGP M.P. 209.02
SEC 18, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	10-27-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
7	01-22-2016	JTS	REISSUED FOR PERMIT	1026555	TEG	TEG
8	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-132	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.686" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.60
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
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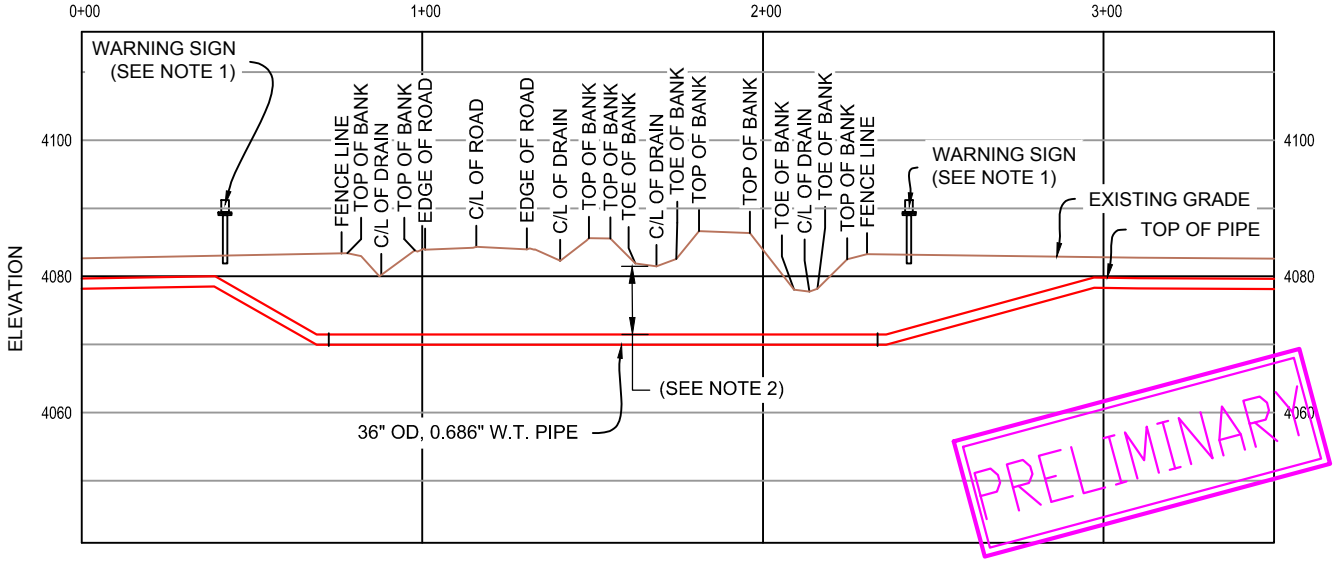
3.) CROSSING PIPE SHALL EXTEND 1' MIN. BEYOND CANAL EASEMENT - BOTH SIDES.
4.) 3" MINIMUM WIDTH, DETECTABLE BILINGUAL YELLOW WARNING TAPE READING "CAUTION BURIED GAS LINE" SHALL BE INSTALLED IN TRENCHED AREAS OF RECLAMATION EASEMENTS. (CANNOT BE INSTALLED ACROSS THE BORE HOLE PORTION OF BORED CROSSINGS)



REFERENCE DRAWINGS

DRAWING NO.	TITLE

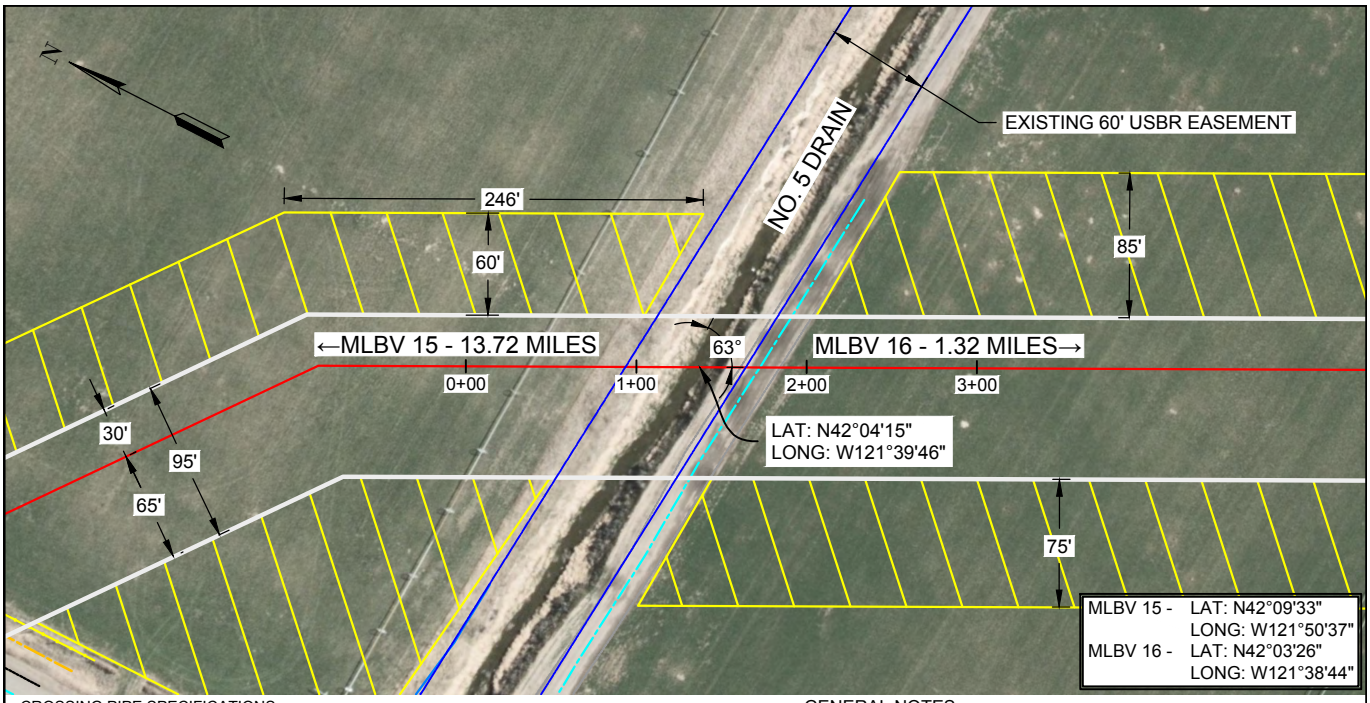
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #17 - C-9 LATERAL - PCGP M.P. 209.15
SEC 20, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
5	10-27-2015	JTS	REISSUED FOR PERMIT	52408	BSB	NJL
6	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
7	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-133	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

- PROPOSED CENTERLINE
- CONSTRUCTION R.O.W.
- ROAD C/L
- EDGE OF ROAD
- OVERHEAD POWERLINE
- FENCE LINE
- T.E.W.A.

GENERAL NOTES:
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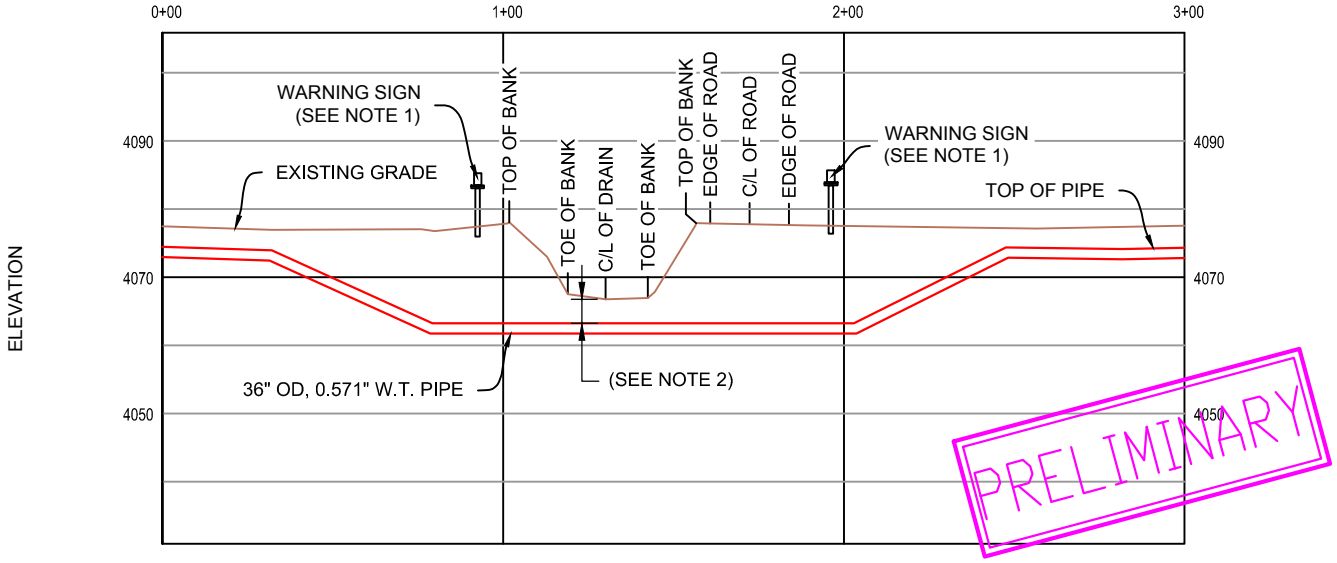


REFERENCE DRAWINGS

DRAWING NO.	TITLE

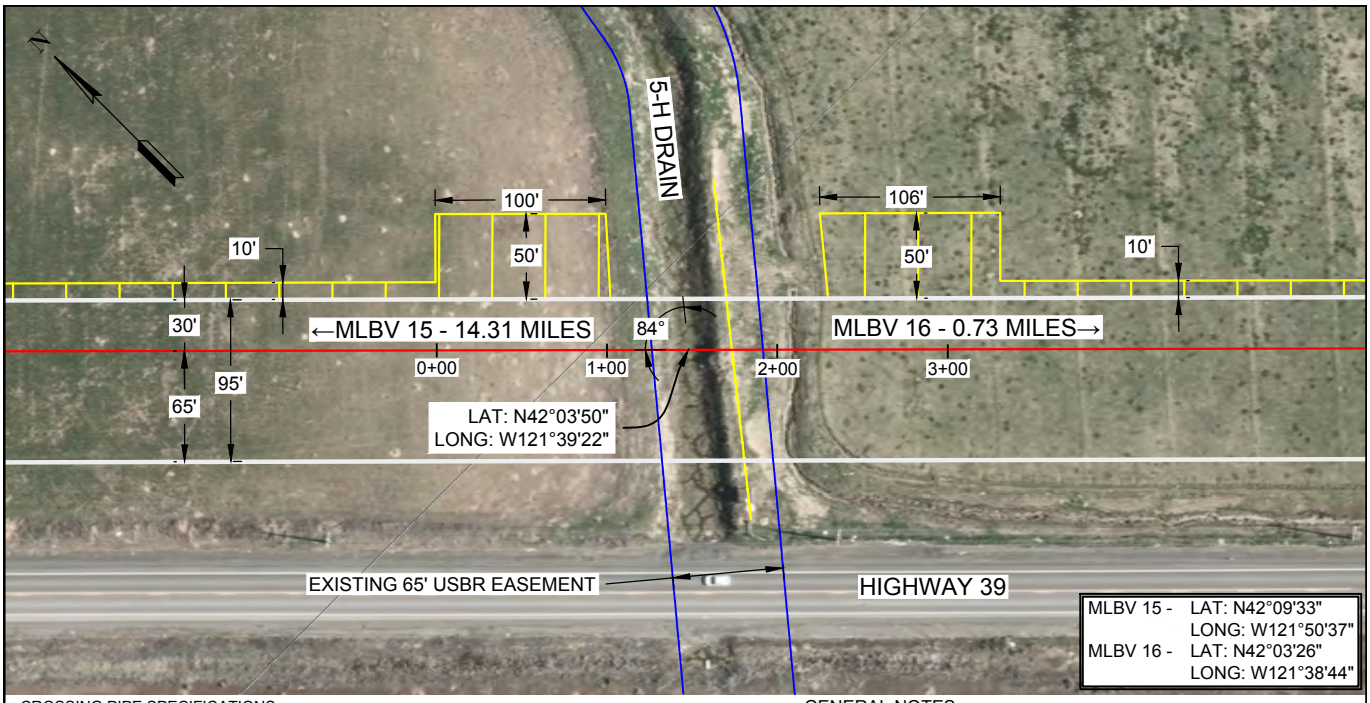
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #18 - NO. 5 DRAIN - PCGP M.P. 210.26
SEC 20, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
7	01-22-2016	JCP	REISSUED FOR PERMIT	1026555	TEG	TEG
8	12-08-2017	AWL	UPDATE PIPE DATA		JW	TB
9	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-134	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 15-20 MILS FBE
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

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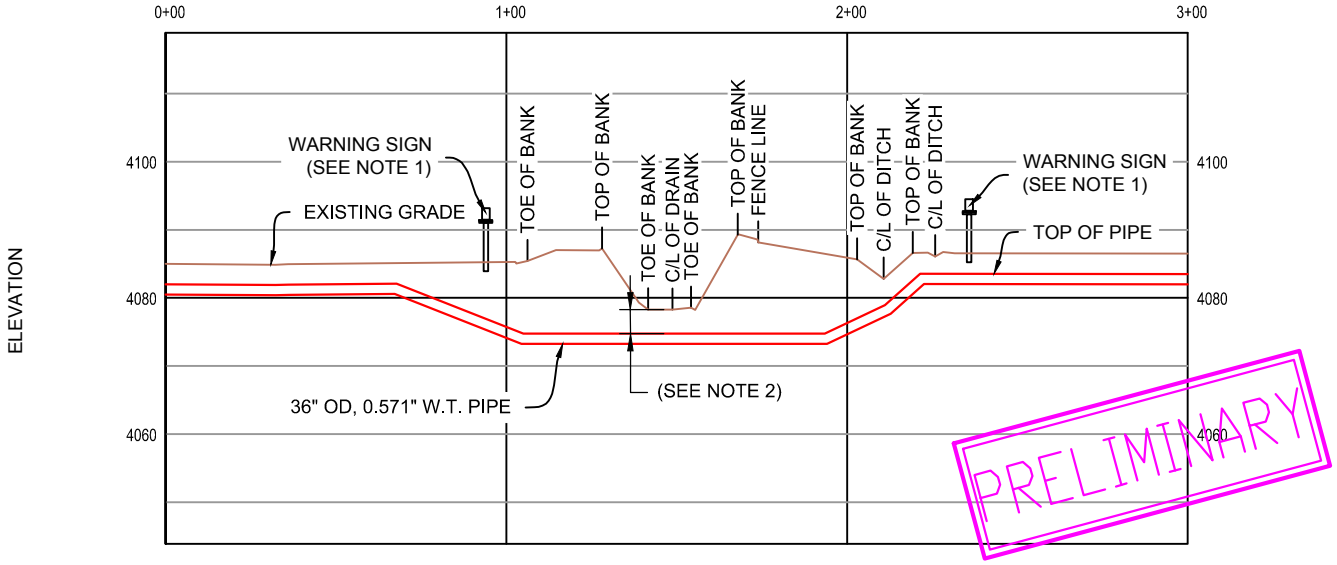


REFERENCE DRAWINGS

DRAWING NO.	TITLE

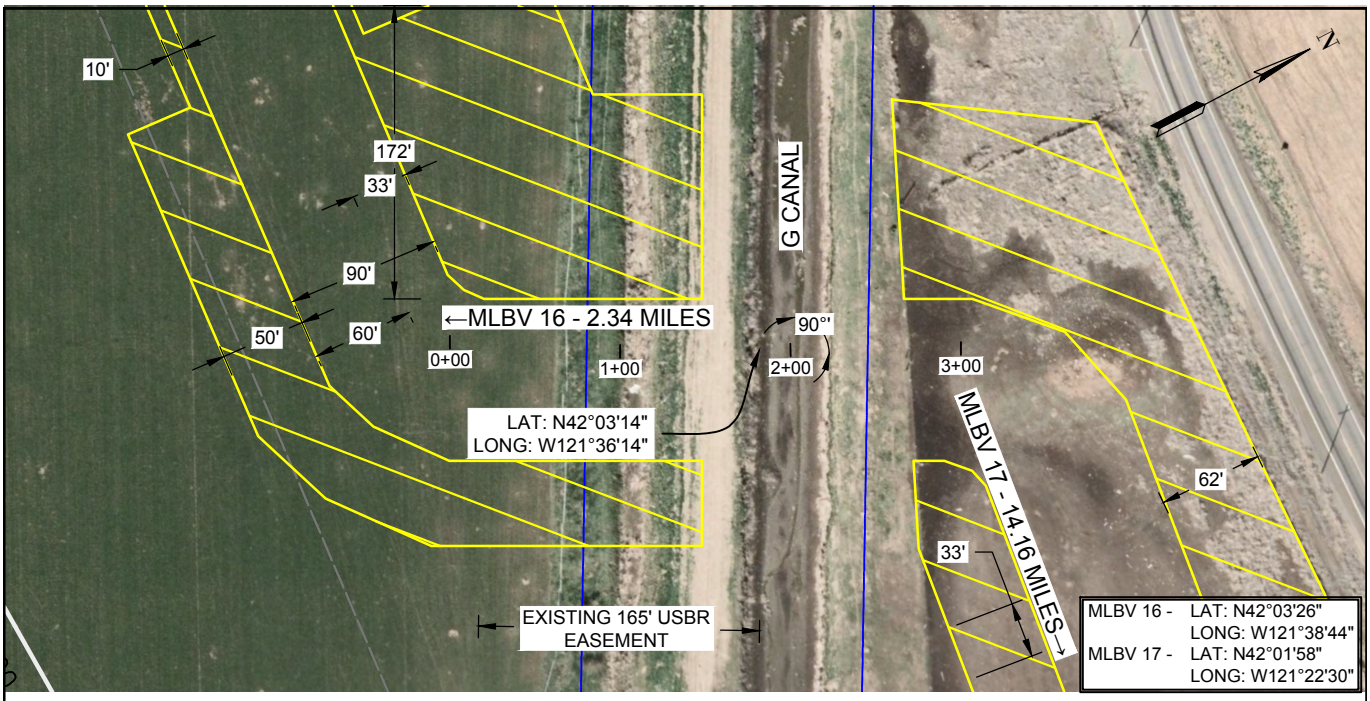
PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #19 - 5-H DRAIN - PCGP M.P. 210.85
SEC 28, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
6	01-22-2016	JTS	REISSUED FOR PERMIT	1026555	TEG	TEG
7	12-08-2017	AWL	UPDATE PIPE DATA	1026555	JW	TB
8	1-15-2018	AWL	UPDATED METHOD OF INSTALL FROM OPEN CUT TO BORE		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-135	SHEET 1 OF 1



CROSSING PIPE SPECIFICATIONS:
36" O.D. 0.571" W.T. API-5L X-70
EXTERNALLY COATED - 8-10 MILS FBE & 40 MILS ARO
TYPE OF PIPE: WELDED STEEL
METHOD OF INSTALLATION: BORE
DESIGN FACTOR: 0.72
CLASS LOCATION: 1
MAXIMUM ALLOWABLE OPERATING PRESSURE: 1600 PSIG
MAXIMUM TEST PRESSURE: 2444 PSIG
CODE: B 31.8, CFR 49, AND ALL OTHER APPLICABLE CODES.

PROPOSED CENTERLINE
CONSTRUCTION R.O.W.
ROAD C/L
EDGE OF ROAD
OVERHEAD POWERLINE
FENCE LINE
T.E.W.A.

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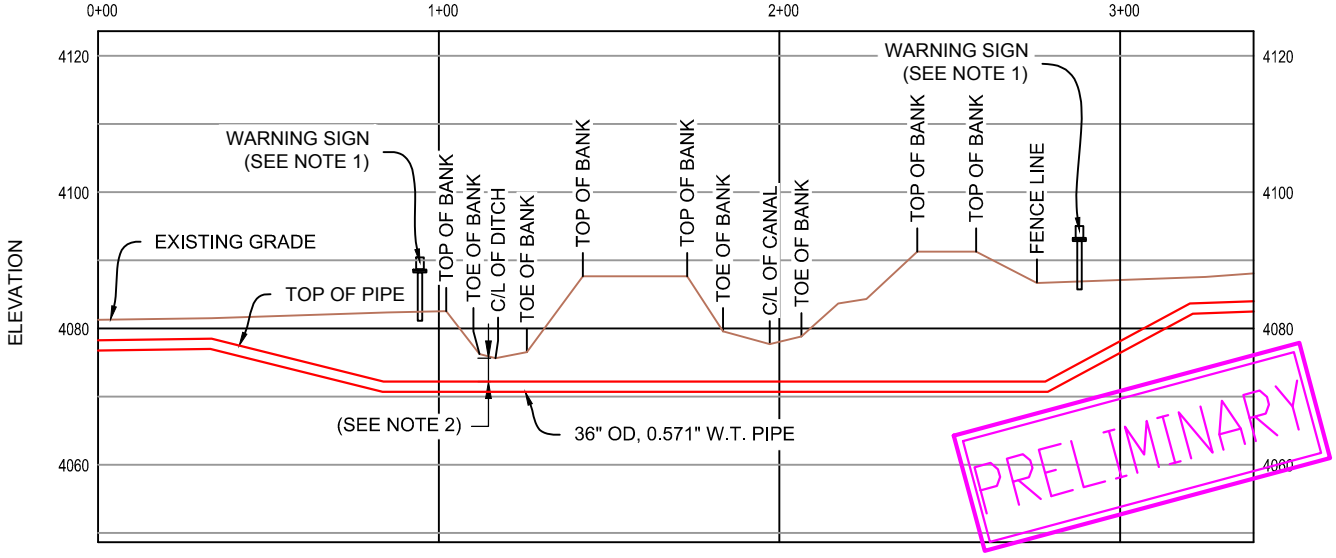


REFERENCE DRAWINGS

DRAWING NO.	TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
KLAMATH PROJECT FACILIITY CROSSING PLAN/PROFILE
CROSSING ID #23 - G CANAL - PCGP M.P. 213.87
SEC 26, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

REVISIONS

NO.	DATE	BY	DESCRIPTION	W.O. NO.	CHK.	APP.
7	10-03-2016	JCP	REVISED SECTION NUMBER	1026555	KLL	BAB
8	12-08-2017	AWL	UPDATE PIPE DATA & CROSSING LOCATION		JW	TB

DRAWN BY: JTS	DATE: 11-12-2014	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY: BSB	DATE: 11-12-2014	ISSUED FOR CONSTRUCTION:	
APPROVED BY: NJL	DATE: 11-12-2014	DRAWING NUMBER: 3430.5-X-140	SHEET 1 OF 1

ATTACHMENT 2

Site Photos of Selected Facility Crossings

Crossing 1, No. 1 Drain looking east (left image) and north (right image)

Crossing 1, No. 1 Drain looking southeast


Crossing 4, C-4-F Lateral looking west (left image) and Crossing 5, No.3 Drain looking east (right image)


Crossing 6, C-4-C Lateral looking north (left image) and Crossing 8, D-2 Lateral looking south (right image)


Crossing 7, C Canal looking southeast (left image) and southwest (right image)


Crossing 10, 5-A Drain looking east (left image) and Crossing 12, 5-A Drain looking northwest (right image)

Crossing 15, 5-A Drain looking southeast

Crossing 17, C-9 Lateral panorama looking west, Matney Way to the right

Crossing 18, No. 5 Drain looking west

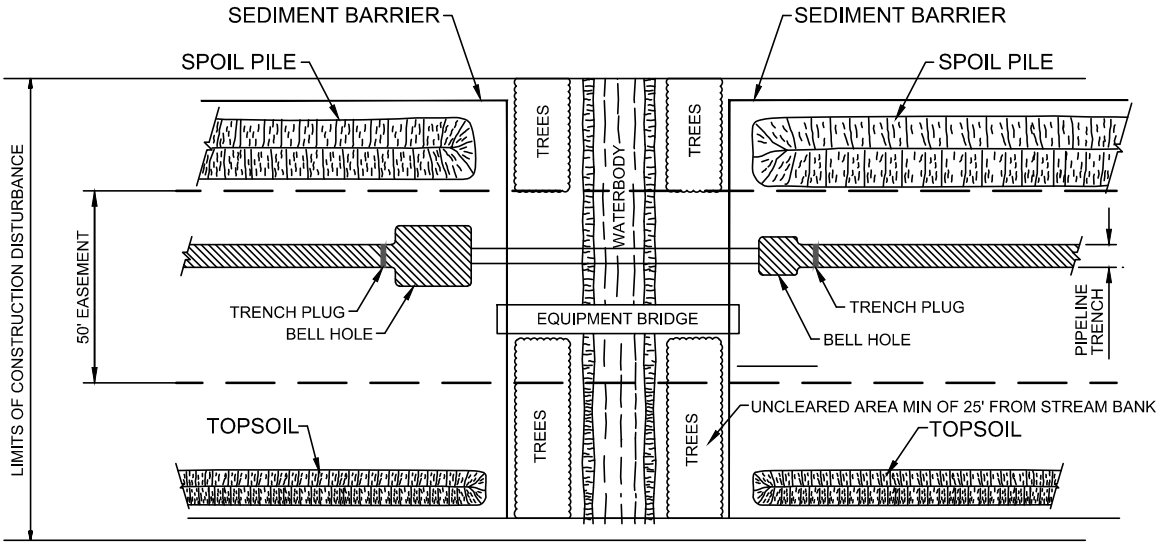
Crossing 19, 5-H Drain looking northeast

Crossing 21, D-3-A Lateral looking southeast. Image was taken approximately 650-ft northwest of the proposed crossing location.

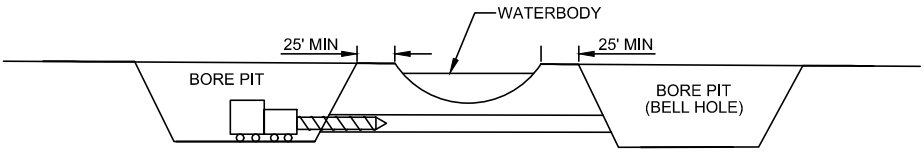
Crossing 23, G Canal looking northeast (left image) and east (right image)

ATTACHMENT 3

Typical Drawings



PLAN



PROFILE

BORE NOTES:

1. CONTRACTOR SHALL INSTALL SEDIMENT BARRIERS AT THE BASE OF SLOPES ADJACENT TO STREAM CROSSINGS WHERE VEGETATION IS DISTURBED, TO INTERCEPT SURFACE RUNOFF.

2. CONTRACTOR SHALL INSTALL SEDIMENT BARRIERS TO PROTECT SPOIL PILES WHERE SEDIMENT BARRIERS ACROSS THE ENTIRE DISTURBED AREA ARE NOT REQUIRED.

4. MAINTAIN A MINIMUM 10 FEET VEGETATIVE BUFFER ALONG BOTH SIDES OF THE WATERBODY IF POSSIBLE.

5. THE SIDES OF THE BORES PITS, SHALL BE SLOPED BACK TO A STABLE CONFIGURATION, UNLESS SHORING IS NECESSARY. INSTALL SAFETY FENCE AROUND BORE PITS AS NECESSARY.

6. DEWATER BORE PIT TO CONTROL SEEPAGE WATER INFLOW. WATER REMOVED FROM BORE PIT AND BELL HOLE SHALL BE FILTERED THROUGH A TRENCH DEWATERING FACILITY (TDW). TO PREVENT ENTRY OF UNCONTROLLED WATER INTO WATERBODY. MINIMIZE DRAW DOWN OF WATERBODY AND MAINTAIN STEAM FLOW.

7. UPON COMPLETION OF PIPE INSTALLATION AND TIE-INS, BACKFILL AND COMPACT THE BORE PITS.

REVISIONS		
NO.	DATE	DESCRIPTION
A	12/18/17	ISSUED FOR INFORMATION ONLY

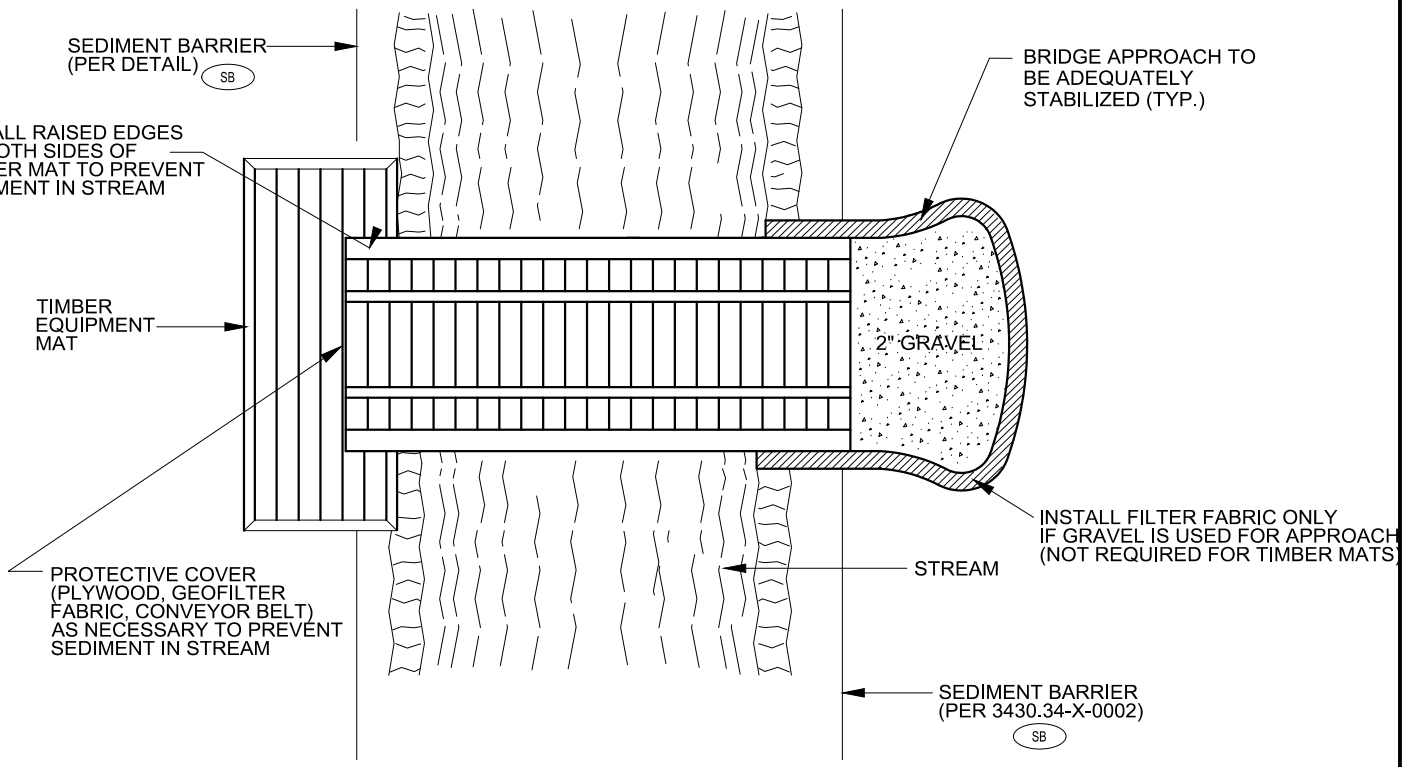
SCALE	N.T.S.	
DRAWN AWL	DATE	12/18/17
CHK'D	DATE	
APPROVED	DATE	
EMS JOB NO.		
AFE/P.O.NO.		
CLIENT FILE NO.		
EMS FILE NO.	6793-1000-9801.dwg	

Pacific Connector Gas Pipeline, LP

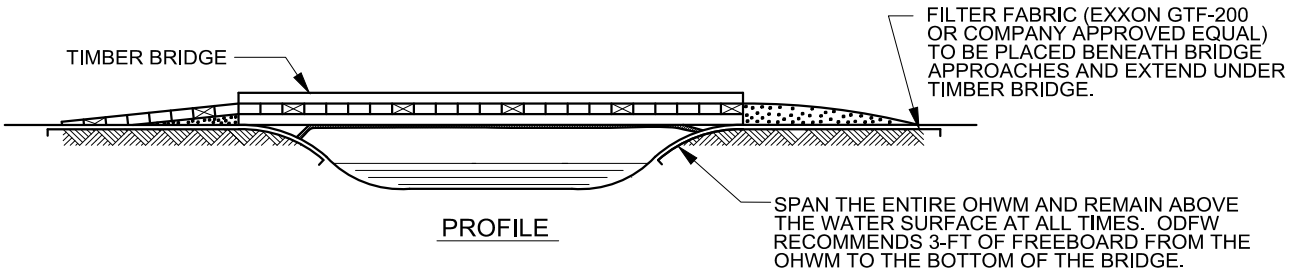
TITLE
WATER BODY CROSSING
TYPICAL CONVENTIONAL BORE

NO. 6793-1000-9801

REV. A



PLAN



PROFILE

MINIMUM PERFORMANCE/DESIGN STANDARDS:

1. TIMBER BRIDGES SHALL BE ADEQUATELY ANCHORED AT ONE END.
2. BRIDGE APPROACHES SHALL BE EITHER COARSE AGGREGATE OR TIMBER EQUIPMENT MATS.
3. SEDIMENT AND DEBRIS SHALL NOT ENTER WATERBODY. PROVIDE RAISED EDGES ON BOTH BRIDGE EDGES AND PROTECTIVE COVER (PLYWOOD, GEOFILTER FABRIC, CONVEYOR BELT), AS NECESSARY, TO PREVENT SEDIMENT IN STREAM.
4. PERIODICALLY CHECK BRIDGE INSTALLATION AND REMOVE BUILD-UP OF SEDIMENT OR DEBRIS ON BRIDGE.
5. MATERIALS PLACED ALONG STREAM CHANNEL SHALL BE COMPLETELY REMOVED DURING FINAL CLEAN-UP. REMOVAL OF THIS STRUCTURE IS NOT CONTINGENT UPON ESTABLISHMENT OF PERMANENT VEGETATION.
6. THE TIMBER BRIDGE SHALL BE DESIGNED TO SPAND THE ENTIRE OHWM OF THE WATEBODIES AND REMAIN ABOVE THE WATER SURFACE ELEVATION AT ALL TIMES. ODFW RECOMMENDS 3-FT OF FREEBOARD FROM THE OHWM/ACTIVE CHANNEL TO THE BOTTOM OF THE BRIDGE.
7. CONTRACTOR MAY USE MANUFACTURED PORTABLE BRIDGES OR RAIL CAR BRIDGES AS SUBSTITUTES FOR THE MEASURES SHOWN, IF APPROVED BY COMPANY REPRESENTATIVE.
8. MID-STREAM BRIDGE SUPPORTS PIERS OR CULVERTS SHALL, SHALL BE USED TO PREVENT SETTLEMENT OF THE BRIDGE, IF NECESSARY. WHERE PIERS/CULVERTS ARE USED TO SUPPORT BRIDGES THEY SHALL NOT RESTRICT FLOW AND SHALL BE DESIGNED TO WITHSTAND AND PASS THE HIGHEST FLOW THAT WOULD OCCUR WHILE THE BRIDGE IS IN PLACE.
9. USE OF MID-STREAM BRIDGE SUPPORTS PIERS/CULVERTS WILL TRIGGER ODFW FISH PASSAGE PERMIT REQUIREMENTS AND APROVALS BEFORE INSTATALLATION.

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP

TYPICAL
PORTABLE BRIDGE CROSSING

PB

Pacific Connector SM
GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0010	SHEET 2 OF 2

Appendix P

Leave Tree Protection Plan

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Leave Tree Protection Plan

Pacific Connector Gas Pipeline Project

January 2018

Table of Contents

List of Attachments

1.0 INTRODUCTION

The intent of this plan is to describe the measures that will be implemented during construction of the Pacific Connector Gas Pipeline Project (Pipeline or Pipeline Project) to identify, conserve and protect selected trees (living and snags) within or along the edges of the Pipeline Project's certificated work limits (i.e., construction right-of-way, uncleared storage areas (UCSAs) and temporary extra work areas (TEWAs). This plan describes the preconstruction surveys that will be completed to clearly mark the boundaries of the Pipeline Project's certificated working limits; the procedures that will be conducted to identify individual trees within or along the edges of the certificated work limits that can be conserved or left standing; and the measures that would be employed to ensure these trees are saved and protected from clearing activities. This plan describes the Best Management Practices (BMPs) that would be employed to minimize damage to trees within UCSAs, where slash, stumps or other materials may be temporarily stored. This Plan is intended to describe the measures that will be used to protect trees not removed from the construction right-of-way and TEWAs and protect trees within UCSAs on federal lands.

PCGP will be required to purchase all timber located within the construction right-of-way clearing limits and all trees outside of the construction clearing limits that are damaged excessively by clearing and construction activities (including road construction, renovation and repair), as determined by the authorized representative of the BLM or USFS. If PCGP damages any BLM trees outside of the authorized clearing area and the UCSAs, PCGP may be subject to trespass under BLM regulations and Oregon Revised Statutes.

2.0 PRECONSTRUCTION SURVEY

Prior to construction, the certificated construction right-of-way limits, including the boundaries of UCSAs, TEWAs, temporary disposal sites, temporary and permanent access roads, and other areas of ground-disturbing activities, as shown on the Environmental Alignment Sheets, will be surveyed and clearly marked with stakes and flagging in accordance with stipulations found within the Right-of-Way Marking Plan (see Appendix T to the POD).

3.0 FOREST/TIMBER CLEARING

Prior to clearing operations and before or concurrently with timber cruising, the EI or PCGP's authorized representative in conjunction with the construction contractor will identify and flag existing snags on the edges of the construction right-of-way or TEWAs where it is feasible to save/conserve them from clearing operations. These snags will be saved as mitigation to benefit primary and secondary cavity nesting birds, mammals, reptiles, and amphibians. In addition, during this process the EIs will identify and flag other large-diameter trees on the edges of the construction right-of-way and TEWAs that can be saved/protected as green recruitment or as habitat/shade trees. Some of these trees would be girdled to create snags to augment the number of snags along the right-of-way providing habitat structures. The feasibility to salvage snags and trees on the edges of the construction right-of-way and TEWAs will be based on the ability to not hinder construction activities or the potential safety of construction personnel. This decision will ultimately be made by PCGP's Chief Inspector if there is disagreement between inspectors. As required by Oregon's regulations, PCGP will cut

hazard/danger trees[1] that have been designated by PCGP's professional forester and/or certified arborist that may be on the edges of the certificated construction work limits. PCGP has requested a Danger/Hazard Tree Modification to FERC's Upland Plan (se Table A.1-1 in Appendix A.1 to Resource Report 1).

The specific method to mark snags or trees to be conserved/saved will be determined prior to clearing operations based on PCGP's consultation with the clearing contractors. The selected marking method will be a common method that will be used on all construction spreads and will be selected based on the clearing contractor's experience to ensure maximum protection as well as marking efficiency. PCGP's EI or authorized representative would prioritize evaluating the trees that can be saved/conserved (within the certificated working limits) that are within or adjacent to sensitive areas including riparian areas, wetlands, northern spotted owl (NSO) home ranges and marbled murrelet (MAMU) stands (i.e., known occupied, and potential occupied stands).

During the evaluation process to identify the trees that can be conserved/saved within the construction working limits, the EI, in consultation with, the BLM/FS designated representative would identify trees that would be used for instream habitat structures or Large Woody Debris (LWD), which would be salvaged with the root wads attached. These trees would be selected based on their site-specific use. For example, if these trees are to be used for on-site instream habitat, these trees would be selected based on their proximity to the stream to minimize hauling/moving requirements and based on the size of the specific stream where the LWD is to be placed. If LWD is required for use off-site, selected trees would be identified in areas near suitable landings, TEWAs, and ingress/egress locations to minimize moving the LWD and to improve the efficiency in storing and hauling this material. The specific method to mark trees within the construction right-of-way and TEWAs that would be used for various habitat purposes/LWD will be determined prior to clearing operation based on PCGP's consultation with the clearing contractors. The selected marking method will be a common method that will be used on all construction spreads and will be selected based on the clearing contractor's experience to ensure maximum protection as well as marking efficiency. Where LWD is acquired from the certificated construction limits, this material will be collected from areas outside riparian zones to maintain root structure within the riparian zone. The exception is where the LWD can be obtained from the trenchline or construction right-of-way cut areas where root systems would be removed during trench excavation or grading operations. Trees selected for LWD would be selected from the interior of the construction right-of-way or TEWAs, as much as possible, because pulling trees with root wads could extend disturbance off of the construction right-of-way or TEWAs, and a large depression, where the root wad was removed, may need to be filled during construction right-of-way restoration efforts. Any timber cleared from the construction right-of-way that will be used for instream or upland wildlife habitat diversity structures will be stored on the edge of the construction right-of-way or in TEWAs for later use during restoration efforts.

Once PCGP has selected the construction contractors and the pipeline centerline and construction limits have been surveyed and marked, the construction limits will be reviewed by the contractors and PCGP to determine if any TEWAs could be potentially eliminated or reduced in size to avoid tree clearing in these areas and minimize overall Pipeline Project effects. Where feasible, the review of the construction limits by the contractor would occur prior

[1] OAR 437, Division 7 Forest Activities - Oregon OSHA: Danger tree – A standing tree, alive or dead, that presents a hazard to personnel due to deterioration or physical damage to the root system, trunk (stem), or limbs, and the degree and direction of lean.

to, or concurrently with the timber cruises so that these areas could be eliminated from the timber appraisals. However, if this review occurs after the timber cruises/forest appraisals, any areas of TEWAs that can be eliminated or reduced in size would be marked to be saved from clearing operations. The specific method to mark TEWAs that can be eliminated or reduced in size will be determined prior to clearing operation based on PCGP's consultation with the clearing contractors. The selected marking method will be a common method that will be used on all construction spreads and will be selected based on the clearing contractor's experience to ensure maximum protection of these eliminated areas. During clearing operations, PCGP's clearing inspectors or the construction contractors may also identify other trees on the edges of the construction right-of-way or within TEWAs that can be saved from clearing operations. In these situations, PCGP's clearing inspector would flag/mark these trees that can be saved/conserved, as previously noted in this Plan.

If PCGP's construction contractor determines that it is necessary to clear any of the identified/designated saved trees within the certificated working limits, the contractor would notify PCGP with the rationale to remove these trees. PCGP would review the contractor's rationale and confirm if any appropriate seasonal timing restrictions apply, such as a buffer (1/4 mile) from MAMU stands or NSO nest patches, prior to removing any of these trees in year two.

4.0 UNCLEARED STORAGE AREAS

The UCSAs will not be cleared of trees during construction. All UCSAs are shown on the Environmental Alignment Sheets. These areas will be used for temporary storage of equipment and construction spoils. In addition, these UCSAs will be used to store materials (e.g., forest slash, stumps, and dead and downed logs) generated during timber clearing and pipeline construction. These materials will be scattered back across the construction right-of-way after pipeline construction during restoration efforts. The amount of this type of material is expected to be large enough to hinder construction activities if it were stored within the 95-foot construction right-of-way.

Generally, the forests in these areas are characterized by mature trees that are spaced such that sufficient storage space is available between them to store forest slash, stumps, dead and downed logs, and spoil.

Vegetation disturbance within the UCSAs would generally depend on the site-specific vegetation characteristics – with younger precommercial forests being potentially more susceptible to damage (limb breakage or tree damage). However, use of UCSAs that contain precommercial size forest stands will be accredited special consideration and care when implementing the protection measures described below. PCGP Environmental Inspectors (EIs) or Utility Inspectors would monitor the use of UCSAs that are in a regenerating age class and which could be more susceptible to tree damage to ensure potential impacts from their use are minimized.

PCGP will implement protection measures to minimize damage to live trees in the UCSAs. Measures that will be employed to protect live trees located in the UCSAs would include, but are not limited to:

- PCGP's Chief and Environmental Inspectors will be trained on the importance of protecting live trees within UCSAs;
- PCGP's equipment operators will leave as much space between the stored material and live trees as practical, as depicted in Drawing 3430.34-X-0021 provided in Attachment 1;

- Train and educate the construction contractors and the equipment operators to place materials such that placement and retrieval will minimize potential impacts (i.e., soil compaction and bark damage);
- Train equipment operators to strategically place various slash materials using techniques to minimize resource damage within the UCSAs. These techniques would include sorting, sizing, stacking, or placing these materials to facilitate their use, retrieval, and redistribution back across the construction right-of-way;
- Haphazard dozing/pushing of slash materials off the construction right-of-way or TEWAs into UCSAs will not be allowed;
- Along steep and narrow ridgeline areas, logs, slash, and dead and downed material may be used as cribbing to contain excavated materials during construction (construction right-of-way grading and trenching activities);
- In limited locations, the UCSAs may be used to store spoil or to temporarily park equipment between the mature trees. However, storage and temporary parking of equipment/vehicles will not occur immediately adjacent to the tree to minimize soil compaction or tree damage; and
- PCGP's inspectors will ensure that the protective measures are followed during construction.

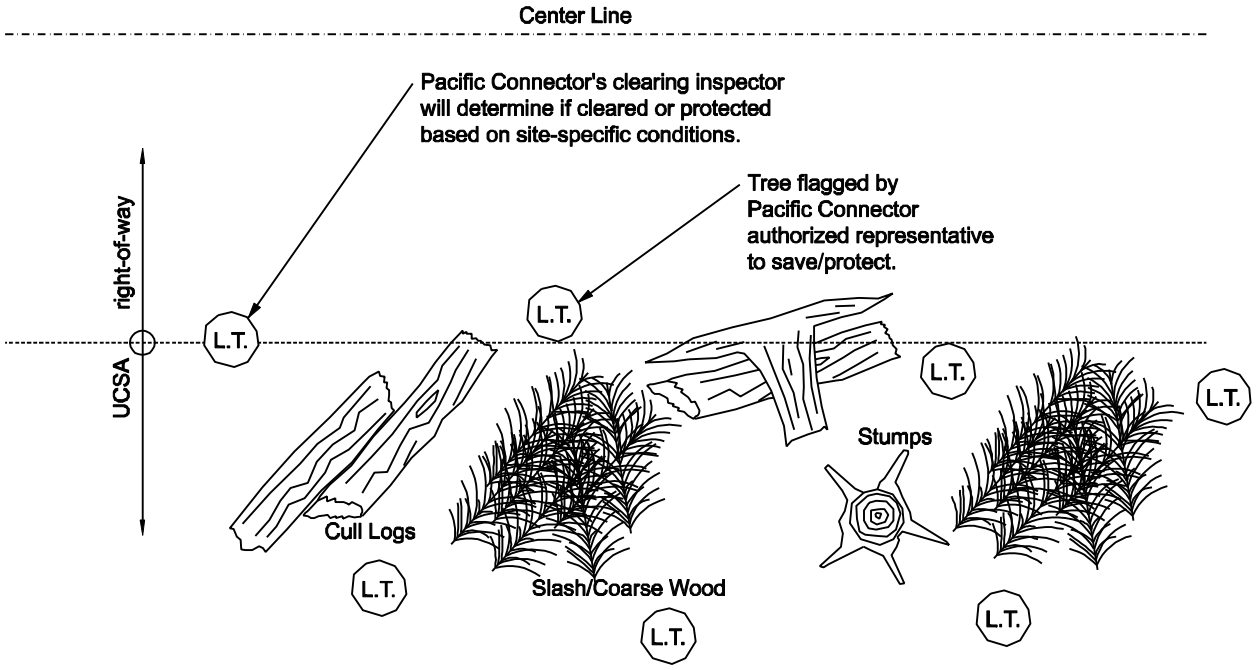
Following completion of construction, PCGP, BLM and USFS authorized representatives will assess tree damage (on their respective federal lands) within the UCSAs and other Pipeline Project areas for excessive live tree damage.

During restoration, some of the materials that are pulled out of the UCSAs may roll beyond the construction limits. In these circumstances, PCGP will act to retrieve as much of the overcast material as possible without undertaking additional tree clearing and grading to reach the overcast material, as determined appropriate by PCGP's EI, in coordination with a BLM/FS designated representative

During restoration, PCGP's EI, in coordination with a BLM/FS designated representative, will determine appropriate measures necessary to mitigate any Pipeline Project damage that may have occurred within the UCSAs, including scarification, reseeding, and replanting, as specified in the Erosion Control and Revegetation Plan (ECRP) provided as Appendix I to the POD.

Attachment 1

Uncleared Storage Areas
Typical Best Management Practices



Legend:

L.T. = Live Tree

Notes:

1. Operators will be trained to place material such that the placement of forest slash, stumps, cull/decayed logs, coarse wood material, or spoil and retrieval of these materials minimizes potential impacts (i.e., soil compaction and bark damage) to trees within the Uncleared Storage Areas (UCSA).
2. Stored material within UCSA will be placed leaving as much space between the stored material and the trees as practical.
3. Pacific Connector's inspectors will monitor material placement during construction and encourage operators to follow the mitigation practices to the extent feasible.
4. During restoration the contractor will remove as much material stored within the UCSA as practical.
5. During restoration, Pacific Connector's EI will determine appropriate restoration measures necessary to mitigate any project damage that may have occurred within the UCSAs, including scarification, reseeding, and replanting as specified in the ECRP.

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP

UNCLEARED STORAGE TYPICAL USE

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: JST	DATE: JUNE 2007	ISSUED FOR BID:	SCALE: NONE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0021	SHEET
		%TIME% %PATH%	OF

Appendix Q

Overburden and Excess Material Disposal Plan

Pacific Connector Gas Pipeline, LP

Overburden and Excess Material Disposal Plan

Pacific Connector Gas Pipeline Project

January 2018

Table of Contents

List of Attachments

1.0 INTRODUCTION

The purpose of this Overburden and Excess Material Disposal Plan is to identify the proposed locations on federal lands that may be used for the permanent and temporary storage of excess rock, timber, and spoil generated during timber removal and pipeline construction of the Pacific Connector Gas Pipeline Project (Pipeline or Pipeline Project). Existing federal rock quarries and select temporary extra work areas (TEWAs) along the construction right-of-way have been identified for potential use as both permanent and temporary storage sites. These locations are listed in Attachment A - Table 1. Pacific Connector Gas Pipeline, LP (PCGP) will obtain federal Right-of-Way Grant approval prior to utilizing any of the existing quarries, pits or TEWAs for storage of excess materials. This plan goes hand in hand and must be read with the Exhibit H to the PCGP right-of-way grant.

2.0 ROCK SOURCE AND EXCESS MATERIAL DISPOSAL LOCATIONS

At existing federal rock quarries, excess rock, overburden and other materials removed from the construction right-of-way will be separated and stored based on the type, size, quality and quantity of material excavated. Details of the preconstruction survey and right-of-way marking are described in the Right-of-Way Marking Plan provided in Appendix T to the POD. PCGP is aware that some of the existing federal quarries identified for potential disposal storage may still contain high quality rock resources and the storage methodology will need to be approved by the land-managing agency prior to material placement to minimize potential encumbrance to the existing rock resources.

Large slash and timber debris, such as stumps or large wood debris (LWD) that may be removed from the construction right-of-way and decked in designated disposal sites may also occur at these disposal sites. This material would be of a size and quality that could be used in various habitat restoration projects or as OHV barriers as stipulated by the land-managing agencies. This excess timber material could also be of a size and quality that could be made available to the public.

Table 1 in Attachment A lists the rock source and disposal sites that have been identified for potential permanent or temporary use during construction of the Pipeline Project on federal lands. PCGP may need to use material sources on federal lands for the production of aggregate for road surfacing, pipe bedding, slope armoring, or other Pipeline Project needs, as stated in Section 3.2.3 of the Transportation Management Plan (TMP – Appendix Z to the POD). PCGP's contractor will abide by the applicable regulations (including 36CFR228 Subpart C & FSM 2850) and apply for the appropriate removal permits from the federal land-managing agencies for any material to be removed from a federal quarry for Pipeline Project use. Prior to use, PCGP shall prepare a Site Development and Reclamation Plan for agency review and approval for each source of mineral material for Pipeline Project use. PCGP does not plan to expand the existing quarry sites on federal lands beyond the previously disturbed footprints for material storage. Attachment C contains site maps identifying the footprints of the proposed TEWAs and quarries listed in Attachment A – Table 1.

Access to all temporary and permanent federal quarry disposal locations will utilize existing roads and in some cases the construction right-of-way. All proposed access roads are identified in the TMP. PCGP will determine the average daily traffic for the access roads and will be responsible for the maintenance and upgrading activities based on the existing commensurate road share agreements.

2.1 ENVIRONMENTAL CONTROLS

For both temporary and permanent disposal sites, PCGP's Contractor will be responsible for installing appropriate environmental controls to prevent material transport outside the Pipeline Project or quarry boundaries, and to ensure potential sedimentation of area drainage does not occur from the material storage. Appropriate environmental controls may include among other best management practices (BMPs) adequate signing, placement, sloping, mulching, seeding, staking or fencing and the use of sediment barriers, berms, or diversion ditches where necessary. These erosion control measures will follow the BMPs outlined in the Erosion Control and Revegetation Plan (ECRP) provided in Appendix J to the POD or as determined necessary by PCGP's Environmental Inspector or an authorized Federal agency representative.

2.2 TEMPORARY DISPOSAL LOCATIONS

Temporary disposal sites will be needed to store rock, timber, and other material depending on the specific phase of the Pipeline Project. Appropriate environmental controls and BMPs will be used to ensure the temporary storage of materials will not cause sedimentation issues or other offsite impacts or interfere with other on-site users. PCGP will provide a Site Development and Reclamation Plan that will include surveyed drawings of the temporary disposal sites that identify the storage location of material based on material type and material size for agency approval. At the conclusion of the Pipeline Project, the temporary storage sites will be reclaimed to their previous condition as detailed in the ECRP, or as stipulated by an authorized Federal agency representative. Excess material that cannot be used by the Pipeline Project or redistributed across the construction right-of-way will be relocated to one of the approved permanent disposal sites, or potentially to a permanent disposal site located on private lands approved by FERC, or to a state-approved, offsite disposal site (i.e. landfill). Additionally, in areas where slash has been concentrated, such as on landings, and cannot be evenly scattered across the right-of-way according to the fuel loading standards, the slash may be mechanically or hand piled and burned according to state burning requirements and federal land-managing agency stipulations. PCGP has developed a Prescribed Burning Plan which is included as Appendix R to the POD that describes the proposed burning of forest slash as a disposal method.

2.3 PERMANENT DISPOSAL LOCATIONS

At permanent disposal sites, excess material will be deposited and treated in a manner that will be agreed upon with the corresponding federal land-managing agencies. PCGP will provide a Site Development and Reclamation Plan that will include surveyed drawings of the permanent disposal sites that identify the storage location of material based on material type and material size for agency approval. The disposal drawings will also show any temporary and/or permanent erosion control measures that may be required. Attachment B – Typical 1 shows the information that would be included in the sample quarry drawing for permanent disposal sites.

3.0 CONCLUSION

This Overburden and Excess Material Storage Plan shall be updated and finalized prior to construction based upon the Contractor(s) material quantity estimates and evaluation of the proposed disposal sites' proximities to the construction right-of-way. Draft proposed disposal site-specific drawings and Site Development and Reclamation Plans, depicting maximum footprint impacted, type of materials to be stored, general storage locations within the overall footprint, typical placement methods and material treatment will be submitted to the federal

land-managing agencies after PCGP selects the construction Contractor(s). Finalized site-specific drawings and plans will be submitted by the Contractor through PCGP to the federal agencies for final approval prior to actual use.

Attachment A

Table 1
Rock Source and Disposal Sites Identified for Construction of the Pipeline Project on Federal Lands

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP location	Purpose	Jurisdiction	Land Use	Permanent/ Temporary Use	Vegetation	Access
Douglas County								
Signal Tree Road Quarry – Sec. 3 (3430.26-X-0004)	1.22	45.86	Rock source and overburden disposal; spoil storage, staging	BLM-Roseburg district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)	Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008)
Signal Tree Road Quarry – Sec. 35 (3430.26-X-0002)	1.09	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)	Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008b)
Weaver Road Quarry Site 1 (3430.26-X-0003)	1.62	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)
Weaver Road Quarry Site 2 (3430.26-X-0003)	1.30	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)
Signal Tree Quarry Site – Sec. 15 (3430.26-X-0005)	1.75	47	Rock source and overburden disposal	BLM-Roseburg district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Lower Signal Tree (BLM 29-9-36.0) 46.51 (3430-31-Y-008)
TEWA 79.85-N (BLM Quarry Site) [1]	3.61	79.85	Overburden disposal, PI, spoil storage, log landing, steep slope staging	BLM-Roseburg district	Transportation, communication, utilities corridors, regenerating evergreen forest land; quarries	Permanent or Temporary	Roads, corridors, Douglas fir dominant - mixed conifer	Pack Saddle Road (BLM 29-4-17) 79.89 - 80.42 & Construction Right-of-Way (3430-31-Y-013)
Hatchet Quarry MP 102.30 (3430.26-X-0016)	2.00	102.30	Log (mitigation) storage	FS-Umpqua	Strip mines, quarries, gravel pit and evergreen	Permanent	Industrial	FS 3220000 (3430-31-Y-016c)

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP location	Purpose	Jurisdiction	Land Use	Permanent/ Temporary Use	Vegetation	Access
					forest.			
C&D Pit MP 104.12 (3430.26-X-0017)	3.36	104.12	Overburden disposal, Log (mitigation) storage	FS-Umpqua/ Private	Strip mines, quarries, and gravel pits, transportation, communication, utilities corridors, regenerating forest land	Permanent or Temporary	Industrial, roads and corridors, Douglas fir dominant – mixed conifer	FS 3230135 & C&D Lumber (3430-31-Y-017)
Jackson County								
TEWA 110.73-W (Peavine Quarry) (3430.26-X-0019)	15.87	110.54	Staging, parking, overburden disposal, hydrostatic discharge, log (mitigation) storage	FS- Umpqua	Strip mines, quarries, gravel pit and evergreen forest	Temporary	Industrial and Douglas fir dominant - mixed conifer	South Fork Cow Creek FS 3232000 FS 3232895 (3430-31-Y-018)
TEWA 150.31-W (Heppsie Mountain Quarry) [1]	5.56	150.31	Ingress/egress, staging, parking, spoil storage, rock source and disposal	Private and BLM-Medford district	Mixed rangeland, strip mines, quarries, and gravel pits, evergreen forest land, mixed forest land, transportation, communication, utilities corridors, regenerating evergreen forest land, clearcut forest land, herbaceous rangeland	Temporary	Grasslands (W. Cascades), industrial, Ponderosa Pine/white oak, roads, corridors, grass-shrub-sapling or regenerating young forest	Heppsie Mountain Quarry Spur (BLM 37-2E-1.3 Includes BLM 37-2E-1.1) 150.35 - 150.64 & Construction Right-of-Way (3430-31-Y-024)
Rum Rye (3430.26-X-0026)	4.91	160.41	Log (mitigation) storage	FS-Rogue River-Siskiyou	Strip mines, quarries and gravel pits.	Permanent	Industrial	FS 3740000 FS 3740100 (3430-31-Y-041)
TEWA 160.54-W (Big Elk Cinder Pit) [1]	15.26	160.54	Log landing/decking / hauling,	FS-Rogue River-Siskiyou	Strip mines, quarries, and gravel pits, transportation, communication,	Temporary	Industrial, grasslands (W. Cascades),	FS 373000 (S. Fork Little Butte Creek Road) FS 3700130

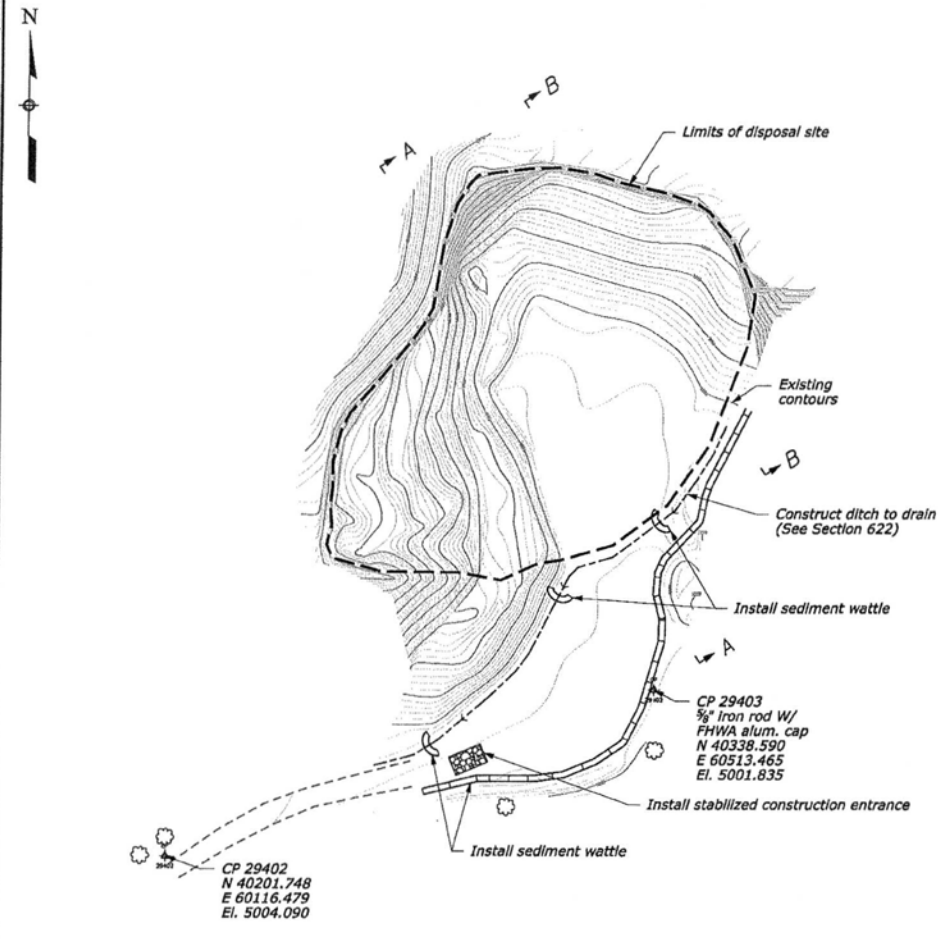
Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP location	Purpose	Jurisdiction	Land Use	Permanent/ Temporary Use	Vegetation	Access
			ingress/egress, staging, rock source and overburden disposal		utilities corridors, evergreen forest land		roads, corridors, true-fir hemlock montane, Douglas fir dominant - mixed conifer	FS3700133 FS 3700134 & Construction Right-of-Way (3430-31-Y-025)
Total	**57.55**							

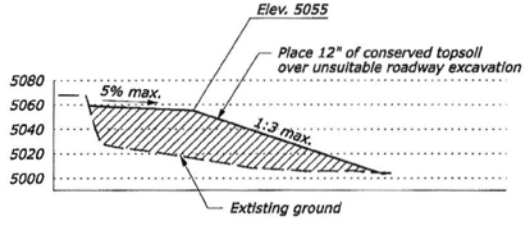
[1] Shown on Environmental Alignment Sheets in Appendix AA to the POD.

Attachment B – Typical 1

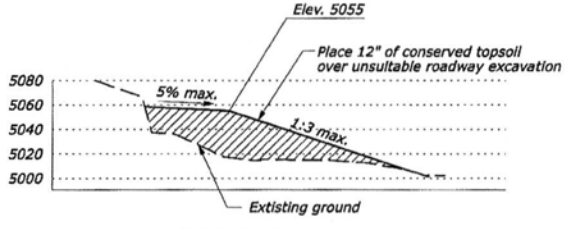
Foster Creek Disposal Area

STATE	PROJECT	SHEET NUMBER
OR	PFH 47(1)	H.2





SECTION B-B



SECTION A-A

DISPOSAL QUANTITIES

ITEM	DESCRIPTION	QUANTITY
	Estimated disposal volume available (For information only)	78,000 yd3
15703-2500	Soil erosion control, mulching hydraulic method	2.0 acre
15705-1500	Soil erosion control, sediment wattle	500 ln ft
15706-1600	Soil erosion control, stabilized construction entrance	1 each

NOTE:

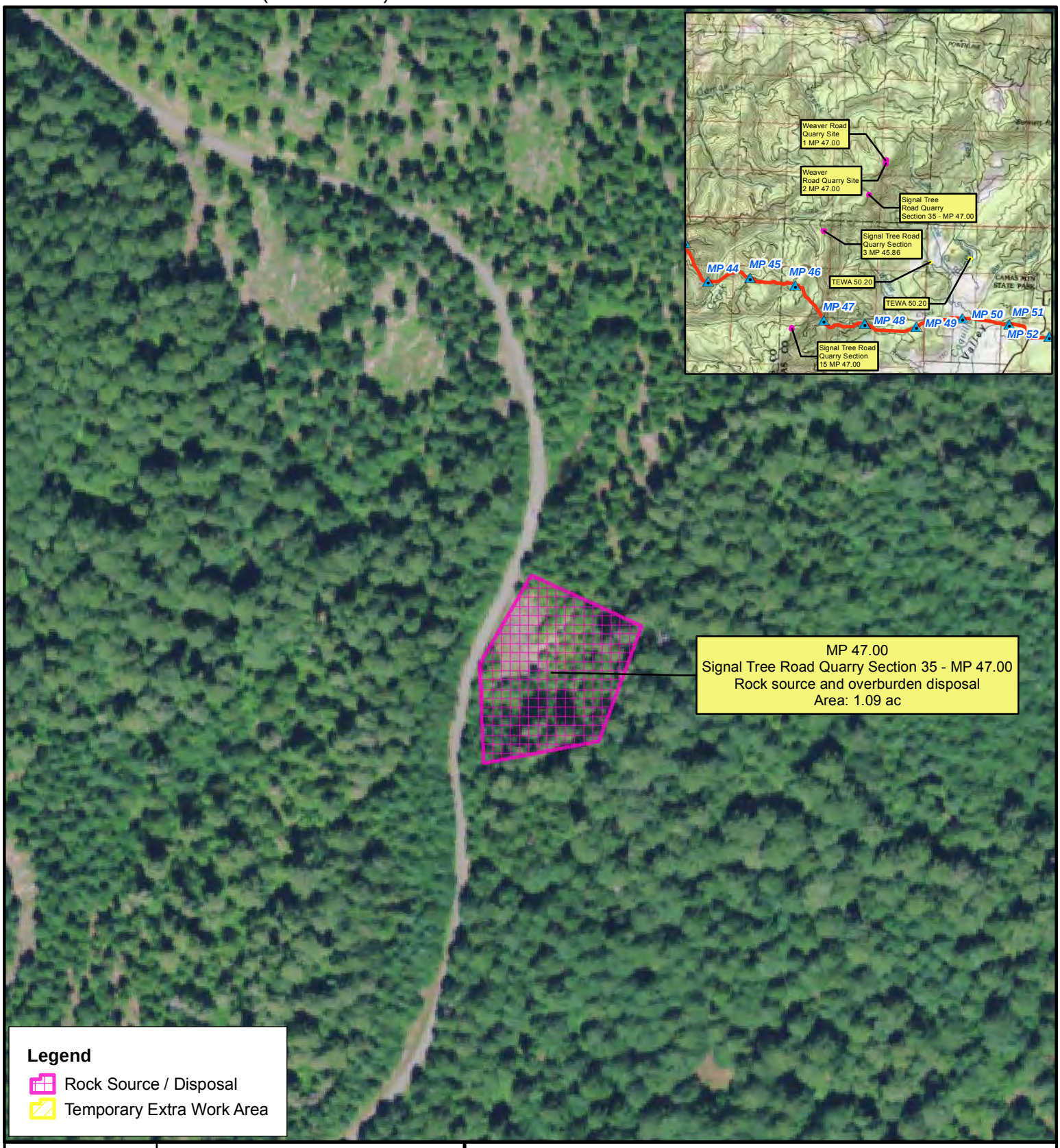
1. *Install all erosion control devices prior to placing material in disposal site.*
2. *See vicinity map on Sheet A.4 for disposal site location.*
3. *Shape and contour the disposal area to avoid water pockets.*
4. *Permanent seeding, mulching, planting to be performed by others.*

FOSTER CREEK DISPOSAL AREA

10/2009 | DJBA | Checked by: | 09/2009 | M. Sweeney | Designed by: | 10/16/2009 | L:\Projects\55\55105101\Roadway\Deliverables\srpt\fc04701mb4.dgn

Attachment C

Site Maps



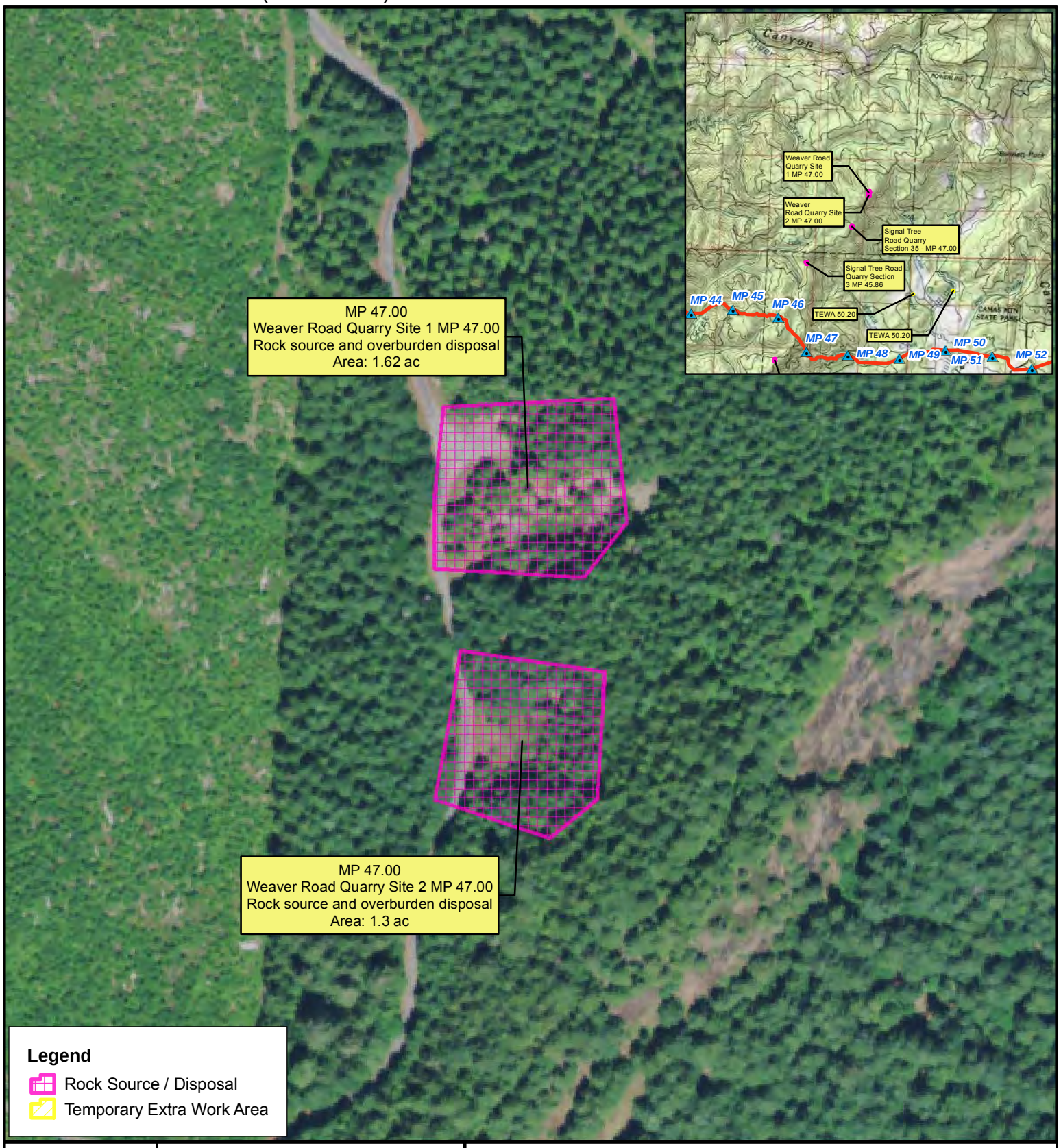
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
Signal Tree Road Quarry Section 35
M.P. 47
Section 35, T28S, R9W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0002	SHEET 2 OF 36



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
Weaver Road Quarry Site 1 & 2
M.P. 47
Section 25, T28S, R9W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
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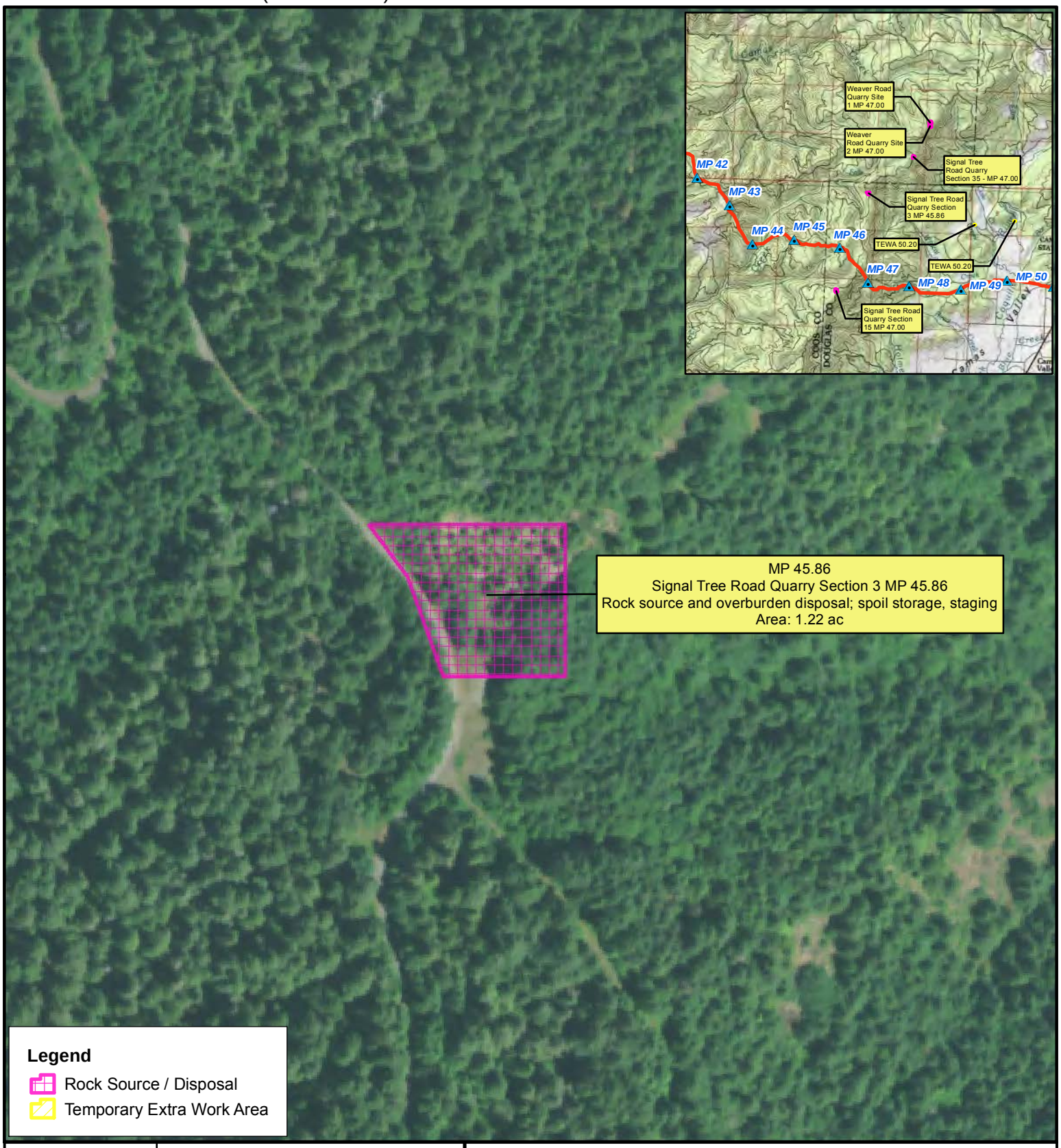
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0003	SHEET 3 OF 36



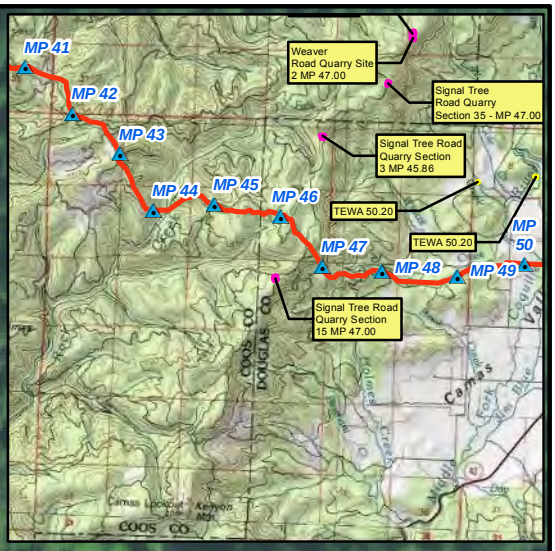
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
Signal Tree Road Quarry Section 3
M.P. 45.86
Section 3, T29S, R9W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0004	SHEET 4 OF 36



MP 47.00
Signal Tree Road Quarry Section 15 MP 47.00
Rock source and overburden disposal
Area: 1.75 ac

Legend

- Rock Source / Disposal
- Temporary Extra Work Area

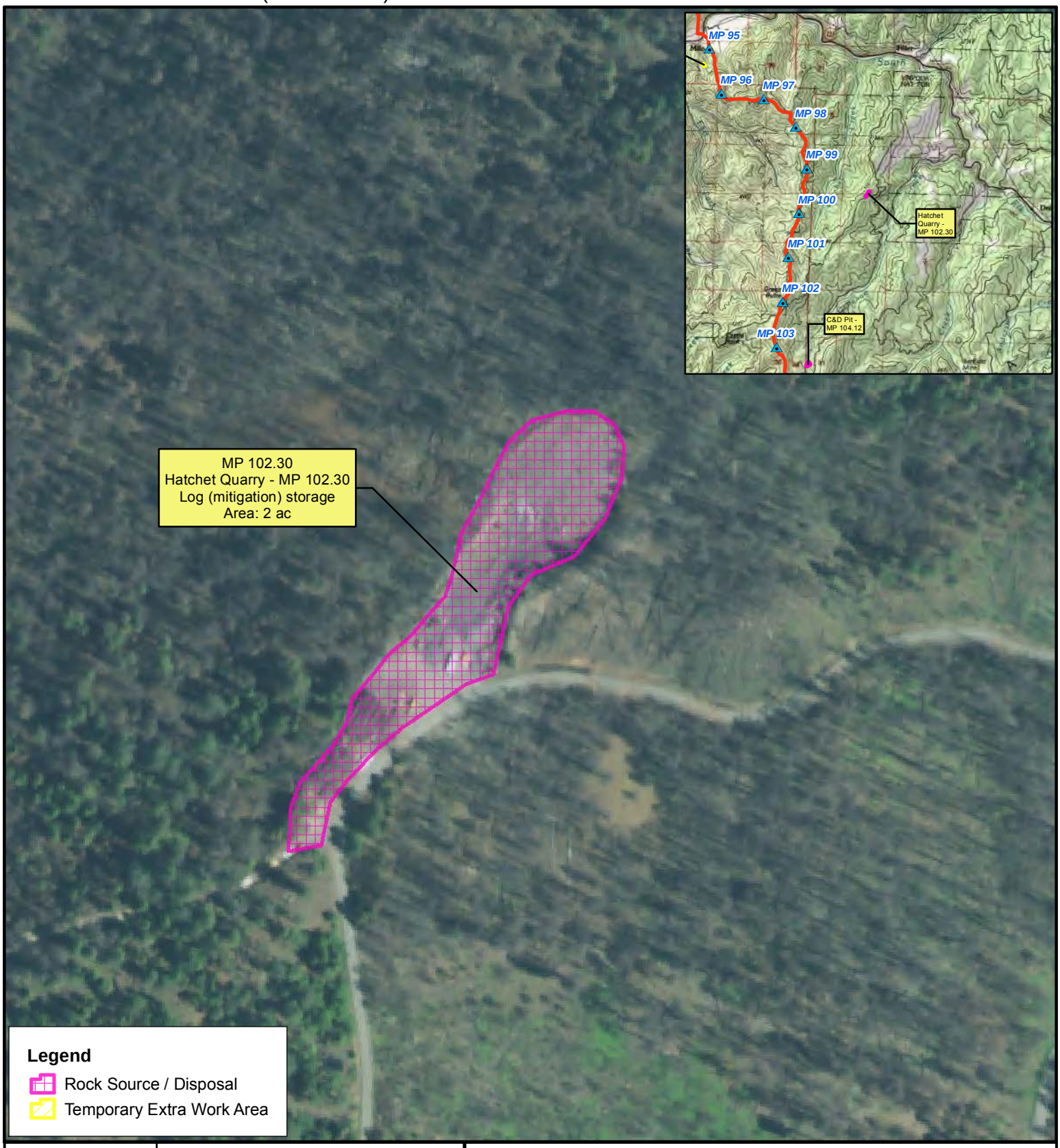
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
Signal Tree Road Quarry Section 15
M.P. 47
Section 15, T29S, R9W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0005	SHEET 5 OF 36



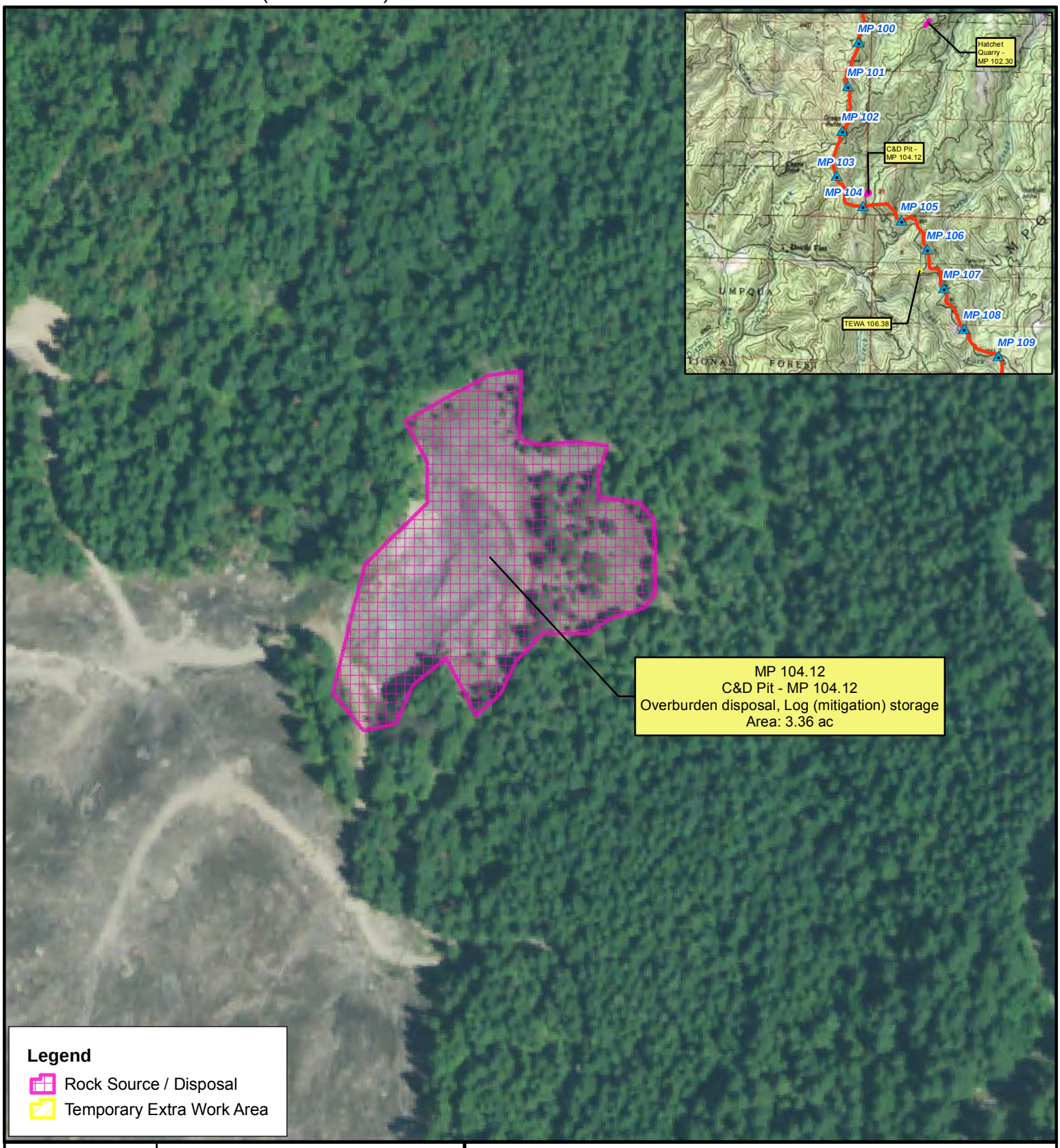
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
Hatchet Quarry
M.P. 102.3
Sections 8 & 17, T31S, R2W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0016	SHEET 16 OF 36



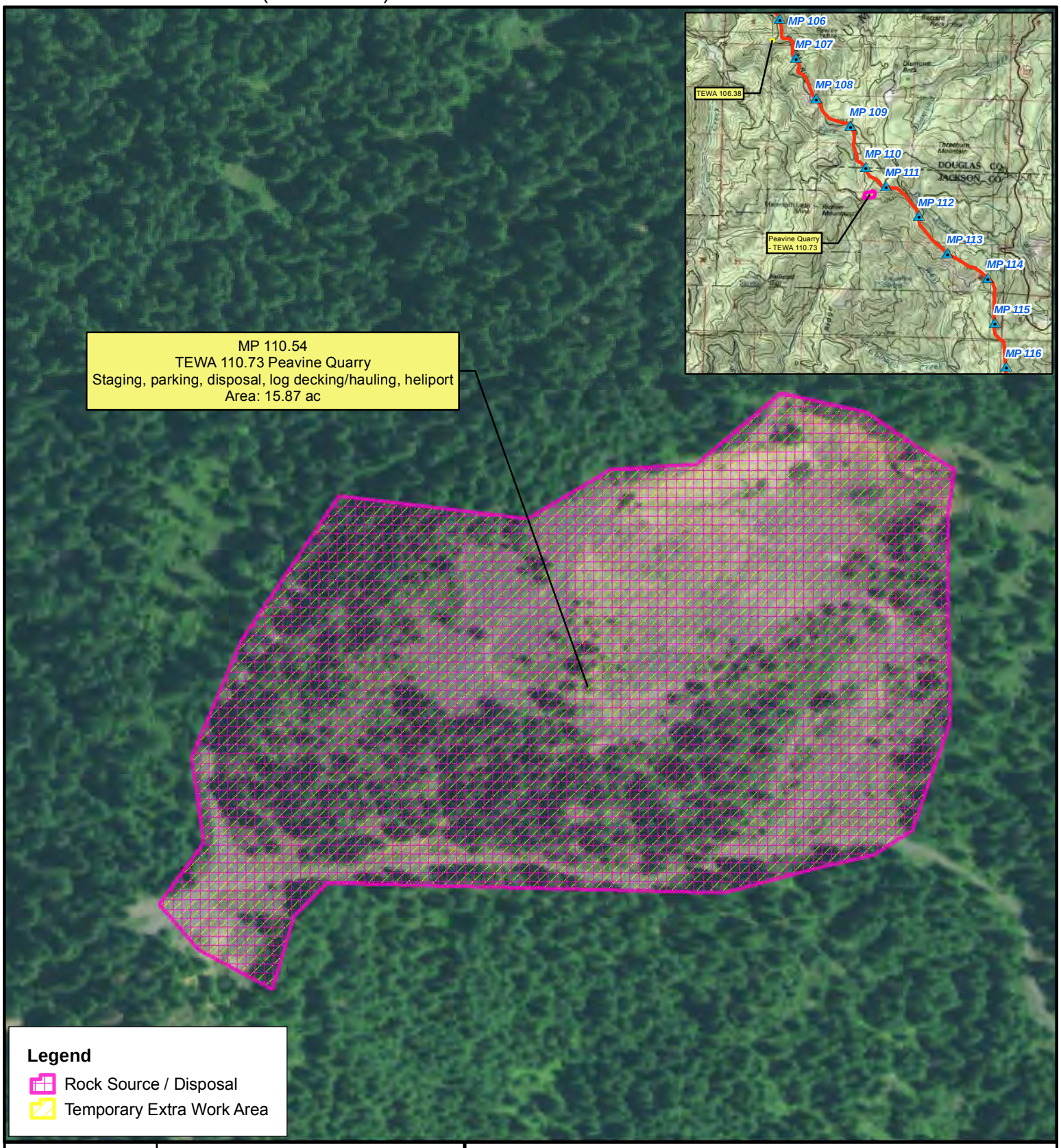
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
C&D Pit
M.P. 104.12
Section 31, T31S, R2W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0017	SHEET 17 OF 36



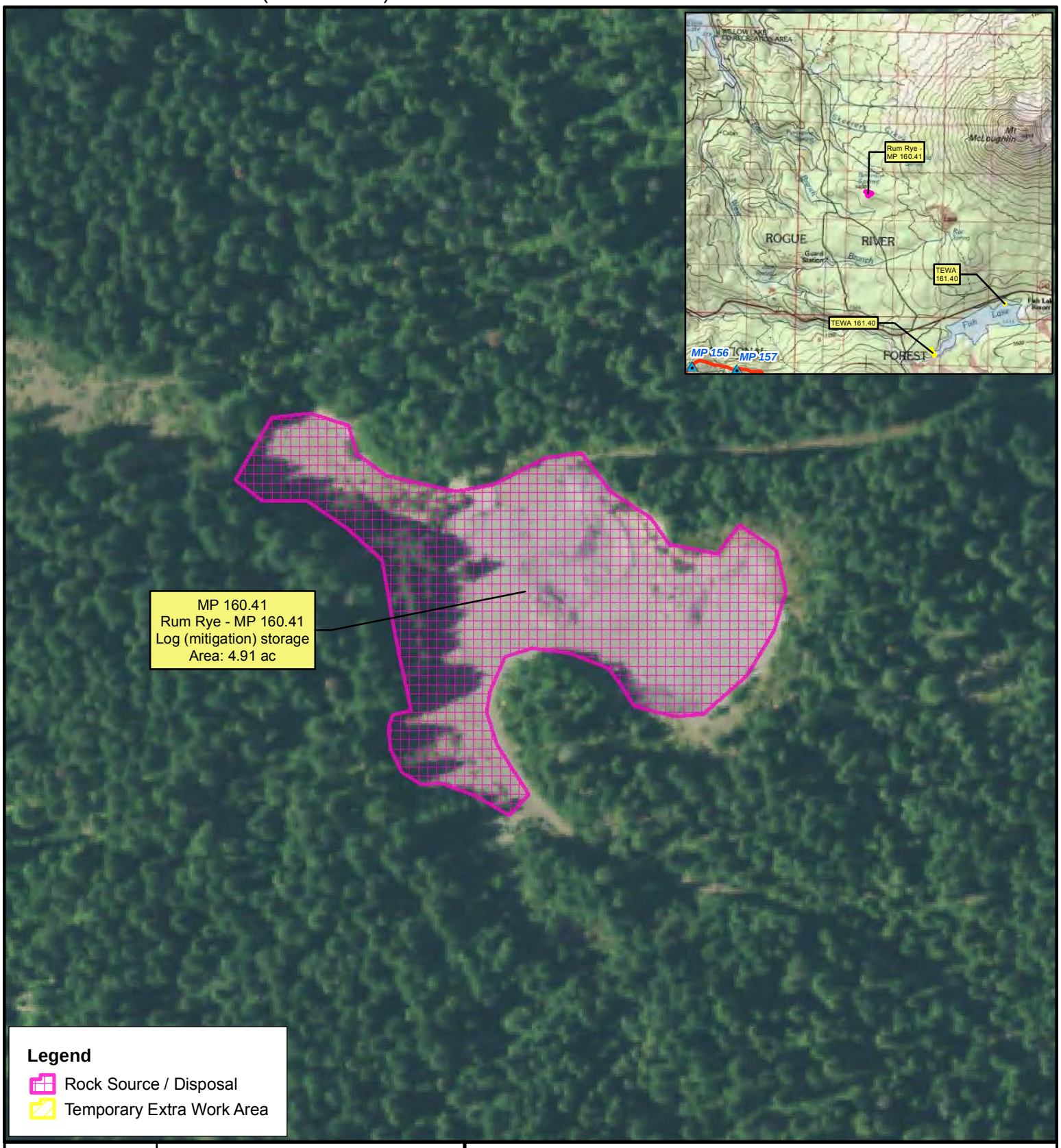
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
TEWA 110.73 & Peavine Quarry
M.P. 110.54
Section 27, T32S, R2W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0019	SHEET 19 OF 36



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
OFF ALIGNMENT SHEET DETAIL
TEMPORARY EXTRA WORK AREA OR ROCK DISPOSAL\SOURCE
Rum Rye
M.P. 160.41
Sedtion 20, T36S, R4E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: SEPT 2017	ISSUED FOR BID:	SCALE: 1 inch = 200 feet
CHK BY:	DATE:	ISSUED FOR CONTS:	
APPR. BY:	DATE:	DRAWING NUMBER: 3430.26-X-0026	SHEET 26 OF 36

Appendix R

Prescribed Burning Plan

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Prescribed Burning Plan

Pacific Connector Gas Pipeline Project

January 2018

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List of Tables

List of Attachments

1.0 INTRODUCTION

Pacific Connector Gas Pipeline, LP (PCGP) developed this Prescribed Burning Plan according to the applicable protocols and Best Management Practices (BMPs) that would be implemented if it is necessary to burn excess forest slash generated from right-of-way clearing operations for the Pacific Connector Gas Pipeline Project (Pipeline or Pipeline Project). PCGP has determined that it may be necessary to dispose of forest slash in areas where this material exceeds the fuel loading specifications outlined by the Forest Service or Bureau of Land Management (BLM) in the Erosion Control and Revegetation Plan (ECRP – Appendix I to the POD). This Prescribed Burning Plan describes the protocols that PCGP would follow to obtain appropriate agency authorization on all lands (federal, state and private) crossed by the Pipeline, where it is necessary to dispose of forest slash by burning. This plan also outlines the appropriate BMPs that would be utilized to safely conduct slash burning operations. PCGP would not use burning as a method to dispose of any construction debris that may be generated during Pipeline Project activities.

Prior to harvesting or burning on private and BLM-managed lands, PCGP must first obtain a Notification of Operation/Application Permit (NOAP-Attachment A). The application can be obtained from the Oregon Department of Forestry (ODF) district offices along the Pipeline (see Table 1). The NOAP may have up to a 15-day waiting period unless waived by the ODF Forester. The NOAP must be renewed yearly for continuing operations. The ODF districts, through which the Pipeline crosses, may utilize different protocols (i.e., application forms/processes, notifications, BMPs, etc.); therefore, PCGP or PCGP's Contractor(s) will contact the appropriate district to obtain the applicable permit(s). Section 3.2 describes the burn permit process on Forest Service (USFS) lands.

Table 1
Agency Contacts

Agency	Phone Number
Coos Forest Patrol – Coos District	541-267-3161
Douglas Forest Protective Association	541-672-6507
Bureau of Land Management (BLM)	
BLM Coos Bay District	541-756-0100
BLM Lakeview District	541-947-2177
BLM Medford District	541-618-2200
BLM Roseburg District	541-440-4930
Oregon Department of Forestry (ODF)	
ODF Klamath Unit Office	541-883-5681
ODF Southwest Oregon District, Medford Unit	541-664-3328
U.S. Forest Service (USFS)	
USFS - Fremont-Winema National Forest, Lakeview Ranger District	541-947-3334
USFS - Rogue River-Siskiyou National Forest, High Cascades North Ranger District - Prospect	541-560-3400
USFS - Umpqua National Forest, Tiller Ranger District	541-825-3100

2.0 STATUTORY FRAMEWORK

2.1 Private Lands

ORS 477.552 Policy

It is the policy of the State of Oregon:

1) To improve the management of prescribed burning as a forest management and protection practice; and

2) To minimize emissions from prescribed burning consistent with the air quality objectives of the federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan developed by the Department of Environmental Quality under ORS 468A.035.

ORS 477.013 Smoke Management Plan

1) For the purpose of maintaining air quality, the State Forester and the Department of Environmental Quality shall approve a plan for the purpose of managing smoke in areas they shall designate. The plan shall delineate restricted areas to which this subsection applies. The plan shall also include but not be limited to considerations of weather, volume of material to be burned, distance of the burning from designated areas, burning techniques and provisions for cessation of further burning under adverse air quality conditions. All burning permitted within the restricted areas shall be according to the plan. The plan shall be developed by the State Forestry Department in cooperation with federal and state agencies, landowners and organizations that will be affected by the plan. The approved plan shall be filed with the Secretary of State and may thereafter be amended in the same manner as its formation.

2) The State Forester shall promulgate rules to carry out the provisions of the smoke management plan approved under this subsection.

477.560 Oregon Forest Smoke Management Account; moneys paid to account; use.

1) The Oregon Forest Smoke Management Account is established separate and distinct from the General Fund in the State Treasury.

2) The following moneys shall be credited to the Oregon Smoke Management Account:

   a) Nonrefundable registration fees received by the State Forestry Department for Class I forestlands classified under ORS 526.324 to be burned west of the summit of the Cascade Mountains, not including Hood River.
   b) Fees received by the State Forester for Class 1 forestland classified under ORS 526.324 and treated by a prescription burn method under ORS 477-515(1) west of the summit of the Cascade Mountains, not including Hood River.

c) Fees for federal forestland included within the regulated area under ORS 477.013 to be treated by any prescription burn method subject to the provisions of the State of Oregon Clean Air Act Implementation Plan and the federal Clean Air Act received the State Forester.

3) The moneys in the Oregon Forest Smoke Management Account are appropriated continuously for all and shall be used by the State Forester exclusively for the administration of the Smoke Management Program under ORS 477.013 and 477.554.

477.515 Permits required for fires on forestlands; waiver; permit conditions; cooperative agreements for permit administration.

1) It is unlawful to set or cause to be set an open fire inside or within one-eighth of one mile of a forest protection district, either on one's own land or the land of another, without first securing a written permit for burning from the forester and complying with the conditions of the permit. In granting permits for burning:

   a) The forester may waive the requirement that permits be secured prior to burning except during fire season or when required under rules promulgated pursuant to subsection (4) of this section.
   b) The forester shall prescribe conditions necessary to be observed in setting fire and preventing it from spreading out of control.
   c) The forester may prescribe conditions necessary to be observed in maintaining air quality.

2) Any permit obtained through willful misrepresentation is void.

3) To avoid confusion or duplication of administration and to promoted government efficiency, the forester may enter into a cooperative agreement with a county, a city or a rural fire protection district that:

   a) Allows the forester to administer the requirements of this section, in conjunction with the enforcement authority of ORS 477.980 and 477.985, on lands not otherwise subject to the requirements of this chapter; or
   b) Allows the cooperating agency to administer the burning permit requirements of ORS Chapter 476 and 478, as appropriate, including applicable enforcement authority, on lands otherwise subject to the requirements of this chapter.

4) Holders of permits for burning shall comply with applicable rules that may be promulgated by the State Board of Forestry and the Department of Environmental Quality.

2.2 Federally-Managed Lands

Federal Clean Air Act

1) Congress passed the Clean Air Act (CAA) in 1963, with major amendments in 1970 and 1990. The purpose of the act is to protect and enhance air quality

while ensuring the protection of public health and welfare. The 1970 amendments established National Ambient Air Quality Standards (NAAQS), which must be met by most state and federal agencies, including the Forest Service.

State Guidance

2) In compliance with the Clean Air Act, the Forest Service is operating under the Oregon Administrative Rules OAR 629-048-0001 through OAR 629-048-0500 (Smoke Management rules) that apply to prescribed burning of Oregon's forested lands. The Forest Service is complying and will continue to comply with the requirements of the Oregon Smoke Management Plan (OSMP) which is administered by the Oregon Department of Forestry.

3) The Environmental Protection Agency has approved the OSMP as meeting the requirements of the Clean Air Act, as amended. The OSMP regulates the amount of emissions from forestry-related burning that can accumulate in an air shed at any one time. The amount of burning that can occur on any one day depends upon the specific type of burning, the tons of material to be burned, and the atmospheric conditions available to promote mixing and transportation of smoke away from sensitive areas.

4) Section 118 of the federal Clean Air Act provides for enforcement of state air quality regulations against federal agencies. It will be the policy of the Board of Forestry (BOF), in the event of a failure of a federal land management agency to comply with the smoke management plan, that the forester will first inform the responsible agency of the failure and coordinate efforts to ensure timely correction of any breakdowns in procedure that may have resulted in the failure. However, if this method does not appear in the judgment of the State Forester to result in necessary correction of procedures, or under other circumstances that in the judgment of the State Forester warrant further action, enforcement action may be taken as with any other responsible party.

Stat. Auth: ORS 477.013, 477.562 (Registration fee), 526.016 (General duties), 526.041 (General duties of State Forester).

Stats. Implemented: ORS 477.013, 477.515, 477.562.

3.0 PROTOCOL FOR PRESCRIBED BURNING

3.1 Private Lands and BLM-Managed Lands

Burning on federal lands would follow the Interagency Prescribed Fire Planning and Implementation Procedures Guide issued by the National Wildfire Coordinating Group in July 2017. The document addresses requirements for all Prescribed Fire Burn Plans for federal lands and can be found on-line at:(www.nwcg.gov/sites/default/files/publications/pms484.pdf) . Attachment H provides the Prescribed Fire Plan Template that would be utilized for Prescribed Fire Plans on BLM lands. BLM does not submit burn plans to ODF; for registering prescribed fire activities to ODF smoke management on BLM lands, the BLM uses the "Fastrax" system.

OAR 629-048-0020 (Necessity of Prescribed Burning)

Prescribed burning is used as a management technique to reduce forest fuels either as the primary mechanism such as in grass and brush areas for maintenance of grazing, and underburning of open forest stands for forest health purposes; or as a secondary fuel reduction method following thinning or final harvest. It is typically conducted at a time and under planned fuel and weather conditions whereby the fine fuels that more readily ignite and carry fire across the landscape are consumed but the larger fuels are consumed to a lesser degree than in a wildfire. Resulting emissions are both reduced overall, and more likely carried into higher altitudes and dissipated by high level winds, away from concentrations of people.

When adequate forest fuel reduction can be achieved economically without the use of burning, because of other fire associated risks, that choice is usually favored. Even so, there are often silivicultural or agricultural advantages to prescribed burning such as site preparation, nutrient cycling and reduction of pests and disease that may not be achieved by simply removing the forest fuels. For these reasons, the Oregon Legislative Assembly (ORS 477.552) and the Board of Forestry have found it necessary to maintain the viability of prescribed burning as a forest management practice. Refer to OAR 629-615-0300 Prescribed Burning of the Oregon Forest Practices Act (see Attachment B).

1) Process

   a) In all instances of prescribed burning on forestland within a protection district, the operator, federal land manager, landowner, or timber owner must first register with Oregon Department of Forestry (State Forester) all forestland debris that is intended to be burned. Burn registration must be completed at least seven days before the first day of ignition.

   b) The State forester may waive the seven day waiting period required upon the forester's approval of a burn plan or conditions of federally prescribed fire policies having already been met.

   c) Information provided for burn registration must be complete and recorded in a standard format approved by the State forester (see Attachment C for background information on fire season).

   d) Any prescribed burning on forestland requires payment of a non-refundable registration fee of $.50/acre.

   e) Burn fees for all forms of prescribed burning, including but not limited to, broadcast burning and burning of piles shall be assessed.

   f) If only land or right-of-way piles are burned, the burn fee shall be $.50/acre. Subsequent attempts to improve accomplishment only in the landing or right-of way piles in the same unit, in the same calendar year or the two following calendar years, shall not incur additional fees.

   g) If subsequent to burning only landing or right-of-way piles, the first time fire is applied to any other portion of a registered unit an additional burn fee of $2.60 per acre shall be required.

h) Obtain a burn permit/plan. A burn permit is required for debris created by forest management activities (see Attachment D – Westside and Attachment E – Eastside).

i) For a single unit, the burn permit/plan will cover; for multiple units, ODF will complete a Unit Worksheet and note on the Burn permit/plan that the attached Unit Worksheet will be covered under this plan (see example and form in Attachment F).

j) Once ODF receives the burn permit/plan (see Attachment F for applications for private lands and Attachment H for application on BLM lands) and if applicable the Unit Worksheet, the information will be entered into the Oregon Smoke Management Database and fee system. On BLM lands, the BLM Line Officer must approve the burn permit/plan application before it is submitted to ODF (see Attachment H). As previously noted, the BLM does not submit burn plans to ODF; for reporting prescribed fire activities to ODF on BLM lands, the BLM uses a "Fastrax" system.

k) When planning to burn you are required to call the day prior to the burn to obtain clearance. There are occasions when clearance cannot be granted, which is normally based upon weather and smoke dispersion issues.

l) Once the burn is completed the permit holder must call the appropriate district with estimated 'accomplishments.' This information is then entered by the district into the database for tracking and fee purposes (see Attachment G).

2) Burning Factors

a) Weather: Extra caution is needed when weather conditions are unstable. Wind, humidity and temperature play the biggest roles when determining the best time to burn debris. High temperatures result in low humidity, which increases the chances of a fire starting and spreading.

b) Time: Depending on the severity of fire season, the time of day in which burning is conducted may be restricted to morning and evening hours. Relative humidity tends to be at it's highest during these hours allowing for better control.

c) Site Preparation: The steps needed to prepare the burn site are determined by the type of materials that are to be burned and the fuels in the surrounding area. A fire trail must be clear of all flammable debris. Trails must encircle the entire burning area and must meet the approval of the Fire Warden

d) Fire Suppression Equipment: The permit holder must have a shovel and a supply of water on hand at the burn site or other equipment or manpower as outlined in the permit and slash burn plan.

e) Burning prescriptions will be strictly adhered to on highly sensitive soils. These soils include: shallow, rocky soils on 70 percent or greater slopes with

south or west aspects. The same kinds of soils on extremely steep (80 percent or greater), and north and east aspects.

3) Alternatives to Burning:

   a) When planning forest management prescriptions owners are encouraged to use practices that will eliminate or significantly reduce the volume of prescribed burning necessary to meet their management objectives.

      - Maximize the cost-effective use of woody material for manufacture of products.
        Where cost-effective, using wood or other biomass for energy production or mulch.
        Biomass contactors may also be available such as Biomass One of White City, Oregon (541-826-9422, www.biomassone.com).
      - Lopping and scattering limbs and other woody material.
      - Re-arranging woody materials, as necessary to accomplish reforestation through the slash.

4) Burn Procedures:

   a) Before any prescribed burning is initiated, PCGP's burn bosses should have a well thought-out plan that takes into account:

      - How weather will be monitored and changes in conditions will be communicated;
      - Resources necessary to accomplish ignition and ignition sequences;
      - Resources and methodology necessary to contain and control the fire and prevent its escape, including communications to access additional resources, if necessary; and
      - How the burn will be conducted to avoid smoke from entering smoke sensitive areas and to minimize smoke effects on other communities.

   b) On BLM lands, the BLM may elect to have an agency Burn Boss retain oversight or responsibility or have a presence during prescribed burns for slash disposal. Further, as indicated in the Interagency Prescribed Fire Planning and Implementation Procedures Guide (2017) and in Attachment H, the BLM Line Officer must sign a "Go/No-Go" checklist prior to ignition.

   c) Burn Accomplishments for both BLM and ODF Protected lands need to be reported within 24 hours to the Oregon Department of Forestry District office.

3.2 BLM and USFS Lands

Authorization to burn on BLM and USFS lands will be granted through the development and approval of a Prescribed Fire Plan (see Attachment H). All burning activities will be conducted in compliance with the approved Prescribed Fire Plan. Burning on BLM and USFS Lands will also include continued efforts to meet the National Ambient Air Quality Standards, Prevention of Significant Deterioration, and the Oregon Visibility Protection Plan and Smoke Management Plan goals.

When preparing site-specific burn plans, the BLM and USFS will obtain all necessary air pollutant emission permits and approvals from the State of Oregon prior to initiating a prescribed burn. The agency will follow and implement the terms of the interagency Oregon Smoke Implementation Plan and MOU as well as any site-specific open burning permit.

USFS personnel may prepare burn plans for the Pipeline Project and the Ranger Districts would issue a special use permit to conduct the prescribed burn. The USFS may also conduct the prescrided burns. If the USFS prepares and conducts the prescribed burn, arrangenments for specifc contracting would be made during the timber sales contract for the Pipeline Project in the Brush Disposal Plan which is a component of the timber sales contract.

All personnel involved in burning on federal lands must meet minimum requirements under the NIMS Wildland Fire Qualification System Guide 310-1 (October 2017). This guide can be accessed at https://www.nwcg.gov/publications/310-1.

The Oregon Department of Forestry's (ODF) smoke management section has developed two computer aids to calculate fuel consumption for the Oregon Smoke Management system. They are Automatic Calculation of Slash Tonnage (ACOST) and Pile Calculation of Slash Tonnage (PCOST). The USFS is required to input these spreadsheets to the Salem Office of ODF.

PCOST uses pile shape codes found in the Oregon Smoke Management directive, pile dimensions, wood species, piles per acre and unit acres. The program uses this information to calculate tons per pile and unit total tons. ACOST and PSCOST can be accessed at: www.odf.state.or.us/Divisions/protection/fire_protection/Daily/ACOST/ACOST.HTM.

Washington State University has developed a 'Piled Fuels Biomass Calculator.' Refer to: https://depts.washington.edu/nwfire/piles/.

1) When the decision to use prescribed fire is made, a prescribed fire burn plan must be created. But considerably more than just preparing a burn plan is involved when anticipating the use of prescribed fire. Input from other resource managers is important, because prescribed burning can benefit or impact other resource objectives such as siliviculture, range, wildlife, archeology, aesthetics, air, soil, and water quality.

2) The Burn Plan prepared would define specific parameters for burning operations. These parameters include acceptable ranges for weather conditions (temperature, relative humidity, wind direction and wind speed ranges), forecasted weather conditions, fuel moisture in the pile, and fuel moisture in adjacent fuels (Attachment H).

3) The Burn Plan would also specify personnel needs, equipment needs, and escape fire Prevention plans in order to conduct safe, efficient and effective burning operations.

4) The Burn Plan:

    a) Review.
        - All federal plans will have reviews before implementation.
        - Technical review by someone qualified and not part of the project team.

- The Fire Management Officer (FMO) and line officer signature of approval is required. Technical Reviewer qualifications and responsibilities are outlined on pages 9 and 10 of the Interagency Prescribed Fire Planning and Implementation Procedures Guide at: https://www.nwcg.gov/sites/default/files/publications/pms484.pdf

b) Pre-burn checklist,
- Every burn plan should include a checklist to be reviewed immediately prior to ignition. The checklist should include the factors essential to safe execution of the burn project, and a list of points to review with the crew during the pre-burn briefing.

Operations,
- The burn plan must describe in detail how fire will be used.
- Safety. Include provisions to be made to ensure the safety of the crew.
- Communications. How will the crew communicate with each other, and with dispatch or emergency support.
- Equipment and Personnel. What resources are needed to effectively accomplish the burn and how will they be deployed.
- Fire lines. If required what is the width and condition of the existing fire line(s).
- Ignition Pattern and Sequence. Describe how the burn will be ignited.
- Holding. Determine how the fire will be kept within its predetermined boundaries. Determine how snags will be dealt with.
- Mop-up. Determine resources needed to extinguish the fire and determine what standard will be used to determine the fire is safe to leave.

Accomplishment must be reported to the Oregon Department of Forestry, Fire Protection Program: 503-945-7451 or through the Fastrax system.

4.0 REFERENCES

Bureau of Land Management: www.blm.gov

Coos Forest Protective Association: www.coosfpa.net

Douglas Forest Protective Association: www.dfpa.net

Leuschen, Tom; Dale Wade; Paula Seamon. 2001. Fire Use Planning. Smoke Management Guide for Prescribed and Wildland Fire. National Wildfire Coordinating Group. Accessed at: www.fs.usda.gov/treesearch/pubs/7174.

Oregon Administrative Rule (OAR) and Revised Statute (ORS) citations:
OAR 629-048-0230(4) and 629-048-0300 – Register burns prior to ignition
OAR 629-048-0230(2) and 629-043-0026(4) – Obtain approval for and follow a burn plan.
OAR 629-048-0230(5) and ORS 477-515 – Obtain a burn permit and comply with any conditions included therein.
OAR 629-048-0230(6) – Obtain and comply with daily smoke management instructions and updates.

OAR 629-048-0210(4) - Comply with restriction regarding use of polyethylene covers on burn piles.
OAR 629-048-0100(4) and 629-048-0230(10) – Cease burning when directed by the forester.
OAR 629-048-0320 – Report accomplishments.
OAR 629-048-0310 – Pay fees.

Oregon Department of Forestry: www.oregon.gov/ODF
Klamath Falls unit office: www.oregon.gov/ODF/AboutODF/Pages/MapOffices.aspx

Grants Pass unit office: www.oregon.gov/ODF/AboutODF/Pages/MapOffices.aspx

National Wildfire Coordinating Group (NWCG). 2017. Prescribed Fire Complexity Rating System Guide. PMS 424. July. Accessed at: https://www.nwcg.gov/sites/default/files/publications/pms424.pdf.

NWCG. 2017. Interagency Prescribed Fire Planning and Implementation Procedures Guide. PMS 484. July. Accessed at: https://www.nwcg.gov/sites/default/files/publications/pms484.pdf.

NWCG. 2017. NIMS Wildland Fire Qualification System Guide. PMS 310-1. October. Accessed at: https://www.nwcg.gov/publications/310-1.

Prichard, Susan., Roger Ottmar, Gary Anderson. 2013. Consume 3.0 User's Guide. Pacific Wildland Fire Sciences Laboratory. USDA Forest Service. Pacific Northwest Research Station. Accessed at: www.fs.fed.us/pnw/fera/research/smoke/consume/consume30_users_guide.pdf

USDA Forest Service website: www.fs.fed.us
Umpqua National Forest: www.fs.usda.gov/umpqua
Rogue Siskiyou National Forest: www.fs.usda.gov/rogue-siskiyou
Fremont-Winema National Forest: www.fs.usda.gov/fremont-winema

USDI/USDA. 2005. Wildland Fire Use. Implementation Procedures Reference Guide. May. Accessed at: http://www.wilderness.net/toolboxes/documents/fire/Wildland%20Fire%20Use%20-%20Implementation%20Procedures%20Reference%20Guide.pdf.

Attachment A
Notification Application Forms

"STEWARDSHIP IN FORESTRY"

NOTIFICATION OF OPERATION/APPUCATION FOR' PERMIT

OREGON DEPARTMENT OF FORESTRY OREGON DEPARTMENT OF REVENUE

OREGON DEPARTMENT OF REVENUE

Filing this notification does not grant permission to remove forest products! First obtain permission from the landowner and timber owner.

For activities or operations within an urban growth boundary, the applicant is advised to contact the appropriate local government regarding land use regulations which may apply to the future use or development of this site.

On-site inspections may be conducted by Oregon Department of Forestry (ODF) employees to ensure compliance with all the laws and rules governing fire protection and forest practices on private land.

File a new Notification of Operation/Application for Permit form at an ODF office if any of the following conditions apply:

- **Your operation area is new.**
- **You are adding a new activity to the operation.**
- **You are changing or increasing the area involved in an existing operation.**
- **It is after February 28, and you are continuing an operation that has been idle since the end of the previous calendar year and you have not informed ODyou intend to continue the operation before now.**

ODF must also be informed in writing of any other changes in the information on an existing notification, but completion of a new form may not be required.

Provide PHOTOCOPIES of the completed original notification form and map to the local offices of the Water Resources Department and the Oregon Department of Fish and Wildlife ONLY IF you plan to use on-site water to mix pesticides or to control slash burns.

Multiple harvest units may be listed on one notification. BUT, if HARVEST units are separated by a mile or more (in a straight line) or are in different counties, file separate notifications for each unit. An operation can be any combination of forest activities. See OAR 629-605-0140 for a complete list. OAR 629-600-0100 defines "operation," "commercial," and "unit."

The instructions are printed in italics. Please print or type the information on the form. [illegible] *Fife notice with the State Forester at least 15 days prior to the date you would like to start operating. A notification is not considered accepted until it* is *properly filled out, has* a *map attached, and* is *received by the appropriate ODF office. Mail, fax, or deliver the form to one of the Oregon Department of Forestry offices that accepts notifications.*

COUNTY *(Enter only one) :*

NOTIFICATION NUMBER *(Office Use)*

NOTICE & PERMIT TYPE

Check box(es) that apply

D 2A Notice to the State Forester that an operation will be conducted on lands described here (ORS 527.670). **15 day waiting period required, unless waived.**

D **28** Application for permit to operate power driven machinery (ORS 477.625). **Expires at end of calendar year.**

D **2C** Notice to the State Forester and the Dept. of Revenue of the **intent to harvest timber** (ORS 321.550).

DATE RECEIVED: _____

TIME RECEIVED: _____ INITIALS: _____

DISTRICT: _____

OFFICE: _____

Enter name & phone number of person to be contacted in case of fire emergency. This person should know what resources they have available for fire and have the authority to commit these resources in case of fire.

REPRESENTATIVE: _____

AREA CODE: PHONE NUMBER:

DATE OF CORRECTION: _____

CORRECTION: _____

Check the appropriate box as to who is completing this form:

D Operator D Landowner D Timber Owner

IMBER SALE NAME AND/OR NUMBER (If applicable):

Enter the Operator information

OPERATOR

(Person and/or company conducting the operation)

Name:

Business Name:

Mailing Address:

City, State, & Zip Code:

Area Code: Phone No.:

Codes: UDF1: UDF2: UDF3: UDF4: UDF5:

ATTENTION: If you are conducting timber harvesting or road construction within 100 feet of overhead or underground utility lines, call the Oregon Utility Notification Center at 1-800-332-2344. Request that the owner of the line be notified, and record the number issued to you by the Oregon Utility Notification Center here:

Enter and check the Landowner information

LANDOWNER
RC/EG/S Codes

Information about the forest landowner in Recipient Class (RC), Ethnic Group (EG}, and Land Ownership-Size (S) is needed for annual reports. We ask you to voluntarily enter this information.

RC: ***(Recipient Class)*** *Check the box that best identifies the* ***landowner:***

- D 1. Local Government
- D 2. State Government
- D 3. Federal Agency
- D 4. Individual/Non-industrial private
- D 5. Partnership/Corporation/Industrial
- D 6. Other private (church, nonprofit organization, etc.)

E.G. ***(Ethnic Group)*** *Check the box that best identifies the* ***landowner*** *(Codes 2-7 apply to recipient class 4 [individual} only}:*

- D 1. Does not apply
- D 2. White
- D 3. Black
- D 4. Hispanic
- D 5. American Indian/Alaskan Native
- D 6. Asian/Pacific Islander
- D 7. All other

S: ***(Land Ownership Size)*** *Check the box that best identifies the total forest ownership of the* ***landowner:***

- D 1. Does not apply
- D 2. 0-9 acres
- D 3. 10-99 acres
- D 4. 100 – 499 acres
- D 5. 500 – 999 acres
- D 6. 1,000-4,999 acres
- D 7. 5,000 + acres

(Landowner is responsible for reforestation)

Name:

Business Name:

Mailing Address:

City, State, & Zip Code:

Area Code Phone Nc

ATTENTION: Timber harvesting may result in a tree planting requirement on the landowner. The landowner has the responsibility to reforest if the harvest results in an under stocked condition.

Landowner Codes: UDF1: UDF2: UDF3: UDF4: UDF5:

Enter the Timber Owner and Tax

TIMBER OWNER AND TAXPAYER

(Responsible for paying the harvest and, if applicable, severance taxes)

Name:

Business Name:

Mailing Address:

City, State, & Zip Code:

Area Code: Phone Nc

ATTENTION: You are required to provide a Timber Owner Employer Identification Number OR a Social Security Number by the Oregon Department of Revenue's Statute ORS 321.015. **The Social Security Number will be used ONLY for the purpose of identifying you to the Dept. of Revenue for the collection of timber tax.** The Social Security number will be held in confidence.

Enter the ***Timber Owner Employer Identification No.*** *OR a* ***Social Security No.*** *in the box:*

Timber Owner Codes: UDF1: UDF3: UDF4: UDF5:

(Continued on Next Page)

Enter Unit No. If more unit, use Unit Addendum Sheets.
Check appropriate box(es) & fill in acres/feet/etc.

ACTIVITY CODE	METHODS USED
D 1A COMMERCIAL THINNING, SELECTIVE CUTTING (leaving most of the merchantable timber on the unit after harvesting) _____ Acres	Ocable O Ground O Other (explain) _____
1B CLEAR-CUT, OVERSTORY _____ Acres	
ESTIMATED MBF REMOVED:	
D REMOVAL (most or all of the merchantable timber will be removed during harvesting) _____ Acres	Ocable O Ground O Other (explain) _____
ESTIMATED MBF REMOVED: _____	
D 1C FELLING only _____ Acres	
D 10 OTHER HARVEST TYPES not covered in **1A or 1B** (wind storm salvage, hauling r/w logs, selling chips, etc.) _____ Acres	Explain on lines below _____
ESTIMATED MBF REMOVED: _____	
D 1E SORT YARD	
D 2A ROAD CONSTRUCTION _____ Feet _____ Est MBF	O Dozer O Backhoe O Other (explain)
D 2B ROAD RECONSTRUCTION _____ Feet _____ Est MBF	O Dozer O Backhoe O Other (explain)
D 3 SITE PREPARATION (Do not use for building construction site) _____ Acres	O Manual D Mechanical O Burning

*CAUTION: Fill out **MethodsJ!sed** for each type of chemical application.*

Check appropriate box(es) & fill in acres, etc.

ACTIVITY CODE	METHODS USED
D 5 CHANGING LAND USE to a non-forest use (house site, agricultural, etc.)	WARNING: Local government land use approval may be required. A land use change may not exempt the landowner from all reforestation requirements.
[redacted]	
7 PRE-COMMERCIAL	D Mechanical
D 6 TREATMENT OF _____ Acres SLASH _____ Acres	O Manual O Burning
D THINNING _____ Acres	
D 8 OTHER (any noncommercial activities, i.e, rockpits, etc.)	**Explain on line below**

Enter starting and ending dates.
ESTIMATED STARTING DATE: _____
(Must be 15 days after the appropriate office receives notification)
ESTIMATED ENDING DATE:

(Exoires
fE '1

Check the appropriate Waters, Topography, and Sbi/ site codes.
One of each code must be checked on eac,h unit.

WATERS
D W100 Within 100' of any lake or stream, (a channel that carries flowing surface water during some time of the year)
D W300 Within 300' of any estuary or any wetland greater than 8 acres
D WNA Waters not applicable

TOPOGRAPHY (over the steepest third of operation)
D T1 Slope of **0% to 35%**
D T2 Slope of **36% to 65%**
D T3 Slope greater than **65%**

SOIL
D 51 **No evidence** of mass soil movement (slips, landslides, etc.)
D 52 Evidence of old slides, small failures
D 53 **Recent or active** movement; **wet areas**

APPLICANT REMARKS: *Please describe the intent of the operation, what equipment will be used and any other information that may be relevant to the Stewardship Forester.*

D 4A HERBICIDE application

Acres

D 4B INSECTICIDE application

Acres

D 4C RODENTICIDE application

Acres

D 4D FERTILIZER application

Acres

D 4E FUNGICIDE application

Acres

D 4F REPELLENT application

Acres

on Next

D Aerial

D Ground

D Pressurized & Broadcast

D Other methods

Write in common name, brand name (if known), carrier, additives, or, for fertilizer only, the application rate. For triclopyr and 2,4-D only, specify whether amine or ester formulation:

on Next Page)

CONCERNS

*Check any **Concerns** that you are aware of in the boxes below.*

- D **ARC** Archaeological site
- O **CGG** Columbia Gorge General management area
- D **CGS** Columbia Gorge Scenic management area
- O **SH** Scenic Highway (operation near a FPA scenic highway)
- D **SW** Operation near a state Scenic Waterway
- D **UGB** Operation takes place within an Urban Growth Boundary
- D **WG** Operation takes place in the Willamette Greenway

STREAM NAME and/or SIZE, TYPE, & WATERSHED CODE

WATERS

*Check any of the **Water** codes that you are aware of in the boxes below.*

O **DWS**	Domestic Water Supply
D **LL**	Lake greater than 8 acres
D OTHER LAKES	Less than 8 acres
D OTHER WETLANDS	Less than 8 acres
D WETLANDS	Bog, estuary, significant wetland (>8 acres), important springs in E. Oregon

(Continue to Next Column)

RESOURCES

*Check any of the **Resources** that you are aware of in the boxes below.*

- O **BEN** Bald Eagle Nesting site
- O **BEP** Bald Eagle Perch and foraging Site
- D **BER** Bald Eagle Roosting site
- D **810** Biological site of a rare life form or community
- D **BPS** Band-tailed Pigeon mineral, watering, or springs site
- D **CC** Operation will result in a single clear-cut or continuation of contiguous clear-cuts that exceed 120 acres
- D **CWO** Columbia Whitetail Deer
- D **GBH** Great Blue Heron nest site
- D **GLD** Golden eagle nest site
- D **HLH** High Landslide Hazard Location
- D **MUR** Marbled Murrelet nest site
- O NSO Northem Spotted Owl site
- O **OSP** Osprey nest site
- D **RAP** Other Raptor nest site
- D **SBS** Sensitive Bird nesting, roosting, or watering site
- D **T&E** Threatened or Endangered species site

(Continue to Legal Description)

Rule:	Stat. WP:	AP:	Rule:	Non stat. WP:	Stat. WP:	AP:

LEGAL DESCRIPTION

Check each 1116 of every section that applies. Enter information for government lots (if applicable), section, township, and range.
*If more space is needed use a **Legal Description Addendum Sheet.***

Govt. Lot# if outside std section	NE	SW	SE	SE	SEC	TWP	RGE	REGULATED USE AREA
	D D D D D D D D D D D D D D D D							
	D D D D D D D D D D D D D D D D							
	D D D D D D D D D D D D D D D D							
	D D D D D D D D D D D D D D D D							
	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □							

Subscriber:	Subscriber:	W. R. Subscriber:	AAccmp
Subscriber:	Subscriber:	W. R. Subscriber:	

There is a 15 day waiting period in effect unless otherwise informed by the Stewardship Forester.

Check this box if a waiver of the 15 day waiting period is requested: Checking the box does not necessarily mean a waiver will be granted. D

Waiting period waived by:

Date:

***Print** name of applicant in box below.*

X

I (applicant) certify that all information **I** have provided is true & correct.

Sianature: **Date:**

AITACH MAP AND/OR AERIAL PHOTOS (The notification form is NOT complete unless a map or aerial photo of the operation area is attached. Either one of these must show the o eration area, access route, north arrow, scale, etc.

NOTIFICATION OF OPERATION/APPLICATION FOR PERMIT

STATE OF OREGON

"STEWAROSHIP IN FORESTRr

DEPARTMENT OF FORESTRY

REGON DEPARTMEN
=-'oF REVEN

DEPARTMENT OF REVENUE

NotifiCation Number.

lo. lro Lo J

Geographic Area:

Date Received: Time:

Initials:

District: Office:

Correction:

FILING THIS NOTIFICATION DOES NOT GRANT PERMISSION TO REMOVE FOREST PRODUCTS! FIRST OBTAIN PERMISSION FROM THE LANDOWNER AND TIMBER OWNER.

ON.SITE INSPECTIONS MAY BE CONDUCTED BY THE STATE FORESTER/FOREST PRACTICES FORESTER TO ENSURE COMPLIANCE WITH ALL THE LAWS AND RULES GOVERNING FIRE PROTECTION AND FOREST PRACTICES ON PRIVATE LAND.

1. COUNIY Wnte 1none county name

2. NOTICE AND PERMIT TYPE

Check Appropnate Boxes (2A, 26, and/or 2C).

a

NOTICE TO THE STATE FORESTER THAT OPERATO N WILL BE CONDUCTED ON LANDS DESCR IBED ON REVERSE (ORS 527.670).

APPLICATION FOR PERMIT TO OPERATE POWER DRIVEN MACHNERY (ORS 477.625).

2C NOTICE TO THE STATE FORESTER AND THE DEPARTMENT OF REVENUE OF THE INTENT TO HARVEST TIMBER (ORS 321.550).

3. REPRESENTATIVE: PLEASE PRINT! Person to be contacted in case of Fire Emergency (Designated Representative). Area Code & Phone No.

4. Timber Sale Name and/or Number:

CHECK ONE SHADED BOX BELOW TO INDICATE WHO ALLED OUT THE APPUCATION.

Please describe the intent of the operation,and any other information that may be relevant to the Forest Practices Forester.

APPLICANT REMARKS:

5. OPERATOR

ATIENTION If you are conduct1ng timber harvesting or road construction Wlthm 1DO feet of overhead or underground utility lines, call the Oregon Utility Notlficabon Center at 1 800 332-2344 Request that the owner of the lme be nobfied, and record the number 1ssued to you by the Oregon Utility Nollficabon Center here

Name

Bus ness Name

Mailing Address- Street Address

CitY- state and Zip Code Area Code & Phone No.

6. LANDOWNER

Timber harvesting may result in a tree planting requirement on the landowner. The landowner has the responsibility to reforest if the harvest results in an understocked condition. Call a Department of Forestry office for more information.

For activities or operations within an urban grow1h boundary, the applicant is advised to contact the appropriate local government regarding land use regulations which may apply to the future use or development of this site.

Name

Business Name RC:

Mailing Address - Street Address EG:

City, State and Zip Code Area Code & Phone No. S:

7. WESTERN OREGON PRIVATE LAND ONLY

None Part All Is any timber being harvested certified under the Western Onegon Small Tract (WOSTOT) program? If you have checked "Part" or "All" please list the number in the 'WOSTOr' Certlf1cate Number box to the ri!lht.

WOSTOT Certficate

8. TIMBER OWNER AND TAX PAYER

You are required to provide a SoctalSecunty number OR Tax payer Identlficabon number by the Oregon Department of Revenue's statute ORS 321.015. The Soc!al Secunty number Will be used ONLY for the purpose of 1dentlfytng you to the Department of Revenue for the collection of Timber Tax.

Name

s isTness Name

Mailing Address- Street Address

City, State and Zip Code Area Code & Phone No.

limber (};yner Employer Idenbficabon Number Or Social Security Number

FORM 629-2-1-002A 8K Intenm Order (Rev. 2/02)

FPF No.(s)	FIRE FPA	9. TYPE OF ACTIVITY						10. ACTIVITY PERIOD		11. SITE CODES				12. LOCATION OF OPERATION																				13. $
		Unit No.	Activity Codes	Methods Used	Quantity (by unit)		Estim. MBF Removed	Est. Activity Starting Date	Est. Activity Ending Date	Conditions	Concerns	SIGNIF. WET. OTHER WET. LAKES >8 OTHER LAKES STREAMS EOS, BOG ES, DWS, SEEP	BEN. BEP, BER, BIO, BPS, CC, CWO, GBH, GLD HRA, HRS, MUR, NSO, OSP, RAP, SBS, T&E	LEGAL DESCRIPTION																SEC	TWP	RGE	Western Oregon Severance Tax Unit Number	
					Acres	Feet				WNA W100, W300 S1, S2, S3 T1, T2, T3	ARG, CGG CGS, SH SW, UGB WG			NE				NW				SW				SE								
														NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE					

14. The applicant may request a waiver of the fifteen-day waiting period by checking this box. Requesting a waiver does not necessarily mean one will be granted. ☐

15 a. Print name of applicant here:

X

15b. I (applicant) certify that all information I have provided is true and correct. (Signature and date.)

X Date: / /

16. ATTACH MAP AND/OR AERIAL PHOTOS!

WRITTEN PLANS PRIOR APPROVALS	NAMES OF PROTECTED RESOURCES	WATERSHED CODE	STREAM CLASS CODE

FPF COMMENTS:

SUBSCRIBERS:

WATER RIGHTS SUBSCRIBERS:

Fifteen-day waiting period waived by:

X Date: / /

NOTIFICATION OF OPERATION/APPLICATION FOR PERMIT

STATE OF OREGON
DEPARTMENT OF FORESTRY
DEPARTMENT OF REVENUE

FILING THIS NOTIFICATION DOES NOT GRANT PERMISSION TO REMOVE FOREST PRODUCTS! ARST OBTAIN PERMISSION FROM THE LANDOWNER AND TIMBEROWNER.

Notification Number: 20180123-5100 FERC PDF (Unofficial) 1/23/2018 12:12:09 PM
PP ____ ID ____ ILO ____
Geographic Area
Date Received:
r-ime Received:
Initials:
District:
Office:
Date of Correction:
Correction:

1. COUNTY (Enter only one): Clackamas

2. NOTICE AND PERMIT TYPE — Check Appropriate Boxes (2A, 28, and/or 2C).

- [ ] 2A NOTICE TO THE STATE FORESTER THAT OPERATION WILL BE CONDUCTED ON LANDS DESCRIBED ON REVERSE (ORS 527.670).
- [X] 2B APPLICATION FOR PERMIT TO OPERATE POWER ORIVEN CHINERY (ORS 77.625). Exp(res at end of eak!ndar year.
- [ ] 2C NOTICE TO THE STATE FORESTER AND THE DEPARTMENT OF REVENUE OF THE INTENT TO HARVEST TIMBER (ORS 321.550).

3. REPRESENTATIVE: PLEASE PRINT! Person to be contacted in case of Fire Emergency (Designated Representative). Joe Smith — Area Code & Phone Number: 503 777-7722

4. Timber Sale Name and/or Number:

CHECK ONE BOX IN THE FAR LEFT COLUMN TO INDICATE WHO FILLED OUT THE APPLICATION.

5. OPERATOR
Name: Jim Clark
Business Name: Logging, Inc.
Mailing Address - Street Address: 1432 SE Boon Ave.
City, State and Zip Code: Molalla, OR 97308 — Area Code & Phone No.: 503-888-8888

On-sire ispections may be conducted by the State Forester/Forest Practices Forester to ensure compliance with all the laws and rules governing fire protection and forest practices on private land.

APPLICANT REMARKS:

[ ] 6. LANDOWNER
Name: Jane Mackie — RC: 4
Business Name: Lazy Acres — EG: 2
Mailing Address - Street Address: 32076 SE 1st. Ave. — S: 3
City, State and Zip Code: Darwin, OR 97001 — Area Code & Phone No.: 541 333-8989

Timber harvesting may result in a tree planting requirement on the landowner. Call a Department of Forestry office for more information.

7 WESTERN OREGON PRIVATE LAND ONLY — NoneX IPart IAir — Irs any timber being harvested certified under the Western Oregon Small Tract (WOSTOT) program? If you have checked "Part" or "All" please list the number in the "WOSTOT" Certificate Number box to the right. WOSTOT Certificate t:

[ ] 8. TIMBER OWNER AND TAX PAYER
Name: Same as Landowner
Business Name:
Mailing Address - Street Address:
City, State and Zip Code — Area Code & Phone No.:

You are required to provide a Social Security number or Taxpayer Identification number by the Oregon Department of Revenue's statute ORS 371.015. The Social Security number will be used ONLY for the purpose of identifying you to the Department of Revenue for the collection of Timber Tax.

Timberowner Employer Identification Number: ____ OR [ ] Social Security Number: 656-66-6666

FORM 629-2-1-00(Rev. 12/95) 30K

9. TYPE OF ACTIVITY								10. ACTIVITY PERIOD	
IUnll No.	Fff No. (•	FIRE 1 -- FPA	Activity Codes	Methods Used	Quanlily {by - - -) Ac:IH	Quanlily {by - - -) Feel	Ettim. MBf Removed	Est. Activity StartinG DM•	Est. ActiYily EndinG DMo
I		1 --	lb	Ground	65		1500	6/1/96	12131/96
2		r--	Ia	Ground	25		50	3/1/96	12131196
3		1 --	2b	Dozer		3000		211196	12131196
4		1 --	4a	Weedone, diesel, none, 10 gal. per acre	150			4l5196	12131196
		1 ---							
		1 --							
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		1 ---							

No.	11. SITE CODES Conditions W100, W300 S1, S2, S1 T1, T2, T3 WNA	Concerns ARC, COO COS, SH SW.UOa WO	Waters SIGNIF. WET., OTHER WET. LAKES >I, OTHER LAKES STREAM, EOS, BOG ES, DWS, SEEP	Resources BEN. BEP. BER, 810 CC, CWO. OBH. OLD MUR, NSO, OSP PS, RAP, SBS, T&E
I	WNA T1, Sl	Ulijj		
2	WIOO T2, SI	UGB	Stream: Pickle Creek	OSP
3	WNA T1, Sl	UGB		
4	WNA Tl , Sl	UGB		

No.	GO't Lot NumbonW Oueside st.nd•d Section	NE N E	NE N W	NE S W	NE S E	NW N E	NW N W	NW S W	NW S E	SW N E	SW N W	SW S W	SW S E	SE N E	SE N W	SE S W	SE S E	S E C	T W p	R G E	St'ltlf'IIIK' Tax UnO	13. Regulated Uoo Ar••
I										x	x	x	x					4	3s	6e		
2													x					"	"	"		
3										x	x	x	x					"	"	"		
4										x	x	x	x					"	"	"		

... If 1he applcant wants a waiver of 1he ntteen-daywaiting pet1od, dleck lhls box. ... J

... ATTACH IIIAP AND/OR AERIAL PHOTOS!

15•. Pmt '*"" t;(ewkenl '*-

x Jim Clark

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X gw..ctwJ. X J/12196

S setfber.

Subscriber:

S scriber.

Subsctl)er.

Sl.bscriber:

Water Rights Subsefber:

Wlter Rlot'ts Subscriber:

WIUTTWN ..u.NI I"Jt!OIlt AP',IItOVALS

HAMil O,l"fltOTICTIO JtUOIMCIS:

WAftlltSHt:D COOl' ITWUM CLASS COOES

COW.NTI:

Date:

fi\ -l'Hir(wklg p•riod ⊂1 by

Provide PHOTOCOPIES of the completed notification form and map to the local offices of the Water Resources epartment and the Oregon Department of Fish and Wildlife IF AND ONLY IF you plan to use on-site water to mix pesticides or to control slash burns. In the applicant remarks section of the notification form identify the proposed water source. Addresses of the Water Resources and ODF&W offices are available in each Forestry office.

A notification is not considered accepted until it is received by the Forestry office that handles the location of your planned activitv. Mail, fax or hand-deliver the notification form to the offices whose addresses are shown below.

For assistance filling out the notification form, contact your local ODF office.

OFFICE	COUNTIES COVERED	ADDRESS	PHONE NO.	FAX NO.
ASTORIA	Clatsop	92219 Hwy #202, 97103	503-325-5451	503-325-2756
BAKER CITY	Baker	2995 HUGHES LANE, 97814	541-523-5831	541-523-5874
CENTRAL POINT	Jackson	5286 TABLE ROCK ROAD, 97502	541-664-3328	541-776-6184
COLUMBIA CITY	Columbia, Clatsop	405 E STREET, 97018	503-397-2636	503-397-6361
COOS BAY	Coos, Curry, Douglas	63612 FIFTH STREET, 97420	541-2674136	541-269-2027
DALLAS	Polk, Yamhill	825 OAK VILLA ROAD, 97338	503-623-8146	503-623-9034
FOREST GROVE	nllamook, Wasr.:.,gton, West Multnomah, Yamhill	801 GALES CREEK ROAD 97116-1199	503-357-2191	503-3574548
FOSSIL	Wheeler, Morrow, Gilliam	45945 HWY 19, 97830	541-763-2575	541-763-2027
GRANTS PASS	Josephine	5375 MONUMENT DRIVE, 97526	541474-3152	541474-3158
JOHN DAY	Grant	PO BOX 546 97845 (400 NW 9"')	541-575-1139	541-575-2253
KLAMATH FALLS	Klamath, Lake	3200 DELAP ROAD 97601	541-883-5681	541-883-5555
LAGRANDE	Baker, Malheur, Union	611 20TH STREET, 97850	541-963-3168	541-962-1058
LAKEVIEW	Lake, Klamath	2290 NORTH 4TH STREET, 97630	541-947-3311	541-947-3078
MEHAMA	Linn, Marion	22965 N. FORK ROAD SE, LYONS 97358	503-859-2151	503-859-2158
MOLALLA	Clackamas, East Multnomah	14995 S.HWY 211, 97038	503-829-2216	503-8294736
MONUMENT	Grant, Wheeler	PO BOX 386, 97864 (MAY STREET)	541-934-2300	541-934-2301
PENDLETON	Umatilla, Grant, Morrow	1055 AIRPORT ROAD 97801	541-276-3491	541-276-0710
PHILOMATH	Benton	24533 ALSEA HWY, 97370	541-929-3266	541-929-5549
PRINEVILLE	Crook, Deschutes, Jefferson	3501 NE 3RD, 97754	541-447-5658	541-447-1469
ROSEBURG	Douglas	1758 NE AIRPORT ROAD, 97470-1499	541-440-3412	541-440-3424
SPRINGFIELD	Lane	3150 E.MAIN STREET, 97478	541-726-3588	541-726-2501
SWEET HOME	Linn	4690 HWY 20, 97386	541-367-6108	541-367-5613
THE DALLES	Hood River, Sherman, Wasoo	3701 W.13TH ST., 97058	541-2964626	541-2984993
TILLAMOOK	nnamook	5005 THIRD STREET, 97141-2934	503-842-2545	503-842-3143
TOLEDO	Linooln	763 NW FORESTRY ROAD, 97391	541-336-2273	541-336-5261
VENETA	Lane, Douglas	PO BOX 157, 97487 (87950 TERRITORIAL HWY)	541-935-2283	541-935-0731
WALLOWA	Wallowa	802 WEST HWY 82, 97885	541-886-2881	541-886-9085

PLEASE PRINT OR TYPE INFORMATION ONTO THE FORM. Please don't write in shaded areas. The instructions are numbered to match numbered areas on the notification form.

Instructions For Filling Out The Notification Of Operation/Application For Permits form 629-2-1-002A

File notice with the State Forester at least 15 days prior to the date you would like to start operating.

File a notification (form 629-2-1-002A) at an Oregon Department of Forestry (ODF) office if any of the following conditions apply:

- Your operation area is brand new.
- You are adding a new activity to the operation.
- You are changing or increasing the area involved in an existing operation.
- It is after February 28, and you are continuing an operation that has been idle since the end of the previous calendar year and you have not informed ODF you intend to continue the operation before now.

1. "COUNTY (Enter only one)." Fill in the county name where the operation will take place. If an operation spans two or more counties, file a separate notification for each county. The address list shows which counties are handled by which offices.
2. "NOTICE AND PERMIT TYPE" Check Appropriate Boxes (2A, 2B and/or 2C). Checkmark in the boxes next to the notices you are giving and/or the permit you need. Anyone filing a notification for hauling only should check box 2B.
3. "REPRESENTATIVE" The person ODF should contact in case of fire emergency. Print the name and phone number. This person must know what resources you have available to fight the fire and have the authority to commit those resources.
4. "Timber Sale Name and/or Number: This information is required for all state and federal sales and is optional for private land sales.

"CHECK ONE BOX NEXT TO 5, 6, OR 7 TO INDICATE WHO FILLED OUT THE APPLICATION."

5. "OPERATOR" The name, address and phone of the person or company who is doing the work.
6. "LANDOWNER" The name, address and phone of the person who owns the land. Harvesting timber may result in a tree planting requirement for the landowner. RC (Recipient Class) EG (Ethnic Group) and S (Size of land ownership) boxes gather information about the landowner. We ask you to voluntarily enter this information which we will use for annual reports. In these reports no names are connected with the codes.

Recipient Class	Ethnic Group		Size
1. Local Government	1. Does not apply		1. Does not aoolv
2. State Government	2. White		2. 0-9 acres
3. Federal Government	3. Black		3. 10-99 acres
4. Individual/Non-industrial Private Forest Landowner (someone who owns 5,000 or fewer acres of forest land, and makes less than 50% of his or her annual inoome from the primary processing of forest products.)	4. Hispanic		4. 100499 acres
5. Partnership/Corp. Industrial Forest Landowner	5. American Indian/Alaskan Native		5. 500-999 acres
6. Other (private landowner such as a church or non-profit organization.)	6. Asian/Pacific Islander		6. 1,0004,999 acres
No number seven.	7. All Other		7. 5,000 + acres

7. "TIMBER OWNER AND TAX PAYER" Enter the name of the person or company, their address and phone number. Fill in EITHER the timber owner's Employer Identification number OR the timber owner's Social Security number. The Social Security number will be held in confidence. The party who owns timber at the point of first measure is the timber owner, and is responsible for paying the harvest and, if applicable. severance taxes.

8. "TYPE OF ACTIVITY." "UNIT NUMBERS" Assign a unit number between 1 and 99. A unit can be:

- A single operating area within a continuous boundary; or
- An operating area with a state or federal sale unit number; or
- A separate area within your total operation area on which you plan to conduct a single type of activity (for example, 30 acres of harvest type 3 only).

Multiple harvest units may be listed on one notification. BUT, if HARVEST units are separated by a mile or more (in a straight line), file separate notifications for each unit.

In all cases, all activities you plan on that unit should be listed beside the unit number. For example, road construction activity needed prior to starting a commercial timber harvest should be described along with the harvest activity. Multiple lines may be used for each unit to describe the activity.

Activity Code	Methods Used	Activity Code	Methods Used
1a. Commercial Thinning. Most of the conifer timber or large hard woods will remain uncut on the unit after harvesting (such as commercial thinning or selective cutting).	Cable/Ground/Other	2a. Road Construction 2b. Road Reconstruction	Dozer/Backhoe/Other Dozer/Backhoe/Other
1b. Most, or all, oonifer timber or large hardwoods will be cut and removed from the unit during harvesting (such as in clearcuts, shelterwood, and seed tree harvests).	Cable/Ground/Other	3. Site Preparation. (Do not use for building site preparation, this is preparing for planting.)	Manual/Mechanical/ Burning (not slash)
1c. Felling only (no yarding or decking involved).		4a. Herbicide Application 4b. Insecticide Application 4c. Rodenticide Application 4d. Fertilizer Application 4e. Fungicide Application 4f. Repellent Application	Ground or Aerial/Common Name/Brand Name/ Carrier/Additives/ Application Rate (For fertilizer application only list all of the above plus the application rate)
1d. Other Harvest Type not covered in 1a. or 1b. Describe in applicant's remarks box. (Examples are removal of just cedar timber from a mixed conifer stand, or creating salable chips.)	Other	5. Land Use Change Planned • to agricultural use • to residential use • to other uses Local government land use approval may be required.	
1e. Sort Yard. A single location where woods-direct logs are stored prior to being taken to a mill.		6. Treatment of Slash	Manual/Chemical/ Burning/Mechanical
		7. Pre-commercial Thinning	
		8. Others	Explain: EXAMPLES: rockpits used in roadway construction and chiooina.

"Quantity by Unit." Enter either the acres (A) or lineal feet (F) involved in the activity.
"Approximate Thousand Board Feet (MBF) Removed." List the approximate MBF to be removed, for each unit with commercial timber harvesting. For example 50 MBF = 50,000 Board Feet.

9. The starting date must be at least 15 days after the date the notification form is received by the appropriate ODF office.

10. "Site Codes." You must enter the W, S, and T conditions code(s) for each unit. Fill in concerns, waters, and resources code(s) when known. We are asking for your assistance in identifying units with characterics that we are bound by law to protect. If you don't know whether any of these characteristics exist, go to item 15.

CONDITIONS		CONCERNS		WATERS	RESOURCES	
W100	Within 100 feet of any lake, stream (a channel flowing surface water during some part of the year).	ARC	(haeological) site.	SIGNIF WET. A wetland 8+ acres.	BEN	Bald Eagle Nesting site.
W300	Within 300 ft. of any estuary or any wetland greater than 8 acres.	CGG	Columbia Gorge General management area.	OTHER WET (land).	BEP	Bald Eagle foraging site. (A perch.)
WNA	Waters Not Applicable.	CGS	Columbia Gorge Scenic management area.	LAKE 8+ acres.	BER	Bald Eagle Roosting site.
51	No evidence of mass soil movement (landslides, slips, slumps).	SH	Scenic Highway. The operation takes place near a FPA Scenic Highway.	OTHER LAKES	BIO	(logical) site of a rare life form or community: example, a rare snake pit.
52	Evidence of old slides, small failures.	SW	The operation takes place near a state Scenic Wale	STREAM A channel flowing surface water during some part of the year.	BPS	Band-tailed Pigeon Spring.
53	Recent or active movement; wet areas.	UGB	The operation takes place within an Uriban Growth Boundary.	EOS, important spring in Eastern Oregon.	CC	The operation will result in a single ClearCut or continuation of contiguous clearcuts that exceed 120 acres.
T1	is a slope of 0 to 35%	WG	The operation takes place in the Willamette Greenway.	BOG Any size Bog.	CWO	Columbia White Tail Deer.
T2	is a slope of 36% to 65%			ES(tuary) A type of bay.	GBH	Great Blue Heron nest site.
T3	is a slope greater than 65%			DWS Domestic Water Supply	GLD	Golden eagle nest site.
				SEEP Water seeps out of ground, no flow evident.	HLH	High Landslide Hazard Location.
					MUR	Maribled Murrelet nesting site.
					NSO	Northern Spotted Owl nesting sites.
					OSP	Presence of Osprey nest and key components.
					RAP	Other Raptor nests.
					SBS	Sensitive Bird roosting, nesting, watering site.
					TorE	Threatened or Endangered species.

11. "Government Lot Numbers." Special numbers for map locations that do not fit the standard Township/Range grid.

12. "Location of Operation." If the activities codes description for a unit takes up several lines, REPEAT THE CODES ON EACH LINE: DO NOT REPEAT THE LEGAL DESCRIPTION.

13. To request a waiver of the 15-day waiting period, check the box and contact the Stewardship Forester (SF) at the ODF office where the notification is filed. The SF will decide if a waiver will be granted.

14. Print your name in 14a.; sign your name and write the date in 14b.

15. ATTACH MAP AND/OR AERIAL PHOTOS!" The notification form is NOT complete unless a map or aerial photo of the operation area is attached.

On-site inspections may be conducted by the Stewardship Forester to ensure compliance with state laws and rules governing fire protection and forest practices on private land.

Attachment B

OAR 629-615-0300

Attachment B

629-615-0300
Prescribed Burning

(1) Prescribed burning is a tool used to achieve reforestation, maintain forest health, improve wildlife habitat and reduce wildfire hazard. Prescribed burning is to be done consistent with protection of air and water quality, and fish and wildlife habitat. The purpose of this rule is to ensure that necessary prescribed burning is planned and managed to maximize benefits and minimize potential detrimental effects.
(2) When planning and conducting prescribed burning, operators shall:
(a) Comply with the rules of Oregon's "Smoke Management Plan."
(b) Adequately protect reproduction and residual timber, humus and soil surface.
(c) Consider possible detrimental effects of prescribed burning upon riparian management areas, streams, lakes, wetlands, and water quality, and how these effects can be best minimized.
(d) Lay out the unit and use harvesting methods that minimize detrimental effects to riparian management areas, streams, lakes, wetlands, and water quality during the prescribed burning operation.
(e) Fell and yard the unit to minimize accumulations of slash in channels and within or adjacent to riparian management areas.
(f) Minimize fire intensity and amount of area burned to that necessary to achieve reforestation, forest health, or hazard reduction needs.
(3) When burning within 100 feet of Type F and Type D streams, within 100 feet of large lakes, and within 300 feet of significant wetlands, operators shall describe in the written plan how detrimental effects will be minimized within riparian management areas; especially when burning on highly erosive soils, for example decomposed granite soils and slopes steeper than 60 percent.
(4) During prescribed burning operations, operators shall protect components such as live trees, snags, downed wood, and understory vegetation required to be retained by OAR 629-635-0310 through 629-650-0040. When the operator has taken reasonable precautions to protect the components, but some detrimental effects occur, the intent of the rule is met if the overall integrity of the riparian management area is maintained. Operators shall not salvage trees killed by prescribed fire in a riparian management area if the trees were retained for purposes of 629-635-0310 through 629-655-0000.
(5) When the need for prescribed burning outweighs the benefits of protecting components required to be left within the riparian area, aquatic area and wetlands, protection requirements may be modified through a plan for an alternate practice. Approval of such a plan shall consider the environmental impacts and costs of alternative treatments.
(6) (For information only) When water is to be withdrawn from the waters of the state for use in mixing pesticides or for slash burning, ORS 537.141 requires operators to notify the Water Resources Department and the Department of Fish and Wildlife. Notification to the State Forester does not satisfy this requirement.

Stat. Auth.: ORS 527.710
Stats. Implemented: ORS 527.674 & 527.715
History:
DOF 1-2017, f. 6-9-17, cert. ef. 7-1-17
DOF 2-2013, f. 7-11-13, cert. ef. 9-1-13
DOF 8-2005, f. 12-13-05, cert. ef. 1-1-06
DOF 6-2005(Temp), f. & cert. ef. 8-2-05 thru 1-27-06

FB 9-1996, f. 12-2-96, cert. ef. 1-1-97, Renumbered from 629-024-0302
FB 3-1994, f. 6-15-94, cert. ef. 9-1-94

Available at: https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=162542

Attachment C
Burn, Data Reporting, Slash Burn Fees Instructions

"STEWARDSHIP IN FORESTRY"

Oregon Department of Forestry

Southwest Oregon District

Fall 2009 & spring 2010

Smoke Management

Information & Processes Guide

Contents

Introduction

The Oregon Department of Forestry, Southwest Oregon District, provides the enclosed instructions, and information documents to assist you in the Smoke Management processes, rules and regulations.

The Southwest Oregon District will operate under the Smoke Management Plan.

It is our intent to continue to:

- To protect public health
- Provide a quality service to our customers wishing to utilize the Smoke Management Plan to burn debris caused by the harvesting and growing of timber.
- As a result of such burning, prevent smoke from being carried to or accumulating in designated areas and other areas sensitive to smoke.
- To provide maximum opportunity for burning while coordinating with other state and federal smoke management programs and users.
- To conform to state and federal air quality and visibility requirements.
- To encourage the reduction of emissions with alternative methods.

Southwest Oregon District – Directory

Southwest Oregon District – 541-664-3328 Fax 776-6184
Business Hours: Monday – Friday 0800-1700

District Forester	Dan Thorpe

Medford Unit – 541-664-3328 Fax 776-6184
Business Hours: Monday – Friday 0800-1700

Unit Forester	Greg Alexander
* Stewardship Forester	Bob Marcu
Protection Supervisor	Tyler McCarty
Protection Supervisor	Bill Smith

Grants Pass Unit – 541-474-3152 Fax 474-3158
Business Hours: Monday – Friday 0800-1700

Unit Forester	Rick Dryer
* Stewardship Forester	Steve Wetmore
Protection Supervisor	Aaron Whiteley
Protection Supervisor	Karl Witz

* = Stewardship foresters are the primary contact to obtain slash burning permits.

Smoke Management Coordinators

There are specific hours when you may call either office to plan or accomplish a burn. These are established so that we can accomplish our other tasks during the day.

Established hours are *8:30 to 9:30 a.m.* and between the hours of *3:00 and 4:00 p.m.* Monday through Friday.

***** Burns to be conducted in Jackson County - Medford ODF Unit Dispatch office.**

Kristina Sheppard – Dispatch Supervisor Matt Fumasie - Dispatcher

Mailing Address: Medford Unit, 5286 Table Rock Road, Central Point OR 97502

Business Number: 664-3328 ask for dispatch Fax Number: 776-6260

Email Address: ksheppard@odf.state.or.us cmarshall@odf.state.or.us

***** Burns to be conducted in Josephine County - Grants Pass Unit Dispatch office.**

Shelly Hoffer – Dispatch Supervisor Sandy Schwab – Dispatcher

Mailing Address; Grants Pass Unit, 5375 Monument Drive, Grants Pass OR 97526

Business Number: 471-2855 Fax Number: 471-3892

Email address: shoffer@odf.state.or.us sschwab@odf.state.or.us

Process

Obtain a burn permit/plan; A burn permit is required for debris created by Forest Management activities which are the growing and harvesting of timber.

For a single unit the Burn permit/plan will cover; for multiple units, complete a Unit Worksheet and note on the Burn permit/plan that the attached Unit Worksheet will be covered under this permit.

Once we receive the Burn permit/plan and if applicable, Unit Worksheet, the information will be entered into the Oregon Smoke Management database and fee system.

When you plan on burning, you are required to call the day prior to the burn to obtain clearance. There are occasions when clearance can not be granted, which is normally based upon weather and smoke dispersion issues. At this time the unit(s) you plan on burning will be “planned” in the Oregon Smoke Management database. This will allow Salem and others to pull reports on current planned burns.

Once you have completed your burn, even if you have still more to burn, call in your “accomplishment” the working day after you have burned. This information will also be entered into the database for tracking and fee purposes.

Registrations, Required Form(s) and Burn Permits/Plans

Landing and Piled debris: The Landing and Piled Units Worksheet (instructions below & Worksheet attached) shall be completed. After the worksheet(s) has been received and reviewed, a Burn Permit may be created and either faxed, mailed or personally picked up.

NOTE: Please make every attempt to have your Worksheets into us 7 days prior to requesting to burn. This helps us audit the information, make corrections and coordinate the issuing of a permit. We understand there are times when this timeframe can not be met; we just ask that you make that the exception, not the rule.

The information will be entered into the Smoke Management computer tracking system. Once entered, registered units requiring burn fees will be gathered and processed by the Oregon Department of Forestry Finance Section in Salem Oregon.

Broadcast and Underburn Units: These units require additional paper work and closer coordination than other burning. If you have a unit in which you want to broadcast or underburn, please contact either the Forest Practice Forester or Protection Supervisor in which the Unit resides to receive further direction.

Planning to Burn

The afternoon prior to the day you would like to burn, call the appropriate office between the hours of 3:00 p.m. and 4:00 p.m. Monday - Friday.

The information needed at the time you call in, will be; Unit name (if available), where the unit is (legal location) and how much tonnage you are requesting to burn.

Accomplishments

Burning accomplishments must be reported the following workday after the burn!

Unit Worksheet Instructions

Unit Number (Facts #): This is the 12-digit number assigned to the Unit from ODF.

District/Forest ID 711 = Medford Unit 712 = Grants Pass Unit

Owner Name Name of the company/landowner

Ownership P = Private S = State, local government

FPF Number Optional

Sale Name: Enter the name of the Unit**.**

Sale Unit Number (Unit #): IF available, enter the number of the unit.

Legal Description (T) (R) (S): Enter location by Township, Range and Section. If a 1/2 township, enter it as .5 (example; 35.5 = township 35 1/2)

County Number (Co.#): 15 = Jackson County 17 = Josephine County

Distance from nearest SSRA: SSRA=Smoke Sensitive Receptive Area i.e. old Designated Area. # of miles from the boundary

Special Protection Zone: M = Medford N = None

Acres in Unit: Total acres in the harvest/treatment unit.

Date when 70% of the cutting was completed (Cutting Date): Enter the month and year (example; March 1997 = 0397). For Natural Fuels, or no cutting enter " 9999".

Minimum Harvest Log Diameter:

2 = Whole Tree Yarding	4 = 4 inches
6 = 6 inches	8 = 8 inches
9 = Other	1 = Not Applicable

Elevation of the burn (Elev.): Use the average elevation to the nearest 100 feet.

Slope (% Slope): Enter the actual average slope.

Average Duff Depth: in $1/10^{th}$ of an inch without the decimal i.e. 1.6 inches of duff would = 16

Type of Burn:	B = Broadcast Activity R = Right-of-way L = Landing only G = Grapple Pile T = Tractor Pile	Underburn Activity = U Broadcast Natural = F H = Handpile S = Rangeland
Predominant Species of Fuel:	D = Douglas Fir, Cedar M = Mixed Conifer B = Brush	P = Ponderosa Pine H = Hardwood G = Grass
Fuel Loading Method:	C = Ocular Photo Series	R = Random Sample T = Transect

Landing & Right-of-way Acres: Enter the acres from which material was gathered.

Landing & Right-of-way Piles: Total TONS of material in landing and Right-of-way from the entire unit.

Other Acres: Acres of in-unit piles, broadcast, and/or Underburn.

Unit Pile Tons: Total tons in unit piles

Broadcast/Underburn loading: tons per acre by size class, round to whole tons,

Acres in the Unit: Enter the actual number of acres to be treated.

Piled acres, enter the total # of acres from which the material was collected.

Landing acres, enter the # of landings for the unit. Example; you have a 20 acre unit with 3 landings, the acres entered would be 3.

Landing Piles (Landing Tons): Enter the total tons.

Piled Burns (Piled Tons): Enter the total tons.

Primary Reason for the Burn:	H = Hazard Reduction R = Other	S = Silviculture B = Hazard & Silviculture

We have received direction through Salem ODF to use the attached form which will standardize the forms used across the state for those of you working with more than one District.

The Unit Worksheet can be completed electronically and e-mailed to the appropriate dispatch office if you prefer the electronic method. If you do not already have the new form, e-mail your host dispatch and they can reply with a copy of the form.

Burn Fees

Broadcast Burns / Under Burns / Tractor Piles / Hand Piles / Grapple Piles

Acres	Registration Fee	Burn Fee	Notes
8 acres or less	$5.00	$25.00	= $30.00 minimum
9 acres or more	$ .50	$ 3.10	per acre

Landings

Acres	Registration Fee	Burn Fee	Notes
29 acres or less	$15.00	$15.00	= $30.00 minimum
30 acres or more	$ .50	$ .50	per acre

Combined Registrations

If a unit is initially registered as a Landing Unit and then within the 3 year timeframe has piled or broadcast tons
added to it, once burned an additional burn fee of $2.60 per acre based upon the accomplished acres is then billed to bring it up to the $3.10 per acre burn fee for piles and broadcast burning.

Fees are good for 3 years per Unit.

Information Sources

Smoke Management Instruction Internet Address:

http://www.odf.state.or.us/DIVISIONS/protection/fire_protection/smoke/smkfcst.asp

Land Management Forecast Internet Address:

http://nimbo.wrh.noaa.gov/Medford/fire/

Smoke Management Plan, Burn Fee Rules and much more

http://www.odf.state.or.us/DIVISIONS/protection/fire_protection/smp/smokemgt_onthe_web.asp

ODF, Southwest Oregon District, Medford Unit

http://oregon.gov/ODF/FIELD/MED/aboutus.shtml

ODF, Southwest Oregon District, Grants Pass Unit

http://oregon.gov/ODF/FIELD/GP/aboutus.shtml

Smoke Management Burn Procedures Data Reporting and Consumption Estimation (Level 1 Regulated Areas)

Accurate, timely reporting of smoke management data is essential. Information in the data system is used to manage daily burning to; avoid impacting Smoke Sensitive Receptor Areas and overloading the airshed with particulates, facilitate coordination of burning between adjacent districts and landowners, enable calculation of emissions from burns, administer the fee program, and respond to enquiries about burning.

Fuel Loading and Consumption Estimation

The first step in the reporting burning activities is determining the amount of material that will be burned. Accurate estimation of pre-burn fuel loading is essential. Numerous techniques are available to assist in making accurate estimates of the amount of material available to be burned. A number of photo series publications have been developed to assist in this need. Links to on-line versions of these publications can be accessed from: http://oregon.gov/ODF/FIRE/SMP/FLET.shtml.

The publications referenced above may also be used after a unit is burned to help estimate consumption. In addition computer applications for calculating consumption are also available via the Internet, at: http://www.odf.state.or.us/DIVISIONS/protection/fire_protection/Daily/ACOST/ACOST.htm.

Reporting Requirements

Once the amount of material to be burned has been determined, this and other pertinent information must be reported. This is divided into three areas:

Registration: All units intended to be burned must be pre-registered in the Forestry smoke management data system. Units should be registered through the ODF district or the federal data system, FASTRAXS.

Planning: The day prior to ignition, a plan for the unit(s) to be burned is entered into the data system. This plan includes the location, an estimation of the amount of material intended to be burned and planned time for ignition. This facilitates coordination with adjacent landowners.

Accomplishment: The business day after the burn, the actual amount of material consumed and other pertinent data needed to produce emissions estimates is entered into the data system.

Specific requirements for data reports are contained in the smoke management directive. Approved data collection forms are available either on paper or electronically. Invoices for burn fees are based on the reports submitted, so accurate reporting of burning cannot be overemphasized.

Changes That Impact Data Reporting

Landings represent the most significant change in the data reporting system.

- The acres reported for landings are the acres that the material came from, not the area covered by the pile(s). Thus, unless additional material is yarded to the landing, the reported acres for landings will normally be the same as the harvested acres in the unit.
- Piles that include additional material yarded to the landing site (e.g., YUM) are not considered landing piles but are classed as “in-unit” piles.
- Landings must be registered in the data system, prior to burning.
- Landings are no longer fee exempt but will be charged both registration and burning fees.

Small units are no longer exempted from reporting or fees. If the burning is related to harvesting and replanting, the unit is reported regardless of size.

Smoke Management Burn Procedures Data Reporting and Consumption Estimation (Level 2 Regulated Areas)

Accurate, timely reporting of smoke management data is essential. Information in the data system is used to manage daily burning to; avoid impacting Smoke Sensitive Receptor Areas and overloading the airshed with particulates, facilitate coordination of burning between adjacent districts and landowners, enable calculation of emissions from burns, and respond to enquiries about burning.

Fuel Loading and Consumption Estimation

The first step in the reporting burning activities is determining the amount of material that will be burned. Accurate estimation of pre-burn fuel loading is essential. Numerous techniques are available to assist in making accurate estimates of the amount of material available to be burned. A number of photo series publications have been developed to assist in this need. Links to on-line versions of these publications can be accessed from: http://oregon.gov/ODF/FIRE/SMP/FLET.shtml.

The publications referenced above may also be used after a unit is burned to help estimate consumption. In addition computer applications for calculating consumption are also available via the Internet, at: http://www.odf.state.or.us/DIVISIONS/protection/fire_protection/Daily/ACOST/ACOST.htm.

Reporting Requirements

Once the amount of material to be burned has been determined, this and other pertinent information must be reported. There are two reports that are required for burning in areas of level 2 regulation:

Registration: All units intended to be burned must be registered in the Forestry smoke management data system through the ODF district or the federal data system, FASTRAXS.

Planning: Planning prior to the actual burn is not required for areas under level 2 regulation but may be done if desired. This plan includes the location, an estimation of the amount of material intended to be burned and planned time for ignition. Entering plans the afternoon before ignition will aid coordination with other burning.

Accomplishment: On the first business day of the week after the burn, the actual amount of material consumed and other pertinent data needed to produce emissions estimates is entered into the data system.

Specific requirements for data reports are contained in the smoke management directive. Data collection forms are available either on paper or electronically through the local ODF district.

Changes That Impact Data Reporting

Landings represent the most significant change in the data reporting system.

- The acres reported for landings are the acres that the material came from, not the area covered by the pile(s). Thus, unless additional material is yarded to the landing, the reported acres for landings will be the same as the harvested acres in the unit.
- Piles that include additional material yarded to the landing site (e.g., YUM) are not considered landing piles but are classed as “in-unit” piles.
- Landings only units are no longer exempt from reporting but must be entered into the data system as is done for any other type of burn.

Small units are no longer exempted from reporting. If the burning is related to harvesting and replanting, the unit is reported regardless of size.

Smoke Management Fees

(Level 1 Regulated Areas)

Smoke management fees are assessed to nearly all burning conducted in areas under Level 1 regulation. This includes federal forest land statewide and Class 1 forestland in western Oregon.

Fee structure

The basic fees are assessed against the number of acres registered to burn. Thus, the burn fees are assessed for the number of acres registered, regardless of the area actually burned.

Type of Burn	Registration	Burn (Accomplishment)
Landing, Right-of-Way Piles	$.50/acre	$.50/acre
Forest Health Maintenance *	$.50/acre	$.50/acre
In-unit piles	$.50/acre	$3.10/acre
In-unit piles (landings already burned)	$.50/acre (if registered separately from landing acres)	$2.60/acre
Broadcast/underburn	$.50/acre	$3.10/acre
Broadcast/underburn (landings already burned)	$.50/acre (if registered separately from landing acres)	$2.60/acre

*Condition Class 1 land burned within 5 years of previous burn.

Minimum fee

Burns are charged a minimum fee of $30 per unit.

OFFICE/CALL IN SMOKE MANAGEMENT ACCOMPLISHMENT (Piles)

2 Notification#	**5** Landowner Name	**7** Township; Range; Sec; 1/4 Sec	Date of Burn	Ignition Time	Acres Burned*1	Piled Tons Burned (Within Unit)*2	**15** Landing Pile Tons (Only)*3

***1 Acres Burned:** Total acres of the unit from which the material was gathered from to form the piles.
Report only those acres treated by fire, not the total unit size, if different.

***2 Piled Tons Burned Within the Unit**: Total tons of material burned in the piles within the unit. Do not include landing piles in this colum.

***3 Landing Pile Tons Burned**: Total Tons of material burned in the piles at the landing.

See Instructions #15 for Tonnage Calculations

Smoke Management District
Identification Numbers

Oregon Department of Forestry

72 Coos
- 721 Bridge
- 722 Coos Bay

73 Douglas
- 731 North Douglas
- 732 South Douglas

71 Medford
- 711 Medford Unit
- 712 Grants Pass Unit

98 Klamath-Lake
- 981 Klamath Falls
- 982 Lakeview

National Forest

15 Umpqua
- 152 Tiller

10 Umpqua Rogue
- 103 Butte Falls
- 106 Prospect
- 112 Galice

02 Fremont-Winema
- 021 Bly
- 022 Lakeview
- 201 Chemult
- 202 Chiloquin
- 203 Klamath

SLASH BURN FEE REGISTRATION

Registration Fee - $ .50/acre
Landing Burns (Total Harvest Acres) - $ .50/acre
Broadcast Burns (Actual Acreage of Burn Area) - $2.60/acre with landings; $3.10/acre without landings
Piled Burns (Actual Acreage of Burn Area) - $2.60/acre with landings; $3.10/acre without landings
All burns must meet a $30.00 minimum.

1/26/2013
COOS FPA

THIS IS NOT A BURNING PERMIT

BILLING NAME: _____

ADDRESS: _____ VID: _____

_____

_____ SIGNATURE: _____

PHONE NO.: (_____) _____ DATE: _____

UNITS MUST BE REGISTERED 7 DAYS PRIOR TO BURNING. ALL CHARGES WILL BE BILLED OUT OF SALEM AT THE END OF EACH MONTH. PAYMENTS WILL BE SENT TO OREGON DEPARTMENT OF FORESTRY. ALL MONIES RECEIVED GO TO FUND THE OREGON SMOKE MANAGEMENT PROGRAM IN SALEM. REFER TO OAR 629-43-041 (3) AND (4) FOR FEE REQUIREMENTS.

NOTIFICATION NUMBER	UNIT NAME	ACRES	TYPE OF BURN Broadcast(B) Landing (L) Piled (P)	TOWN-SHIP	RANGE	SEC.	ELEV.	HARVEST DIAMETER (1=n/a) (2,4,6,8=INCHES) (9=OTHER)	CUTTING DATE (MO/YR)
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/
-740-				S	W				/

COMMENTS:

Oregon Department of Forestry – Smoke Management Registration Form

1. County: _____ 2. Notification/Permit #_____ 3. Year: _____

4. Person to be contacted in case of a Fire Emergency: _____Phone: _____

5. Landowner Information: Name: _____ Phone: _____
Mailing Address: _____
City/State/Zip: _____

6. Person Conducting Burn: Name: _____ Phone: _____
(If different than Landowner) Mailing Address: _____
City/State/Zip: _____

7. Legal Description of Burn

Township	Range	Section	NE				NW				SE				SW			
			NE	NW	SE	SW	NE	NW	SE	SW	NE	NW	SE	SW	NE	NW	SE	SW

8. Acres in Unit	9. Cutting Date	10. Harvest Diameter (DBH)	11. Elevation	12. Type of Burn

13. Fuel Species	14. Fuel Load	15. Landing Piled Ton (Only)	16. Piled Tons (Within Unit)	17. Reason for Burning	18. Planned Ignition Date

PLEASE CALL FOR SMOKE MANAGEMENT INFORMATION BEFORE ANY BURNING

Klamath Falls: 541-883-5681 or Lakeview: 541-947-3311

Smoke Management Data is available online @
http://egov.oregon.gov/ODF/FIRE/fire.shtml#Smoke_Management

Instructions:

1. **County (enter only one):** Fill in the county where the operation will take place. If an operation spans two or more counties, file a separate Notification/Permit for each county.

2. **Notification/Permit #:** 7 digit number assigned to you by your local ODF office.

3. **Year:** Fill in the year in which the registration form is being filed.

4. **Person to be contacted in case of fire emergency and phone #:** Print the name and phone number of the person to contact in case a fire starts on the operation. This person should know what resources are available to fight the fire and have the authority to commit those resources in case of a fire.

5. **Landowner Information:** Enter the person or company name, address and phone number.

6. **Person Conducting Burn:** Enter the person or company name, address, and phone number, if different than the landowner.

7. **Legal Description of Burn:** Enter the legal description of the burn unit.

8. **Acres in Unit:** Enter the total number of acres from which the material was collected for each burn unit. An operation can be divided up into more than one burn unit for fire management purposes so this figure doesn't necessarily have to be the total acres logged.

9. **Cutting Date:** Enter the date that at least 70% of the cutting was completed on the operation.

10. **Minimum Harvest Log Diameter (DBH:** Use one of the following:
    Less than 4" (2) 4 inches (4) 6 inches (6) 8 inches (8) Other (9) Not applicable (1)

11. **Elevation:** Enter the elevation of the burn in feet, using the average elevation to the nearest 100 feet.

12. **Type of Burn:** Use one of the following:
    Tractor piles (T) Handpiles (H) Broadcast (B) Grapple piles (G) Underburn (U) Landing only (L)

13. **Fuel Species:** Enter the predominate species of fuel on the operation. Use one of the following:
    Mixed Conifer (M) Ponderosa Pine (P) Lodgepole Pine (L) Sagebrush or Bitterbrush (S) Brush (B)
    Grass (G) Juniper (J) Hardwood (H) Douglas Fir, Hemlock Cedar (D)

14. **Fuel Load:** Enter (C) for ocular fuel tonnage measurement.

15. **Landing Piled Tons:** Enter total tons of material gathered in piles at the landing. See tonnage calculation under Piled Tons. If you need help, call your local ODF office.

    Tonnage (for 1 pile) = (pile length x pile width x pile height x .0001 x wood density)
    Wood density: White fir/Spruce = 21; Pine = 26; Douglas fir/Larch = 31
    Example: Pile of pine slash that is 25 long by 20 feet wide by 12 feet high: 25 x 20 x 12 x .0001 x 26 = 15.6 Tons

16. **Piled Tons:** Enter the total tons piled in the unit.

17. **Reason for Burning:** Use one of the following:
    Hazard Reduction (H) Silviculture (S) Forest Health (F) Hazard & Silviculture (B)

18. **Planned Ignition Date:** Enter the date you plan to burn.

County Number

1	Baker	10	Douglas	19	Lake	28	Sherman
2	Benton	11	Gilliam	20	Lane	29	Tillamook
3	Clackamas	12	Grant	21	Lincoln	30	Umatilla
4	Clatsop	13	Harney	22	Linn	31	Union
5	Columbia	14	Hood River	23	Malheur	32	Wallowa
6	Coos	15	Jackson	24	Marion	33	Wasco
7	Crook	16	Jefferson	25	Morrow	34	Washington
8	Curry	17	Josephine	26	Multnomah	35	Wheeler
9	Deschutes	18	Klamath	27	Polk	36	Yamhill

Attachment D
Westside Example of Burn Permit

BURNING PERMIT

COOS FOREST PROTECTIVE ASSOCIATION

In accordance with ORS 477.515, a permit for burning is hereby issued as set forth below:

Permittee:

Last Name First

Address

City State Zil!

D Smoke Mgt. _____
Smoke Mat or Graze Unit Number / Unit Name

D Graze

D Debris / Yard Acres _____ Tons

D Other

BRIDGE	572-2796
BROOKINGS	469-2302
COOS BAY	267-3161
FOURMILE	347-3400
GOLD BEACH	247-6241
REEDSPORT	271-2224

Permittee's Phone

Forest Officer's Name
tJnn

Location:

Quarter Sec. Section Township S Range W County

All condttẗons must be met to make thts pemuẗ valtd and to prevent the spread of uncontrolled fire.

This permit is valid only during the following times:

From AM PM To AMPM

c=J Daylight Hours Only

Issued By: _____

This permit is valid only on the following inclusive dates:

Issued: through:

Received By: _____

IMPORTANT: READ REVERSE SIDE BEFORE BURNING

Attachment E
Eastside Example of Burn Permit

Oregon Department of Forestry • Klamath-Lake District

APPLICATION FOR USE OF FIRE OR PERMIT TO OPERATE POWER DRIVEN MACHINERY

ORS 477.625

Received:
Date:
Time:
Initial

Starting Date: _____ End Date _____

FPF#: Fire_ _ _

Operator: _____

FOR OFFICE USE ONLY
Notification Number:

Address: _____

City/State/Zip: _____ Phone/Cell _____

Landowner: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Address/City/State/Zipcode: _____ Phone/Cell _____

County you will be working in: _____

Representative Name: _____ Phone/Cell _____

Describe the type of activity being performed (i.e., broadcast or pile burning, road construction, septic installation, well drilling, etc.) # of Piles and size.

_____ Acres _____

1. List equipment being used:

_____

2. Legal: (Township, Range, Section) Include Map with area highlighted.

Govt. Lot# if outside std section	NE				NW				SW				SE				SEC	TWP	RGE	REGULATED USE AREA
	NE	IN	W	ISW	NE	IN	W	ISW	NE	IN	W	ISW	NE	IN	W	ISW				
	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O				

In Klamath County
Call (541) 883-5681

Fire Danger Level

In Lake County
Call (541) 947-3311

Oregon Department of Forestry
3200 Delap Road
Klamath Falls, OR 97601

Oregon Department of Forestry
2290 North 4th Street
Lakeview, OR 97630

The landowner/operator can still be liable for up to $300,000. Of fire suppression costs when afire starts within a legally operating activity.

I have read the above and understand the requirements and the potential liability.
This permit expires at the end of this calendar year.

_____
(Print Name)
Signature: _____ Date _____

Attachment F
Examples of Slash Burn Plans

PMS 484 Appendix A Prescribed Fire Plan Template

Updated April 2014. This is Appendix A of the Prescribed Fire Planning and Implementation Procedures Guide. This document is an editable Word document.

Accessed at: https://www.wildfirelessons.net/communities/community-home/librarydocuments/viewdocument?DocumentKey=c376b950-e1b6-4e85-a3e2-10ef7008f222

Interagency Prescribed Fire Planning and Implementation Guidance

The Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS 484) provides standardized procedures specifically associated with planning and implementation of prescribed fire. These procedures meet all policy requirements described in the 2009 Guidance for Implementation of Federal Wildland Fire Management Policy (USDA, USDI, et al, 2009). The PMS 484 provides unified direction and guidance for prescribed fire planning and implementation for the U.S. Department of the Interior Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), National Park Service (NPS), Fish and Wildlife Service (FWS), and the U.S. Department of Agriculture Forest Service (USFS). The National Wildfire Coordinating Group (NWCG) member agencies agree with the principles identified in the PMS 484.

The Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS 484) was updated in July 2017. Available at: https://www.nwcg.gov/sites/default/files/publications/pms484.pdf

Element 1: Signature Page

PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT NAME(S): _____

PRESCRIBED FIRE NAME:
Prescribed Fire Unit (Ignition Unit): _____

PREPARED BY:
Name (print): _____ Qualification/Currency: _____

Signature: _____ Date: _____

TECHNICAL REVIEW BY:
Name (print): _____ Qualification/Currency: _____

Signature: _____ Date: _____

COMPLEXITY RATING: _____

MINIMUM BURN BOSS QUALIFICATION: _____

APPROVED BY:
Name – Agency Administrator (print): _____

Signature – Agency Administrator: _____ Date: _____

Element 2A: Agency Administrator Ignition Authorization

Replace this page with the signed: *Agency Administrator Ignition Authorization*, PMS 485

The Agency Administrator Ignition Authorization form is a separate PDF file that must be printed and signed.

The Agency Administrator Ignition Authorization must be completed before a prescribed fire can be implemented. If ignition of the prescribed fire is not initiated prior to expiration date determined by the agency administrator, a new authorization will be required.

Element 2B: Prescribed Fire Go/No-Go Checklist

Replace this page with the signed:
Prescribed Fire Go/No-Go Checklist,
PMS 486

The Prescribed Fire Go/No-Go Checklist form is a separate PDF file that needs to be printed and signed by the burn boss.

Element 3: Complexity Analysis Summary

This summary should include the same summary rationale that is in the complexity analysis in Appendix C of the prescribe fire plan.

ELEMENT	RISK	POTENTIAL CONSEQUENCE	TECHNICAL DIFFICULTY
1. Potential for escape			
2. The number and dependence of activities			
3. Off-site values			
4. On-site values			
5. Fire behavior			
6. Management organization			
7. Public and political interest			
8. Fire treatment objectives			
9. Constraints			
10. Safety			
11. Ignition procedures/methods			
12. Interagency coordination			
13. Project logistics			
14. Smoke management			

COMPLEXITY RATING SUMMARY	OVERALL RATING
RISK	
CONSEQUENCES	
TECHNICAL DIFFICULTY	
SUMMARY COMPLEXITY DETERMINATION	

Rationale:

Fill out Elements 4 through 21 based on the guidance provided in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484.

Element 4: Description of Prescribed Fire Area

A. Physical Description

1. Location**:**
2. Size:
3. Topography:
4. Project area:
5. Ignition units:

B. Vegetation/Fuels Description:

1. On-site fuels data:
2. Adjacent fuels data:
3. Percent of vegetative type and fuels model(s):

C. Description of Unique Features, Natural Resources, Values:

D. Maps - Attach in Appendix A

1. Vicinity (Required)
2. Project/Ignition Unit(s) (Required)
3. Significant or Sensitive Features (Optional): ☐ Included ☐ Not Included
4. Fuels or Fuel Model(s)(Optional): ☐ Included ☐ Not Included
5. Smoke Impact Area (Optional): ☐ Included ☐ Not Included

Element 5: Objectives

A. Resource objectives:

B. Prescribed fire objectives:

Element 6: Funding

A. Cost:

B. Funding source:

Element 7: Prescription

A. Prescription Narrative:

1. Describe how fire behavior will meet objectives

B. Prescription Parameters:

1. Environmental or fire behavior (or both)

2. Fire Modeling or empirical documentation (or both)

Element 8: Scheduling

A. Implementation Schedule:

1. Ignition Time Frames or Season(s) (or both)

B. Projected Duration:

C. Constraints:

Element 9: Pre-burn Considerations and Weather

A. Considerations:

1. On-site

2. Off-site

B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

C. Notifications:

Element 10: Briefing

A. Briefing Checklist; including, but not limited to: (additional items may be added)

- Burn organization and assignments
- Prescribed Fire objectives and prescription
- Description of prescribed fire project area
    - Special considerations and sensitive features
- Expected weather and fire behavior
- Communications
- Ignition plan
- Holding plan
- Contingency plan and assignments
- Wildfire declaration
- Safety and medical plan
- Aerial ignition briefing (if aerial ignition devices will be used)

Element 11: Organization and Equipment

A. Positions:

B. Equipment:

C. Supplies:

Element 12: Communication

A. Radio Frequencies:

1. Command frequency(ies):
2. Tactical frequency(ies):
3. Air operations frequency(ies):

B. Telephone Numbers:

Element 13: Public and Personnel Safety, Medical

A. Safety Hazards:

B. Mitigation: Measures Taken to Reduce the Hazards:

C. Emergency Medical Procedures:

D. Emergency Evacuation Methods:

E. Emergency Facilities:

Element 14: Test Fire

A. Planned Location:

B. Test Fire Documentation:

1. Weather conditions on site

2. Test fire results

Element 15: Ignition Plan

A. Firing Methods:

1. Techniques, sequences and patterns

B. Devices:

C. Minimum Ignition Staffing:

Element 16: Holding Plan

A. General Procedures for Holding:

B. Critical Holding Points and Actions:

C. Minimum Organization or Capabilities Needed:

Element 17: Contingency Plan

Management Action Points or Limits:

(Optional MAP Table Format)

Management Action Point - Documentation Element	Management Action Point Narrative
Designator and Description:	
Condition:	

Management Action Point - Documentation Element	Management Action Point Narrative
Management Intent:	
Recommended Action(s) to Consider:	
Recommended Resources:	
Time Frame:	
Describe the consequences of not taking the recommended action(s) (Optional):	
Responsibility:	
Date Each Action is Initiated (Optional):	

(if you need to include more MAPs, copy and paste the above template)

B. Actions Needed:

C. Minimum Contingency Resources and Maximum Response Time(s):

Element 18: Wildfire Declaration

A. Wildfire Declared By:

B. IC Assignment:

C. Notifications:

D. Extended Attack Actions and Opportunities to Aid in Fire Suppression (Optional):

Element 19: Smoke Management and Air Quality

A. Compliance:

B. Permits to be Obtained:

C. Smoke-Sensitive Receptors:

D. Potential Impacted Areas:

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:

Element 20: Monitoring

A. Fuels Information Required and Procedures:

B. Weather Monitoring (Forecasted and Observed) Required and Procedures:

C. Fire Behavior Monitoring Required and Procedures:

D. Monitoring Required to Ensure that Prescribed Fire Plan Objectives are Met:

E. Smoke Dispersal Monitoring Required and Procedures:

Element 21: Post-burn Activities

A. Post-Burn Activities that must be Completed:

Prescribed Fire Plan Appendices

Appendix A: Maps: Vicinity, Project or Ignition Units (or both), Optional: Significant or Sensitive Features, Fuels or Fuel Model, Smoke Impact Areas

Appendix B: Technical Reviewer Checklist

Appendix C: Complexity Analysis

Appendix D: Agency-Specific Job Hazard Analysis or Risk Assessment

Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation

Appendix F: Smoke Management Plan and Smoke Modeling Documentation (Optional)

Appendix A: Vicinity Map

Insert your vicinity maps here. Refer to Element 4D in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, to fill out this appendix.

Appendix A: Project (Ignition Units) Maps

Insert your project (ignition unit) map(s) here. Refer to Element 4D in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, to fill out this appendix.

Appendix A: Significant or Sensitive Features: (Optional) Maps

Insert your significant or sensitive feature map(s) here. Refer to Element 4D in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, to fill out this appendix.

Appendix A: Fuels or Fuel Model: (Optional) Maps

Insert your fuel or fuel model map(s) here. Refer to Element 4D in *the Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, to fill out this appendix.

Appendix A: Smoke Impact Areas: (Optional) Maps

Insert your significant or sensitive feature map(s) here. Refer to Element 4D in *the Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, to fill out this appendix.

Appendix B: Technical Reviewer Checklist

Fill out this checklist based on the guidance provided in the Technical Review section in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484.

Rate each element in the following table with an "S" for Satisfactory or "U" for Unsatisfactory. Use Comment field as needed to support the element rating.

PRESCRIBED FIRE PLAN ELEMENTS	RATING	COMMENTS
1. Signature page		
2. A. Agency Administrator Ignition Authorization, PMS 485		
2. B. Prescribed Fire GO/NO-GO Checklist, PMS 486		
3. Complexity Analysis Summary		
4. Description of Prescribed Fire Area		
5. Objectives		
6. Funding		
7. Prescription: Prescription Narrative and Prescription Parameters		
8. Scheduling		
9. Pre-Burn Considerations and Weather		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public and Personnel Safety, Medical		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Declaration		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-Burn Activities		
Appendix A: Maps		
Appendix C: Complexity Analysis		
Appendix D: Agency-Specific Job Hazard Analysis or Risk		
Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation		
Appendix F: Smoke Management Plan and Smoke Modeling Documentation (Optional)		
Other		

☐ **Approval is recommended** subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

☐ **Recommendation for approval is not granted**. Prescribed fire plan should be re-submitted for technical review subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

Technical Reviewer Signature: _____ Qualification and Currency: _____

Date Signed:_____

Appendix C: Complexity Analysis

Please refer to Element 3: Complexity Analysis Summary in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, and the procedures in *the Prescribed Fire Complexity Analysis Rating System Guide*, PMS 424, to fill out this appendix.

Appendix D: Agency-Specific Job Hazard Analysis or Risk Assessment

Please refer to your specific agency guidance to fill out this appendix.

Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation

Refer to Element 7: Prescription, *in the Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484, to fill out this appendix.

Appendix F: Smoke Management Plan and Smoke Modeling Documentation

(OPTIONAL)

Refer to the *Smoke Management Guide for Prescribed and Wildland Fire* (National Wildfire Coordinating Group, 2001) and Appendix B. Basic Smoke Management Practices in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484 to fill out this appendix.

Attachment G
Examples of Oregon Smoke Management Accomplishment forms

Oregon Department of Forestry- Smoke Management Accomplishment Form

Notify the Oregon Department of Forestry at **541-947-3311 (Lakeview) or 541-883-5681 (Klamath Falls), PRIOR** to burning, to obtain smoke management advisories, and as a courtesy to avoid fire suppression equipment and personnel being dispatched to your controlled bum. Advisories are also available @ http://egov.oregon.gov/ODF/FIRE/fire.shtml#Smoke_Management

Please use this log to record your burn accomplishments each day you burn. It is required to report this information on a weekly basis if burning activity is occurring.

Mail, phone, fax or bring into the office:

Klamath Falls:	3200 Delap Road Klamath Falls, OR 97601	Phone: 541-883-5681	Fax: 541-883-5555
Lakeview:	2290 North 4th Street Lakeview, OR 97630	Phone: 541-947-3311	Fax: 541-947-3078

Landowner Name: _____ Notification/Permit # _____

Date of Burn	Ignition Time	Acres Burned	Piled Tons Burned Within Unit	Landing Pile Tons Burned

-OVER-

Biomass Contractors *

Contractor**					HomeTown	Area of Operation	Contact	Phone	Address
Bar Seven A	v'	v'	v'	v'	Redmond	Oregon	Binny Skidgel	541-548-4747	!060 SE Lake Road – PO Box 890 Redmond, OR 97756
Bar Trucking		./	./		John Day	Oregon	Tim Nelson	541-910-0621	P9 Box 388, John Day, OR 97845
Better Bark & More		v'	v'		Toledo	l-5 Corridor	Zack Dahl	541-336-21 51	5441 U.S. 20, Toledo, OR 97391
Biomass Harvesting LLC	v'	v'	./		Banks	50-100 miles of Banks	Harve Dethlefs	503-324-2422 503-720-6589	120 N. Main, Banks, OR 97106
FCO Inc		v'	v'		Bend	Easte rn OR / WiL Vly	Wade Fagen	541-382-4997	1328 Seward Ave, Bend, OR 97701
Forest Energy Group, LLC	v'	v'	v'	v'	Central Point	Roseburg and south / Lakeview and west	Jack LeRoy	541-664-3476 541-840-1444	4953 Glen Echo Way, Central Point, OR97502
Gilbert Cutting and Contracting	./	./	./		Longview, WA	Oregon / Wash	Charles Gilbert, James Arndt	360-425-8078 541-413-1927	3211 Oak St, Longview, WA 98632
Godfrey & Yeager Excavating	v'	v'			Coos Bay	West side	Kevin Yeager	541-269-53 16 541-297-7197	PO Box 719, Coos Bay, OR 97420
Huffman-Wright	./				Canyonville	Douglas, s. Lane, n. Jackson & Josephine	Butch Wright	541-839-4251 541-863-2894	PO Box 910, 3rd & Huffman St, Canyonville, OR 97417
James Forest Products	v'	v'			Coquille	Curry, Coos, Douglas	Chase Carlson, Ron Robinson	541-396-3726	PO Box 40, Coquille, OR 97423
Lane Forest Products		v'		v'	Eugene	West side	Oren Posner	541-345-9085	2111 Prairie Road, Eugene, OR 97402
MarkGwillim	v'				Monroe	McMinnville to Roseburg	MarkGwillim	541-953-6235	PO Box 518, Monroe, OR 97456 .
McFarlane's Bark		./	v'	v'	Milwaukie	Oregon / Wash	Dan McFarlane	503-659-4240	13345 SE Johnson Rd, Milwaukie, OR 97222
Melcher Logging	v'				Sweet Home	depends on job	Scott Melcher	541-367-3232	1328 Clark Mill Road, Sweet Home, OR97386
Miller Timber Services	v'				Philomath	Oregon	Lee Miller, Dan Mase	541-929-2840	PO Box 638, 24745 Alsea Hwy, Philomath, OR 97370
Pacific Biomass	v'	v'	./	./	Lebanon	Wil.VIy I Snow Peak Area / Central OR	Ryan Wolfenburger	541-258-7188 541-979-8007	PO Box 2259, Lebanon, OR 97355
Pacific Hog		./	v'		Yamhill	Oregon	Carl Greenlund	503-871-3331	PO Box 57, Yamhill, OR 97148
PJF, Inc		./			Roseburg	Douglas County	Paul Fenter	541-863-7847 541-580-2685	2400 Clarks Branch Rd, MyrtleCreek, OR 97457
Quicksilver Contracting	v'	v'	v'		Bend	Eastern OR / WiL Vly	John Williams	541-382-3653 541-419-9446	64682 Cook Avenue #99, Bend, OR 97701-8465
Rexius Forest Products		./		v'	Eugene	200 miles of Eugene	Jack Hoek	541-335-8008	1275 Bailey Hill Rd, PO 22838, Eugene, OR 97402
S & H Landscape & Recycling		v'	v'	./	Tualatin	Oregon	Casey Stroupe	503-638-1011	20200, SW Stafford Rd, Tualatin, OR 97062
T2	v'	./	./	./	Sweet Home	Oregon	Steve Lawn	541-913-8681	44501 Wiley Creek Dr, Sweet Home, OR 97386-9767
Trails End Recovery, Inc. Custom Excavating)		v'	v'	v'	Warrenton	Oregon	Dean Larson	503-861-6030 503-741-0376	34661 Airport Ln, Warrenton, OR 97146-7402
Van Norman Logging	v'	v'	v'		Glendale	depends on job	Bud Van Norman, Cory Van Norman	541-660-4665 541-218-2000	PO Box 370, Glendale, OR 97442

* No endorsement or recommendation is implied in providing this information. When choosing any contractor: verifY documentation, check referrals, and evaluate previous wo

Contractors to change information or to be included on this list please call: (541) 440-3412 ext 172

OREGON SMOKE MANAGEMENT
REPORTING SYSTEM CODING SHEET
PART ONE, PAGE 1

Agency: _____ **Forest/District:** _____

Date entered (optional)	Unit Number (FACTS #) 1	District/ Forest ID 2	Owner Name (optional) 3	Owner ship 4	FPF No. (Opt) 5	Sale Name (optional) 6	Sale Unit No. (optional) 7	Township 8	Range 9	Sec. 10	County No. 11	Distance from SSRA 12	SPZ 13	Acres in Unit 14	Cutting Date 15	Harvest Diameter 16

Elev. 17	Slope % 18	Duff Depth 19	Type of Burn 20	Species of Fuel 21	Method Fuel Load 22	Landing or R/W Acres	Landing & R/W Pile Tons 23	Other Acres	Piled Tons 24	0-¼" Fuel per Acre * 25	¼-1" Fuel per Acre * 26	1-3" Fuel per Acre 27	3-9" Fuel per Acre 28	9-20" Fuel per Acre 29	20+" Fuel per Acre 30	Reason for Burn 31

Fee Structure:

Registration (All units) $0.50/acre	Landing/ROW Only $0.50/acre	Broadcast/In-unit piles after landings $2.60/acre	Broadcast/In-unit piles w/o landings $3.10/acre

Minimum fee = $30

OREGON SMOKE MANAGEMENT
REPORTING SYSTEM CODING SHEET
Part 2 and Part 3, Page 1

AGENCY:_____ FOREST/DISTRICT:._____

PART2 PLANNED BURNS									PART3 ACCOMPLISHMENT REPORT							
Date **entered** (optional)	**Unit Number** (FACTS#)	**District/ Forest** ID	**Planned** Date	Est. **Ignition Time**	**Acres Planned**	**Landing** Pile **Tons**	Unit Pile **Tons**	Best/ **Underburn Tons/Acre**	**Unit Number** (FACTS#)	**District/ Forest** ID	Date of **Burn**	**Ignition Time**	Landing/ R-0-W **Acres Burned**	**Landing or RJW Tons Burned**	Other **Acres Burned**
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7
-	_ _ __ _	__clQ<J000<		)0000(	)0000(	)00000(	_ _	_)Q9<_	xJOOOOOOOO	)000(	XXXXXX		xxxx	)00000(	)0000(

OREGON SMOKE MANAGEMENT
REPORTING SYSTEM CODING SHEET
Part 3(cont.),Page 2

	Enter for Broadcast and Underburn Only														
Unit Pile Tons Burned	BcsUUbrn Tons per Acre Burned	Ignition Our.	Ignition Method	Rapid Ignition (YIN)	WX Station Used	10-Hr Fuel Moist	1000-Hr Fuel Moist	1000-Hr Moist Method	Number Days Since Sig. Rain	Air Temp	Rei. Humidity	Wind Dir.	Wind Speed (mph)	Snow off Month	Remarks (optional)
8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	(Not entered in data system)
)0000(	XXX	XXX	X	X	XXXX	XX	XX	X	XXX	XXX	XXX	XX	XX	XX	

10/14/08 CFPA

SMOKE MANAGEMENT UNIT INFORMATION

D: - - - - - - - - - - - - - - - - - - -

NOTIFICATION#: (1111-740--.##)

FOREST ID: 721 CB 722 BR 723 GB

LANDOWNER: _____

OPERATOR:

OWNERSHIP:

FPF NO.:

SALE NAME:

SALE UNIT NO 0

TWP: 0S RNG: OW SEC: _____

ADD'L LEGAL:

LATITUDE:

LONGITUDE: _____

COUNTY:
06-COOS,08·CURRY,10·DGLS ———————

DISTANCE TO DA: ——————

SPZ: N

UNIT ACRES:--------

CUTTING DATE: ____,=,.---
MMIYY

HARVEST DIAMETER:----- BDCST AC ———— PILEAC _____

ELEVATION:--------

SLOPE:--------

DUFF DEPTH: _____

BURN TYPE:--------

FUEL SPECIES: _____

METHOD FUEL LOAD:------

	ACRES	TONS
LANDING ACRES/TONS:	_____	_____
OTHER ACRES/PILE TONS:	_____	_____
0-.25:/ACRE:		
0.26-1" ACRE:		
1.1-3"/ACRE:		
3.1-9"/ ACRE:		
9.1-20"/ACRE		
20" +/ACRE		
TOTAL TONS!AC:		
DUFF TONSIAC:		
TOTAL BURN TONS:		

	CON FACT	BURN TONS	CON FACT	BURN TONS	CON FACT	BURN TONS	CON FACT	BURN TONS
	30%		25%		20%			
	100%	0	100%	0	100%	0		
		0		0		0		
		0		0		0		
	0.38	0.00	0.59	0.00	0.ro	0.00		
	0.16	0.00	0.26	0.00	O.	0.00		
	0.08	0.00	0.13	0.00	0.18	0.00		
TOTAL TONS/AC.	0	0	0	0	0	0		
DUFF TONS/AC.	7	0	8	0	9	0		
TOTAL BURN TONS:	7	0	8	0	9	0		

BURN REASON: B

BURN FEE EXEMPT: N

UNIT ACCOMPLISHMENT INFORMATION

PLANNED	ACRES	TONS

*** If Exempt Status (Fee Status) is coded "N", attach Fee Registration form prior to submitting to Coos Bay Dispatch office.**

Reviewed by (initial): _____ SMK MGT Tracking: _____

SALE NAME **0**
NOTIFICATION#: **0**

Attachment H
Prescribed Fire Plan for BLM and USFS

Appendix B: Prescribed Fire Plan Template

A standardized, reproducible template form for the Prescribed Fire Plan development process is included in this appendix. A standardized format is provided for the Prescribed Fire Plan in PDF. An electronic version editable in Word is also available. Users should prepare the plan using the electronic version.

PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT(S): _____

PRESCRIBED FIRE NAME: _____

PREPARED BY: _____ **DATE:** _____

Name & Qualification/Currency

TECHNICAL REVIEW BY: _____ **DATE:** _____

Name & Qualification/Currency

COMPLEXITY RATING: _____

MINIMUM RXB REQUIREMENT: _____

APPROVED BY: _____ **DATE:** _____

Agency Administrator

ELEMENT 2: AGENCY ADMINISTRATOR GO/NO-GO PRE-IGNITION APPROVAL CHECKLIST

Instructions: The Agency Administrator's GO/NO-GO Pre-Ignition Approval is the intermediate planning review process (i.e. between the Prescribed Fire Complexity Rating System Guide and Go/No-Go Checklist) that should be completed before a prescribed fire can be implemented. The Agency Administrator's Go/No-Go Pre-Ignition Approval evaluates whether compliance requirements, Prescribed Fire Plan elements, and internal and external notifications have been or will be completed and expresses the Agency Administrator's intent to implement the Prescribed Fire Plan. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

YES	NO	KEY ELEMENT QUESTIONS
		Is the Prescribed Fire Plan up to date? *Hints: amendments, seasonality.*
		Will all compliance requirements be completed? *Hints: cultural, threatened and endangered species, smoke management, NEPA.*
		Is risk management in place and the residual risk acceptable? *Hints: Prescribed Fire Complexity Rating Guide completed with rational and mitigation measures identified and documented?*
		Will all elements of the Prescribed Fire Plan be met? *Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources*
		Will all internal and external notifications and media releases be completed? *Hints: Preparedness level restrictions*
		Will key agency staff be fully briefed and understand prescribed fire implementation?
		Are there any other extenuating circumstances that would preclude the successful implementation of the plan?
		Have you determined if and when you are to be notified that contingency actions are being taken? Will this be communicated to the Burn Boss?
		Other:

Recommended by: _____ Date: _____
FMO/Prescribed Fire Burn Boss

Approved by: _____ Date: _____
Agency Administrator

Approval expires (date): _____

ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLIST

	YES	NO
A. Has the burn unit experienced unusual drought conditions or does it contain above normal fuel loadings which were not considered in the prescription development? If NO proceed with checklist below, if YES go to item B.		
B. Has the prescribed fire plan been reviewed and an amendment and technical review been completed; or has it been determined that no amendment is necessary? If YES to any, proceed with checklist below, if NO, STOP.		

YES	NO	QUESTIONS
		Are ALL pre-burn prescription parameters met?
		Are ALL smoke management specifications met?
		Has ALL required current and projected fire weather forecast been obtained and are they favorable?
		Are ALL planned operations personnel and equipment on-site, available, and operational?
		Has the availability of ALL contingency resources been checked and are they available?
		Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?
		Have all the pre-burn considerations identified in the Prescribed Fire Plan been completed or addressed?
		Have ALL the required notifications been made?
		Are ALL permits and clearances obtained?
		In your opinion, can the burn be carried out according to the Prescribed Fire Plan and will it meet the planned objective?

If all the questions were answered "YES" proceed with a test fire. Document the current conditions, location, and results

_____ _____

Burn Boss Date

ELEMENT 3 COMPLEXITY ANALYSIS SUMMARY

PRESCRIBED FIRE NAME			
ELEMENT	**RISK**	**POTENTIAL CONSEQUENCE**	**TECHNICAL DIFFICULTY**
1. Potential for escape			
2. The number and dependence of activities			
3. Off-site Values			
4 On-Site Values			
5. Fire Behavior			
6. Management organization			
7. Public and political interest			
8. Fire Treatment objectives			
9 Constraints			
10 Safety			
11. Ignition procedures/ methods			
12. Interagency coordination			
13. Project logistics			
14 Smoke management			

COMPLEXITY RATING SUMMARY	
	OVERALL RATING
RISK	
CONSEQUENCES	
TECHNICAL DIFFICULTY	
SUMMARY COMPLEXITY DETERMINATION	
RATIONALE:	

ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

A. Physical Description

1. Location**:**
2. Size:
3. Topography:
4. Project Boundary:

B. Vegetation/Fuels Description:

1. On-site fuels data
2. Adjacent fuels data

C. Description of Unique Features:

ELEMENT 5: OBJECTIVES

A. Objectives:

1. Resource objectives:
2. Prescribed fire objectives:

ELEMENT 6: FUNDING:

A. Cost:

B. Funding source:

ELEMENT 7: PRESCRIPTION

A. Environmental Prescription:

B. Fire Behavior Prescription:

ELEMENT 8: SCHEDULING

A. Ignition Time Frames/Season(s):

B. Projected Duration:

C. Constraints:

ELEMENT 9: PRE-BURN CONSIDERATIONS AND WEATHER

A. Considerations:

1. On Site:

2. Off Site

B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

C. Notifications:

ELEMENT 10: BRIEFING

Briefing Checklist:

Burn Organization Prescribed Fire

Objectives Description of

Prescribed Fire Area Expected

Weather & Fire Behavior

Communications

Ignition plan

Holding Plan

Contingency Plan

Wildfire Conversion

Safety and Medical Plan

Aerial Ignition Briefing (if Required)

ELEMENT 11: ORGANIZATION AND EQUIPMENT

A. Positions:

B. Equipment:

C. Supplies:

ELEMENT 12: COMMUNICATION

A. Radio Frequencies

1. Command Frequency(s):
2. Tactical Frequency(s):
3. Air Operations Frequency(s):

B. Telephone Numbers:

ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL

A. Safety Hazards:

B. Measures Taken to Reduce the Hazards:

C. Emergency Medical Procedures:

D. Emergency Evacuation Methods:

E. Emergency facilities:

ELEMENT 14 TEST FIRE

A. Planned location:

B. Test Fire Documentation:

1. Weather conditions On-Site:

2. Test Fire Results:

ELEMENT 15: IGNITION PLAN

A. Firing Methods (including Techniques, Sequences and Patterns):

B. Devices:

C. Ignition Staffing:

ELEMENT 16: HOLDING PLAN

A. General Procedures for Holding:

B. Critical Holding Points and Actions:

C. Minimum Organization or Capabilities Needed:

ELEMENT 17: CONTINGENCY PLAN

A. Trigger Points:

B. Actions Needed:

C. Additional Resources and Maximum Response Time(s):

ELEMENT 18: WILDFIRE CONVERSION

A. Wildfire Declared By:

B. IC Assignment:

C. Notifications:

D. Extended Attack Actions and Opportunities to Aid in Fire Suppression:

ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY

A. Compliance:

B. Permits to be Obtained:

C. Smoke Sensitive Receptors:

D. Potential Impacted Areas:

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:

ELEMENT 20: MONITORING

A. Fuels Information Required and Procedures:

B. Weather Monitoring (Forecasted and Observed) Required and Procedures:

C. Fire Behavior Monitoring Required and Procedures:

D. Monitoring Required To Ensure That Prescribed Fire Plan Objectives Are Met:

E. Smoke Dispersal Monitoring Required and Procedures:

ELEMENT 21: POST-BURN ACTIVITIES

Post-Burn Activities That Must Be Completed:

APPENDICES

A. Maps: Vicinity and Project

B. Technical Review Checklist

C. Complexity Analysis

D. Agency Specific Job Hazard Analysis

E. Fire Behavior Modeling Documentation or Empirical Documentation (unless it is included in the fire behavior narrative in Element 7; Prescription)

A: MAPS

1. Vicinity Map:

2. Project Map:

B: TECHNICAL REVIEWER CHECKLIST

PRESCRIBED FIRE PLAN ELEMENTS:	S /U	COMMENTS
1. Signature page		
2. GO/NO-GO Checklists		
3. Complexity Analysis Summary		
4. Description of the Prescribed Fire Area		
5. Objectives		
6. Funding		
7. Prescription		
8. Scheduling		
9. Pre-burn Considerations and Weather		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public and Personnel Safety, Medical		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Conversion		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-burn Activities		
Appendix A: Maps		
Appendix C: Complexity Analysis		
Appendix D: Agency specific job hazard analysis		
Appendix E: Fire Prediction Modeling Runs or Empirical Evidence		
Other		

S = Satisfactory **U = Unsatisfactory**

Recommended for Approval: _____ Not Recommended for Approval: _____

_____ _____ _____

Technical Reviewer Qualification and currency (Y/N) Date

Approval is recommended subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

C: COMPLEXITY ANALYSIS

D: AGENCY SPECIFIC JOB HAZARD ANALYSIS

E: FIRE BEHAVIOR MODELING DOCUMENTATION OR EMPIRICAL DOCUMENTATION

Appendix S

Recreation Management Plan

Pacific Connector Gas Pipeline, LP

Recreation Management Plan

Pacific Connector Gas Pipeline Project

January 2018

Table of Contents

List of Tables

List of Attachments

1.0 INTRODUCTION

The public lands and waters crossed by the Pacific Connector Gas Pipeline Project (Pipeline or Pipeline Project) provide users with many opportunities for group and individualized forms of recreation. These include, but are not limited to: harvesting non-timber forest products, sightseeing, hunting, fishing, camping, cross-country skiing, mountain biking, snowmobiling and off-highway vehicle (OHV) use. Where the Pipeline Project is located on federal lands managed by the USDA Forest Service (Forest Service) and USDI Bureau of Land Management (BLM), Pacific Connector Gas Pipeline, LP (PCGP) recognizes the importance of maintaining safe access to outdoor recreation areas. In some cases, controlling access to the right-of-way to facilitate restoration activities and prevent damage to other resources is also a major concern. In addition the Coos Bay Estuary, crossed by the Pipeline (using two horizontal directional drills), and Kentuck Inlet support boating and other water-related recreation. To aid in maintaining recreation opportunities, limiting right-of-way access, and preventing user conflict on public lands and in the waterway within the Pipeline Project area, PCGP has prepared this Recreation Management Plan (Plan).

1.1 Purpose

The purpose of the Plan is to assist in the management of existing recreation resources on lands within the Pipeline Project area or impacted by the Pipeline. This Plan establishes goals for managing recreation in the vicinity of the Pipeline and describes actions to provide continued safe access, prevent resource damage, and to avoid potential user conflict.

1.2 Goals

- Goal 1: Provide for Safe and Continual Access to the Pacific Crest National Scenic Trail throughout the construction and revegetation phases, to the extent practicable.

- Goal 2: Minimize Potential User Conflicts at Trail Intersections used by hikers, skiers, snowmobilers, OHVs, and others.

- Goal 3: Prevent Unauthorized OHV Use on federal land where the Pipeline right-of-way could create additional access points.

- Goal 4: Provide Boaters and Anglers Safe Access within the Coos Bay Estuary.

- Goal 5: Minimize Recreation Access Disruption on public lands.

2.0 RECREATION IMPACTS

The impacts on a particular recreational activity and specific public land or waterway will depend on the timing of construction and the recreational activity. However, the various forms of recreation typical of the Pipeline Project area will not be permanently impacted by construction and operation of the Pipeline. During construction there would be temporary land and water access restrictions to recreationists on the construction right-of-way for safety reasons. Because construction and restoration along the proposed alignment will span a period of two to three years, there may be areas that remain off limits to recreationists until restoration is complete, revegetation has established, and the construction right-of-way is stabilized.

Temporary access restrictions would be dealt with on a case-by-case basis and in consultation with agency recreation specialists and user groups.

Extended periods of solitude or peaceful off-road camping, hiking or sightseeing in dispersed recreation sites (i.e., Peavine Camp, Project Camp, Brown Mountain Shelter, or dispersed recreation camps) within the vicinity of construction could be temporarily disrupted by the noise and dust from heavy equipment use and traffic. Appendix B to the Plan of Development (POD) provides PCGP's Air, Noise and Fugitive Dust Control Plan that describes the BMPs that would be utilized to control noise emissions and fugitive dust in more detail. Table 2-1 provides the major recreation areas in the Pipeline Project area.

Table 2-1
Major Recreation Areas in the Pipeline Project Area

Milepost	Recreation Site/Area	Recreation Type	Agency [1]	Direct Impacts
0.00-0.3	Oregon Dunes National Rec. Area	Hiking, OHVs, Sightseeing	FS-S	No
0.3-3.00	Coos Bay Estuary	Boating, Fishing, Boat Launch	ODFW, OPRD	No (HDDs)
167.86	Pacific Crest National Scenic Trail	Skiing, Hiking, Horses	FS-RRS	Yes
158.50-168.90	Brown Mountain Trail Network	Snowmobiles, Skiing, OHVs, Hiking, Horses	FS-RRS, FW	Yes

[1] FS=Forest Service; S=Siuslaw; ODFW=Oregon Dept. of Fish and Wildlife; OPRD=Oregon Parks and Recreation Dept; RRS=Rogue River-Siskiyou; FW=Fremont-Winema

Forest Service and BLM access roads in proximity to the Pipeline will experience short-term traffic increases during construction, and some roads may be temporarily closed to ensure safe transport of construction equipment to and from the construction right-of-way, as well as to facilitate construction in areas where the Pipeline is aligned within existing roads. As outlined in Section 3.1 (Notifications) of the Transportation Management Plan (see Appendix Y to the POD), PCGP will ensure that construction schedules are communicated to minimize potential access impacts.

During operations, the cleared right-of-way could be utilized by recreational users, including hikers, equestrians, skiers, and mountain bikers, especially where the corridor crosses existing roads and is easily visible and accessible. Although motorized travel would be discouraged and prevented by barricades suited to the particular area, other users may access the corridor and utilize it to connect with roads and trails. In higher elevations during the winter months, the pipeline corridor may be used by cross country skiers and possibly snowmobilers, depending on the effectiveness of the barricades and the preferences of the land owner/manager. PCGP is inclined to allow incidental use of the right-of-way as long as it does not result in resource damage, erosion, and/or conflict with land owner/manager preferences.

PCGP will make every effort to notify the agency(ies) at least seven (7) days in advance of road and trail closures. District recreation managers from both the Forest Service and BLM will be contacted, as necessary. In some instances, unforeseen schedule changes may limit the seven-day notice goal; in such cases, a minimum 48-hour notice will be provided. Mitigation measures are detailed in Section 3.0 below.

2.1 Recreation Areas

Coos Bay Estuary. Clamming, crabbing, and fishing are common year-round recreation activities in Coos Bay. Canoeing, kayaking, and boating are also common in the sloughs, feeder streams, and tidal waters of the bay.

The Coos Regional Trails Partnership, a consortium of land management agencies and economic development groups developed a brochure that maps Coos Bay's water trails for kayakers and other paddlers. Portions of a water trail is in proximity to the proposed alignment. The Coos Bay Trail starts near North Point, at the south end of the Conde B. McCullough Memorial Bridge (SH 101) (however, the nearest boat ramp is to the south, at the California Avenue Boat Ramp). From the bridge, the trail heads to the east, and then south along the western side of Coos Bay. The Pipeline would cross this water trail approximately 0.35 mile to the southeast of the water trail starting point (at North Point). However, Coos Bay (and the water trail) would be crossed using a horizontal directional drill (HDD). At Kentuck Inlet, the HDD would exit in uplands outside of the open waters of the inlet. Therefore, there would be no impacts to boaters using the water trail or in eastern Coos Bay.

Similarly, from Jordan Cove to the North Point area, an HDD would be used to cross Coos Bay from MPs 0.29 to 0.9. While this part of Coos Bay does not have a designated water trail, this is an active shipping channel area with commercial and recreational boat use. No impacts to boaters would occur from the HDD operations from Jordan Cove to North Point.

There is also a popular fall Chinook salmon fishery throughout the southern portion of Coos Bay and in the Coos River. Anglers fish from late August through late October and would not be affected by Project activities because the alignment has been routed away from this area and the Coos River at MP 11.13R would be crossed using a Horizontal Directional Drill.

Blue Ridge Trail System. This 1,405-acre BLM recreation area (Extensive Recreation Management Area-ERMA) is within the BLM's Coos Bay District. It was designated for hiking, biking, equestrian, and motorcycle trails. This area supports approximately 12 miles of trails, but these trails interconnect with a large network of logging roads which can also be utilized. Active timber harvest and management operations occur in this area; as such, road closures occur intermittently for logging operations. The Pipeline would cross this ERMA from MP 19.92 to MP 22.11 for approximately 2.2 miles. In addition, PCGP would utilize several of the existing roads in this ERMA for construction access.

The Pipeline would cross three Blue Ridge trails. During construction these trail segments would need to be closed, similar to when logging activities occur in the area, and there will be increased traffic volumes on existing roads. Travelers may experience increased traffic congestion and short delays, and access to some of the trails may be precluded. After construction is complete, PCGP would restore trail alignments affected by the Pipeline.

Pacific Crest National Scenic Trail. The Pipeline crosses the Pacific Crest National Scenic Trail (PCT) at approximately MP 167.8. This section of the trail is used year-round by hikers, equestrian users, cross-country skiers, and snow-shoers. The PCT users could be temporarily impacted by construction and might experience short-term (potentially 48 hours or less) delays and/or temporary detours at the trail-pipeline intersection.

Off-Highway Vehicles and Right-of-Way Access. The right-of-way could increase unauthorized OHV, snowmobile, and dispersed motorized access and its associated potential resource

impacts. Locations where unauthorized access could be exacerbated by the right-of-way include: the area around the PCT near MPs 167.0-169.0; the Camel Hump area between MPs 123 and 128; the Obenchain area between MPs 132 and 137.2; and along the Clover Creek Road between MPs 168.9 and 175.4 (on Forest Service-administered land), MPs 176.2 to 177, and MPs 179.6 to 179.7 (on BLM lands). In the Obenchain area, four-wheel drive vehicles have caused extensive resource damage, and there is concern that the right-of-way might create opportunities for more access and impacts. The Camel Hump and Obenchain areas are located within the Jackson Access and Cooperative Travel Management Area, which encompasses both private and BLM lands, and is generally closed to motorized use from mid-October through April. Because the Pipeline will closely parallel Clover Creek Road for 18 miles on public and private lands, the right-of-way clearing could potentially see increased unauthorized OHV use, without appropriate barriers and mitigation.

Brown Mountain Multi-Use Trails. In addition to summer recreation, the PCT and surrounding/connecting trails form a popular cross-country ski trail system during the winter. Snowmobile use is also a popular winter activity in the general area around MPs 160.0-170.0. Due in part to a housing development at Clover Creek Road, land managers have noted that snowmobile users have been accessing and crossing the PCT between Dead Indian Memorial Road and Forest Road (FR) 700. The Pipeline Project could potentially contribute to this problem without appropriate mitigation.

Lake of the Woods. This popular lake in the Fremont-Winema National Forest hosts fishing, camping, and various forms of boating and water-based recreation during summer months. A private resort and marina on the lake provides seasonal lodging and food service. During the winter, cross country skiing and snowmobiling are common activities in the area. Lake of the Woods is a potential source for water used in the Pipeline Project's hydrostatic testing requirements. The proposed withdrawal would likely occur in late summer/fall. No road or recreation facility closures are anticipated for water withdrawals and transport. The water would be withdrawn from the east side of the lake near the Sunset Campground and boat launch, and transported using tanker trucks on Forest Service Road FS 3700240 and Dead Indian Road (see Drawing 3430.31-Y-Map 27a of the Transportation Management Plan included as Appendix Y to the POD). As noted in Section 3.1, once PCGP has selected a Contractor and the Contractor has assessed the water withdrawal requirements, the Contractor will work through PCGP to submit a water withdrawal plan to the Forest Service to minimize recreational user impacts and encumbrances at the lake.

Fish Lake. Located on the Rogue River-Siskiyou National Forest near the crest of the Cascades, this scenic lake provides year-round recreational opportunities. The Fish Lake Recreation area provides Forest Service campgrounds, picnic areas, a boat-launch ramp, as well as a privately-operated resort with cabins, a trailer park, additional camp sites, food service, and a marina. During the winter, ice fishing, cross-country skiing and snowmobiling are common activities in the area. Fish Lake is a potential source for water used in for the Pipeline Project's hydrostatic testing requirements. The proposed withdrawal would likely occur in late summer/fall. No road or recreation facility closures are anticipated for water withdrawals and transport. The water would be potentially withdrawn from two locations; with one location located at the lower end of the lake near the dam and the second at the upper end of the lake near Fish Lake Campground and the boat ramp. Water would be transported using tanker trucks on Forest Service Roads 2800700 and 2800705 for access near the Dam, and Forest Service Road 2800800 for access near the Campground (see Drawing 3430.31-Y-Map 025a of the Transportation Management Plan included as Appendix Y to the POD). As noted in Section 3.1, once PCGP has selected a Contractor and the Contractor has assessed the water

withdrawal requirements, the Contractor will work through PCGP to submit a water withdrawal plan to the Forest Service to minimize recreational user impacts and encumbrances at the lake.

3.0 MITIGATION

Generally, recreation mitigation on federal lands will be ongoing through all phases of construction and will consist of trail barriers, signage, agency and user group consultation, and adaptive construction techniques. Detours will be established for trails, if necessary, and PCGP will coordinate with the appropriate agencies to minimize construction-related impacts. If unanticipated recreational impacts occur during construction or operations, the appropriate land managing agency will notify and request that PCGP address/mitigate the impact. Construction near these areas will be short-term in nature. Following construction, all disturbed areas will be restored to pre-construction contours and recreational activities will continue unimpeded. Where practical, PCGP will design recreation resource mitigation measures in ways that do not conflict with the area's visual resources. Pipeline operation activities will not be noticeable to recreationists, except in periodic cases of inspection and maintenance during the life of the Pipeline.

Where necessary during construction in areas of recreational use, PCGP will water roads and areas of active construction when site-specific conditions require dust suppression to minimize potential impacts associated with fugitive dust. Watering for fugitive dust abatement will be directed by PCGP's Environmental Inspectors (EIs) and will take into account recommendations and concerns raised by the federally-authorized representative on federally-managed land. The water for dust control will be acquired from an approved source. The Air, Noise and Fugitive Dust Control Plan (Appendix B to the POD) describes the Best Management Practices that will be employed to minimize fugitive dust. Overall, construction-related impacts to recreation will be minimized by:

- Not allowing construction workers to camp on federal lands;
- Continued coordination with each affected land management agency, as necessary, to finalize site-specific mitigation measures to address recreational land impacts; and
- Effective post-construction reclamation of the construction right-of-way as outlined in the Erosion Control and Revegetation Plan (ECRP) (see Appendix I to the POD).

After construction, pipeline monitoring methods will be conducted which will benefit vegetation restoration and discourage vehicle access. Specifically, where necessary, steep portions of the pipeline corridor should be posted closed to all vehicles. Successful revegetation efforts and the absence of vehicle tracks on these areas will help discourage unauthorized vehicle use by not attracting attention to "hill climbs." Monitoring-related impacts to recreation will be minimized by:

- Conducting inspections of pipeline sections on foot instead of by vehicle, where steep pipeline corridor sections are visible from nearby roads.
- Conducting vehicle monitoring only during dry conditions.

Descriptions of specific mitigation measures are detailed below. These measures are subject to change and could be expanded, substituted, or abandoned as a result of ongoing consultations with agency recreation specialists.

3.1 Specific Mitigation for Recreation Sites/Types

Coos Bay. Initial routes would have impacted recreational boater use in Coos Bay and in various inlets. With PCGP's proposed route (i.e., HDDs of Coos Bay), there will be no impact to water trails or boater traffic in the Bay.

Recreationists accessing beach and shoreline activities at the Coos Bay Shorelands Recreation Management Area and Oregon Dunes National Recreation Area would likely see some traffic impacts on Jordan Cove Road, Trans Pacific Lane, and on the other local roads near Jordan Cove. This would be due to mobilization of equipment, supplies, and workers to the Pipeline location at Jordan Cove; these traffic impacts, as related to pipeline construction, may last for up to two years. However, in this area pipeline construction and associated traffic would be occurring at the same time as the terminal construction activities, therefore traffic related to the pipeline would be unnoticeable with the larger volume of traffic associated with the terminal activities. Access would not be precluded to recreation sites in this area, but some delays are likely during some periods of construction.

Pacific Crest National Scenic Trail Crossing. To minimize impacts to trail users, PCGP has necked down the construction right-of-way from 95 feet to 75 feet in width for more than 300 feet on both sides of the trail. Additionally, at the request of the Forest Service, the alignment in the PCT area was designed with a "dog leg" to avoid a perpendicular crossing of the trail, thereby reducing visibility of the pipeline corridor for users. Construction of the trail crossing will also be completed as a "tie-in" so that trenching, pipe stringing, and installation activities do not interrupt trail users for extended periods. It is expected that construction of the trail tie-in would be completed within 48 hours or less to minimize potential impacts to trail users and reduce the need for trail detours. Additionally, PCGP will implement the following:

- Establish a roughed-in trail tread within 24 hours of construction crossing completion with temporary directional signs posted at each end of the crossing.
- Remediate trail to full design standards within two weeks (weather permitting) of the trail crossing construction.
- Install standard Nordic ski trail markers, as needed, post-construction.
- Provide as much advance notice as possible to the Forest Service District Ranger and the Pacific Crest Trail Association (PCTA) as to the estimated construction dates in the area of the trail.
- Notify the Forest Service District Ranger 48 hours in advance if any anticipated delays for PCT users would exceed one hour.
- Provide at least 7 days advance notice if the PCT needs to be detoured.
- Obtain Forest Service approval and install detailed signage for detour routes.
- Plan, if practicable, for PCT disruption outside of the trail's busiest hiking season (mid-July to early August).
- Use a combination of rocks, logs, slash, and gates to deter motorized vehicles and OHVs from gaining access to the PCT, in such a manner as to not adversely impact the area's visual resource qualities, to the extent practicable.

Upon completion of construction in the area, PCGP will revegetate the construction right-of-way using native trees (not within the 30 foot-operational easement), shrubs, and plants. Section 3.0

of the Aesthetics Management Plan – (Appendix A to the POD) describes additional measures to be used on federal lands for protecting and mitigating for visual resources. PCGP will coordinate with the Forest Service and the Pacific Crest Trail Association regarding the need for and location of trail detours.

Representatives of PCGP and the Forest Service conducted a site visit to the PCT in November 2016. The purpose of the site visit was to develop additional measures that could be implemented at the PCT crossing to minimize impacts and to shorten vegetative recovery to achieve a VQO of Modification within five years. Additional measures include:

- Identify trees along the edge of the construction right-of-way that can be saved from clearing, based on hazard tree and construction safety.
- Scallop adjacent edges of timber as directed by the Forest Service landscape architect.
- Salvage topsoil (duff and A horizon) to a depth of 12-inches along the trench line, segregate from spoil material, and replace during restoration.
- Minimize grading within the 75-foot construction right-of-way based on safety requirements. Stumps would be removed, or gridded as necessary to provide a safe equipment working plane.
- A 75-foot wide visual screen on either side of the trail would be replanted with nursery trees and shrubs within 6 days of final grading, dependent on seasonal planting constraints (and not within the 30 foot-operational easement). Replanting would be with mixed conifer species of differing age class per the USFS landscape plan and would include hydro-mulch seeding.
- Revegetate the remaining right-of-way with nursery trees and shrubs planted along the edges of the right-of-way in scalloped arrangement.
- Hydro-mulch seeding all disturbed soils.
- Place logs and LWD in the construction right-of-way as directed by the USFS landscape plan.
- A gravity drip irrigation system would be used, with a water source from the well at Brown Mountain Shelter, to improve replanting establishment.
- Replanting would occur if mortality exceeds 30 percent.

Off-Highway Vehicle Control and Right-of-Way Access. PCGP prefers to limit OHV use on the right-of-way to avoid problems with revegetation efforts, prevent potential erosion, avert user conflicts, and because it is typically the preference of the landowner. To minimize OHV access on the right-of-way, PCGP will install barriers at appropriate locations in coordination with the land management agencies or landowner. The proposed OHV barriers will be designed and constructed in a manner that attempts to prevent unauthorized motor vehicle/OHV use of and along the right-of-way. It has been PCGP's experience that unauthorized OHV trespass can be difficult to control in some heavy OHV use areas.

The need for OHV control measures will be assessed primarily where the right-of-way intersects roads, OHV trails, or other trails. These areas will be identified by the EI and/or authorized agency representative. PCGP will consult with the land management agencies for review and approval of site-specific designs for OHV control. All designs will meet agency standards, and, where applicable, will not conflict with visual resource management objectives or impact the area's visual resources.

To deter potential user conflicts and resource damage caused by unauthorized OHV use (including snowmobiles), PCGP will provide various natural and constructed control measures at select intersections of the right-of-way with road and trail crossings. These would include, but are not limited to the PCT area, the Camel Back, and Obenchain Road areas, Dead Indian Memorial Highway, FR 700, and along the Clover Creek Road. Where feasible, and depending on the site-specific conditions at the area of concern and management agency/landowner preferences, one or more of the following items may be used to control OHV access (see Figures 1 through 3 in Attachment 1 for typical diagrams of OHV control measures):

- Dirt/rock berms placed across the right-of-way, sometimes coupling as part of erosion control measures;
- Non-merchantable logs, slash and/or stumps strategically placed along the construction right-of-way as prohibitive barriers (see Figure 1);
- Large rocks and boulders partially buried along the right-of-way and at road crossings to block access but also positioned in such a manner as to not form an attractive OHV "obstacle course" (see Figure 1);
- At the request of the BLM and Forest Service, trench/earthen barriers would not be installed on federal lands. These types of barriers (see Figure 2) may be utilized on private lands at the direction of or where approved by the landowner.
- Signs (see Figures 3) and/or locked gates and fencing;
- Additional signing and gating needs within the Jackson Access and Cooperative Travel Management Area (Camel Hump and Obenchain areas) will be coordinated with the Oregon Department of Fish and Wildlife.
- Vegetative screens planted or transplanted to block and/or disguise the right-of-way;
- Salvaged woody debris (slash) scattered across the right-of-way to discourage OHV use;
- OHV barriers in sensitive viewsheds will be developed and installed in accordance with guidelines found in PCGP's Aesthetics Management Plan (see Appendix A to the POD); and/or
- Where necessary, OHV control structures would extend out beyond the right-of-way to prevent drive-around and would be built at an appropriate height to prevent passage.

Additionally, PCGP will establish a line of communication between the federal management agencies and landowners in the vicinity of Clover Creek Road, Dead Indian Memorial Highway, and FR 3720 in order to help prevent current and potential future snowmobile and OHV use on non-motorized trails in the area.

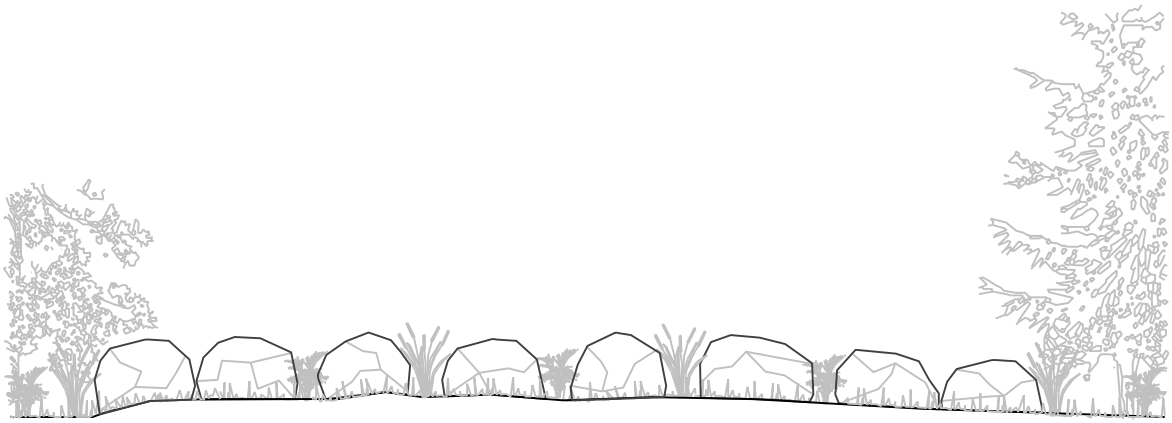
PCGP will coordinate with each affected land management agency during construction and restoration to finalize site-specific OHV control measures. Following construction, the effectiveness of the site-specific measures will be assessed in consultation with the land management agencies, on a periodic basis. Generally, these assessments will be made in conjunction with revegetation monitoring and in response to identified problem areas. Adjustments will be made to OHV control measures as indicated by such assessments. PCGP will be responsible for monitoring and managing unauthorized OHV use during the life of the Pipeline, will implement additional measures as necessary, and will continue to coordinate with

federal land management agencies during operations to ensure deterrence of unauthorized OHV use on the right-of-way.

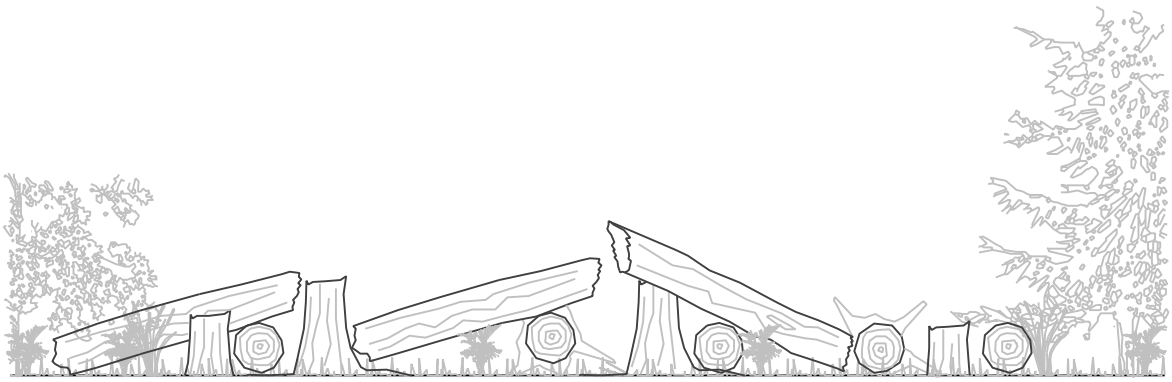
Brown Mountain Multi-Use Trails. To help prevent potential user conflict, PCGP will provide OHV and snowmobile control measures, to the extent practicable and safe, at key right-of-way road and trail crossings as described above. These include the Dead Indian Memorial Highway, FR 700, and other appropriate locations. PCGP will engage in ongoing consultation and monitoring with local recreation groups and land managers during the construction phases and, if necessary, following construction to assess and modify the mitigation.

Lake of the Woods and Fish Lake Hydrostatic Test Water Withdrawals. Lake of the Woods and Fish Lake are potential sources of water for use in the Pipeline Project's hydrostatic testing requirements. The proposed withdrawals would likely occur in late summer/fall. Although no roads or recreation facility closures are anticipated for water withdrawals and transport, potential localized impacts to the lakes' recreational users could occur, if construction activities are not properly planned. Therefore, once PCGP has selected a Contractor, and the Contractor has assessed the water withdrawal requirements, the Contractor will work through PCGP to submit a water withdrawal plan to the Forest Service to minimize potential recreational user impacts and encumbrances at these lakes. The plan will address operational requirements, workspace requirements, schedule of operations, and Best Management Practices to ensure environmental protection and measures to minimize potential impacts to the lakes' recreational users.

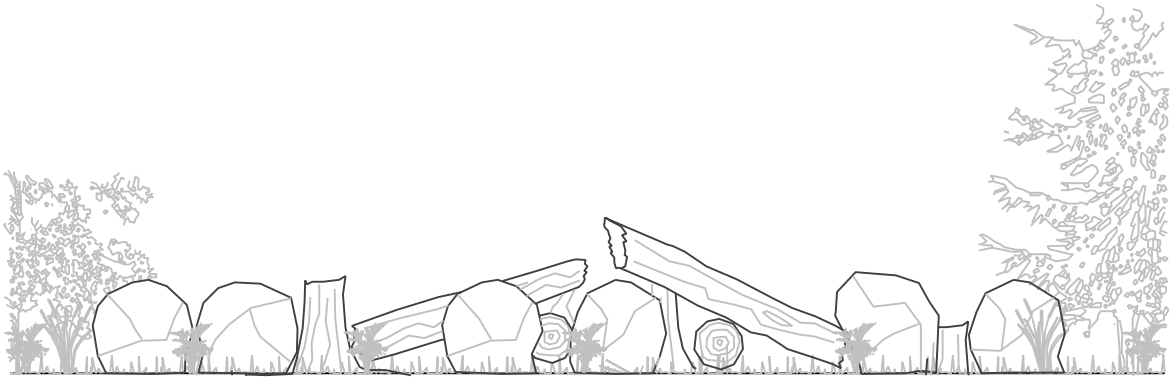
Attachment 1
Figures



OHV ROCK BARRIER



OHV SLASH BARRIER

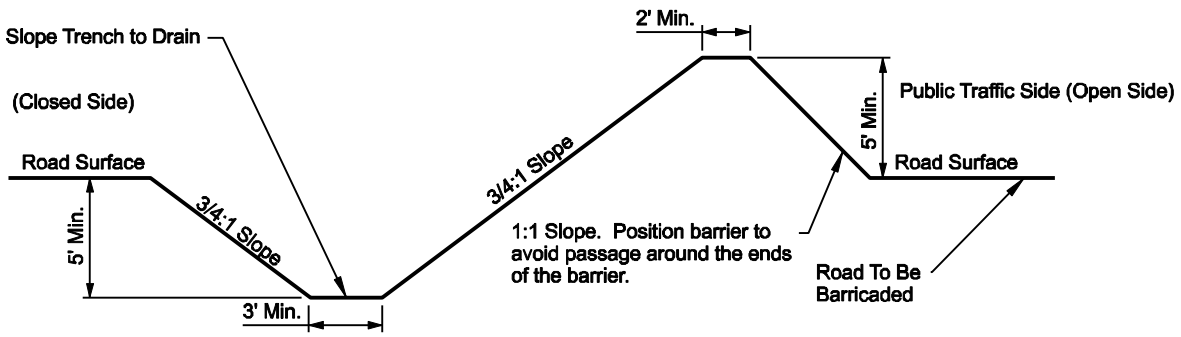


OHV ROCK / SLASH BARRIER

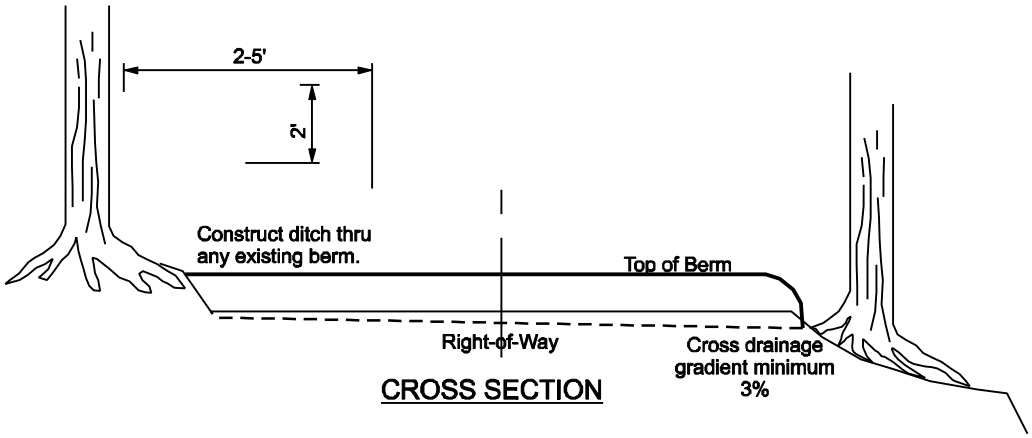
NOTES:

1. Large rocks/boulders used to deter OHV traffic will be approximately 3 feet in diameter, partially buried and spaced to prevent OHV traffic including motorcycle use.
2. Slash, including stumps, logs and tree tops may be appropriate piled and stacked to create an effective OHV deterrence across the right-of-way at road intersections, trails and other appropriate locations.
3. Multiple methods and types of OHV barriers may be used to prevent/discourage OHV traffic.
4. Ensure OHV deterrence by extending barriers to existing vegetation or other natural barriers to discourage OHV traffic from accessing the pipeline corridor. Barriers may need to extend outside of the pipeline ROW in order to be effective.
5. Unnatural rows of barriers should be avoided. Barricade material should be more heavily concentrated directly adjacent to potential access points, roads trails and parking areas then decrease in density further away from the access point.

FIGURE 1
TYPICAL ROCK/SLASH OHV BARRIERS



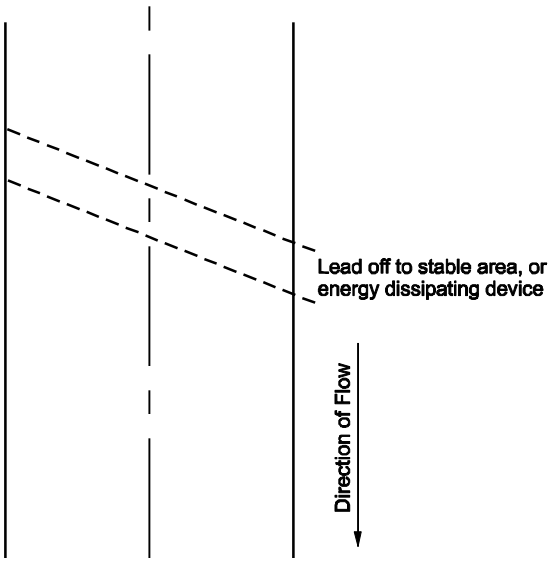
PROFILE



CROSS SECTION

NOTES:

1. Barriers should be sloped to drain with a relief ditch through the down slope edge of the right-of-way. The trench shall be behind the berm for approaching traffic.
2. Tie-in to existing vegetation or other natural barrier when feasable. Use large rocks/boulders, stumps or slash where barriers are not present to control OHV traffic from bypassing trap.
3. On private lands the structure locations will be approved by the landowner. These structures are not approved for use on federal lands.
4. Trench depth to be determined by PCGP when paced across the right-of-way to ensure pipeline protection.



PLAN VIEW

FIGURE 2
TYPICAL TRENCH/EARTHEN BERM BARRIER SPECIFICATIONS
(Not to be used on federal lands)

Figure 3
Examples of Signs[1] that Could Be Posted
to Discourage OHV & Snowmobile Traffic on the Construction Right-of-Way

[1] http://www.benmeadows.com/