Pacific Connector Gas Pipeline, LP

Resource Report No. 1

General Project Description

Pacific Connector Gas Pipeline Project

March 2017

General Project Description Location of Information to Satisfy Minimum Filing Requirements	
	Section
1. Provide a detailed description and location map of the project facilities – Title 18 Code of Federal Regulations (CFR) part (§) 380.12 (c)(1)	1.1 and Figure 1.1-1
2. Describe any non-jurisdictional facilities that would be built in association with the project	1.8
3. Provide current original U.S. Geological Survey 7.5-minute-series topographic maps with mileposts showing the project facilities – 18 CFR § 380.12 (c)(3)	Appendix 1G
4. Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the project facilities – 18 CFR § 380.12 (c)(3)	Appendix 1H
5. Provide plot/site plans of compressor stations showing the locations of the nearest noise sensitive areas within 1 mile – 18 CFR § 380.12 (c)(3,4)	Resource Report 9
6. Describe construction and restoration methods – 18 CFR § 380.12 (c)(6)	Section 1.3 and ECRP
7. Identify the permits required for construction across surface waters – 18 CFR § 380.12 (c)(9)	Section 1.6 Table 1.6-1
8. Provide the names and address of all affected landowners and certify that all affected landowners will be notified as required in § 157.6(d) – 18 CFR § 380.12 (c)(10)	Appendix 1D Filed as privileged

Information Recommended or Often Missing	
	Section
Describe all authorizations required to complete the proposed action and the status of applications for such authorizations, including actual or anticipated submittal and receipt dates.	Table 1.6-1
Provide plot/site plans of all aboveground facilities that are not completely within the right-of-way.	
Provide detailed typical construction right-of-way cross-section diagrams for each proposed right- of-way configuration showing information such as widths and relative locations of existing rights- of-way, new permanent rights-of-way, and temporary construction rights-of-way. Clearly identify any overlap of existing rights-of-way for projects involving collocation. Identify by pipeline facility and milepost where each right-of-way configuration	Figure 1.5-1
Summarize the total acreage of land affected by construction and operation of the project.	Table 1.2-1
Describe cathodic protection system; include associated land requirements as appropriate.	Section 1.4
Describe construction and restoration methods for offshore facilities as well as onshore facilities.	Section 1.3 and ECRP
For proposed abandonments, describe how the right-of-way would be restored, who would own the site or right-of-way after abandonment, who would be responsible for facilities that would be abandoned in place, and whether landowners were given the opportunity to request removal.	N/A
If Resource Report 5, Socioeconomics is not provided, provide the start and end dates of construction, the number of pipeline spreads that would be used, and the workforce per spread	Sections 1.3 and RR5
If project includes construction in the federal offshore area, include in the discussion of required authorizations and clearances the status of consultations with the Bureau of Ocean Energy Management, Regulation and Enforcement. File with the Bureau of Ocean Energy Management, Regulation and Enforcement for right-of-way grants at the same time or before filing the Federal Energy Regulatory Commission (FERC) application.	N/A
For project involving the import or export of natural gas/liquefied natural gas and construction of liquefied natural gas facilities, include in the discussion of required authorizations and clearances the status of consultations and authorizations required from the U.S. Department of Energy, U.S. Coast Guard, and the Federal Aviation Administration, as applicable.	N/A
Send two (2) additional copies of topographic maps and aerial images/photographs directly to the environmental staff of the Office of Energy Projects.	
Provide an electronic copy of the landowner list directly to the FERC environmental staff (check with FERC staff for required format).	

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(to be filed in subsequent draft of this resource report)

List of Abbreviations and Acronyms

ABVA	automated block valve assembly
ACEC	Area of Critical Environmental Concern
API	American Petroleum Institute
BLM	Bureau of Land Management
BMP	Best Management Practice
BPA	Bonneville Power Administration
Bcfd	billion cubic feet per day
BVA	block valve assembly
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
CP	cathodic protection
DLCD	Department of Land Conservation and Development
Dth/d	Dekatherms per day
DOE/FE	United States Department of Energy Office of Fossil Energy
DOT	U.S. Department of Transportation
ECRP	Erosion Control and Revegetation Plan
EI	Environmental Inspector
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FEIS	Final Environmental Impact Statement
Forest Service	U.S. Forest Service
FWS	U.S. Fish and Wildlife Service
GTN	Gas Transmission Northwest
HDD	horizontal directional drill
HP	horsepower
I-5	Interstate-5
ISO	International Organization for Standardization
JCEP	Jordan Cove Energy Project, LP
JCLNG	Jordan Cove Energy LNG, LLC
JPA	Joint Permit Application
LiDAR	Light Detection and Ranging
LNG	liquefied natural gas
LSR	Late Successional Reserve
LWD	large woody debris
MAMU	marbled murrelet
MAOP	maximum allowable operating pressure
Mg/L	milligrams per liter
MP	milepost
MW	megawatts
NAIP	National Agricultural Imagery Program
NEPA	National Environmental Policy Act
NFS	National Forest System
NGA	Natural Gas Act
NHD	National Hydrography Dataset
NOI	Notice of Intent
NRCS	Natural Resource Conservation Service
NSO	northern spotted owl
NWI	National Wetland Inventory
O&C	Oregon & California
OAR	Oregon Administrative Regulations
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife

ODOT	Oregon Department of Transportation
ODSL	Oregon Department of State Lands
OHV	off-highway vehicle
OHWM	ordinary high water mark
ORS	Oregon Revised Statutes
OSHA	Occupational Safety and Health Administration
OWRD	Oregon Water Resources Department
PAR	permanent access road
PCGP	Pacific Connector Gas Pipeline
PHMSA	Pipeline and Hazardous Materials Safety Administration
PI	point of intersection
ppm	parts per million
POD	Plan of Development
psig	pounds per square inch gauge
SPCC	Spill Prevention, Containment, and Countermeasures
SUA	Special Use Authorization
SVID	Shasta View Irrigation District
SWPPP	Stormwater Pollution Prevention Plan
TAR	temporary access road
TEWA	temporary extra work area
TMP	Transportation Management Plan
UCSA	uncleared storage area
USDA-FS	U.S. Department of Agriculture – Forest Service
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WRP	Wetland Reserve Program

1. GENERAL PROJECT DESCRIPTION

1.0 INTRODUCTION

Pacific Connector Gas Pipeline, LP ("PCGP") is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") under Section 7 of the Natural Gas Act ("NGA") to construct and operate a new approximately 235-mile-long, 36-inch-diameter natural gas transmission pipeline ("Pipeline") capable of transporting approximately 1,200,000 dekatherms per day (Dth/d) of natural gas from interconnections with two existing interstate natural gas pipelines (Ruby Pipeline LLC's Ruby Pipeline and Gas Transmission Northwest LLC's GTN Pipeline) near Malin, Oregon, to the proposed Jordan Cove Liquefied Natural Gas ("LNG") export facility ("LNG Terminal") being developed by Jordan Cove Energy Project, L.P. ("JCEP"). The Pipeline and the LNG Terminal are referred to, collectively, as the "Project."

Contemporaneously, JCEP is seeking authorization from the Commission under Section 3 of the NGA to site, construct, and operate the LNG Terminal, located on the bay side of the North Spit of Coos Bay, Oregon. JCEP will design the LNG Terminal to receive a maximum of 1,200,000 Dth/d of natural gas and produce a maximum of 7.8 million tonnes per annum ("mtpa") of LNG for export. JCEP plans to submit a contemporaneous application to FERC that will include its own set of resource reports.

FERC's National Environmental Policy Act ("NEPA") review process requires that an applicant submit an Environmental Report consisting of up to 13 individual resource reports. While the LNG Terminal and the Pipeline are interrelated projects, this Resource Report 1 provides a description of the Pipeline and its purpose and need, as well as a specific description of the Pipeline facilities and certain non-jurisdictional facilities. This resource report also includes a description of the benefits to the local Pipeline area, land requirements, construction and operation procedures, and applicable regulatory approvals and coordination, as well as the current construction schedule for the Pipeline.

This resource report is consistent with and meets or exceeds all applicable FERC filing requirements. A checklist showing the status of FERC's filing requirements for Resource Report 1 (18 CFR § 380.12) is included following the table of contents.

1.1 PROPOSED FACILITIES

1.1.1 Statement of Purpose and Need

The overall Project purpose and need is to construct a natural gas liquefaction and deep-water export terminal capable of receiving and loading ocean-going LNG carriers, that receives its natural gas supply from a point near the intersections of the GTN Pipeline system and the Ruby Pipeline system in Malin, Oregon. The Pipeline receipt point in Malin is strategically located to give international customers in Asia access to abundant supplies of natural gas from two burgeoning natural gas supply basins – one in the U.S. Rocky Mountains (through the existing Ruby Pipeline) and a second in western Canada (through the existing GTN Pipeline). The LNG Terminal, on the bay side of the North Spit of Coos Bay, would support receipt, liquefaction, storage, and loading of LNG onto ocean-going LNG tankers for delivery to export markets. The Project is a market-driven response to the availability of these burgeoning and abundant natural gas

supplies, giving those supplies an efficient and cost-effective outlet. The Project is also a market-driven response to the growth of international, particularly Asian, natural gas markets.

The Pipeline is needed to transport natural gas from the hub near Malin, Oregon to the JCEP LNG Terminal near Coos Bay, Oregon to provide the feedstock necessary to manufacture 7.8 mtpa LNG. PCGP has executed precedent agreements with JCEP, Macquarie Energy LLC ("Macquarie"), and Avista Corporation ("Avista") for 807,354 Dth/d of long term, firm transportation service, or 68 percent of the Pipeline's capacity. JCEP will use the capacity it has subscribed to support its own sales of LNG and will serve as an aggregator and gas supplier to liquefaction service customers. Macquarie also plans to serve as an aggregator of gas supplies for liquefaction service customers of the LNG Terminal. Avista is a local distribution company serving residential, commercial, and industrial customers in Oregon. PCGP intends to hold an open season and expects to execute contracts for substantially all of the available capacity prior to the issuance of a final environmental review document regarding the Project.

1.1.1.1 Project Summary

1.1.1.1.1 Background

On September 4, 2007, JCEP filed an application with FERC to construct and operate an LNG import terminal at Coos Bay, Oregon, in Docket No. CP07-444-000. That same day, PCGP, in Docket No. CP07-441-000, filed an application with FERC to construct and operate a natural gas sendout pipeline connecting the JCEP LNG import terminal with existing natural gas transportation systems. In May 2009, FERC produced a final environmental impact statement ("FEIS") for Docket Nos. CP07-441-000 and CP07-444-000. The Commission authorized both the import terminal and the natural gas sendout pipeline on December 17, 2009. On April 16, 2012, the Commission vacated the previously issued certificates for the LNG import terminal in Docket No. CP07-444-000 and the associated sendout pipeline in Docket No. CP07-441-000.

On May 21, 2013, JCEP filed an application seeking authorization for its proposed LNG export terminal on the North Spit of Coos Bay in Coos County, Oregon, in Docket No CP13-483-000. PCGP filed its companion application with FERC for the supply pipeline to the proposed terminal on June 6, 2013, in Docket No. CP13-492-000. FERC conducted an extensive environmental review thereunder, issuing an FEIS in September 2015. On March 11, 2016, the Commission denied the applications for certificates in Docket Nos. CP13-483-000 and CP13-492-000, without prejudice to JCEP's and PCGP's refiling of new applications.

On January 23, 2017, JCEP and PCGP requested approval to participate in FERC's Pre-Filing Review Process to assist in the identification and proper assessment of issues and to obtain input on the development of the environmental resource reports. FERC granted this request on February 10, 2017, and assigned Docket No. PF17-4-000.

1.1.1.1.2 Market Demand and Economic Support for the Project

The Project would provide clean burning natural gas to Asian markets, which would reduce the amount of coal currently being burned in these markets for electric power generation and increase cleaner-burning supplies to other commercial and residential markets. The Project would also provide new market access for natural gas producers in the Rocky Mountains and Western Canada. These producers have seen their access to markets in the eastern and central regions of the United States and Canada erode

with the development and ramp-up of natural gas from the Marcellus and Utica shales. Two large under-utilized pipeline systems, the Ruby pipeline and the GTN pipeline, already exist to transport natural gas from these large gas supply basins to the Malin hub in southern Oregon. The Pipeline would be able to access these supplies and transport them to the LNG Terminal for export.

Global LNG Market

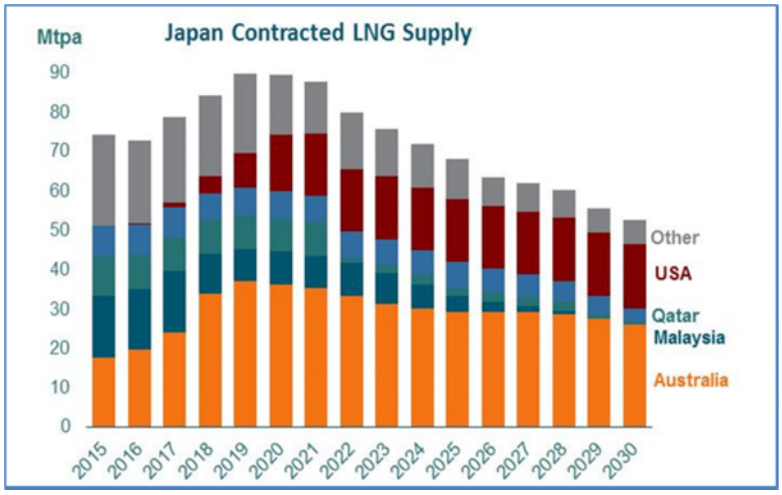
Demand for LNG is expected to grow 4% to 5% per year between 2015 and 2030, and LNG demand growth has exceeded expectations recently. While many expected the market to be oversupplied in 2016, demand in Asia and the Middle East absorbed the increase in supply from Australia and the U.S. Chinese imports of LNG increased 33% in 2016 over the prior year, and India saw an increase of 25% over the same period. There were also six new importing countries in 2016 (Colombia, Egypt, Jamaica, Jordan, Pakistan and Poland), bringing the total number of LNG importing countries to 35. Shortages in domestic gas supplies in Egypt, Jordan and Pakistan led those countries to be among the fasting growing importers, importing a total of 13.9 million tons of LNG in 2016 during their first year of imports.

Despite the resurgent LNG demand, global LNG prices fell dramatically over the last two years following the slump in oil prices. This has led to new LNG supply projects being deferred or cancelled, and it will undoubtedly lead to a tightening of the global market post 2020. With few new supply projects and strong demand growth driven by India, China and Southeast Asia, the market is expected to recover by 2023, and LNG demand is expected to almost double by 2030, requiring an incremental 150 mtpa of new supply by the end of the next decade.

U.S. LNG exports are one of the lowest cost supply sources in the world and are expected to maintain their competitive advantage going forward due to the size and quality of the upstream natural gas resources in North America and the availability of infrastructure, including existing pipelines and road and rail infrastructure. The Project, by virtue of its West Coast location, has the further advantage of a shorter shipping distance to major Asian markets relative to other U.S. export projects. The distance from the Port of Coos Bay to Tokyo Bay requires nine days shipping as compared to 22 days from the Gulf of Mexico utilizing the recently expanded Panama Canal.

The Japanese Market

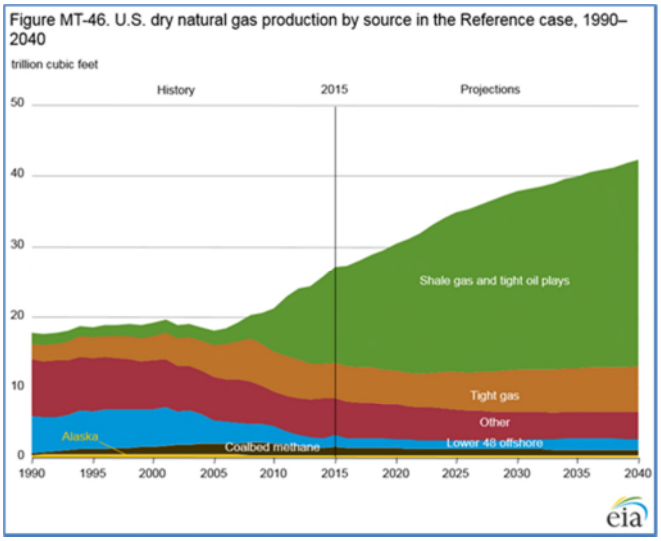
On March 22, 2016, JCEP announced that it had executed a preliminary agreement with JERA Co., Inc. (“JERA”), the largest LNG buyer in the world, for the acquisition of at least 1.5 mtpa of LNG capacity from the Project. JERA was formed on April 1, 2015, and is a joint venture between Tokyo Electric Power Company and Chubu Electric Power Company, two of the largest Japanese power utilities. The joint venture was formed to combine the international energy assets of the two companies, including energy procurement and shipping. At formation, JERA had 40 mtpa of LNG supplies under contract. Following the announcement of the JERA agreement, JCEP announced the execution of a preliminary agreement with ITOCHU Corporation, a significant Japanese investment and trading firm, for the procurement of 1.5 mtpa of LNG capacity from the Project. Negotiations continue with other interested parties for the balance of the available plant capacity.



Demand in Japan is not dependent upon demand growth but is driven by the re-balancing of the supply portfolios held by Japanese companies. Twenty-five percent of Japan's long term contracts expire between 2020 and 2025. U.S. LNG exports to Japan are positive from a number of standpoints. Japan is the most important U.S. ally in Asia, and increased U.S. imports will strengthen this alliance and improve the balance of trade between our two countries.

U.S. Market

The development of ultra tight shales and siltstones through horizontal drilling and hydraulic fracking has revolutionized the U.S. and Canadian long-term natural gas outlook. Resource estimates continue to climb as new and advanced exploration, well drilling, completion and stimulation technologies allow access to and delineation of more technically recoverable natural gas resources. The U.S. Energy Information Agency ("EIA") is an independent agency of the U.S. Federal Statistical System responsible for collecting, analyzing, and disseminating energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. As of January 1, 2014, the EIA estimated there was 2,136 trillion cubic feet ("Tcf") of technically recoverable natural gas resources yet to be delineated in the U.S., with natural gas from shale plays an increasingly large part of the mix. The Potential Gas Committee sponsored by the Colorado School of Mines in its biennial resource assessment estimated that at the end of 2014 technically recoverable resources were 2,515 Tcf. When combined with EIA's estimate of proved natural gas reserves of 308 Tcf of dry gas at the end of 2015, total U.S. natural gas resources are estimated at 2,444 Tcf to 2,823 Tcf, or approximately 100 years of natural gas supply at current rates of consumption.



Of particular importance to the Project, the U.S. Geological Society ("USGS") upgraded its assessment of technically recoverable natural gas resources in the Mancos Shale in the Piceance Basin of Colorado to 66 Tcf as compared to the USGS' 2003 assessment of 1.6 Tcf. The Piceance Basin is a key natural gas province that can be sourced by the Project through the Ruby pipeline

for delivery to the Malin, Oregon gas hub.

None of these figures include technically recoverable natural gas resources from the Western Canadian Sedimentary Basin ("WCSB"), which can also access the Project by the GTN pipeline system. The current estimate of recoverable resources in the WCSB exceeds 1,000 Tcf with 449 Tcf of this from the Montney Formation as estimated in a joint report by the Canadian National Energy Board, the British Columbia Oil and Gas Commission, the Alberta Energy Regulator and the British Columbia Ministry of Natural Gas Development published in November 2013.

One concern with U.S. LNG exports is the possible impact exports could have on natural gas availability and price in the U.S. market. In May 2014, the U.S. Department of Energy Office of Fossil Energy ("DOE/FE") announced its intention to undertake an updated economic study in order to gain a better understanding of how potential U.S. LNG exports between 12 and 20 Bcf/d could affect the public interest. Specifically, DOE/FE commissioned the EIA to update its 2012 LNG Export Study. This document is titled Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets, dated October 2014 (USEIA 2014). Further, DOE/FE determined that it would follow the EIA Study with an additional study that would evaluate the macroeconomic impacts of the exports evaluated in the EIA Study and directed the National Energy Technology Laboratory to facilitate this additional analysis. To carry out this task, The Center for Energy Studies at Rice University's Baker Institute and Oxford Economics were commissioned on behalf of the DOE/FE to undertake a scenario-based assessment of the macroeconomic impact of alternative levels of U.S. LNG exports under different assumptions for U.S. resource endowment, U.S. gas demand, and the international market environment. This document is titled The Macroeconomic Impact of Increasing U.S. LNG Exports ("Economic Study"), dated October 29, 2015 (USDOE 2015).

As related by the Economic Study, the outlook on North American gas supplies has undergone a dramatic reversal since 2008, when the general consensus was that supplies would be insufficient to keep pace with growing demand and that foreign-sourced LNG would need to be imported. As discussed above, the Economic Study identifies shale gas production growth as the biggest contributor to overall gas supply abundance due to the ramp-up in production of natural gas extracted from ultralow permeability and ultralow porosity shale formations in the U.S. The development and continuing improvement of hydraulic fracturing technology have led to increasingly efficient shale gas production, and shale gas production "has grown in less than a decade to comprise about one-half of U.S. domestic production" (USDOE 2015). Estimates of dry natural gas resources in the U.S. have likewise grown, reflecting significantly increased estimates of shale gas resources. The EIA's Annual Energy Outlook 2016 ("AEO 2016") (USEIA 2016) estimates that total U.S. dry natural gas production was 27.2 Tcf in 2015. Of this total amount of production for 2015, it is estimated that 13.6 Tcf, or 50 percent, came from shale gas and tight oil plays. Based on the AEO 2016 Reference Case, total U.S. dry natural gas production is projected to increase to 42.1 Tcf by 2040, of which approximately 69 percent is derived from shale gas and tight oil plays, leading the share of U.S. dry natural gas production growth (see EIA graph above).

The Economic Study also states that gas production will continue to grow steadily throughout the forecast period to 2040, as "the majority of the increase in LNG exports is

accommodated by expanded production rather than reductions in domestic demand, a result that reflects the very elastic long-run supply curve in North America" (USDOE 2015). The Economic Study also states that increased production will also have a positive spillover to "key suppliers of the sector such as machinery and engineering services, and rising employment in the gas sector also leads to increased demand for goods and services more broadly" (USDOE 2015). Indeed, the growth potential is enhanced by the fact that the reduced geologic risk and resulting reliability of shale gas discovery and production make it responsive to demand and by the fact that the presence of natural gas liquids in some shale formations creates an added incentive for development.

For the demand outlook, the Economic Study projects steady growth, driven by demand in the industrial and power-generation sectors in the near term, and continued growth in power generation longer term. This projected growth is "driven by emerging environmental policies that target the use of coal" (USDOE 2015). Additionally, the AEO 2016 Reference Case estimates that total U.S. natural gas consumption will increase from 27.5 Tcf in 2015 to 34.4 Tcf in 2040. The AEO 2016 Reference Case also estimates that the U.S. will become a net exporter of natural gas in 2018 and that "growing natural gas production from shale gas and tight oil formations at relatively low prices support an increase in U.S. LNG exports of 6.7 Tcf from 2015-40" (USEIA 2016). Even as both domestic demand and net exports are projected to grow throughout the forecast period, U.S. natural gas production is sufficient to meet these increases. As technology improves in the development of shale resources, higher rates of recovery at lower costs occur.

According to both the Economic Study and the AEO 2016 report, growing natural gas demand in the industrial and electric power sectors and increasing exports of LNG place upward pressure on U.S. natural gas pricing. While this is occurring, the AEO 2016 report notes that improvements in drilling technology allow production to keep pace with demand, "resulting in relatively stable prices throughout the projection period." Examples of technology improvements include better rigs and drill bits, resulting in lower unit costs and the expansion of tight and shale gas formations. The Economic Study expects higher U.S. gas production and increased profitability of U.S. gas producers to "typically exceed the negative impacts of higher domestic natural gas prices associated with increased LNG exports" (USDOE 2015).

The Economic Study concludes that the overall macroeconomic impact of increasing U.S. LNG exports from 12 Bcf/d to 20 Bcf/d is marginally positive. "In aggregate the size of the economy is little changed in the long run, with GDP less than 0.1 percent ($7.7 billion USD annually in today's prices) higher on average over 2026-2040 than in the 12 Bcf/d export case" (USDOE 2015). While an increase in LNG exports from the U.S. will yield small declines in output for some energy-intensive industries, such as cement, concrete, and glass, "the estimated impact on sector output is very small compared to expected sector growth to 2040" (USDOE 2015). Also, since most of any U.S. LNG exports would be derived from increased extraction rather than diverted natural gas supplies, "other sectors benefit from increasing U.S. LNG exports, especially the industries that supply the natural gas sector or benefit from the capex needed to increase production. This includes some energy-intensive sectors such as cement and helps offset some of the impact of higher energy prices" (USDOE 2015). These conclusions are also consistent with the results from the EIA Study, which determined that "increasing LNG exports leads to higher economic output, as measured by real

gross domestic product, as increased energy production spurs investment. This higher economic output is enough to overcome the negative impact of higher domestic energy prices over the projection period" (USEIA 2016).

In addition, the Project is capable of serving domestic needs. Natural gas customers in Oregon situated along the route of the new pipeline, particularly those west of the Cascade Mountains, will stand to benefit from its construction in conjunction with the Project. Capacity on the Pipeline could bring additional natural gas supplies to this otherwise isolated market area, with concomitant beneficial price effects.

1.1.1.1.3 Current LNG Terminal and Pipeline Proposals

JCEP is proposing to develop an LNG facility with a nominal capacity of 7.8 mtpa of LNG. The LNG Terminal would be capable of receiving natural gas from the Pipeline, processing the gas, liquefying the gas into LNG, storing the LNG, and loading the LNG onto ocean-going vessels at its marine dock. PCGP proposes to construct and operate the Pipeline, an approximately 235-mile-long, 36-inch diameter pipeline between the Malin hub in Oregon and the LNG Terminal, crossing portions of Klamath, Jackson, Douglas, and Coos Counties, Oregon ("Proposed Route"), that would be capable of providing 1,200,000 Dth/d of firm transportation service to the LNG Terminal.

In accordance with the pre-filing review process, PCGP is committed to continuing the review of the Proposed Route with stakeholders and working to address their concerns. PCGP will submit, in this docket, periodic updates of any changes in the Proposed Route.

Since the 2015 FERC FEIS, PCGP has continued to meet with agencies and landowners and conduct civil, environmental, and cultural field surveys where access has been granted. The Proposed Route has been improved in response to those meetings, landowner requests, and civil survey. Additionally, some temporary extra work areas, rock sources, and yards have been modified, and the Proposed Route has been adjusted based on civil survey along the same alignment in various locations. Table 1A-3 provides a list of the individual changes. The main modifications are:

- Coos Bay estuary/Haynes Inlet avoidance route
- SVID route modification and incorporation
- Increased compression at Klamath Compressor Station
- Increased Pipeline maximum allowable operating pressure from 1480 to 1600 psig

In addition to meeting the statement of purpose and need discussed in Section 1.1.1, completion of the Project would result in these additional benefits:

- Result in additional investment in and modernization of the Port of Coos Bay, which was once the largest timber port in the world but has seen utilization and investment steadily decline over time. JCEP and PCGP would directly invest in improving marine-related infrastructure and capability, such as the procurement of four state-of-the-art tractor tugs with firefighting, active ship escort and emergency towing and rescue capability, procurement and set up of a private vessel traffic information system, and installation of three meteorological ocean data collection buoys to measure wind speed and direction, current speed and direction and tide height in real time.

- Create potential for future deliveries to communities along the Pipeline that have previously not had access to clean burning natural gas. These natural gas supplies would replace the current consumption of fuel oil, coal, wood and propane. In particular, the LNG demand to which this Project is responding provides a scale of development allowing these incidental benefits to domestic needs. These customers, particularly those west of the Cascade Mountains, would benefit from deliveries of such natural gas supplies to this otherwise isolated market area, with concomitant beneficial price effects.
- Facilitate the re-building of the industrial and property tax base of the County of Coos and the towns of Coos Bay and North Bend. The decline in timber and wood products has hit the local economy hard. The LNG Terminal will be located in a zoned industrial park on the north spit of the Port of Coos Bay. The site was previously home to a Weyerhaeuser paper plant that closed in 2003. JCEP has agreed to execute a Community Enhancement Plan ("CEP") under which property tax benefits available at the site would be re-sculpted by JCEP such that the tax benefit would be returned to the County, the communities and the Port of Coos Bay under a formula that accelerates payments at the start of construction and levelizes payments from the commencement of operations for 15 years. The CEP will result in JCEP's payment of over $500 million over the first 20 years (five plus 15) to be used for capital projects for the schools, the SW Oregon Community College, and rehabilitation of the waterfront and for the Port of Coos Bay.

1.1.2 Location and Description of Facilities

The proposed Pipeline is composed of a pipeline and aboveground facilities. Although resource report discussions of natural gas projects typically begin at the point of gas receipt and move downstream in the direction of gas flow to delivery points, the various facility discussions in this report generally begin at the LNG Terminal delivery point and move upstream to the Pipeline receipt point in Malin, Oregon, in order to maintain consistency with prior route development efforts and planning documents.

The Pipeline will have these characteristics (also see Table 1.1-1):

- 36-inch diameter;
- 1600 psig maximum allowable operating pressure;
- 235-mile approximate length;
- beginning milepost ("MP") 1.47R and ending MP 228.81.

Aboveground facilities for the Pipeline include (also see Table 1.1-2):

- the new Klamath Compressor Station with three operating compressor units totaling approximately 61,500 ISO horsepower (with one additional standby unit of 20,500 ISO horsepower) at MP 228.81 located in Klamath County, Oregon;
- three new meter station locations (three interconnects: Jordan Cove Meter Station/MP 1.47R; Klamath-Beaver Meter Station [GTN]/MP 228.81; and Klamath-Eagle Meter Station [Ruby]/MP 228.81);
- five new pig launcher/receiver units (co-located with other aboveground facilities);
- 17 new mainline block valves spaced along the Proposed Route (Coos, Douglas, Jackson and Klamath Counties, Oregon) according to U.S. Department of Transportation ("DOT") safety requirements; and

- new communications towers and equipment buildings and usage of existing communications towers and equipment buildings along the Proposed Route (Coos, Douglas, Jackson and Klamath Counties, Oregon) (see Table 1.1-3).

Table 1.1-1
Pipeline Facilities

Diameter	Type	County	State	MP Begin[1]	MP End[1]	Length (mi)
36”	New Mainline	Coos	Oregon	1.47H	45.72	51.36
36”	New Mainline	Douglas	Oregon	45.72	110.07	66.39
36”	New Mainline	Jackson	Oregon	110.07	166.41	55.88
36”	New Mainline	Klamath	Oregon	166.41	228.81	61.60
		Total		1.47H	228.81	235.23
[1] Mileposts are reference points and do not equal total length due to route changes.						

Table 1.1-2
Aboveground Facilities

Facility Type and Name	Approximate MP	County	State	Description
Compressor Stations				
Klamath Compressor Station	228.81	Klamath	Oregon	New fenced compressor station with equipment and control buildings, with turbine-compressors, gas coolers, filter separators and other ancillary equipment. (3) operating units at 20,500 HP ea. (1) installed spare unit at 20,500 HP 82,000 HP total installed
Meter Stations				
Klamath-Eagle Meter Station	228.81	Klamath	Oregon	New meter station with ultrasonic meters, filtration, and gas analysis; collocated with Klamath Compressor Station interconnecting with GTN pipeline
Klamath-Beaver Meter Station	228.81	Klamath	Oregon	New meter station with ultrasonic meters, filtration, and gas analysis; collocated with Klamath Compressor Station interconnecting with Ruby pipeline
Jordan Cove Meter Station	1.47H	Coos	Oregon	New fenced meter station with buildings, canopies, ultrasonic meters, filtration, and gas analysis interconnecting with LNG Terminal
Launchers and Receivers				
Jordan Cove Receiver	1.47H	Coos	Oregon	New pig receiver collocated with Jordan Cove Meter Station
Clarks Branch Receiver and Launcher	71.51	Douglas	Oregon	New pig receiver and launcher collocated with BVA #6
Butte Falls Receiver and Launcher	132.46	Jackson	Oregon	New pig receiver and launcher collocated with ABVA #11
Keno Receiver and Launcher	187.43	Klamath	Oregon	New pig receiver and launcher collocated with BVA #14
Klamath Launcher	228.81	Klamath	Oregon	New pig launcher collocated with Klamath Compressor Station

Facility Type and Name	Approximate MP	County	State	Description
Mainline Block Valve Assemblies (BVA)				
BVA #1	1.47H	Coos	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #2	15.66	Coos	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #3	29.50	Coos	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
ABVA #4 (Automated)	48.58	Douglas	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #5	59.58	Douglas	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #6	71.51	Douglas	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #7	80.03	Douglas	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #8	94.66	Douglas	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #9	113.65	Jackson	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
ABVA #10 (Automated)	122.18	Jackson	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
ABVA #11 (Automated)	132.46	Jackson	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #12	150.70	Jackson	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #13	169.48	Klamath	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #14	187.43	Klamath	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
ABVA #15 (Automated)	196.53	Klamath	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
ABVA #16 (Automated)	211.58	Klamath	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
BVA #17	228.81	Klamath	Oregon	New, buried, Mainline Block Valve with above ground actuator; fenced
Communication Sites[1]				
Jordan Cove Meter Station	1.47	Coos	Oregon	New 140 foot tower collocated with the meter station
Blue Ridge Communication Site	~ 20	Coos	Oregon	Existing Tower Site located off of the pipeline alignment (space to be leased)
Signal Tree Communication Site	~45	Coos	Oregon	New 140 foot tower located off of the pipeline alignment
ABVA #4	48.58	Douglas	Oregon	New 40 foot tower collocated with BVA
Sheep Hill Communication Site	~70	Douglas	Oregon	New 140 foot tower located off of the pipeline alignment
Harness Mountain Communication Site	~75	Douglas	Oregon	Existing Tower Site located off of the pipeline alignment (space to be leased)
Starvout Communication Site	~115	Douglas	Oregon	New 140 foot tower located off of the pipeline alignment
ABVA #10	122.18	Jackson	Oregon	New 40 foot tower collocated with BVA
Flounce Rock Communication Site	~123	Jackson	Oregon	New 140 foot tower located off of the pipeline alignment
ABVA #11	132.46	Jackson	Oregon	New 40 foot tower collocated with BVA

Facility Type and Name	Approximate MP	County	State	Description
Robinson Butte Communication Site	~159	Jackson	Oregon	New 140 foot tower located off of the pipeline alignment
ABVA #15	196.53	Klamath	Oregon	New 40 foot tower collocated with BVA
Stukel Mountain Communication Site	~209	Klamath	Oregon	New 140 foot tower located off of the pipeline alignment
ABVA #16	211.58	Klamath	Oregon	New 40 foot tower collocated with BVA
Klamath Compressor Station	228.81	Klamath	Oregon	New 140 foot tower collocated with the compressor station
[1] The Communication facilities design assumes new towers are required as noted. However, PCGP will endeavor to firstly lease space on existing towers where available.				

In an effort to maintain milepost continuity while adjusting the Proposed Route, milepost equations have been incorporated into the alignment. This allows the mileposts, for the most part, to remain unchanged. However, the ending milepost no longer reflects the actual length of the Pipeline. The equation incorporation process results in two possible conditions near a milepost equation – the first being an overlap in or duplication of milepost values (longer reroute) and the second being a gap in the milepost values (shorter reroute). To minimize confusion where incorporated route modifications create a duplication in MPs, letter suffixes ("H" and "R") have been included with the MP designation. Between MPs 1.47H and 5.18H, PCGP used an "H" where the Proposed Route was rerouted to avoid Haynes Inlet. This reroute increased the overall Pipeline length by approximately 1.0 mile, and the "H" distinguishes the repeated MPs between 4.20 and 5.18. An "R" was used where PCGP incorporated the land route (WC-1A) and the Brunschmid Wetland Reserve Program Easement Avoidance ("WRP") between MPs 1.47R and 12.39R. This reroute increased the overall Pipeline length by approximately 3.8 miles causing duplication in MPs 8.58 through 12.39 (see U.S. Geological Survey – USGS Maps 1 and 2 in the Mapping Supplement, Appendix 1G, and Environmental Alignment Sheets 3430.29-002 through 3430.29-008, Appendix 1H).

Because of the engineering station equations associated with the various reroutes and alternatives that have been integrated into the design since PCGP mileposted the centerline in 2007, the Pipeline's total length (approximately 235 miles) does not equal the ending milepost (MP 228.81). Table 1A-3 in Appendix 1A provides a matrix of the differences (excluding the alternative analyses described in Resource Report 10) between the 2015 FEIS route in Docket CP13-492-000 and the Proposed Route.

The Pipeline requires new right-of-way. The alignment will be co-located with or adjacent to a number of existing powerlines, roads, and pipelines for approximately 94.61 miles or 40.4 percent of its length; the remaining 59.6 percent of the alignment will be cross-country construction. Table 8A-5 in Appendix 8 to Resource Report 8 provides the locations where the alignment will be co-located with existing rights-of-ways.

1.1.2.1 Pipeline Facilities

1.1.2.1.1 Route Development

During routing analysis of the Pipeline, PCGP reviewed more than 1,000 miles of alternative alignments for development of the Proposed Route. The Proposed Route was developed with consideration of the construction requirements for a large-diameter, high-pressure natural gas transmission pipeline. Constructability/stability requirements

were of primary consideration for routing the pipeline along with minimizing potential impacts to protected species and their habitats, the number of waterbody crossings, and landowner encumbrances, where feasible. Avoidance of wilderness areas, known cultural resource areas, national parks and monuments as well as scenic waterways and byways was also a factor in development of the Proposed Route.

Where practicable, the Proposed Route utilized existing pipeline and powerline corridors while providing a safe distance between the proposed facilities and the existing utilities. Although the Proposed Route parallels existing roads and railroads in a number of areas, routing the Pipeline within existing transportation and utility easements was avoided because of the impact to traffic flow during construction and because future road expansions or improvement projects may require the Pipeline to be relocated, which may create unforeseen environmental, landowner, and system impacts. Further, long-term safety and the potential for third-party damage to the Pipeline must be considered. Many roads are located in valleys or drainage bottoms adjacent to streams where it is not feasible to install a large-diameter, steel pipeline due to large temporary extra work area ("TEWA") requirements, confining topographic conditions, and waterbodies running parallel to the alignment. Many forest roads are located on steep side slopes where it is impractical to route the Pipeline because of constructability/stability requirements and concern for the long-term safety and integrity of the Pipeline. To ensure the Pipeline is installed properly within consolidated (non-filled) materials and to provide the necessary equipment workspace, construction on steep side slopes requires significantly more TEWAs to accommodate the necessary cuts or excavations and spoil storage.

The Pipeline will be constructed in Coos, Douglas, Jackson, and Klamath counties (see Figure 1.1-1). The western terminus of the Proposed Route is at MP 1.47R at the Jordan Cove Meter Station located adjacent to the LNG Terminal site in Coos County. The detailed discussion below proceeds from west to east, to correspond with the original milepost markings of the PCGP.

As shown on Map 1 (Mapping Supplement, Appendix 1G), the Proposed Route from the Jordan Cove Meter Station at MP 1.47R proceeds north along the west side of the railroad and crosses the Trans Pacific Parkway (County Road 216 - Jordan Cove Road) at MP 1.89H. At MP 2.00H the Proposed Route would incorporate an approximate 6,100-foot HDD to cross the North Slough. The HDD would cross Highway 101 at MP 3.11H and exit immediately on the east side of the highway at MP 3.13H within the highway easement. The Proposed Route would follow ridgelines and a timber road to the east along a ridgeline to MP 4.53H where it would turn south descending ridgelines to the Haynes Inlet floodplain at MP 4.88H. From this point, an approximate 2,600-foot HDD is incorporated into the Proposed Route to cross Haynes Inlet in an easterly direction where it crosses North Bay Drive at MP 5.29H and exits near MP 5.36H. The Proposed Route then proceeds southwesterly following ridgelines and a logging road to MP 5.15R. The Proposed Route then turns south across ridgelines, crossing Kentuck Slough and the former Kentuck Golf Course. At MP 9.42R the Proposed Route avoids the Brunschmid WPR 2 and continues to the south following ridgelines, crossing Echo Valley at MP 10.2R and the Coos River at MP 11.13R to avoid the U.S. Department of Agriculture, Natural Resources Conservation Service's ("NRCS") Brunschmid WRP easement.

At MP 11.13R there is a proposed HDD crossing of the Coos River. The HDD crossing plan is provided in Appendix 2G to Resource Report 2. Near MPs 10.20 and 11.10 the Proposed Route crosses Stock and Catching sloughs. The Proposed Route avoids crossing the Stock Slough Road and two crossings of Stock Slough in the slough's tight meandering bends which were crossed immediately below Stock Slough Road and immediately adjacent to a residence.

At MP 12.79, the Proposed Route deviates from a Bonneville Power Administration ("BPA") powerline corridor to minimize side slopes and waterbody crossings, including several steeply incised drainages, and to avoid a residential parcel and areas with unstable conditions (see Map 3 in the Mapping Supplement, Appendix 1G [1]). The Geologic Hazards and Mineral Resources Report (Resource Report 6) describes the geotechnical evaluation that was conducted for the Pipeline to ensure long-term stability, safety and integrity of the Pipeline. At MP 21.60 the Proposed Route again deviates from the BPA corridor to avoid side slopes, a substation, and to provide a better crossing location of the North Fork of the Coquille River. Appendix 2E to Resource Report 2 provides the site-specific crossing plan for the North Fork Coquille River, which was requested by the Oregon Department of Fish and Wildlife ("ODFW") during interagency task force meetings (Waterbody Crossing Methodologies Subgroup) on endangered species issues for the Project. Near MP 25.0, an HDD was incorporated into the design to avoid steep sideslopes where the Proposed Route paralleled the BPA corridor and the Coos County Pipeline located between the two power transmission lines along a narrow ridgeline.

The Proposed Route leaves the BPA powerline corridor (MP 26.10) to avoid crossing Cherry Creek and an area of difficult side hill topography where the Coos County Pipeline is also located (see Map 5 in the Mapping Supplement, Appendix 1G). The Proposed Route then crosses the East Fork of the Coquille River near MP 30.00 (see Appendix 2E to Resource Report 2 for the ODFW requested site specific crossing plan). After the river crossing, the Proposed Route proceeds for approximately 19 miles through timberlands in a southeasterly direction following ridgelines and existing logging roads, where feasible, before entering the Camas Valley at MP 49.50.

Between MPs 31.44 and 32.22, the Proposed Route was routed to avoid an Oregon State University Red Alder Test Plot on Bureau of Land Management ("BLM") land. Based on geotechnical evaluations conducted during the summer and fall of 2006, the Proposed Route between MPs 23.50 and 47.00 was routed to avoid potential unstable areas due to deep-seated landslides as well as shallow, rapidly moving landslide areas. Detailed descriptions of routing choices that were made because of geotechnical concerns are provided in the Geologic Hazards and Mineral Resources Report (Resource Report 6). The most significant of these were located between MPs 36.90 and 39.20, where it was necessary to avoid a large landslide complex. Between MPs 43.00 and 44.70, the Proposed Route has been routed to avoid the BLM's Coos Bay District's Upper Rock Creek Area of Critical Environmental Concern ("ACEC") and land use areas designated as Late Successional Reserve ("LSR") (Section 5, T. 29 S., R. 9 W). With the issuance of the BLM's 2016 Resource Management Plans (BLM 2016a and 2016b), the boundary of the ACEC has been modified, and the Proposed Route no

[1] Map numbers of the General Location Maps refer to the Drawing Number (*i.e.*, 3430.31-Y-Map 3) not the sheet number

longer crosses the ACEC. The Proposed Route crosses from Coos County into Douglas County at MP 45.70 (see Maps 5 through 8 in the Mapping Supplement, Appendix 1G).

At Weaver Ridge near MP 46.8, the Proposed Route incorporates a modification of a BLM-suggested route, which provides a better descent/ascent of Weaver Ridge and minimizes impacts to marbled murrelet ("MAMU"), northern spotted owl ("NSO"), and LSR on BLM-managed lands.

The Proposed Route was routed between MPs 47.60 and 49.50 to avoid multiple crossings of Deep and Wildcat creeks and associated constructability issues (see Map 8 in Volume III). The Proposed Route continues east across the Camas Valley, crossing Highway 42 at MP 51.54 in Section 16, T. 29 S., R. 8 W. Between MPs 51 and 53, the Proposed Route incorporates an avoidance of occupied MAMU habitat. PCGP also incorporated two landowner route requests between approximately MPs 51.4 and 52.5 west and east of Highway 42. The Proposed Route then proceeds east, along ridgelines crossing Ireland Road at MP 55.81 in Section 1, T. 29 S., R. 8 W. (see Map 9 in the Mapping Supplement, Appendix 1G). Between MPs 57.84 and 57.92, the Proposed Route proceeds to the south to avoid direct impacts to federally listed Kincaid's Lupine populations as indicated in the Kincaid's Lupine Mitigation Plan provided as Appendix J to the plan of development ("POD") (Appendix 1F). Based on landowner concerns between MPs 59.60 and 67.00, the Proposed Route was aligned to minimize potential easement encumbrances by traversing primarily timberlands along narrow ridgelines and steep slopes away from residential areas. The Proposed Route in this area also minimizes impacts to agricultural lands, shallow ground and surface water domestic supplies, and proposed developments of a reservoir and large subdivision.

The Proposed Route continues easterly to just beyond MP 71 and approaches the I-5 and South Umpqua River. Several approaches to crossing these features were studied, considering geotechnical, channel characteristics and residential factors, and, included both open cut and trenchless crossing techniques. The Proposed Route utilizes Direct Pipe® technology to cross both I-5 and the South Umpqua River in a single trenchless operation (see Resource Report 2, Appendix 2I). This crossing method provides an efficient/single crossing of I-5, the South Umpqua River, Dole Road, and a railroad and eliminates an open cut river crossing. The Proposed Route also avoids improved pastures and croplands and construction near several residences.

To minimize construction-related effects to Cox's Mariposa Lily, an endangered state plant and a federal species of concern, the Proposed Route deviates from the ridgeline between MPs 75.05 and 75.3 and is aligned within the road prism of Bilger Creek Road - BLM 29-5-11 (see Environmental Alignment Sheet 3430.29-074, Appendix 1H). The Proposed Route continues easterly for approximately 8 miles along ridgelines, crossing the stream valleys of Bilger Creek and Little Lick Creek (see Map 13 in the Mapping Supplement, Appendix 1G). After crossing Little Lick Creek, the Proposed Route proceeds in a southeasterly direction across ridgelines and stream valleys for about 14.5 miles, crossing North Myrtle Creek, South Myrtle Creek, Wood Creek, Days Creek, and St. Johns Creek (see Maps 13, and 14 in the Mapping Supplement, Appendix 1G). The Proposed Route between MPs 81.22 and 82.47 is routed so as to avoid a NSO nest patch. To further minimize NSO habitat effects, the Proposed Route is co-located with a logging road and routed through clear-cut forest. PCGP also incorporated a landowner request between MPs 81.4 and MP 82.0 to minimize parcel encumbrances and potential visual effects to the residence.

Between MPs 82.70 and 89.20, the Proposed Route has been routed to address landowner concerns regarding water supply springs in the Woods Creek area as well as landowner concerns in the Days Creek area. PCGP located and incorporated a feasible route to avoid these two areas as well as steep, dissected topography. The Proposed Route between MPs 85.4 and 87.08 was also routed to minimize effects to the Oregon Women's Land Trust property. Between MPs 91.60 and 94.52, the Proposed Route was routed so that St. Johns Creek could be crossed within its floodplain using conventional crossing methods and to avoid NSO nesting habitat.

At MP 94.73, the Proposed Route crosses the South Umpqua River a second time near Milo, downstream of the Milo Academy (see Map 15 in the Mapping Supplement, Appendix 1G) utilizing a diverted open-cut crossing method. After the second crossing of the South Umpqua River, the Proposed Route continues in a southeasterly direction traversing steep narrow ridgelines primarily cross-country to Trail, Oregon at MP 122.60. Between approximate MPs 95.5 and 102.5, the Proposed Route passes through a forested area affected by the 2015 Stouts Creek fire, which burned more than 26,000 acres.

The Proposed Route enters the Umpqua National Forest at MP 99.3, west of Callahan Ridge. The Proposed Route crosses over Green Butte at MP 101.80 and Neauman Gap at MP 105.40 before traversing Wildcat Ridge. Along Wildcat Ridge, the Proposed Route parallels but is offset from Forest Road 32 and passes south of Drew Lake near MP 108.70. The Proposed Route enters Jackson County near MP 110.0 and leaves the Umpqua National Forest Boundary at MP 113.20 (see Maps 16 through 18 in the Mapping Supplement, Appendix 1G).

Between MPs 108.9 and 111.24, the Proposed Route is routed to avoid the cultural resource concerns expressed by the Forest Service and Cow Creek Band of Umpqua Tribe of Indians. The Proposed Route in this area is based on cultural resources, topographic and geotechnical constraints, and NSO nesting habitat. Co-locating the Proposed Route within the existing road prism of Forest Road 3200, as the Forest Service recommended, was not feasible or practical because of steep side slopes and unstable conditions along this road, including occurrence of recent shallow-rapid landslides and high surface erosion potential from exposed and disturbed cut and fill areas. Additionally, the footprint and the quantity of excavation required for construction within the road prism would be greater than that required for the proposed ridgeline alignment.

The Proposed Route was routed between MPs 113.50 and 115.47 to improve constructability by minimizing side slope construction requirements. At MP 122.60, at Trail, Oregon, the Proposed Route crosses Highway 62 and the Rogue River by HDD (see Map 18 in the Mapping Supplement, Appendix 1G). After crossing the Rogue River, the Proposed Route proceeds in a southeasterly direction, crossing ridgelines and passing south of Indian Lake Reservoir near MP 128.00. The Proposed Route across Indian Creek and south of Mucky Flat and across the Butte Falls Highway between MPs 128.40 and 133.0 was routed to address landowner concerns. These areas are shown on Map 21 in the Mapping Supplement, Appendix 1G.

The Proposed Route continues southerly crossing the Butte Falls Highway at MP 132.47. Between MPs 132.60 and 133.00, the Proposed Route avoids a home site on the Mitchell Creek Ranch. At MP 133.38, the Proposed Route crosses the Medford

Aqueduct. The Proposed Route is routed on the west side of Obenchain Mountain between MPs 135 and 137 to avoid a drainage, springs, and wet pasture lands (see Map 21 in the Mapping Supplement, Appendix 1G).

The Proposed Route proceeds in a southeasterly direction, past the east side of Star Lake Reservoir at MP 141.00 and crosses Highway 140 at MP 145.58 and North Fork Little Butte Creek at MP 145.68 (see Maps 22 and 23 in the Mapping Supplement, Appendix 1G). Between MPs 142.9 and 148.8, the Proposed Route crosses the C2 Ranch, on which there are numerous irregularly-shaped conservation easements held by the Southern Oregon Land Conservancy ("Conservancy"). PCGP met with the Conservancy and received GIS data showing the locations of the conservation easements. PCGP reviewed this information and, using aerial surveys as a basis, the Proposed Route minimizes the impacts to the conservation easements and to irrigated pastures and irrigation facilities (canals/ditches) on the ranch.

The Proposed Route continues easterly traversing Heppsie Mountain near MP 152.00, and crossing into the Rogue River-Siskiyou National Forest at MP 153.80 (Section 4, T. 37 S., R. 3 E.) (see Map 24 in the Mapping Supplement, Appendix 1G). Between MPs 150.37 and 150.70, the Proposed Route was aligned, through consultations with the Medford BLM District, to minimize the crossing of the existing Heppsie Mountain rock quarry. The Proposed Route continues south of Robinson Butte near MP 160.00 and crosses Big Elk Road (FS 3700) at MP 161.41. At MP 162.18, the Proposed Route turns in a southeasterly direction crossing northeast of Cox Butte and Daley Prairie between MPs 164.00 and 165.00 (see Map 26 in the Mapping Supplement, Appendix 1G). The Proposed Route crosses into Klamath County at MP 166.42. The route on the Rogue River-Siskiyou National Forest has been aligned to minimize impacts to NSO and late successional mature habitats, Riparian Reserves, and to minimize TEWAs, reducing total disturbance.

At MP 168.0, the Proposed Route crosses the boundary between the Rogue River-Siskiyou and Fremont-Winema National Forests. The Proposed Route between MPs 167.67 and 168.17 was aligned to provide a perpendicular crossing of the Pacific Crest Trail at MP 167.86, and the construction right-of-way was narrowed to minimize effects to the setting of the trail. The Proposed Route crosses Dead Indian Memorial Road at MP 168.84. Between MPs 168.30 and 168.80, the Proposed Route has been aligned on the Fremont-Winema National Forest to avoid an intermittent drainage and to minimize impacts to mature forest habitat by placing the Pipeline adjacent to an existing road and through a previously thinned area. This Proposed Route also avoids the Lakewoods community at the intersection of Dead Indian Memorial Highway and Clover Creek Road.

From MP 169.50 to MP 187.30, the Proposed Route parallels the east side of Clover Creek Road for approximately 18 miles. This route avoids areas such as Buck Lake, a wet meadow, and a crossing location at Spencer Creek, some of which include areas where redband trout are known to spawn and where the Oregon Spotted Frog (a U.S. Fish and Wildlife Service ("FWS") candidate species and BLM and Forest Service Sensitive species) has been documented. The Proposed Route leaves the Fremont-Winema National Forest at MP 175.39.

To avoid the community of Keno and residences along McLaughlin and Big Buck lanes, the Proposed Route abuts the Pacific Power & Light powerline corridor near MP 187.70

and is adjacent to the powerline for approximately 1 mile, skirting around the residential development. The Proposed Route then turns southerly following a ridgeline through forested rangelands before descending the ridge, crossing agricultural hayfields, and to about MP 191.8. In this area, between MPs 189.15 and 191.20, the Proposed Route incorporates a landowner request to avoid a building site and a construction improvement by moving off of a near rocky ridgeline to minimize blasting requirements.

After crossing State Highway 66 (MP 191.47), the Proposed Route sharply turns to the east at MP 191.60 and parallels the south side of a drainage ditch for about 1 mile to MP 192.68, where the Proposed Route is adjacent to an existing road (Weyerhaeuser Timber Co Road) and the GTN Pipeline for about 2.85 miles (see Map 30 and 31 in the Mapping Supplement, Appendix 1G). The Proposed Route between MPs 195.42 and 196.60 deviates from the GTN Pipeline and road to minimize effects to suitable habitat and avoids direct effects to a population of Applegate's milk-vetch, a federally listed endangered plant. PCGP developed a mitigation plan which describes the design, construction methods, and restoration measures to minimize effects to this species (see Appendix J to the POD, Appendix 1F).[2] At MP 197.00, the Proposed Route skirts an industrial facility owned by Collins Timber Company near the community of West Klamath.

Between MPs 199.20 and 199.60, the Proposed Route crosses the Klamath River, and Highway 97 with an HDD. At MP 200.00, south of the town of Klamath Falls, the Proposed Route has been routed adjacent to the BPA powerline corridor and proceeds in a southeasterly direction for approximately 4 miles to MP 204.20.

At MP 204.20, the Proposed Route deviates from the powerline and turns east to avoid a lake which the powerline spans (see Maps 31 and 32 in the Mapping Supplement, Appendix 1G). At MP 206.00, the Proposed Route joins the powerline corridor again and follows this alignment, along with State Highway 39, and the Southern Pacific Railroad, in a southeasterly direction to MP 208.80. Along this alignment, the Proposed Route slightly deviates from the corridor to provide suitable waterbody crossing locations (*i.e.*, canals) and to avoid structures near MPs 207.70 and 208.10. The Proposed Route crosses over to the east side of powerline, railroad, and highway corridors at MP 208.80 and parallels this corridor on the east until MP 211.60. The Proposed Route was slightly offset from the corridor in this area to provide suitable crossings of roads and canals and to avoid residences. Between MPs 209.2 and 210.2, the Proposed Route was moved away from the BPA powerline corridor to abut State Highway 39 based on a landowner request. At MP 211.52, the Proposed Route turns east and crosses the Lost River at MP 212.05 and the Burlington Northern Railroad at MP 212.52 (see Map 33 in the Mapping Supplement, Appendix 1G).

After crossing the Burlington Northern Railroad at MP 212.50, the Proposed Route turns south and proceeds to MP 213.13, where it continues in an easterly direction. The Proposed Route crosses the G Canal at MP 214.18 and Hill Road at MP 214.31. The Proposed Route traverses the southern foot slopes of Stukel Mountain to join with the

[2] Some USGS topographic maps of the area show old Lower Klamath Refuge boundaries on lands that were withdrawn from consideration in the 1920s (Coles, 2006). Pacific Connector confirmed with the FWS in June 2006 that the pipeline will not impact any lands within the Klamath Basin Refuge boundaries.

BPA powerline corridor at MP 215.03. The Proposed Route was routed away from the west side of Stukel Mountain to avoid landslide deposits and a fault (see Geologic Hazards and Mineral Resources Report, Resource Report 6). The Proposed Route continues east in parallel with the powerline corridor for approximately 5 miles to MP 220.1 (see Maps 33 and 34 in the Mapping Supplement, Appendix 1G). Between MPs 220.0 and 228.8, the Proposed Route avoids U.S. Bureau of Reclamation ("Reclamation") jurisdictional facilities within the Shasta View Irrigation District to the extent practicable based on available survey permissions, landowner requests, optimizing topographic conditions to minimize disturbance, facilitating construction, and minimizing agricultural impacts, including crossing irrigated croplands and center pivot irrigation systems. The Proposed Route terminates at the northern boundary of the proposed Klamath Compressor Station site at MP 228.8. The Klamath Compressor Station site extends to the north edge of Malin Loop Road and is adjacent to the GTN Malin/Tuscarora Meter Station and the Ruby Turquoise Flats facility. The Klamath-Beaver Meter Station, which will interconnect with the GTN transmission system, and the Klamath-Eagle Meter Station, which will interconnect with the Ruby transmission system, will be co-located with the Klamath Compressor Station facility.

1.1.2.2 Aboveground Facilities

1.1.2.2.1 Jordan Cove Meter Station

Gas will be delivered to the proposed LNG Terminal via the Jordan Cove Meter Station located at MP 1.47R (see Map 1 in Volume II the Mapping Supplement, Appendix 1G). The meter station will be located in Coos County in the NW of Section 3, T. 25 S., R. 13 W. The meter station will be located on JCEP property adjacent to the LNG Terminal. The meter station will occupy a site of approximately 0.85 acre and will be enclosed by a 7-foot high chain-link fence. The entire site will be graveled and existing power and phone service for gas control communication equipment is available. A pig launcher/receiver and mainline block valve will be located within the meter station facility. Access to the site will be from a road provided by the LNG Terminal. A building will be installed to house the gas chromatographs, moisture analyzer, communications equipment, and flow computer. A building will also be required to house the control valves and ultrasonic meters. A communications antenna will be installed to provide a link with the gas control monitoring system. The antenna will be installed on a new 140-foot tall steel tower.

1.1.2.2.2 Klamath Compressor Station

To meet contract pressure and flow requirements at the Jordan Cove Meter Station (MP 1.47R), PCGP will install an operational 61,500 ISO horsepower of new compression (with one additional standby unit of 20,500 ISO horsepower) at the Klamath Compressor Station located at MP 228.81 in Section 11, T. 41 S., R. 12 E. in Klamath County (see Map 35 in the Mapping Supplement, Appendix 1G). The location is accessed on the south from Malin Loop Road and on the west from Morelock Road. The site is located adjacent to the supply interconnects with GTN Malin/Tuscarora Meter Station and the Ruby Turquoise Flats facility.

The compressor station will consist of turbine-driven centrifugal compressor units. The compressor station is located approximately 1.75 miles northeast of Malin, Oregon, and will occupy a site of approximately 17 acres that will be secured by a 7-foot high chain-link fence. To minimize visual intrusions, the security fence around the perimeter of the

station would be installed with screening slats and landscaping along appropriate sides of the station to reduce potential visual effects to area residences. Areas inside the fenced area subject to operating or maintenance traffic will have a covering of paving, concrete, crushed rock or gravel. The southern edge of the site is adjacent to Malin Loop Road, which will provide primary access to the site via a new paved road connecting the Malin Loop Road to the fenced area of the compressor station. There will be a secondary access/egress to the site via a new gravel road connecting the northeast corner of the site to Morelock Road. The proposed site is relatively flat, currently supports rangeland vegetation with a few scattered juniper trees, and is adjacent to croplands and rangelands.

The new compression units will be installed in a new Class 1 Division 2 rated compressor building. Other facilities will include an inlet filter/separator, lube oil cooler, inlet air silencer/cleaner, exhaust system, and gas coolers. The compressor building will include fuel gas conditioning, measuring, and regulation equipment. Related suction and discharge headers and piping will be installed between the Pipeline and the compressor units. Other buildings inside the station include a new control room/ancillary equipment building and unit valve skid buildings. The ancillary equipment building will include an air compressor system, hot water boiler, and back-up generator. A high pressure vent system with a silencer will be installed in order to allow the station to be blown down. Near where the Pipeline leaves the station boundaries, aboveground pig launcher/receiver equipment and a mainline block valve will be installed. There will be a small office in one of the buildings with phone and computer access. The station will also be utilized as a maintenance base for operation of the Pipeline facilities. The station will not be manned 24 hours per day but will have emergency pipe, spare parts, portable equipment such as blow-down silencers, and small hand tools stored on site. The facility will be equipped with outside lighting to support night work activities; however, these lights will only be utilized when operations personnel are working at the station. During operations, nighttime work or maintenance activities will generally not be scheduled; therefore, these lights will only be used periodically and possibly for short periods during the winter when daylight hours are shorter.

The compressor station will be constructed contemporaneously with Pipeline construction.

1.1.2.2.3 Klamath Meter Stations

The Pipeline will receive all of its gas supply from interconnections with the GTN and Ruby transmission systems near Malin, Oregon. These meter stations will be co-located within the Klamath Compressor Station. Each meter station will be capable of receiving up to 100 percent of the Pipeline design capacity of 1,200,000 Dth/d. The Klamath-Eagle Meter Station will serve as the interconnect with Ruby, and the Klamath-Beaver Meter Station will serve as the interconnect with GTN.

1.1.2.2.4 Gas Control Communications

The meter stations and compressor station will require a communications link with the gas control monitoring system. A radio tower will be required at the Jordan Cove Meter Station and the compressor station. In order to communicate with these sites, PCGP will need to lease space on existing mountaintop radio communications towers or install new towers. PCGP has conducted initial communications studies and determined that in addition to the proposed towers that will be installed at the meter station and compressor

station, leased space on existing communication towers as well as new towers will be needed for the project. Table 1.1-3 lists the existing and proposed tower locations.

PCGP developed a Communication Facilities Plan, Appendix D to the POD (Appendix 1F). The Communication Facilities Plan describes the construction, modification, operation and maintenance of communication facilities necessary for the operation of the Pipeline on lands managed by the BLM and the Forest Service. PCGP prefers to co-locate with existing facilities when possible and will do so if leased space is available within existing facility sites at the time of construction. If leased space is not available on existing facilities, and construction of new facilities is required, PCGP will seek to obtain an approximate 100 foot by 100 foot (0.23 acre) area for each of the new facility installations in the immediate vicinity of the existing communication tower facilities. The new towers and communication buildings will be enclosed within a 50 foot by 50 foot (0.06 acre) fenced footprint located within the larger 100 foot by 100 foot area. The Communication Facilities Plan provides preliminary location maps for the potential tower sites, as well as the BLM/Forest Service guidance for communication site development plans regarding new facilities (see Attachments 3 and 4 of Appendix D to the POD (Appendix 1F). PCGP is reviewing the Communication Facilities Plan based on current technologies and Pipeline requirements.

Figure 1.1-1 and Table 1.1-3 provide the locations of the proposed communication system required for the Pipeline. Table 1.1-3 also provides the heights of these proposed or existing steel towers.

Table 1.1-3
Location of Proposed and Existing Gas Control Communication Towers

Site Name	Location							Tower Height (feet)	Jurisdiction
	Latitude			Longitude			County		
Proposed New Towers within Proposed Aboveground Facility Sites									
Jordan Cove Meter Station [1, 2]	43	25	58.1	124	14	27.8	Coos	140	Private
ABVA #4 (Deep Creek Spur) [2]	43	3	2.6	123	42.	57.01	Douglas	40	BLM
ABVA #10 (Shady Cove) [2]	42	38	43.8	122	49	3.4	Jackson	40	Private
ABVA #11, Launcher/Receiver (Butte Falls) [2]	42	34	40.4	122	40	49.7	Jackson	40	Private
ABVA #15 (Klamath River) [2]	42	9	33	121	50	37.4	Klamath	40	Private
ABVA #16 (Hill Road) [2]	42	3	25.5	121	38	43.9	Klamath	40	Private
Klamath Compressor and Meter Stations, BVA #17, Launcher [2]	42	2	1.4	121	22	23.9	Klamath	140	Private
Existing Communication Tower Site									
Harness Mountain	43	31	27.4	123	5	39.2	Douglas	150	Private
Existing Communication Tower Sites (space to be leased or new tower installed)									
Blue Ridge	43	16	16	124	5	9	Coos	170	BLM [3, 4]
SignalTree (Kenyon Mtn.)	43	0	7.4	123	46	44.3	Coos	120	BLM [3, 4]

Site Name	Location							Tower Height (feet)	Jurisdiction
	Latitude			Longitude			County		
Sheep Hill MW	43	0	7.5	123	21	19.3	Douglas	125	Private [4]
Starvout Communication	42	42	50.3	123	12	10.4	Jackson	115	Private [4]
Flounce Rock	42	43	40.4	122	36	33.1	Jackson	120	BLM[3, 4]
Robinson Butte	42	21	51.4	122	22	54.1	Jackson	125	Forest Service[3, 4]
Stukel Mountain	42	5	46.0	121	38	1.0	Klamath	100	BLM[3, 4]

[1] A tower will be constructed at this site unless PCGP is able to mount an antenna on one of the structures within the LNG Terminal footprint.
[2] Communication facilities are included in the fenced facility (disturbed areas) associated with the meter station, block valves and compressor station.
[3] The Communication Facilities Plan (Appendix D to the POD, Appendix 1F) provides more detail on the communication tower sites located on federally-managed lands.
[4] New towers and equipment buildings may be necessary at these locations if lease space is unavailable at the time of construction. Table 1.2-4 includes the potential disturbance for these sites.

1.1.2.2.5 Launchers/Receivers and Mainline Block Valves

Mainline block valves will be located along the Pipeline's permanent easement according to DOT's spacing requirements (49 CFR § 192.179) (see Table 1.2-4). Mainline block valves will be equipped with actuators and control equipment as necessary to allow operations compliant with DOT requirements in place at the time of construction, and consistent with any applicable guidelines or rules promulgated by the Pipeline and Hazardous Materials Safety Administration ("PHMSA") for such facilities. Each mainline block valve will occupy a site 50 x 75 feet (0.09 acre) and will be enclosed by a 7-foot high, chain-link fence. Five mainline block valve assemblies will be automated (ABVA) to allow remote operation, which will require a 40-foot tower to be installed within the facility's fenced footprint (see Tables 1.4-1 and 1.5-4).

PCGP has attempted to locate block valves adjacent to existing roads to allow reliable all-weather access and minimize the length of new permanent access roads. PCGP will paint the aboveground piping in the block valve locations green unless otherwise dictated by permit conditions. Locations of mainline block valves are depicted on the quad-based site location maps in the Mapping Supplement, Appendix 1G, and on the photo-based Environmental Alignment Sheets, Appendix 1H.

Pig launcher/receiver equipment will be located at each end of the Pipeline (*i.e.*, the Jordan Cove Meter Station and the Klamath Compressor Station). Due to current limitations of in-line inspection tools (pigs), there will also be pig launcher/receiver equipment co-located at Block Valve Assemblies (BVAs) #6, #11 and #14 (MPs 71.51, 132.46 and 187.43). At these locations, the block valve and pig launcher/receiver assembly sites will be approximately 95 x 200 feet (0.44 acre); however, BVA #11 will be 0.29 acre to avoid adjacent wetlands. Pigging facilities will be located inside the fenced areas at all locations.

1.1.2.3 Contractor and Pipe Storage Yards and Rock Source and Permanent Disposal Sites

1.1.2.3.1 Contractor and Pipe Storage Yards

PCGP has identified potential yards and rail facilities (see Table 1.2-3) that may be used during Pipeline construction to off-load and store pipe and stage contractor equipment and materials. Stored materials may include: construction mats, fencing materials, fuel and lubricants, stormwater control materials (straw bales, erosion control fabric, silt fence materials, etc.), and other construction materials. The yards would also be used for contractor office trailers and employee parking facilities.

The existing industrial sites that have been previously graded and graveled, that are proximate to the Pipeline area, and that have rail service are the priority locations for these off-site facilities. PCGP has conducted the required surveys (cultural and environmental) for sites where access was available, and the survey results have been included in the appropriate resource reports. Once a contractor has been selected and chooses suitable, available yards, all necessary surveys will be completed and the survey results will be provided to FERC and the appropriate jurisdictional agencies for approval, prior to use of the yards. Figures of the proposed yards are provided in the Mapping Supplement, Appendix 1G.

1.1.2.3.2 Rock Source and Permanent Disposal Sites

Permanent disposal sites may be required to handle excess rock, spoil, or drilling mud that are generated during construction. Disposal sites for these materials include existing and exhausted rock/gravel quarries and pits near the Proposed Route. Where existing quarries or pits are not available, PCGP has identified stable sites along the right-of-way as permanent disposal sites (see Resource Report 8). Locations of the rock source and disposal sites are also identified on the topographic maps and on site-specific figures in Appendix 8G to Resource Report 8. PCGP has conducted appropriate surveys (cultural and environmental) where permission has been granted, and PCGP has incorporated the survey results into the appropriate resource reports. PCGP will obtain the appropriate landowner approvals prior to utilizing any of these existing quarries, pits, or disposal areas.

1.1.3 Location Maps, Detailed Route Maps, and Plot/Site Plans

Figure 1.1-1 provides a general overview of the locations of the proposed facilities. Detailed maps, based on 7.5-minute topographic quadrangles, are included in the Mapping Supplement, Appendix 1G. Mileposts are shown on the detailed quad-based site location maps. Photo-based Environmental Alignment Sheets (1":200') are included as Appendix 1H. The photography utilized for the Environmental Alignment Sheets was obtained from 2015 high resolution photography flown for the Pipeline and 2016 images from USDA National Agricultural Imagery Program (NAIP).

1.2 LAND REQUIREMENTS

1.2.1 Pipeline Facilities

Construction of the Pipeline will require acquisition of temporary construction rights-of-way, TEWAs, and permanent easements which are described in this section. Table 1.2-1 summarizes the construction and operational land requirements for the Pipeline.

1.2.1.1 Construction Right-of-Way

Temporary Construction Right-of-Way. PCGP proposes to utilize a standard 95-foot wide temporary construction right-of-way with a 50-foot permanent easement (see typical construction right-of-way configuration Figure 1.2-1 at the end of this Resource Report). The temporary construction right-of-way configuration is required to accommodate the necessary clearing and grading activities to prepare the right-of-way, temporarily store spoil materials for construction, and to provide a passing lane during construction for equipment moving up and down the right-of-way. The temporary construction right-of-way will be used as the primary transportation corridor during construction. Eliminating the passing lane by narrowing the right-of-way width would significantly restrict traffic flow along the right-of-way. Efficient traffic flow minimizes impacts by reducing the number of access roads that may need to be constructed and by minimizing construction duration. The proposed 95-foot right-of-way configuration will minimize disturbance and accommodate many of the necessary cuts and spoil storage area requirements along the Proposed Route, thereby reducing the number of additional TEWAs that will be required to safely construct the Pipeline. Typically, large diameter pipeline projects (*i.e.*, 30-inch diameter or greater) utilize at least a 100-foot temporary construction right-of-way. For example, the 712-mile, 42-inch diameter Rockies Express Pipeline (West) Project (FERC Docket CP05-31-000) utilized a 125-foot wide construction right-of-way to construct the project across the Rocky Mountain and Plains States, and the recently completed 675-mile, 42-inch Ruby Pipeline, which extended from southwest Wyoming to Malin, Oregon, utilized a 115-foot wide construction right-of-way (FERC Docket No. CP09-54-000).

Where feasible (*i.e.*, where topographic conditions allow), at palustrine forested and scrub shrub wetland crossings (Cowardin 1979), the construction right-of-way has been reduced to 75 feet in width to minimize impacts to these resources (see Resource Report 2). The reduced construction right-of-way, or "neckdown," is consistent with FERC's Wetland and Waterbody Construction and Mitigation Procedures ("FERC's Wetland and Waterbody Procedures") (Section VI. A.3). The neckdowns are shown on the Environmental Alignment Sheets, Appendix 1H, and are included in the Pipeline's acreage requirements in Table 1.2-1. Because TEWAs are typically required on either side of neckdowns, neckdowns within emergent wetlands were determined on a case-by-case basis depending on the quality of the wetland and the quality of the adjacent vegetation that would be disturbed by the TEWAs.

Table 1.2-1
Total Pipeline Land Requirements for Construction and Operation

Pipeline Component	Length (miles) or Number of Sites	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Facilities	235.23*	2,664.91	1,415.34[1] / 845.97[2]
Temporary Extra Work Areas [3]	1,701	978.42	(44.80) [8]
Uncleared Storage Areas	285	665.41	0.00
Quarries & Disposal Sites	20	41.18	(41.18) [8]
Contractor and Pipe Storage Yards	36	674.27	0.00
Existing Roads Needing Improvements in Limited Locations [4]	40	9.45	(9.45) [9]
Temporary Access Roads	11	4.16	0.00
Permanent Access Roads	18	2.05 [5]	2.42 [5]

Aboveground Facilities	17	18.75 [6]	21.85 [7]
Total		**5,058.60**	**1,439.61** [8, 9]

* Because of changes in the centerline and associated MP equations, the ending MP no longer represents the actual centerline length.

[1] New permanent easement is 50-feet on private and federal lands.

[2] Acreage affected by the 30-foot corridor where brush control will be performed during operation of the Pipeline.

[3] TEWAs are shown on the Environmental Alignment Sheets provided in Appendix 1H.

[4] Includes those existing roads requiring widening in specific locations; does not include limbing/brush clearing or blading/grading for potholes.

[5] Portions of the PARs are within the construction right-of-way and permanent easement.

[6] Construction impacts associated with the aboveground facilities are included in the construction impacts for the Pipeline facilities except the 8 potential communication tower sites and the Klamath Compressor Station, which are included here (1.61 acres and 17.14 acres, respectively).

[7] Portions of the operational impacts of the aboveground facilities are included within the permanent easement acreage.

[8] Represents TEWAs, existing quarries, and rock source and disposal sites provided in Table 8A-4 that may be used as permanent storage areas. The acreages are not included in the overall operational total because the storage areas will not be used during operation of the Pipeline.

[9] Although the improvements will not be reclaimed, these roads will not be used for operations, and the acres are not included in the total operational acreage.

Steep or side slope areas will require the construction right-of-way to be greater than 95 feet in width, through the addition of TEWAs. These conditions may require unique construction techniques such as a "two-tone" right-of-way (see Figure 3430.34-X-0019 in the Erosion Control and Revegetation Plan ("ECRP") provided in Appendix 1B to this Resource Report). Additional TEWAs are necessary for adequate spoil storage/staging and to ensure a safe working area during construction. Sharp angles or points of intersection (PIs) along the alignment also require TEWAs to provide adequate space to install pipeline field bends or manufactured pipeline fittings and to ensure that stringing trucks (which can be greater than 100 feet in length) have the necessary turning radius to navigate the corner and stay within the "certificated construction limits." Areas where the construction right-of-way is greater than 95 feet in width are shown on the Environmental Alignment Sheets and included in the project acreages in Table 1.2-1.

In total, construction of the Pipeline will result in 5,058.60 acres of disturbance (excludes acres associated with contractor yards). Approximately 95.75 miles, or 41 percent, will be constructed within or adjacent to existing utility and transportation corridors (powerlines, pipelines, and roads).

Temporary Extra Work Areas. In addition to the 95-foot wide construction right-of-way, site-specific characteristics of the right-of-way make it necessary to obtain TEWAs. These TEWAs are required for (but not limited to) the following:

- Steep slopes and side sloping areas to accommodate cuts and spoil storage requirements;
- Bore pits and spoil storage at road, canal, pipeline, and railroad crossings;
- Spoil storage, staging, and construction of drag sections such as at wetland crossings, residential/industrial areas, and road crossings, etc.;
- Waterbody and wetland crossings;
- Pipe and equipment staging;
- Areas where tie-ins require additional trench widths to allow workers to enter the trench and perform welds and to ensure Occupational Safety and Health Administration (OSHA) trench safety requirements are met;

- Sharp angles or PIs where additional area is required to account for the wide turning radius of stringing trucks (which can be greater than 100 feet in length);
- Topsoil segregation areas to ensure topsoil and subsoils are not mixed; and
- Timber staging/decking.

Road and stream crossings and tie-in locations are typically conducted with a separate construction crew to fabricate and install the Pipeline across these features. To conduct these crossings, additional work area is required to stage or accommodate the equipment, crew vehicles, pipeline materials, dig the trench, store the spoil and safely install the Pipeline.

A total of 978.42 acres of TEWAs will be disturbed during construction of the Pipeline. All of these areas are considered temporary disturbance and will be reclaimed upon completion of construction (see ECRP in Appendix 1B).

FERC's Wetland and Waterbody Procedures contain a number of specifications regarding the location of TEWAs in proximity to waterbodies and wetlands. PCGP will comply, where possible, with these specifications including:

- TEWAs have been located at least 50 feet away from waterbody and wetland boundaries unless a proposed modification has been requested;
- Vegetation clearing between the TEWA and the edge of the waterbody has been limited to the certificated construction right-of-way; and
- TEWAs have been sized to the minimum necessary.

Because of the rugged terrain, there are numerous areas where site-specific conditions prevent compliance with the specifications provided in FERC's Wetland and Waterbody Procedures. These areas have been identified, described, and requested as proposed modifications in Table 1A-1 in Appendix 1A to this Resource Report. The BLM and Forest Service have requested additional TEWA setbacks within Riparian Reserves (see Resource Report 3) which are greater than the 50-foot setbacks specified in FERC's Wetland and Waterbody Procedures. PCGP has determined that these increased setbacks in Riparian Reserves would not be practical and would render the necessary TEWAs unusable. Therefore, PCGP will follow FERC's Wetland and Waterbody Procedures to minimize the extent and duration of project-related impacts to wetlands and waterbodies. Where feasible, PCGP has attempted to minimize locating TEWAs in Riparian Reserves.

Uncleared Storage Areas. During design of the construction footprint for the Pipeline, PCGP identified the need for additional work areas in various locations such as in dense, mature forested areas; in areas of steep slopes; and in areas where the proposed route follows steep, narrow ridgelines. However, to minimize overall disturbance, PCGP has specifically designated some areas as uncleared storage areas ("UCSA") rather than TEWAs. Unlike the TEWAs, the UCSAs will not be cleared of trees during construction. These areas will be used to store forest slash, stumps and dead and downed log materials that will be scattered across the right-of-way after construction during restoration. The amount of this type of material is expected to be large enough to hinder construction activities if it were stored on the right-of-way. Therefore, these UCSAs will be important construction footprint features. Numerous forested areas crossed by the Pipeline on BLM-managed and National Forest System ("NFS") lands are designated as LSRs and Riparian Reserves (see Resource Report 8) and are also

designated as critical habitat for the NSO or MAMU (see Resource Report 3). In these areas, forested habitat alteration is restricted, and the UCSAs will minimize forested habitat removal while still providing important work areas to facilitate Pipeline construction.

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. Where feasible, measures will be taken to minimize impacting trees by leaving as much space between the stored material and the trees as practical. Operators will be educated to place materials such that placement and retrieval of these materials minimize potential impacts (*i.e.*, soil compaction and bark damage). PCGP's inspectors will also encourage these practices during construction. PCGP developed a Leave Tree Protection Plan as part of the POD, Appendix 1F (see Appendix P to the POD) which describes the Best Management Practices ("BMP") that will be employed to minimize damage to trees not removed from the construction right-of-way and TEWAs and to protect trees within UCSAs on federally-managed lands. This plan was developed in consultation with the BLM and Forest Service.

Understory vegetation will be temporarily impacted in these areas from storage and retrieval of the material; however, this disturbance would vary depending on the quantity and types of material stored. If damage to trees occurred from use of the UCSAs, it is expected to be minor bark damage from scuffing that should have little impact on the trees. However, if damage harms the tree and the tree is stressed and dies over time, these damaged trees would provide a benefit to wildlife as snags. After construction, PCGP would assess potential tree damage within the UCSAs from construction activities and would appropriately compensate the landowner for the damage. Furthermore, appropriate erosion control and restoration measures would be applied as described in the ECRP (*i.e.*, scarification, seeding, replanting, etc. – see Appendix 1B) where determined necessary by the Environmental Inspector ("EI") where disturbance/damage has occurred within the UCSAs. Vegetation disturbance within the UCSAs would generally depend on the site-specific vegetation characteristics – with younger regenerating forests being potentially more susceptible to damage (limb breakage or tree damage). PCGP's 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 are minimized.

In some 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 trees so as to minimize impacts (soil compaction or tree damage). Where UCSAs are adjacent to or overlap a wetland or waterbody, PCGP will not store materials within the wetland or waterbody, and at least a 10-foot buffer will be maintained around the wetland or waterbody edge. In extremely steep and side sloping topography, the UCSAs may be required as a contingency location to contain rock which rolls beyond the construction limits. Along extremely steep and narrow ridgeline areas, logs, slash, and dead and downed material may be used as cribbing to contain excavated materials during construction (right-of-way grading and trenching activities). During restoration, some of the materials that are pulled out of the cribbing may roll beyond the construction limits. In these areas, it would be infeasible and impractical to retrieve all of the overcast materials because additional tree clearing and grading would be required to reach the materials.

A total of 665.41 acres of UCSAs have been identified (see Resource Report 8). The UCSAs are considered temporary disturbance because they will not be cleared and the materials (*e.g.*, slash, stumps and downed and dead material) stored within them will be removed during restoration activities; therefore, effects are expected to be short-term and minor.

1.2.1.2 Permanent Easement

A permanent easement is needed for long-term operations and maintenance of the Pipeline. The dimensions of the permanent easement on all federally-managed and private lands will be 50 feet and will be centered over the pipe as installed. As quantified in Table 1.2-1, the permanent easement for the Pipeline will consist of approximately 1,415.34 acres. PCGP will negotiate perpetual easements for the permanent easement. There will be a one-time payment to the landowner based on the impact of the easement on the property (*i.e.*, impact of the easement on the functional utility of the land). The easement will restrict placement of permanent structures. Subject to PCGP's safety, maintenance, and operational requirements, the easement may be crossed by roads, fences, utilities, etc., and the easement will allow for the growing of trees within 15 feet of the Pipeline centerline. The easement will include one pipeline and associated aboveground facilities, will be assignable to successors in interest, and will provide for ingress and egress. The landowner shall have the right to cultivate, work, plow, harvest and use the land so long as it shall not hinder, conflict or interfere with PCGP's surface or subsurface rights or disturb its ability to operate, maintain and protect its facilities. No reservoir, excavation that results in a change in surface grade, obstruction or structure will be allowed to be constructed, created, or maintained within the described easement area. PCGP will utilize the fee schedule for pipelines that cross BLM-managed and NFS lands according to the standard federal Right-of-Way Grant or alternate fee schedule mutually agreed upon with these agencies.

1.2.1.3 Construction Access Roads

Existing egress and ingress points to and from the construction right-of-way have been identified in Resource Report 8 as well as on the quad-based maps in the Mapping Supplement, Appendix 1G, and on the Environmental Alignment Sheets, Appendix 1H. These points have been identified to allow for safe, efficient construction and movement of equipment and materials.

In some areas, it will be necessary to grade or widen existing roads (to allow large equipment a turning radius) to access the construction right-of-way. The stringing trucks will be hauling 40 to 80-foot joints of pipe. The total length of these vehicles may be more than 100 feet and therefore these vehicles would travel outside the existing road footprint, especially on corners and with oncoming traffic. Widening access roads in the identified constricted locations is necessary to accommodate the potential for the stringing trucks to "walk" outside of the existing road footprint. In some circumstances, it may also be necessary for oncoming traffic to "pull out" of the existing road footprint for passing purposes.

Minor improvements (*e.g.*, potholing, grading to remove ruts, limbing to remove overgrowth) may be needed in some areas to accommodate oversized and heavy construction equipment. In general, roadway improvements will require a minimal amount of site disturbance and earthwork necessary to make the roads useable for access to the construction right-of-way. All maintenance will conform to BLM, Forest

Service, state, county, and landowner requirements. No maintenance or improvements will be allowed on any road not authorized for use and approved for improvements.

In consultation with the BLM, Forest Service, and Reclamation. PCGP developed a Transportation Management Plan ("TMP") to support the federal Right-of-Way Grant required on federally-managed lands. The TMP is included as Appendix Y to the POD (Appendix 1F). The TMP identifies and applies to all federally-managed roads located on federally-managed lands and privately-owned lands that will be used/authorized during timber removal, construction, and operations to access the construction and operational right-of-way. The TMP details the measures, standards, and stipulations to be employed by PCGP and its contractors in the construction, use, improvement, and maintenance of roads under the jurisdiction of the BLM, Forest Service, and Reclamation during and after construction for the duration of the federal Right-of-Way Grant.

1.2.1.3.1 Temporary Access Roads

PCGP has identified 11 locations where it will be necessary to construct temporary access roads ("TAR") which will be reclaimed to preconstruction conditions following completion of construction. Construction of the TARs will temporarily impact 4.16 acres. Appropriate cultural and environmental surveys have been completed for the temporary access roads or will be completed.

1.2.1.3.2 Permanent Access Roads

PCGP will need to construct 18 permanent access roads ("PAR") for access to the aboveground facilities (see Table 1.2-2). These roads will provide access during operational and maintenance activities while the Pipeline is in service. Most of the PARs will be located within PCGP's permanent easement. Construction of the PARs will permanently impact 2.05 acres.

Table 1.2-2
Temporary and Permanent Access Roads for the Pipeline

Access Road (TAR/PAR-MP)	Dimension (feet)	Impact (acres) [1]	Jurisdiction	Purpose
TAR-13.80	20x512	0.24	Private	Access to TEWA 13.96-W
TAR-27.06	20x1,500	0.69	BLM – Coos Bay	Access to TEWA 27.05-W
TAR-29.92	16x3,372	1.24	Private	Access TEWA 29.87-N
TAR-88.69	20x416	0.19	Private	Access to TEWA 88.62-N
TAR-94.81	20x114	0.05	Private	Access to S. Umpqua River
TAR 101.70	25x1,517	0.87	Private/FS - Umpqua	Access to TEWA 101.63-W
TAR-141.10	25x471	0.27	Private	Access to TEWA-140.98
TAR 143.19	20x146	0.07	Private	Access to right-of-way
TAR 145.60	20x391	0.18	Private	Access to TEWA 145.58-N
TAR-208.72	20x281	0.13	Private	Access to TEWA-208.67-W
TAR-215.72	14x728	0.23	Private	Access from Taylor Road
	Total TAR	**4.16**		
PAR-15.65	25x607	0.35	Private	Access to BVA#2
PAR-29.48	25x85	0.05	Private	Access to BVA#3
PAR-48.58	25x225	0.13	BLM	Access to BVA#4
PAR-59.58	25x105	N/A*	Private	Access to BVA#5 McNabb Creek Rd. (No Impact)
PAR-59.58	25x90	0.05	Private	Access to BVA#5

Access Road (TAR/PAR-MP)	Dimension (feet)	Impact (acres) [1]	Jurisdiction	Purpose
PAR-71.46	25x828	0.48	Private	Access to BVA#6; Access to right-of-way
PAR-80.03	25x92	0.05	BLM	Access to BVA #7
PAR-94.66	25x501	0.29	Private	Access to BVA#8
PAR-113.66	25x50	0.03	Private	Access to BVA#9
PAR-122.18	25x171	0.10	Private	Access to BVA#10
PAR-132.46	25x271	0.16	Private	Access to BVA#11 Launcher/Receiver
PAR-150.70	25x282	0.16	BLM	Access to BVA#12
PAR-169.48	25x220	N/A*	Private	Access to BVA#12
PAR-169.48	25x123	0.07	Private	Access to BVA#13
PAR-187.46	25x376	N/A*	Private	Access to BVA#14/ Launcher/Receiver Existing Unknown Rd.
PAR-187.46	25x50	0.03	Private	Access to BVA#14/ Launcher/Receiver Existing Unknown Rd.
PAR-196.53	25x106	0.06	Private	Access to BVA#15
PAR-211.58	25x72	0.04	Private	Access to BVA#16
Total PAR		**2.05**		
Total TAR & PAR		**6.21**		

[1] All or portions of the PARs are located within the permanent Pipeline easement.
*Existing roads not included in areas of Impact.

1.2.1.4 Contractor and Pipe Storage Yards and Rock Source and Permanent Disposal Sites

1.2.1.4.1 Contractor and Pipe Storage Yards

PCGP has identified yards and rail facilities that may be used during Pipeline construction to off-load and store pipe and stage contractor equipment in the Pipeline area (see Table 1.2-3). Identification of existing industrial sites that have been previously graded and graveled, are proximate to the Pipeline area, and which have rail service are the priority locations for these off-site facilities. PCGP will complete the required surveys (cultural and environmental) for these sites prior to initiating any construction activities.

1.2.1.4.2 Rock Source and Permanent Disposal Sites

PCGP has identified 20 rock source/disposal sites which total 85.98 acres (see Resource Report 8). Of these 20 rock source/disposal sites, 15 sites are existing quarries/gravel pits or abandoned quarries/gravel pits. Although some of the existing/abandoned sites appear to have land use types other than quarries/gravel pits, it is not PCGP's intent to expand these sites beyond the existing or previously disturbed footprints.

Table 1.2-3
Privately-Owned Contractor and Pipe Storage Yards
that May Be Used during Construction of the Pipeline

Name	County	Size (acres)	Description
North Spit Dock Yard	Coos	4.79	Industrial dock with gravel/native surface lot
Menasha	Coos	36.93	Export log yard and dock with rail sidings
K-2	Coos	25.56	Export log yard and dock with rail sidings
Brunell	Coos	12.87	Vacant industrial lot and dock with rail siding
Millington 1	Coos	28.4	Log yard
Millington 2	Coos	5.66	Vacant industrial lot, connected to railroad
Coquille Yard	Coos	20.37	Old industrial mill site, vacant lot
Coquille Park	Coos	3.28	Sturdivant Park, adjacent to rail siding

Name	County	Size (acres)	Description
Coquille Mill	Coos	4.37	Mill log, lumber, storage yard and parking lot, adjacent to rail siding
Coquille Sawmill Yard	Coos	7.46	Industrial lot/previous sawmill that was utilized as a contractor's yard
Winchester	Douglas	101.94	Undeveloped lots connected to rail yard, adjacent to interstate interchange
Green #1 Yard	Douglas	9.37	Vacant industrial lot, adjacent to rail siding
Green District Yard	Douglas	7.06	Vacant industrial lot/ log yard, gravel surface/ parking lot adjacent to railroad
Hult Chip Yard 2 (Pipe)	Douglas	13.30	Vacant industrial site; paved/gravel surface
Hult Chip Yard (Parking)	Douglas	2.65	Vacant industrial site; gravel surface
Hult Chip Yard 1 (Roll)	Douglas	8.91	Vacant industrial site; paved lot with rail siding
Roth	Douglas	3.79	Pasture, adjacent to rail siding, connects to project right-of-way
Weaver Highway 99	Douglas	6.37	Vacant undeveloped lot adjacent to Interstate interchange and close to railroad and sidings
Weaver Road Yard	Douglas	7.77	Vacant industrial log storage yard, adjacent to railroad
Riddle Main Street	Douglas	8.78	Vacant industrial lots including railroad siding
Riddle Pasture	Douglas	7.31	Vacant field adjacent to industrial sites and rail siding
Milo Yard 1	Douglas	5.27	Reclaimed quarry
Milo Yard 2	Douglas	10.41	Reclaimed quarry
Burrill Lumber	Jackson	61.44	Vacant lumber mill/log yard
Avenue F and 11th Street	Jackson	26.15	Industrial business and vacant graveled lot, adjacent to rail sidings
WC Short	Jackson	8.38	Rail siding and industrial yard
Rogue Aggregates	Jackson	38.90	Pasture/undeveloped land within active aggregate quarry and processing facility and undeveloped land includes rail siding
Collins Pacific Yard 1	Klamath	9.47	Active wood products plant – vacant gravel lot
Collins Pacific Yard 2	Klamath	5.41	Active wood products plant – vacant gravel lot
Klamath Falls Amuchastegui Building	Klamath	25.46	Existing commercial site and undeveloped industrial lots adjacent to rail siding
Klamath Falls Industrial Oil	Klamath	39.48	Undeveloped industrial lots adjacent highway, rail and rail sidings.
Klamath Falls Memorial Drive 2 / Bair	Klamath	65.53	Undeveloped industrial lots adjacent to rail siding
Klamath Falls Memorial Drive 1 Pipe Yard	Klamath	24.72	Vacant industrial mill site / lot, adjacent to railroad and sidings
Klamath Falls Cross Road East	Klamath	7.01	Farmland, adjacent to rail siding
Klamath Falls Cross Road West (Stukel) Rail siding	Klamath	9.92	Railroad siding
Merrill Oregon RR Siding	Klamath	9.78	Pasture adjacent to rail siding
	Total	**674.27**	

1.2.2 Aboveground Facilities

Permanent disturbance associated with aboveground facilities is summarized in Table 1.2-4. The locations of aboveground facilities are shown on the maps in the Mapping Supplement, Appendix 1G, and on the Environmental Alignment Sheets, Appendix 1H.

Table 1.2-4
Summary of Disturbance Associated with Aboveground Facilities

Facility [1]	MP	Acres Disturbed During Construction [2]	Acres Disturbed – for Permanent Operations [3]	Jurisdiction
Jordan Cove MS, BVA #1, and Receiver[4,5]	1.47R	0.85	0.85	Private
BVA #2 (Boone Creek Road)	15.66	0.09	0.09	Private
BVA #3 (Myrtle Point Sitkum Road)	29.50	0.09	0.09	Private
ABVA #4 (Deep Creek Spur) [5]	48.58	0.09	0.09	BLM
BVA #5 (South of Olalla Creek)	59.58	0.09	0.09	Private
BVA #6, Launcher/Receiver [5]	71.51	0.44	0.44	Private
BVA #7 (Pack Saddle Road)	80.03	0.09	0.09	BLM
BVA #8 (Hwy 227)	94.66	0.09	0.09	Private
BVA #9 (BLM Road 33-2-12/Dead Horse Creek)	113.65	0.09	0.09	Private
ABVA #10 (Shady Cove) [5]	122.18	0.09	0.09	Private
ABVA #11, Launcher/Receiver (Butte Falls) [5]	132.46	0.29	0.29	Private
BVA #12 (Heppsie Mtn Quarry Spur)	150.70	0.09	0.09	BLM
BVA #13 (Clover Creek Road)	169.48	0.09	0.09	Private
BVA #14 and Launcher/Receiver Site	187.43	0.44	0.44	Private
ABVA #15 (Klamath River) [5]	196.53	0.09	0.09	Private
ABVA #16 (Hill Road) [5]	211.58	0.09	0.09	Private
Klamath Compressor Station, Klamath-Beaver and Klamath-Eagle Meter Stations, BVA #17, Launcher & Communications Tower [5]	228.81	17.14	17.14	Private
Total		**20.24**	**20.24**	
Blue Ridge Communication Site – Coos County [6]	~ 20	0.23	0.23	BLM
Signal Tree Communication Site – Coos County [6]	~45.0	0.23	0.23	BLM
Sheep Hill Communication Site – Douglas County [6]	~70	0.23	0.23	Private
Harness Mountain Communication Site – Douglas County [6a]	~75	0.00 [7]	0.00 [7]	Private
Starvout Communication Site – Jackson County [6]	~115	0.23	0.23	Private
Flounce Rock Communication Site – Jackson County [6]	~123.0	0.23	0.23	BLM
Robinson Butte Communication Site – Jackson County [6]	~159.0	0.23	0.23	Forest Service
Stukel Mountain Communication Site – Klamath County [6]	~209	0.23	0.23	BLM
Total		**1.61**	**1.61**	
Grand Total		**21.85**	**21.85**	

Facility [1]	MP	Acres Disturbed During Construction [2]	Acres Disturbed – for Permanent Operations [3]	Jurisdiction

[1] Mainline Block Valves ("BVA") denoted as ABVA are automated valves and will include a 40-foot tall communication tower.
[2] Temporary construction disturbance associated with the aboveground facilities is included within the Pipeline construction right-of-way, and is not double counted in total project disturbance estimates.
[3] The 17 mainline block valves will be located within areas disturbed by the construction right-of way or within associated aboveground facility footprints (*i.e.*, meter stations and the compressor station); however, the permanent operation acres provided will remain as permanent disturbance associated with these graded, graveled and fenced facilities.
[4] The Jordan Cove Meter Station will be located entirely within the proposed Jordan Cove Terminal facilities.
[5] Communication facilities are included in the disturbed areas associated with the meter station, block valves and compressor station.
[6] Communication facilities will utilize existing towers and equipment buildings, where space is available for lease, with no associated disturbance. If construction of new facilities is required, PCGP will obtain an approximate 100 x 100 foot (0.23 acre) area in the immediate area of the existing communication tower facilities (see Appendix D to the POD for site drawings).
[7] The Harness Mountain Communication Tower is an existing communication facility, where no new disturbance is required.

1.3 CONSTRUCTION PROCEDURES

This section describes the general procedures that will be used to construct the Pipeline and aboveground facilities under typical conditions and consistent with the requirements of FERC's Upland Plan and Wetland and Waterbody Procedures.

The Pipeline will be designed, constructed, tested, operated, and maintained to conform with U.S. Department of Transportation (DOT) requirements found in 49 CFR Part 192, 18 CFR § 380.15, rules and regulations promulgated by PHMSA; and other applicable federal and state regulations.

In addition to the requirements listed above, PCGP will construct and reclaim all disturbed areas in accordance with FERC's Wetland and Waterbody Procedures and FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (hereafter FERC's Upland Plan). However, where exceptions to FERC's Wetland and Waterbody Procedures and Upland Plan have been identified, proposed modifications have been requested in Table 1A-1 in Appendix 1A to this Resource Report.

The Pipeline will likely be divided into five (or more) construction spreads to allow for mainline pipeline construction to be completed in two construction years. Each spread will require varying numbers of construction personnel, averaging 200 to 400 personnel per day, with one spread peaking at 800 to 900 personnel during construction activities. With 5 spreads, the average total personnel per day is 1,400 to 1,500, peaking at approximately 3,000 personnel. It is estimated that there will be approximately 75 to 100 construction and environmental inspectors per spread at peak, and that the three proposed meter station sites will require an estimated 60 to 80 construction personnel and support staff at peak and another 8 to 12 construction inspectors. Construction of the compressor station will require approximately 40 to 50 construction personnel and support staff at peak and 5 to 7 construction inspectors. The six HDDs (North Slough; Hayne's Inlet; MP 25; Coos River; Rogue River; and Klamath River) and Direct Pipe® crossings (Interstate 5 and the South Umpqua River) will require an estimated workforce

of 15 to 20 construction and support staff and 2 to 4 construction and environmental inspectors per drill site. Once a contractor has been selected, a determination will be made as to whether there will be one crew that drills each of the waterbody crossings consecutively or if there will be multiple crews working on two or more concurrently.

1.3.1 Pipeline

1.3.1.1 Preconstruction Filings

1.3.1.1.1 Coldwater Fisheries

Section V.B.1 of FERC's Wetland and Waterbody Procedures contains recommended crossing timeframes/windows for coldwater fisheries where crossing dates are not otherwise specified by an appropriate state agency. ODFW does not issue approvals or permits for waterbody crossings but provides guidelines for in-water timeframes which will minimize impacts to spawning fish species and their eggs. To minimize impacts to fish and aquatic habitats, PCGP will utilize the ODFW in-water construction windows for all stream crossings using conventional crossing techniques (i.e., open cut, flume, dam and pump, etc.). PCGP has requested that HDD crossings be allowed to occur outside of ODFW's in-water construction windows to ensure that enough time is provided to successfully complete the crossings. PCGP has also requested permission for temporary equipment bridges to be installed prior to the ODFW recommended in-water construction windows because the construction right-of-way will be utilized as the primary transportation corridor to move equipment and materials up and down the right-of-way.

PCGP has completed wetland and waterbody surveys for approximately 82 percent of the entire alignment; the remaining 18 percent are mostly areas where access has been denied. Resource Report 2 provides details of the wetland surveys results. Geotechnical studies have also been completed at various waterbody crossings. Resource Reports 2 and 3 describe the waterbodies that will be crossed by the Pipeline as well as the fish and aquatic habitats that these waterbodies support. Resource Reports 2 and 3 also specify the crossing method for each waterbody and provide the timing of the proposed crossings. Where blasting is anticipated at waterbody crossings, the potential impacts associated with blasting are identified in the Resource Reports and in the Geologic Hazards and Mineral Resources Report (Resource Report 6). Mitigation methods that would be implemented to reduce impacts from blasting are also identified.

PCGP consulted with ODFW regarding the presence of fish and aquatic habitats in the waterbodies crossed by the Pipeline during the interagency task force Waterbody Crossing Methodologies Subgroup meetings held under FERC Docket CP07-441-000. This information is incorporated into Resource Report 3. The proposed stream crossing methods provided in Table 3B-4 have taken into consideration ODFW recommendations to provide fish passage in streams with fish presence or where fish presence is presumed. The Geologic Hazards and Mineral Resources Report, Resource Report 6, indicates where blasting is anticipated along the Proposed Route. Where blasting in streambeds may be required to provide adequate pipeline design depths, PCGP proposes to use the dam and pump method (see Resource Report 2) to minimize potential impacts to aquatic species. Although this crossing method does not provide for fish passage during construction, potential impacts to aquatic species will be minimized by conducting the crossings during the in-water construction windows specified by

ODFW. Fish passage at these streams will only be restricted in the short-term while the dams are in place, which is expected to be fewer than 7 days.

1.3.1.1.2 Stormwater Pollution Prevention Plan

A Stormwater Pollution Prevention Plan ("SWPPP") will be prepared and submitted to authorize stormwater discharge under the Oregon Department of Environmental Quality ("ODEQ") General Stormwater Discharge Permit (Permit No. 1200-C) approximately one year prior to the start of construction. The SWPPP will be available on-site pursuant to FERC's Wetland and Waterbody Procedures (Section II.C) and U.S. Environmental Protection Agency ("EPA") regulations.

1.3.1.1.3 Spill Prevention, Containment, and Countermeasures Plan

Pursuant to FERC's Wetland and Waterbody Procedures (see Section IV.A), PCGP has prepared a Spill Prevention, Containment, and Countermeasures ("SPCC") Plan for the Pipeline (see Appendix 2B to Resource Report 2).

Additionally, SPCC Plans will be developed in accordance with 40 CFR Part 112 for the Klamath Compressor Station and Jordan Cove Meter Station. Oil storage tanks at the facilities will be constructed with appropriately sized secondary containment. Oil-filled operational equipment will be addressed in a manner consistent with the requirements of 40 CFR 112. In addition to the SPCC Plan, a Spill Procedure poster specific to the station will be prominently displayed in the facility's control room. The poster will identify all potential spill hazards at the facility (including oil) and list the appropriate response actions and contacts for facility and emergency response personnel. All station technicians will be trained for proper handling, storage, disposal, and spill response of hazardous fluids.

1.3.1.1.4 Federal and State Land Management Agencies, and Lands Managed by Federally Recognized Tribes

The Pipeline will cross federal lands managed by the BLM, Forest Service, and Reclamation. BLM-managed lands include four BLM districts: Coos Bay, Roseburg, Medford, and Lakeview. It is estimated that 40.48 miles of BLM-managed lands will be crossed by the Pipeline. Approximately 30.58 miles of NFS lands will be crossed in the Umpqua, Rogue River-Siskiyou, and Fremont-Winema National Forests. The Pipeline will cross approximately 0.31 mile of Reclamation facilities, which consists of approximately 26 facilities. Discussions are ongoing with the BLM, Forest Service, and Reclamation regarding construction of the Pipeline across these lands as well as procurement of a Right-of-Way Grant for the Pipeline's permanent easement. Specific requirements for construction, erosion control, revegetation, and maintenance will be contained in the Right-of-Way Grant. To support the Right-of-Way Grant, PCGP prepared the POD (Appendix 1F), which includes numerous plans that describe the specific activities that will occur on federally-managed lands. BLM/USFS previously indicated that plans for a previous route were complete, and PCGP is updating the plans to address minor revisions. Based on continuing discussions with the agencies, PCGP will be providing an updated POD (Appendix 1F). The plans, some of which are duplicates to appendices in this FERC Certificate application, include:

A Aesthetics Management Plan
B Air, Noise and Fugitive Dust Control Plan
C Blasting Plan

D Communication Facilities Plan
E Contaminated Substances Discovery Plan
F Corrosion Control Plan
G Environmental Briefings Plan
H Emergency Response Plan
I Erosion Control and Revegetation Plan
J Federally-Listed Plant Conservation Plan
K Fire Prevention and Suppression Plan
L Fish Salvage Plan
M Hydrostatic Test Plan
N Integrated Pest Management Plan
O Klamath Project Facilities Crossing Plan
P Leave Tree Protection Plan
Q Overburden and Excess Material Disposal Plan
R Prescribed Burning Plan
S Recreation Management Plan
T Right-of-Way Marking Plan
U Right-of-Way Clearing Plan for Federal Lands
V Safety & Security Plan
W Sanitation and Waste Management Plan
X Spill Prevention, Containment, and Countermeasures Plan
Y Transportation Management Plan
Z Unanticipated Discovery Plan (Cultural Resource Preservation)
AA Wetland and Waterbody Crossing Plan
BB Compensatory Mitigation Plan (Not Attached – Under Revision)
CC Environmental Alignment Sheets

1.3.1.1.5 Other Federal and State Agency Requirements

PCGP will submit or update applications to the federal, state, and local agencies for permits to construct under the current FERC Docket PF17-4-000. PCGP does not expect the permit conditions from these agencies to conflict with FERC's Upland Plan or Wetland and Waterbody Procedures. Pursuant to Section I.A of FERC's Upland Plan, PCGP will file other agency requirements prior to the start of construction, if necessary.

1.3.1.1.6 Municipal Water Intakes

Municipal water intake structures have been identified within 3 miles downstream of waterbody crossings (see Resource Report 2). PCGP will comply with Section V.A.2 of FERC's Wetland and Waterbody Procedures by providing written notification to the authorities of municipal water supply intakes at least 1 week before beginning in-water work or as otherwise specified by the authorities.

1.3.1.1.7 Wetland Delineation Report

As required by Section II.A of FERC's Wetland and Waterbody Procedures, PCGP has completed a wetland and waterbody survey and has provided the results of this survey in Resource Report 2 and the Wetland Delineation Report, as an appendix to Resource Report 2. The locations of wetlands and waterbody crossings that will be affected by construction are shown on the Environmental Alignment Sheets and are described in more detail in Resource Report 2. Wetland surveys have been conducted for approximately 82 percent of the Proposed Route where survey permission has been granted. In areas where survey permission has not been granted, PCGP used available

data (NWI maps, NHD Data[3] and USGS topographic maps) as well as other information, including low level high resolution aerial photographs and LiDAR data taken for the Pipeline in 2015, to make an assessment of wetlands and waterbodies that may be affected. Areas where surveys could not be completed because survey permission was denied have also been identified on the Environmental Alignment Sheets.

1.3.1.1.8 Environmental Controls, Supervision, and Inspection

PCGP will include all requirements in federal, state, and local permits and FERC's Upland Plan and Wetland and Waterbody Procedures in contract documents, including the construction drawings. Sensitive environmental areas are shown on the Environmental Alignment Sheets and will be identified in the contract documents. Procedures for completing construction within these areas will be discussed in detail. Information will be provided regarding wetland and waterbody construction techniques and monitoring requirements. Permit specifications will not be a separate portion of these contracts, but will be incorporated with all other specifications. All inspectors, including EIs, PCGP project management, and the contractor's project management and foremen will receive all contract documents.

PCGP will employ a lead EI and multiple EIs per spread during construction, cleanup, and restoration consistent with FERC's Wetland and Waterbody Procedures. PCGP will evaluate the number of EIs that will be needed to provide adequate coverage to ensure compliance based on the Pipeline's length, access constraints and complexity. Consistent with FERC's Wetland and Waterbody Procedures, the EIs will have knowledge of the wetland and waterbody characteristics in the project area. The EIs will have peer status with all other activity inspectors and will have authority to stop activities that threaten to violate environmental conditions of the FERC Certificate or other authorizations. The EIs will be authorized to order corrective action. All contractor foremen and inspectors will receive training on all specifications and requirements of the Pipeline. Environmental compliance procedures will receive special attention during training of contractor foremen and company inspectors. These individuals will support the EIs by communicating potential conditions observed during daily activities that may jeopardize environmental compliance. All personnel will receive basic training on actions necessary to ensure compliance. All personnel hired after Pipeline construction begins will receive the same basic environmental training.

PCGP's project management/engineering/environmental staff will have ultimate compliance responsibility. If noncompliance occurs, all personnel employed on the Pipeline will be made aware of the noncompliance. Training and/or adjustments in current procedures and techniques will be provided to ensure that the same noncompliance does not occur again.

1.3.1.1.9 Preconstruction Planning

Erosion Control, Revegetation, and Noxious Weed Control. PCGP has completed agency coordination, as required by FERC's Upland Plan (Section III. F.1). PCGP has consulted with the BLM, the Forest Service, and the NRCS regarding erosion control and revegetation specifications. Other appropriate agencies have been consulted as well. The Oregon Department of Agriculture Noxious Weed Control Program, as well as the BLM and the Forest Service, have been contacted regarding recommendations for

[3] https://www.google.com/#q=National+Hydrogrphy+Data+Set

the prevention and spread of noxious weeds. Copies of consultations are provided in Appendix 7A to Resource Report 7. Recommendations have been incorporated into the project-specific ECRP provided in Appendix 1B to this Resource Report. As part of the POD (see Appendix N to the POD, Appendix 1F), PCGP developed an Integrated Pest Management Plan to address the control of noxious weeds, invasive plants, forest pathogens, and soil pests across the entire Pipeline. BMPs have been created to minimize the potential spread of invasive species and minimize the potential adverse effects of control treatments.

Grazing Deferments. Although PCGP believes grazing deferments will not be necessary because grazing is not a dominant land use crossed by the Pipeline, PCGP has consulted with the BLM and the Forest Service regarding grazing resources. Potential impacts to grazing resources and deferments are addressed in Resource Report 8.

Timber Clearing. During tree and brush clearing, all operations and tree falling will occur within the certificated construction limits. All timber cleared from the right-of-way will be cut and cleared in accordance with landowner and land management agency requirements, where practical. Typical BMPs for timber harvesting are designed for standard forest practice operations, and these methods may not be feasible for the narrow right-of-way corridor associated with pipeline installation. For example, BLM BMPs may restrict tractor logging on slopes greater than 35 percent; however, tractor or a ground-based logging method may be the only feasible or practical timber yarding method in areas along the Proposed Route because of the alignment configuration, site-specific topographic conditions and the location of landings and existing haul roads. Cable log yarding systems will not be practical in many areas because of the requirements associated with this logging method, including lack of suitable access along the right-of-way to transport the yarder to a landing due to the steep, rugged and uneven topography, and the area necessary for swinging and landing logs, log decking, and loading.

PCGP has developed scenarios and methods to remove timber from the construction right-of-way and TEWAs using “desk top” methods based on best available data (*i.e.*, aerial photography, contour data, LiDAR data, as well as field reconnaissance). The proposed timber removal methods, direction, and staging areas are detailed in the Right-of-Way Clearing Plan (see Appendix U to the POD, Appendix 1F) developed for the entire Pipeline. These timber removal scenarios were developed utilizing applicable BMPs and compliance protocols outlined in the Erosion Control and Revegetation Plan (“ECRP”).

Prior to right-of-way easement acquisition, agency (BLM or Forest Service) representatives or their designated contractors will conduct timber cruises to verify timber volumes and species composition on forested lands to determine timber values. Timber cruises will be completed according to industry and/or federal agency standards. The timber cruises will validate the Right-of-Way Clearing Plan (see Appendix U to the POD, Appendix 1F), based on site-specific conditions in the field, and help identify the logging systems that will be practical along the route based on the pipeline alignment, construction right-of-way configuration (*i.e.*, temporary construction right-of-way and TEWAs), topographic conditions and constraints, existing access, timber types and volumes to be removed, and the various logging system limitations.

Merchantable timber will be removed and sold according to landowner/land managing agency stipulations; however, it is PCGP's preference to cut and remove all timber from the right-of-way and TEWAs to ensure that these areas are cleared prior to construction. In very limited areas, TEWAs have been identified for log storage and decking. These are existing cleared areas adjacent to existing roads where log storage could occur for extended periods. The construction right-of-way has been designed to minimize additional TEWAs to minimize overall project disturbance. The construction footprint is currently not large enough in many areas to accommodate log clearing and efficient construction activities simultaneously. Therefore, cut timber must be removed from the construction right-of-way to avoid project delays.

PCGP will avoid potential unnecessary impacts by implementing BMPs and applying the measures outlined in the ECRP (see Appendix 1B). These unnecessary impacts include avoidance of construction and restoration delays as well as avoidance of construction during the late fall and winter rainy season. Any timber cleared from the right-of-way that will be used for instream or upland wildlife habitat structures will be stored on the edge of the right-of-way or in TEWAs or UCSAs for later use during restoration efforts. Information regarding placement, size, and species of trees that will be used for instream large woody debris ("LWD") is included in Resource Report 3. Where LWD is acquired for project instream habitat use, this material will only be obtained from the certificated construction limits and will be collected outside riparian zones to maintain root structure within the riparian zone. An exception to this is where the LWD can be obtained from the trenchline or right-of-way cut areas where root systems would be removed during trench excavation or grading operations. Prior to clearing operations, the EI or PCGP's authorized representative will flag existing snags on the edges of the construction right-of-way or TEWAs where feasible to protect from clearing. These snags will be saved as mitigation to benefit primary and secondary cavity nesting birds, mammals, reptiles, and amphibians. During this process, other large diameter trees on the edges of the construction right-of-way and TEWAs would also be flagged for salvage as green recruitment or habitat trees, where feasible. Some of these trees would be girdled to create snags to augment the number of snags along the right-of-way to benefit cavity nesting birds, mammals, reptiles, and amphibians.

Other habitat diversity features that would be created from downed logs, un-merchantable woody debris, and slash (greater than 16 inches in diameter) including large rocks and boulders may also be stacked or piled along the right-of-way to provide wildlife habitat diversity features to benefit mammals, birds, reptiles, amphibians, and the prey base they depend upon. These habitat features would be created within the Pipeline's certificated construction limits where approved by the EI or PCGP's authorized representative and the landowner or land management agency. These features are also included in Section 10.14 of the ERCP (see Appendix 1B).

PCGP developed a Leave Tree Protection Plan as part of the POD (see Appendix P to the POD, Appendix 1F) which describes the BMPs that will be employed to minimize damage to trees not removed from the construction right-of-way and TEWAs and to protect trees within UCSAs on federally-managed lands. This plan was developed in consultation with the BLM and Forest Service.

Timber Clearing – Forest Service and BLM. The authority and procedure the Forest Service would use to dispose of merchantable timber cut for construction of the Pipeline is addressed under 36 CFR § 223.12. This regulation authorizes the Forest Service,

under the issuance of a right-of-way or special use authorization ("SUA"), to sell the timber directly to PCGP at the current appraised value. The intent would be to negotiate one contract covering the three National Forests crossed by the Pipeline. Payment for the timber sold would be made in a lump sum in advance of cutting and removal.

The BLM has authority under 43 CFR Part 5400 to sell PCGP the right-of-way timber through a negotiated sale when it is determined to be impracticable to obtain competitive bids through an advertised sale. The BLM intends to sell the right-of-way timber directly to PCGP under lump sum timber sale contracts at not less than the appraised value as determined by the BLM District. Timber sale contracts would be prepared, negotiated, and administered by each BLM office involved (Coos Bay, Roseburg, Medford, and Lakeview). All federal timber purchased by PCGP would be prohibited from log export and would require domestic processing consistent with existing agency policy and federal law.

The BLM and the Forest Service have required that on federally managed lands, PCGP comply with Oregon Revised Statues (ORS 527.670(3)) and provide a written timber harvest plan to the federal land management agencies and the Oregon Department of Forestry ("ODF") State Forester for each state forest region that would be crossed. Timber harvest plans would include such information as timber sale boundary designation, volume estimation, appraisal, and contract preparation. PCGP would file its final logging plans for both federal and non-federal lands after the completion of timber cruises and the selection of a timber removal contractor(s). PCGP will request proposals from contractors and contracts will be awarded to the most qualified bidder(s). Logging methods will be left to the contractors (subject to appropriate company and agency approval). The exact timber harvest and decking requirement locations will be determined by the contractor within the access roads and staging areas already identified for the Pipeline. Areas for log decking, log loadout, etc. are identified on the Environmental Alignment sheets as TEWAs.

PCGP will be responsible for log removal, log accountability, and marketing of the federal timber. The BLM and Forest Service will be responsible for monitoring payment, log accountability, and trespass. Many of the operational requirements typically detailed in such a timber sale contract such as erosion control, road maintenance, and slash disposal are expected to be contained in the Right-of-Way Grant and would only need to be incorporated by reference into the timber sale contract. Performance bonding typically required in such a timber sale, if included in the Grant and considered adequate, would be used to cover operations performed under the timber sale contract(s). Agency sale administrators would oversee timber disposal operations to ensure they are carried out following any site-specific requirements as well as to ensure payment and proper log accounting for specially-designated revenues. PCGP's Right-of-Way Clearing Plan (see Appendix U to the POD, Appendix 1F) provides details of timber removal requirements on federally-managed lands, including roles and responsibilities of PCGP/BLM/Forest Service, timber cruise and valuation, felling and yarding and logging methods, slash disposal, and BMPs that will be employed to minimize potential effects from these operations. Many of the practices outlined in the Right-of-Way Clearing Plan (see Appendix U to the POD, Appendix 1F) also generally apply to the private timber lands crossed by the Pipeline.

Treatment of Forest Slash. PCGP has determined that the quantity of slash material that will be generated during forest clearing operations will be substantial. The typical

size of the trees that will be cut and cleared from the construction right-of-way and TEWAs are too large to conduct whole tree yarding and, therefore, require the trees to be cut, topped, limbed, and bucked on site where the trees are fallen. Generally, only the logs will be yarded to a landing for decking, loadout, and transport and the slash (tree tops and limbs) will remain on the construction right-of-way where the tree was initially cut. During grading and trenching, stumps would also be generated which are also considered slash. The timber clearing and grading processes are expected to generate a significant quantity of slash that will be impractical to completely remove. During logging, limbs and tops will also be broken/crushed during tree falling and yarding operations, creating a large volume of smaller slash material that is impractical to remove because of the expected large quantity, size and distribution of this material. Further, the slash generated during timber clearing operations will remain on the ground and in place to provide important cover to minimize erosion over the winter prior to main line construction. The retained slash will be stored on the edges of the construction right-of-way, TEWAs, and UCSAs and then pulled back and redistributed/scattered across the right-of-way after construction during final cleanup after seeding during reclamation (according to BLM and Forest Service fuel loading limits) to minimize fire hazard risks.

Where it is not feasible to pull the slash back onto the right-of-way after seeding, seeding in these areas (broadcast or hydroseeding) will occur with specifications to ensure adequate seed coverage. Scattering the slash across the right-of-way will hinder off-highway vehicle ("OHV") traffic on the right-of-way and will act as a natural mulch to minimize erosion as well as organic matter for nutrient recycling to maintain long-term soil productivity. PCGP's proposed slash treatment is a typical silvicultural practice in the Pacific Northwest during logging operations.

Because more than 1 ton per acre of woody material (logs, slash and chips) may be scattered across the right-of-way during final cleanup in many areas, **PCGP proposes a modification to Section IV. F. 3. e. of FERC's Upland Plan.** PCGP will utilize the fuel loading standards of the BLM and the Forest Service as the limit for the quantity of woody debris that will be distributed across the right-of-way to minimize fire hazard risks under the proposed modification. **Section IV. F. 3. e. of FERC's Upland Plan** states that if wood chips are used as mulch to not use more than 1 ton per acre of chips and to add an equivalent of 11 pounds of available nitrogen where chips are used as mulch. The purpose of Section IV.F.3.e. of FERC's Upland Plan is to ensure that revegetation efforts are not hindered due to the decaying process of large amounts of wood chips which can bind up soil nitrogen and impede revegetation. PCGP requests this proposed modification because it will be impractical and infeasible to remove this material from the right-of-way and it is a typical silvicultural practice in the project area (i.e., forest slash left in logged areas). Furthermore, it is expected that the woody slash material will not deplete soil nitrogen in the short-term, during revegetation establishment, because the size of the woody material that will be scattered on the right-of-way will be large and will not readily decay in the short-term. However, as proposed in Section 10.8 of the ECRP (see Appendix 1B), PCGP will apply a standard fertilization rate of 200 pounds per acre bulk triple-16 fertilizer (16:16:16 - nitrogen, potassium and phosphorus) on all disturbed areas to be reseeded, except in wetlands and in federally-designated Riparian Reserves. This fertilization rate will apply 32 pounds per acre of elemental nitrogen, potassium, and phosphorus. The elemental nitrogen rate will also satisfy FERC's requirement to add nitrogen where wood chips are used as mulch (see Section IV. F. 3. e.).

On NFS lands, the maximum amount of slash that will be scattered across the right-of-way will be 12 tons per acre, which will be distributed over the following fuel loading size classes:

Fuel Loading Specification by Size Class	
Size Class (diameter)	**tons/acre**
0-1/4"	< 1
1/4– 3"	4-8
3-8"	7-12
maximum	12

On BLM-managed and private lands, the fuel loading specifications will be:

Fuel Loading Specification by Size Class	
Size Class (diameter)	**tons/acre**
0-1/4"	< 1 [1]
1/4 -8"	5-8 [1]
>8"	10-15
[1] Adapted from U.S. Forest Service Fuel Loading Standards	

As required by the Forest Service, dead and downed woody debris greater than 16 inches in diameter does not contribute to fire hazard and will be maintained on site. Large woody debris will be retained on the construction right-of-way according to agency specifications, as mitigation, to provide down wood for wildlife habitat and to aid in soil productivity. Slash may be chipped and scattered across the right-of-way provided that the average depth of wood chips covering the area does not exceed 1 inch following application. This chip depth will be sufficient to stabilize the soil surface from erosion while allowing grass seed to germinate and seedlings to develop. It is not expected to significantly increase fuel hazards as long as the maximum tonnage for fuel loading does not exceed 12 tons per acre.

In areas where the fuel loading exceeds these standards, such as where slash has been concentrated, as on landings, and cannot be evenly scattered across the right-of-way according to the fuel loading standards, PCGP will machine or hand pile and burn the excess material depending on the site location. Where offsite disposal is necessary, it would occur in accordance with federal, state, and local regulations. Burning will occur during the appropriate burning season and according to the conditions permitted by the BLM, the Forest Service, and ODF (OAR 629-615-300). A Prescribed Burning Plan was developed for these activities and is included as Appendix R to the POD (Appendix 1F). The Prescribed Burning Plan describes the protocols that PCGP will follow to obtain appropriate agency authorizations to burn forest slash materials on all lands crossed by the Pipeline and the BMPs that will be implemented to safely conduct slash burning operations.

On BLM-managed and NFS lands, larger slash pieces (more than 8 inches in diameter), may be removed from the project area and decked in designated storage sites, as stipulated by these agencies, or on the right-of-way at road crossings. This material will be made available to the public as firewood.

PCGP believes that the slash materials that may be generated during periodic right-of-way maintenance activities, which are likely to occur about every 3-5 years along the permanent easement, will not exceed BLM or Forest Service fuel loading standards.

Drain Tiles. The BLM has identified that French drains were installed to stabilize Elk Creek Road near MPs 34.02 and 37.15. The Pipeline crosses agricultural lands in Klamath County which are underlain by drain tiles. The drain tiles are located along approximately 20 miles of the 40-mile agricultural area crossed by the Pipeline. The tiles are mostly small (4 to 6 inches) and depending upon the exact pipeline location and groundwater levels, potential impacts to the drain tiles are unknown at this time. PCGP has not obtained the exact locations of the drain tiles along the Proposed Route but will identify the presence of drain tiles on individual properties during right-of-way easement acquisition. Drain tile repair and/or replacement will be a part of the easement damage negotiations.

Irrigation canals and ditches. The Proposed Route will cross numerous irrigation canals and ditches in agricultural fields in Klamath County. To minimize agricultural impacts and to schedule the crossings of the majority of the canals and ditches when they are dry and not in use, PCGP is proposing to construct during the winter in the Klamath Basin. The winter construction schedule will also minimize the crossing of high groundwater areas in the Klamath Basin which are caused from irrigation and canal leakage or drainage. PCGP will work with Reclamation, irrigation districts, and landowners to minimize disruption of these canals and ditches during construction and has agreed to utilize trenchless (bored) crossings of these features to minimize any downstream impacts. PCGP will maintain water flow in all crop irrigation systems, unless shutoff is coordinated with affected landowners. PCGP will negotiate with the landowners at these locations to minimize impacts to their agricultural operations and will compensate the landowners for any crop loss/damage resulting from the Pipeline.

PCGP has developed the Klamath Project Facilities Crossing Plan, as part of the POD (see Appendix O to the POD, Appendix 1F), which identifies the 26 locations where the Pipeline crosses facilities managed by Reclamation in the Klamath Basin. The plan was developed in consultation with Reclamation and specifies the methods proposed to cross these facilities.

1.3.1.2 Typical Pipeline Construction Procedures

1.3.1.2.1 Construction Spreads

PCGP has determined that to efficiently construct the Pipeline, pipeline construction will likely be divided into at least five construction spreads. The construction spreads will include all construction/restoration activities within a specific milepost range. PCGP has preliminarily determined the extent of each construction spread as provided in Table 1.3-1.

Table 1.3-1
Spread Locations

Spread	Milepost Range
1	1.47H-51.60
2	51.60-94.67
3	94.67-132.47
4	132.47-169.50

5	169.50-228.81

Each spread will consist of all construction activities necessary to construct the Pipeline including: clearing, grading, trenching, pipe stringing, welding, lowering-in, backfilling, regrading, and restoration. Figure 1.3-1 (see end of this Resource Report) provides the construction sequence and activities that each pipeline spread will perform. Table 1A-2 provided in Appendix 1A provides the typical construction crews and equipment that are anticipated for the Pipeline on each construction spread. The construction spread activities will generally occur in sequence or in assembly-line fashion along the right-of-way with one crew following the next from clearing until final cleanup. As work proceeds, there are often small periods between job tasks when work at a specific location on the right-of-way is delayed such as between trenching and pipe stringing or pipe stringing and welding.

1.3.1.2.2 Certificated Work Areas

Consistent with Section IV.A.1 of FERC's Upland Plan, PCGP will confine project-related disturbance to those areas shown on the Environmental Alignment Sheets or discussed in this Resource Report. No disturbance will be allowed to occur outside of these areas without appropriate surveys (cultural, threatened and endangered species, residential, etc.), other federal, state, or local permits and prior written approval from the appropriate FERC representative.

1.3.1.2.3 Surveying and Staking

Preliminary civil, cultural, and environmental surveys were completed between 2006 and 2016 for the majority of the Proposed Route, except for various minor reroutes and access roads or where survey permission was denied. The remaining cultural and wetland surveys will be completed as landowner permission is granted. The various biological surveys were completed in suitable habitat on all areas where survey permission was granted between 2007 and 2016. Additionally, follow up surveys for NSO and MAMU will occur prior to construction. Civil surveys have been conducted according to state and federal standards where applicable.

During construction, the exterior right-of-way limits and the boundaries of TEWAs shown on the Environmental Alignment Sheets will be staked prior to construction. Prior to the start of construction, an EI will verify the limits of the staked right-of-way and TEWAs and these survey stakes will be maintained throughout construction. Survey monuments that occur within the construction right-of-way will be protected, where possible, and if damage occurs, these monuments will be replaced according to state and federal standards. Property line monuments or survey corners on BLM-managed and NFS lands will be reestablished according to federal standards if damaged during construction. PCGP developed a Right-of-Way Marking Plan in consultation with the BLM and Forest Service as part of the POD (see Appendix T to the POD, Appendix 1F). This plan identifies the survey standards and types of survey markings that will be used by PCGP on federally-managed lands during the pre-construction, construction, and operational phases of the Pipeline.

All work will be performed by professional land surveyors licensed in the State of Oregon and which hold a valid and current Certified Federal Surveyor certificate for federal land surveying and setting of monuments. All surveys related to the Pipeline will be performed in accordance with procedures found in the Manual of Surveying Instructions (2009), and all applicable state or county statutes, codes and regulations, and

specifications of the County Surveyor. These surveys will meet the minimum degree of precision and accuracy defined by the State of Oregon's minimum standard requirement for the recording of surveys.

1.3.1.2.4 Construction Right-of-Way Egress and Ingress/Equipment Mobilization

Access roads that will be used during construction or crossed by the Pipeline have been identified and are provided in Resource Report 8. This table lists roads which may be used to access the construction right-of-way and identifies roads which will require improvement (*e.g.*, brush clearing, grading, widening). The locations of egress and ingress points are shown on the Environmental Alignment Sheets, Appendix 1H. Generally, all roads crossed by the right-of-way will be used for access. No additional roads will be widened or otherwise improved to accommodate construction traffic without obtaining the appropriate federal, state, and local approvals, including written authorization from FERC.

As previously noted, PCGP in consultation with the BLM and Forest Service developed a TMP. The TMP is included as Appendix Y to the POD (Appendix 1F). The TMP identifies and applies to all federally-managed roads located on federally-managed lands and privately-owned lands that will be used/authorized during timber removal, construction, and operations to access the construction and operational right-of-way. The TMP details the measures, standards, and stipulations to be employed by PCGP and its contractors in the construction, use, improvement, and maintenance of roads under the jurisdiction of the BLM, Forest Service, and Reclamation during and after construction for the duration of the Right-of-Way Grant.

Equipment involved in Pipeline construction will be moved onto the right-of-way using the roads identified in Resource Report 8. Generally, equipment moved to the construction right-of-way will proceed down the right-of-way performing their job tasks and minimizing the need to transport the equipment to various areas along the right-of-way. PCGP has developed a Noxious Weed Control Plan as part of the ECRP (see Appendix 1B – Section 12) which addresses measures (such as cleaning) that will be utilized to minimize the potential spread of noxious weeds onto the right-of-way from equipment transport. The Integrated Pest Management Plan (see Appendix N to the POD, Appendix 1F) also addresses the BMPs that will be implemented to minimize the spread of noxious weeds on federally-managed lands.

1.3.1.2.5 Vegetation Clearing

The construction right-of-way will cross a variety of types of vegetation cover. These vegetation cover types are described in Resource Report 3. The construction right-of-way will be cleared of all timber using standard logging practices in forested areas as described in the Timber Clearing section above. PCGP expects that all logging methods may be necessary to efficiently remove timber from the right-of-way, depending on the specific location. Ground-based skidding and cable (where feasible) logging methods will likely be the standard method; however, in some isolated rugged topographic areas with poor access, helicopter logging may be utilized. The specific logging methods will not be determined until a contractor has been selected through the bidding process.

On lands supporting taller shrub-type vegetation cover (sagebrush communities), PCGP will clear the right-of-way by mowing or scalping off the tops of the shrubs with a motor-grader or a bulldozer. This material will be salvaged on the edge of the construction right-of-way and scattered across the right-of-way after seeding during final cleanup.

Hayfields and vegetation cover types such as grass, low shrubs, or other low-growth vegetation will not be cleared except in areas directly over the trench or where grading will be required. The cleared vegetation material will be stored on the edge of the right-of-way and spread back over disturbed areas during final restoration. This material will increase moisture retention and reduce wind and water erosion and is considered by PCGP to be the functional equivalent of mulch and a source of native seed. Vegetation clearing in and adjacent to wetlands and at waterbody crossings will be consistent with FERC's Wetland and Waterbody Procedures.

1.3.1.2.6 Temporary Erosion Control Structures

Temporary erosion controls will be installed immediately after vegetation clearing and will be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls or until restoration is complete. Temporary erosion control structures and procedures are discussed in detail in the project-specific ECRP (see Appendix 1B).

1.3.1.2.7 Topsoiling

FERC's Upland Plan (Section IV.B.1) requires topsoil segregation in: 1) all residential areas; 2) annually cultivated or rotated agricultural lands and pasture; 3) hayfields; and 4) other areas at the landowner's request. In these areas, FERC's Upland Plan requires either full work area or trench line and subsoil storage area stripping (see Section V.3.1.a of FERC's Upland Plan). FERC's Wetland and Waterbody Procedures (Section VI.B.2.h) address topsoiling in wetlands. In wetland areas, FERC generally requires the top 12 inches over the trench line to be salvaged, except in areas where standing water or saturated soils are present. Areas that will require topsoiling are provided in Resource Report 7 and are shown on the Environmental Alignment Sheets.

Along the Proposed Route where topsoil segregation is proposed, PCGP has requested 10 feet of TEWA in addition to the 95-foot construction right-of-way to segregate topsoil from the trench line and subsoil storage area. If landowners request topsoil salvage from the construction right-of-way, PCGP would utilize up to a 25-foot wide TEWA, as allowed under FERC's Upland Plan (Section IV.A.2). The purpose of this TEWA is to ensure that the topsoil is segregated and kept separate from the trench subsoil.

On BLM-managed and NFS lands, PCGP will segregate topsoil in all wetlands according to FERC's Wetland and Waterbody Procedures (Section VI.B.2.h). Further, PCGP conducted biological surveys for federal Survey and Manage and Region 6 sensitive listed species including moss, lichen and fungi species. Where these species are identified within the construction right-of-way, PCGP will consult with the BLM and Forest Service to determine if topsoil segregation in these areas is a feasible and appropriate mitigation or management measure to minimize impacts to these species. Resource Report 7 further describes the BMPs that will be utilized on BLM-managed and NFS lands to minimize potential impacts from compaction where topsoil segregation is not proposed.

1.3.1.2.8 Blasting

Section 5.0 in the Geologic Hazards and Mineral Resources Report, Resource Report 6, provides the locations along the Proposed Route where blasting may be necessary. During grading and trenching activities, in areas where hard shallow bedrock is encountered, PCGP will utilize specialized methods to create a safe right-of-way grade and reach the required pipeline design burial depth. These methods may include

ripping, hydraulic hammering, rock sawing, and blasting. PCGP's contractor(s) will determine the most efficient and effective methods.

Where blasting is necessary, mitigation measures have been incorporated into the blasting plan to minimize potential adverse impacts to the environment including nearby water sources, structures, and utilities. Where blasting is required, all necessary permits will be obtained and blasting-related operations (*i.e.*, obtaining, transporting, storing, handling, loading, detonating, and disposing of blasting material; drilling; and ground-motion monitoring) shall comply with applicable federal, state, and local regulations and permit conditions. PCGP developed a Blasting Plan in consultation with the BLM and Forest Service (see Appendix C to the POD, Appendix 1F) to provide guidelines for the safe use and storage of blasting materials during construction to ensure the safety of construction personnel, the public, nearby facilities, and sensitive resources.

All blasting activities will be conducted by licensed blasting contractors in accordance with all applicable regulatory requirements. Section 5.0 in the Geologic Hazards and Mineral Resources Report, Resource Report 6, and the Blasting Plan in the POD (Appendix 1F) provide additional protective measures that will be employed where blasting is required to minimize potential impacts. The Blasting Plan provided a sample blast plan specific to the Heppsie Mountain quarry and evaluated potential particle velocities expected at the Pipeline location. Although PCGP has developed and analyzed sample blast plans and determined quarry development could be completed without harm to the in-service pipeline, the BLM requires that the Heppsie Mountain Quarry be shot prior to the installation of the pipeline. The resultant blasted rock will have dimensions of 24 inches or less. Once shot, the blasted rock will remain in place for future use as determined by the BLM. The BLM is requiring the blasting because it will not assume unknown risk associated with complications, limitations, or liability associated with developing this quarry in the future.

1.3.1.2.9 Trenching

The depth of the trench will be sufficient to provide a minimum depth of cover over the Pipeline of 30 inches in normal soil, 18 inches in consolidated rock, and 48-60 inches in agriculture lands. PCGP will strive to exceed these minimum DOT requirements provided in 49 CFR Part 192 where feasible and will achieve 36 inches of cover in Class I locations with normal soils and up to 24 inches of cover in consolidated rock areas.

For Class II, III, and IV locations, as well as drainage ditches of paved county, city, and state road and railroad crossings, DOT regulations provided in 49 CFR Part 192 require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

1.3.1.2.10 Pipe Installation

After trenching is completed, the pipe sections will be strung along the trench, bent to fit the contour of the trench bottom, aligned, welded together, and placed on temporary supports along the edge of the trench. All welds will be visually inspected, non-destructively tested (using radiographic or equivalent methods), and repaired, if necessary. Line pipe, normally mill-coated prior to stringing, will require field applied coating at the welded joints prior to final inspection. The entire pipeline coating will be inspected and tested to locate and repair any flaws or voids. The pipe assembly will then be lowered into the trench by side-boom tractors and excavators.

1.3.1.2.11 Backfilling

The trench will be backfilled using a backfilling machine or bladed equipment. No foreign substance, including skids, welding rods, containers, brush, trees, or refuse of any kind, will be permitted in the backfill.

PCGP will install trench plugs (see Drawing 3430.34-X-0011 in the ERCP in Appendix 1B) consistent with the requirements of FERC's Upland Plan (see Section V.B.1). Trench plugs will be installed at the base of slopes adjacent to wetlands and waterbodies and where needed to avoid draining of wetlands (springs). Trench plugs may be constructed from sandbags, foam, or bentonite. Topsoil will not be used to fill the bags. Trench plugs will be installed on slopes to minimize water flow down the trenchline to prevent potential subsurface erosion and to maximize stability, according to slope gradient (see spacing indicated on Drawing 3430.34-X-0011 in Appendix 1B).

1.3.1.2.12 Hydrostatic Testing

After backfilling, the Pipeline will be strength tested in accordance with DOT regulations to ensure that the system is capable of operating at the maximum operating pressure. Should a leak or break occur, the line would be repaired and retested until the specifications are achieved. Hydrostatic testing is one acceptable method for strength testing.

Water for hydrostatic testing will be obtained from commercial or municipal sources or from surface water right owners (see Table 1.3-2). If water for hydrostatic testing is acquired from surface water sources, PCGP will obtain all necessary appropriations and withdrawal permits (see Appendix 1C). As required by ODFW, pumps used to withdraw surface water will be screened according to National Marine Fisheries Service screening criteria to prevent entrainment of aquatic species.

The Pipeline will be tested in approximately 35 sections; each with varying lengths and water volume requirements (see Table 1.3-3). During the test, it may be necessary to release water at each of the section breaks; however, PCGP will conserve water as much as practical and minimize release where feasible by cascading water between test sections. Without cascading (not proposed), the maximum test volume for all individual test segments would be approximately 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.

Permission to release the hydrostatic test water will be obtained through ODEQ. Release rates would range from several hundred gallons per minute to several thousand gallons per minute. The specific hydrostatic release rate at each dewater location cannot be estimated at this time because the rate is dependent on a number of factors specific to each location. These variables include: the volume of water to be released, topographic conditions of the location, elevation differences between test sections and the direction of flow (uphill/downhill) between the test section, size of the test head piping, kind and size of the dewater structure to be utilized, infiltration properties of the surrounding soils, and location of any sensitive resources such as wetlands and waterbodies or facilities (*e.g.*, roads, residences) in the vicinity of the dewater location. The rate would be controlled to prevent scour, erosion, and potential effects or sediment migration to sensitive resources or facilities (see ECRP in Appendix 1B).

PCGP developed a Hydrostatic Test Plan (see Appendix M to the POD, Appendix 1F) in consultation with the BLM and Forest Service as well as the Center for Lakes and Reservoirs and Aquatic Bioinvasion Research and Policy Institute (Portland State University) and ODEQ. This Plan outlines the general hydrostatic testing process and describes the BMPs to minimize or avoid potential effects that could result from hydrostatic testing. One of the purposes of the plan was to develop BMPs to prevent the potential transfer of invasive species and pathogens from one watershed to another. This plan describes the potential invasive species and pathogens that were of concern to the BLM, Forest Service, and Portland State University and the BMPs that will be implemented. The details and rationale for these BMPs are described in the plan and summarized below.

If determined to be feasible for hydrostatic testing requirements, water would be returned 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 watershed where the water was withdrawn. If it is impracticable to return hydrostatic test source water to the same water basin from which it was withdrawn, PCGP would employ an effective and practical water treatment method (chlorination, filtration, or other appropriate method) to disinfect the water that would be transferred across water basin boundaries. The hydrostatic test water would be treated after it is withdrawn and prior to hydrostatic testing.

PCGP 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 discharge at least 150 feet from wetlands or waterbodies with no direct discharge to these features. All hydrostatic test water will be released through a dewatering device such as a straw bale structure or sediment bag, in a manner to promote infiltration. Further, all hydrostatic release locations would be monitored after construction to ensure noxious weeds have not established.

As explained in the Hydrostatic Test Plan, PCGP 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. Chlorinated water would be released according to the ODEQ, May 19, 1997, Memorandum for Chlorinated Water Discharges (see Attachment C to Appendix M/Hydrostatic Test Plan to the POD, Appendix 1F) to prevent water quality impacts, potential effects to aquatic species, and to minimize potential impacts to sensitive areas.

Table 1.3-2
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				

County	MP	Source		Owner	Estimated Withdrawal Requirement *(Longest Test Segment Volume)*[1]
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 District	3,315,584
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

County	MP	Source	Owner	Estimated Withdrawal Requirement *(Longest Test Segment Volume)*[1]
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.

Table 1.3-3
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	1.47R (Private)	4.20R	14,840	735,523 (2.26)	Coos Bay - North Bend Water Board	Private	Coos Bay /Coos River / Jordan Cove (1243397433543)	650	Beg. 43.432564 Beg. -124.240191
										Haynes Inlet (1242326434319)	1000	
										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	4.20R	10.13	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	10.13	17.1-17.25	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	17.1-17.25	35.80	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	35.80	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	58.85	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	58.85	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	71.42	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	71.42	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	100.77	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	100.77	110.37	50,960	2,525,177 [4] (7.75)	S. Umpqua River Crossing #2	USFS-Umpqua	East Fork Cow Creek (1229918428021)	870	42.77114
										Tribs to East Fork Cow Creek (1229258427752 & 1229337427754)	810 830	-122.926565
18	Umpqua Rogue (MP 111.11)	Upper Cow Creek 1710030206	Trail Creek 1710030706	110.37	113.67	15,600	771,945 (2.37)	Rogue River Crossing	Private	Tribs to Dead Horse Creek (1228736427515 & 1228712427513)	2145 2075	42.74529
										Trib to West Fork Trail Creek (1228839427397)	1270	-122.885218
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
										Trib to West Fork Trail Creek (1228571426840)	215	-122.885284
20	Rogue	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	117.84	122.20	23,080	1,141,707 (3.50)	Rogue River Crossing	Private	Trib to Cricket Creek (1228167426451 & 1228177426455)	55 450	42.645528
										Cricket Creek (1228054426435)	233	-122.817437
20A	Rogue	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	122.20	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
										Trib to Rogue River (1228061426243)	850	-122.780074
										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
										Trib to South Fork Little Butte Creek (1225728424006)	840	-122.570909
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
										Trib to South Fork	1123	-122.539368

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	169.52	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	169.52	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	197.49	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	197.49	199.17	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	199.17	210.52	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	210.52	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	228.13	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 were to the closest water course regardless of flow characteristics (*i.e.*, perennial, intermittent, or ephemeral).
[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.

1.3.1.2.13 Cleanup and Permanent Erosion Control Devices

PCGP will make every effort to complete final cleanup of an area within 20 days after backfilling the trench. Final cleanup will include final grading and installation of permanent erosion control structures. In no case will PCGP delay final cleanup beyond the end of the next recommended seeding season. During final cleanup, PCGP will remove all construction debris and grade disturbed areas to approximate preconstruction grade to the extent practicable. PCGP anticipates completing final cleanup during summer and fall. However, if it appears that construction may continue into the winter because of unforeseen delays and cleanup and reseeding is delayed until spring, PCGP will implement the measures outlined in the winterization plan provided as Attachment E to the ECRP (see Appendix 1B). This plan will describe the procedures that will be implemented to minimize potential impacts associated with delayed cleanup (*e.g.*, temporary erosion controls procedures, topsoil stabilization, reseeding).

Travel Lane. Because of the restricted nature of the construction right-of-way in several areas, PCGP anticipates that it will be necessary to leave a travel lane open over extended portions of the construction right-of-way. As soon as access is no longer required, the travel lane will be closed and the disturbed area reclaimed. To reduce erosion from the travel lane, PCGP will install appropriate temporary erosion controls in areas where the travel lane is temporarily left open. These are discussed in the project-specific ECRP provided in Appendix 1B.

Excess Rock Removal. FERC's Upland Plan (see Section V.A.3) requires the removal of excess rock from the top 12 inches of soil in cultivated or rotated croplands, hayfields, pastures, residential areas, and other areas at the landowner's request. PCGP will comply with FERC's Upland Plan. In these areas, PCGP will clean up excess rock to a condition (size, density, and distribution) similar to adjacent portions of the construction right-of-way. In rangeland, forestlands, or other non-agricultural or residential lands where shallow bedrock is encountered and rock excavation is required, excess rock will be buried in cuts during restoration to reestablish approximate original contours and scattered across the right-of-way and TEWAs according to landowner agreements. Where excess rock requires disposal, PCGP will consider this material construction debris. The disposal sites have been identified in Resource Report 8, and PCGP will obtain the appropriate approvals prior to use. As noted above, excess rock may be incorporated into habitat diversity structures and stacked or piled along the right-of-way to provide wildlife habitat diversity features to benefit mammals, birds, reptiles, amphibians, and the prey base they depend upon. These habitat features would be created within the Pipeline's certificated construction limits where approved by the EI or PCGP's authorized representative and the landowner or land management agency. These features are also included in Section 10.14 of the ERCP (see Appendix 1B).

Permanent Erosion Control Devices. PCGP will install permanent erosion control devices or BMPs consistent with the requirements of Section V.B. of FERC's Upland Plan and as described in the project-specific ECRP provided in Appendix 1B. These BMPs will consist predominantly of trench breakers, slope breakers or waterbars, and revegetation measures to permanently stabilize disturbed areas. PCGP will utilize the spacing for these structures as specified in FERC's Upland Plan (Section V. B.1. b, and V. B. 2 b) or as recommended by the BLM, Forest Service, or NRCS. Because the recommendations from these agencies varied during consultations, PCGP developed specifications that are consistent across the project based on slope and soil

characteristics and which incorporated the agencies' recommendations as much as practical.

Soil Compaction. PCGP will test for soil compaction in the croplands, hayfields, and residential areas crossed by the Pipeline. The Forest Service and BLM requested that soil compaction tests be completed on BLM-managed and NFS lands and PCGP agreed. Tests will be conducted on the same soil type under similar moisture conditions as specified in Section V.C. of FERC's Upland Plan. Pursuant to Section II.B.8 of FERC's Upland Plan, the EI will be responsible for conducting soil compaction testing and for determining corrective measures. On BLM-managed and NFS lands, corrective measures will be determined in conjunction with BLM and Forest Service personnel. Resource Report 7 describes in more detail the potential for compaction and the measures that will be implemented to mitigate potential compaction.

Rugged Topography. A significant portion of the Proposed Route crosses rugged topography as it traverses the Coast and Cascade mountain ranges and foothills. Where the Pipeline passes through the dissected Coast Range and foothills between Coos Bay and Myrtle Creek, Oregon (MPs 4.14R to 69.00), most of the ridgelines run in the opposite direction of the Proposed Route (see Maps 1 through 11 in the Mapping Supplement, Appendix 1G). The orientation of the ridges requires the Pipeline, in numerous areas, to descend and ascend steep slopes to cross stream valleys so that the alignment can proceed in a southeasterly direction toward Myrtle Creek, Oregon and ultimately toward the terminus near Malin, Oregon. This similar condition also occurs between MPs 70 and 121.00 where the Pipeline traverses the Cascade Range and foothills (see Maps 11 through 20 in the Mapping Supplement, Appendix 1G). During routing of the Pipeline, PCGP utilized ridgelines, where feasible, to minimize the amount of cut and fill slopes, crossing steep slopes, potential geologic hazards, and waterbodies as well as to reduce erosion hazards. Areas of steep side slopes were avoided as much as practical to minimize construction complications.

The Geologic Hazards and Mineral Resources Report, Resource Report 6, provides a geotechnical hazards review that was conducted during project routing and describes the avoidance mitigation measures that were implemented (*i.e.*, minor reroutes) to avoid potential high risk geological hazards areas. Resource Report 7 identifies the miles of soils crossed by the alignment which have steep slopes and high erosion hazards. Areas have been noted where the Proposed Route route traverses steep, narrow ridges and where it will be infeasible to return these ridges to their approximate preconstruction contours during final grading. Drawing 3430.34-X-0018 in the ECRP (see Appendix 1B) provides a typical construction right-of-way configuration for these sharp ridgeline areas; the drawing shows a typical cross section of the original topographic condition, the ridgeline areas during construction, and post construction. Stable alternate pipeline routes were not present in these areas, except for other similar ridgelines that would have created the same situation.

During construction across rugged topography, PCGP will utilize the following measures, as necessary, to minimize construction, geologic and erosion hazards as well as to ensure the integrity of the Pipeline:

- route the Pipeline to ensure safety and integrity of the Pipeline;
- identify adequate work areas to safely construct the Pipeline;

- utilize appropriate construction techniques to minimize disturbance and to provide a safe working grade during construction (i.e., ridge top and two-tone construction, see Drawings 3430.34-X-0018 and 3430.34-X-0019 in the ECRP in Appendix 1B);
- optimize the construction window during the dry season, as much as practicable;
- utilize temporary erosion control measures during construction (i.e., slope breakers/waterbars);
- install trench breakers in the Pipeline trench to minimize groundwater flow down the trench which can cause in-trench erosion;
- properly backfill the trench according to PCGP's construction specifications;
- promptly restore the right-of-way to approximate original contours or to a stable contour after pipe installation and backfilling;
- install properly designed and spaced permanent waterbars;
- revegetate the slope with appropriate and quickly germinating seed mixtures;
- mulch or install erosion control fabric on slopes, as necessary; and
- monitor and maintain the right-of-way as necessary to ensure stability.

The project-specific ECRP (see Appendix 1B) provides additional discussion regarding construction techniques in areas of rugged topography. The ECRP also describes the procedures that will be implemented to minimize erosion hazards and to facilitate successful revegetation of these areas.

1.3.1.2.14 Revegetation

As required by FERC's Upland Plan, PCGP consulted with the NRCS, BLM, and Forest Service regarding specific seeding dates and recommended seed mixtures for the project area. These consultations are provided in Appendix 7A to Resource Report 7 and the recommendations have been incorporated into the project-specific ECRP (see Appendix 1B). The ECRP describes the procedures that will be implemented to minimize erosion and enhance revegetation success for the entire project. The ECRP describes the procedures that will be utilized to minimize the spread of noxious weeds as a result of project construction. The ECRP describes the silvicultural prescriptions that will be implemented in forested areas that are outside the permanent easement to restore these areas to their forested land use.

1.3.1.2.15 Off-Highway Vehicle Control

During restoration of the right-of-way, PCGP will consult with private landowners, the BLM, and the Forest Service to determine appropriate locations for installation of OHV controls to minimize impacts to the right-of-way as well as to adjacent lands, consistent with FERC's Upland Plan (Section VI). Some of the measures that might be used to control OHV traffic include: signage; slash and timber barriers; excess rock piles or barriers; and vegetation plantings or screens.

Measures to address OHV control on federally-managed lands are addressed in the Recreation Management Plan (see Appendix S to the POD, Appendix 1F), which was developed in consultation with the BLM and Forest Service. One of the goals of this plan is to prevent unauthorized OHV use where the right-of-way could create additional access points. This plan provides mitigation measures that could be implemented to control OHV access, depending on site-specific conditions at the area of concern and

the management agency/landowner preferences. The BMPs outlined in this plan to control OHV use are also applicable to private lands crossed by the Pipeline.

1.3.1.3 Road Crossings

For construction across roads, PCGP will comply with requirements of the BLM, the Forest Service, or the state or county agency responsible for permitting the road crossing. Roads will either be bored or open cut (see Table 8A-1 in Appendix 8A to Resource Report 8). Typically, dirt, gravel surfaced and secondary paved roads will be open cut, the pipeline installed, the road repaired, and the crossing completed within one day. At paved county, city, and state road crossings, PCGP will maintain five feet of cover between the road surface and the top of the pipe where possible. During landowner negotiations, PCGP will consult with entities having jurisdictional control at crossing locations where loads may exceed Oregon Department of Transportation (ODOT) legal limits in order to determine if mitigation measures can be employed to handle higher load limits. Some timber harvesting equipment will require specialized road design for travel over the buried pipeline. The TMP (see Appendix Y to the POD, Appendix 1F) outlines the standards for road crossings specific to BLM-managed and NFS lands. Line pipe installed at road crossings will be designed to meet the specific requirements of the DOT and to accommodate the load capacity requirements of roadway jurisdictional entities.

1.3.1.4 Waterbody Crossings

The Pipeline will cross approximately 400 waterbodies as discussed further in Resource Report 2. It is expected that intermittent waterbodies and ditches would be dry during construction. The list of waterbodies crossed by the Pipeline is based on field investigations that were conducted between 2006 and 2016; review of USGS topographic maps; review of GIS data from the OR/WA Hydrography Framework Partnership (2012) providing geographic hydrology information; and review of low level and high resolution aerial photography and LiDAR data developed for the Pipeline. For each waterbody crossing, Resource Report 2 includes the name of the waterbody, milepost location along the Pipeline, and waterbody flow type (i.e., intermittent or perennial). Additional information regarding the stream classification system is found in Resource Report 2. FERC's waterbody classification is also included in the table. PCGP will cross coldwater fisheries using conventional crossing techniques within the ODFW suggested in-water construction windows.

Pipeline crossings of perennial waterbodies will be made nearly perpendicular to the axis of the waterbody channel, where feasible. The Proposed Route avoids paralleling a waterbody within 15 feet or less, where feasible. Where possible, PCGP has located TEWAs so that they are no closer than 50 feet from waterbody boundaries. However, where topographic conditions or other constraints prevent the 50-foot waterbody setback, these areas have been noted and described in Table 1A-1 in Appendix 1A. Consistent with Section V. B. 2. a. of FERC's Wetland and Waterbody Procedures, where the uplands adjacent to a waterbody consist of actively cultivated or rotated cropland or other disturbed land, the TEWAs have been located adjacent to the waterbody. Although allowed under FERC's Wetland and Waterbody Procedures, these areas have been included in Table 1A-1 in Appendix 1A. The Forest Service has recommended that TEWA setbacks at stream crossings be greater than 50 feet in Riparian Reserves. As explained above, in areas of rugged topography, a larger

setback would render the TEWA useless for the stream crossing. Therefore, PCGP will utilize the TEWA setback requirements in FERC's Wetland and Waterbody Procedures.

Major Waterbodies. Major waterbodies (*i.e.*, greater than 100 feet in width) that will be crossed by the Pipeline are identified in Resource Report 2. To develop the crossing methods, PCGP previously consulted with appropriate federal and state agencies during the interagency Waterbody Crossing Methodologies Subgroup meetings. PCGP has prepared detailed, site-specific construction drawings with construction details for each of these waterbody crossings which identify the areas that will be disturbed by the proposed construction method including the areas necessary to fabricate the Pipeline for the crossing, stage equipment, store spoil, and construct the crossing. These drawings are included in Resource Report 2. The waterbody crossing drawings address navigational issues, where appropriate, and mitigation measures that will be implemented to minimize potential impacts. Sediment control structures at the crossings are shown in the site-specific construction drawings and on the Environmental Alignment Sheets.

Minor and Intermediate Waterbodies. If water is present in the streambed at the time of construction, PCGP will utilize a dry-ditch crossing method (flume or dam and pump) to cross all minor and intermediate waterbodies consistent with the requirements of Section V.B.6 of FERC's Wetland and Waterbody Procedures (see Table 2.2-2). Fluming and dam and pump procedures that will be utilized to cross these waterbodies are provided in Resource Report 2. Resource Report 3 notes the waterbody crossing method determined for each waterbody and provides the rationale for the crossing method that was developed during the interagency Waterbody Crossing Methodologies Subgroup meetings.

Hazardous materials, chemicals, fuels, and lubricating oils. These materials will be stored in upland areas at least 100 feet (150 feet on federally managed lands) from waterbodies and wetlands or in accordance with FERC's Wetland and Waterbody Procedures. Restricted areas for storage of these materials will be clearly marked in the field. Concrete coating, refueling, and equipment maintenance activities will be conducted according to FERC's Wetland and Waterbody Procedures. Concrete trucks will not be washed on the right-of-way. All hazardous materials will be handled in accordance with the SPCC Plan. If any unanticipated spill occurs during construction, PCGP will implement the procedures outlined in the SPCC Plan.

Temporary Construction Bridges. If water is present in any streambeds at the time of construction, PCGP will utilize temporary construction bridges during all phases of construction to cross these waterbodies. Except as noted below for Forest Service crossings, equipment bridges will not be installed on intermittent waterbodies which are dry at the time of construction. If a storm occurs which results in water in the streambed of the otherwise intermittent waterbody, no equipment will cross the waterbody until the streambed dries up or until a bridge is installed. As directed by the Forest Service during the interagency Waterbody Crossing Methodologies Subgroup meetings, all stream crossings on NFS Lands (whether intermittent or perennial, wet or dry) will have: 1) a bridge; 2) a temporary culvert with temporary road fill to be removed after work is completed; or 3) a low water ford with a rock mat.

Although FERC's Wetland and Waterbody Procedures (see Section V. B. 5. a.) allow clearing equipment and equipment necessary for installation of the temporary bridges to

cross waterbodies prior to bridge installation, PCGP will not allow clearing equipment to cross waterbodies prior to bridge placement. Instead, where feasible, PCGP's contractors will attempt to lift, span, and set the bridges from the streambanks. However, where it is not feasible to install or safely set the temporary bridges from the streambanks, only the equipment necessary to install the bridge or temporary support pier will cross the waterbody. Resource Report 3 provides PCGP's estimate of whether a temporary equipment bridge would be required; whether one pass of equipment is expected to be necessary; and whether the one pass could occur within the ODFW-recommended in-water period at each of the waterbody crossings. These estimates were developed during the interagency Waterbody Crossing Methodologies Subgroup meetings.

The bridging structures will be designed according to FERC's Wetland and Waterbody Procedures (Section V.B.5.B) as well as according to the COE, ODSL, ODEQ, ODFW, BLM, and Forest Service approvals. To provide equipment and material access up and down the construction right-of-way, it will be necessary to install equipment bridges outside the ODFW-recommended in-water construction windows.

The temporary equipment bridges will be constructed to maintain unrestricted flow and to prevent soil from entering the waterbody. Soil will not be used to stabilize equipment bridges. Bridges will be designed and maintained to withstand and pass the highest flow expected to occur while the bridge is in place. The highest flow expected will be determined during the season of construction and will take into account an evaluation of regional climate and physical conditions as well as existing historic stream-flow data and peak discharge statistics from nearby USGS gauging stations.

Where feasible, bridges will be designed to span the entire Ordinary High Water Mark ("OHWM") of the waterbody. If it is not possible to span the OHWM with a bridge, a temporary culvert or pier may be required. These culverts/piers would be installed to minimize flow restrictions that may deflect stream flow to banks to prevent streambank erosion or scour. The ECRP in Appendix 1B (see Drawing 3430.34-X-0010) and Resource Report 2 provide additional details for temporary bridges. Temporary bridge materials, such as equipment mats, will be inspected and cleaned prior to being brought to the right-of-way to ensure they are clean of potential noxious weed propagules.

Temporary bridges will be set during clearing operations as well as during mainline construction. The temporary bridges set during clearing operations would generally (depending on site-specific conditions and construction schedules) be temporarily removed after clearing is complete and would not be left in place across a waterbody over the winter. During mainline construction the temporary bridges will be reset and will be removed as soon as possible after permanent seeding. If there will be more than one month between final cleanup and the beginning of permanent seeding and reasonable alternate access to the right-of-way is available, equipment bridges will be removed as soon as possible after final cleanup as required by FERC Wetland and Waterbody Procedures (Section V. B. 5. f.).

Sediment barriers will be installed immediately after initial disturbance of the waterbody or adjacent upland as shown on Drawings 3430.34-X-0005 and 3430.34-X-0007 in the project-specific ECRP (see Appendix 1B). Sediment barriers will be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the

trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.

Waterbody trench backfill. All waterbodies supporting coldwater fisheries will be backfilled with material removed from the trench with the upper 1-foot of the trench backfilled with clean gravel or native cobbles. PCGP proposes to modify Section V.C.1. of FERC's Wetland and Waterbody Procedures in fish-bearing streams that do not have gravel, cobble or other rock substrates (see Table 1A-1 in Appendix 1A) prior to construction. This modification is proposed because many of the streams crossed by the Pipeline are remote and are located in steep valley or ravine bottoms. Therefore, hauling rock to these steams is impractical especially where these streams do not have these substrate characteristics prior to construction. The bottom and banks will be returned to approximate preconstruction contours; banks will be stabilized; and temporary sediment barriers will be installed before returning flow to the waterbody channel.

Maintenance. During operation of the Pipeline, vegetation maintenance adjacent to waterbodies will be limited to allow for a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate across the entire right-of-way using native plant species with the exception of maintenance clearing requirements noted below. On BLM-managed and NFS lands where Riparian Reserves are affected, a 100-foot riparian strip (or less if the preconstruction riparian vegetation did not extend to 100 feet) will be planted perpendicular to the waterbody on both sides of the waterbody. However, to facilitate periodic Pipeline corrosion/leak surveys, a corridor centered on the Pipeline and up to 10 feet wide will be maintained in an herbaceous state with no vegetation greater than 6 feet in height. Trees that are located within 15 feet of the Pipeline and that are greater than 15 feet in height will be cut and removed from the right-of-way. Drawings 3430.34-X-0016 and -0017 provided in the ECRP (see Appendix 1B) illustrate the maintenance corridor along streams described in this section. It should be noted that PCGP will only maintain 30 feet of the permanent Pipeline easement (15 feet either side of the Pipeline centerline) which will significantly minimize the impacts to forested riparian areas (see Drawings 3430.34-X-0016 and -0017 in the ECRP, Appendix 1B). Herbicides will not be used in or within 100 feet of a waterbody's mean high water mark.

1.3.1.5 Wetland Crossings

Wetland surveys have been completed for approximately 82.0 percent of the Proposed Route. The Wetland Delineation Report is included as an appendix to Resource Report 2. Including all of the waterbodies, the Proposed Route will cross approximately 12 miles of wetlands (see Resource Report 2 for a complete description of the waterbody and wetlands crossed by the Pipeline).

Consistent with FERC's Wetland and Waterbody Procedures, PCGP has, where feasible, limited the width of the construction right-of-way through jurisdictional wetlands to 75 feet or less. Where topographic conditions or other features or constraints require additional construction right-of-way widths, PCGP has requested proposed modifications (see Table 1A-1 in Appendix 1A). The wetlands crossed by the Pipeline are shown on the Environmental Alignment Sheets, Appendix 1H.

All TEWAs have been located at least 50 feet away from wetland boundaries according to FERC's Wetland and Waterbody Procedures, except where site-specific conditions

prevent the setback. Where the TEWAs could not be set back 50 feet, they have been identified as site-specific proposed modifications and described in Table 1A-1 in Appendix 1A.

During construction, clearing of vegetation between TEWAs and the edge of the wetland will not occur; all vegetation clearing will be restricted to the certificated construction right-of-way. Where feasible, the only access roads that will be used in wetlands are those existing roads that can be used with no modifications and without impacting the wetlands. To minimize impacts associated with the Pipeline, PCGP will utilize the measures addressed in FERC's Wetland and Waterbody Procedures as specified in Resource Report 2.

During Pipeline operations, PCGP will control vegetative growth in wetlands in accordance with the post-construction maintenance measures addressed in FERC's Wetland and Waterbody Procedures, Section VI.D.

1.3.2 Aboveground Facility Construction

Typical construction activities associated with meter stations and the compressor station are summarized below. Construction of the mainline block valves will be the same as those described for the Pipeline facilities, except that these valve sites will be graveled and fenced.

1.3.2.1 General

Construction activities and storage of construction materials and equipment will be confined to areas within the meter station and compressor station sites and designated TEWAs, if any. Debris and waste generated from construction will be disposed of in accordance with federal, state, and local regulations. All surface areas disturbed will be restored or graveled in a timely manner or within 20 days of final site work.

1.3.2.2 Foundations

Excavation will be performed as necessary to accommodate the new reinforced concrete foundations for meter and compressor station equipment. Forms will be set, rebar installed, and the concrete poured, finished, and cured in accordance with applicable standards. Concrete pours will be randomly sampled to verify compliance with minimum strength requirements. Backfill will be compacted in place, and excess soil will be used elsewhere or distributed around the site.

1.3.2.3 Equipment

The meter and compressor station equipment will be shipped to the site by truck. The equipment will be off-loaded using booms, lifts, or cranes. The equipment will then be positioned on the foundation, leveled, grouted (if necessary), and secured with anchor bolts.

1.3.2.4 Piping

All non-screwed piping associated with the meter and compressor stations will be welded, except where connected to flanged components. All welders and welding procedures will be qualified in accordance with American Petroleum Institute (API) standards. All welds in high-pressure gas piping systems will be visually inspected and radiographically tested (or other non-destructive testing method) to ensure compliance with code requirements.

1.3.2.5 Testing

All components in high-pressure natural gas service will be strength tested prior to placing in service. Before being placed in service, all controls and safety equipment and systems will be checked and tested.

1.3.2.6 Mainline Block Valve Assemblies

In all cases, mainline block valves will be installed within PCGP's permanent easement. The installation of the mainline block valves will meet the same standards and requirements established for Pipeline construction.

1.3.3 Proposed modifications from FERC's Plan and Procedures

PCGP has made every effort to comply with FERC's Upland Plan and Wetland and Waterbody Procedures over the majority of the Proposed Route; however, there are several locations where modifications are necessary. The locations for which PCGP is requesting FERC to approve proposed modifications are provided in Table 1A-1 in Appendix 1A. They are listed in milepost order from west to east. Consistent with Section V. B. 2. a. of FERC's Wetland and Waterbody Procedures, where the uplands adjacent to a waterbody consist of actively cultivated or rotated cropland or other disturbed land, the TEWAs may be located adjacent to the waterbody. Although a modification is not required in these locations, they have been included in Table 1A-1 for documentation purposes.

1.3.4 Schedule

PCGP anticipates starting construction in fourth quarter 2019 when civil surveys and access road improvements will be initiated. PCGP plans to conduct clearing in some forested areas starting in 2020 prior to mainline construction in 2021. Horizontal directional drills (HDD) of five waterbodies (North Slough; Hayne's Inlet; Coos River; Rogue River; and Klamath River) and Direct Pipe® installation technology for a sixth waterbody (South Umpqua River) are scheduled for 2021. A sixth HDD to avoid severe steep side-slope on a narrow ridgeline parallel to an existing powerline easement containing two large power transmission lines and the Coos County gas transmission pipeline between them is proposed at MP 25. Figure 1.3-2 (to be filed with the application) provides a general schedule for the Pipeline.

Mainline and facility construction is planned to begin spring 2021 with the in-service date scheduled for fourth quarter 2022. Restoration of construction disturbance in each given area is expected to begin once construction is completed in that area; restoration would be completed by the end of the winter season when forest, wetland, and riparian plantings would be installed. Depending on site-specific conditions, it may be necessary to continue restoration through the spring. Timber clearing in areas of NSO and MAMU would be conducted outside the critical breeding seasons[4]. Construction activities are scheduled to take advantage of the drier periods of the year to minimize winter construction, to reduce potential environmental impacts and construction safety risks.

The Proposed Route will cross numerous irrigation canals, drains, and ditches in agricultural fields in Klamath County. To minimize agricultural impacts and to schedule

[4] Timber clearing in areas of active NSO sites would occur between 10/1 and 2/28 and in areas of known MAMU between 9/16 and 3/31.

the crossings of the majority of the canals, drains, and ditches when they are dry and not in use, PCGP is proposing to construct in the late fall and winter in the Klamath Basin. The winter construction schedule will also minimize the crossing of high groundwater areas in the Klamath Basin which are a result of irrigation operations and canal leakage or drainage. PCGP has developed a Winter Construction Plan for the Klamath Basin which is provided in Appendix 1E and outlines the measures that will be implemented to minimize potential effects from winter construction.

PCGP plans to conduct forest clearing starting fourth quarter 2020 prior to mainline construction, to minimize overall work space and temporary extra work area (TEWA) requirements. TEWA requirements have been minimized by proposing a two-year construction window because the same work areas used to stage right-of-way logging timber clearing activities and provide log storage and decking space would then be utilized for pipeline construction activities. Logging concurrently with pipeline construction would require additional space to work safely and efficiently, and potential clearing delays could force construction activities into the winter rainy season, increasing the potential for erosion and safety hazards. Therefore, scheduling clearing and mainline pipeline construction activities over a two-year period will minimize winter construction requirements resulting from seasonal and biological construction windows. The detailed schedule for clearing activities will include areas of known seasonal restrictions along the route. Temporary erosion control and stabilization measures will be installed where necessary in areas of disturbance. These measures will be maintained throughout construction until the Pipeline is in-service and disturbed areas are stable.

1.4 OPERATION AND MAINTENANCE

PCGP will test, operate, and maintain the Pipeline facilities in accordance with PHMSA regulations, including those provided in 49 CFR Part 192; FERC's guidance at 18 CFR 380.15; and maintenance provisions of FERC's Upland Plan and Wetland and Waterbody Procedures. The Pipeline right-of-way will be clearly marked where it crosses public roads, waterbodies, fenced property lines, and other locations as necessary. All Pipeline facilities will be marked and identified in accordance with applicable regulations (see Resource Report 11).

PCGP maintains compliance with 49 CFR § 192.625(b)(1) concerning odorization requirements and therefore will not add odorant to the gas it receives from the two gas transmission pipelines delivering gas to PCGP for transportation and delivery to Jordan Cove. In the event a local distribution system acquires gas service from the Pipeline in the future, the local distribution company would be responsible for odorization of their system if required.

The Pipeline will be protected from corrosion using a cathodic protection (CP) system, which will be installed following construction. The CP system will generally consist of a number of sites where a rectifier/anode bed is installed and electrically connected by a conductor to the Pipeline. Each site will use power from the local electrical utility to impress current on the Pipeline. These sites will typically be installed along the Pipeline at intervals of approximately 15-20 miles and usually in previously disturbed areas near the permanent right of way. The Corrosion Control Plan, included as Appendix F to the POD (Appendix 1F), contains additional information on PCGP's corrosion control methods and cathodic protection system. Monitoring and maintenance of the cathodic

protection system will be accomplished in compliance with the appropriate regulations at least once per calendar year but with intervals not to exceed 15 months. Problems detected through the monitoring program will be corrected promptly and checked in a follow-up survey no later than 12 months after the initial discovery. Recording and transmitting pressure and temperature data will be controlled and/or monitored by the gas control monitoring system.

No herbicides will be used for brush control to maintain the permanent Pipeline easement. Vegetation at aboveground facilities will be periodically maintained using mowing, cutting, trimming, and herbicides (selectively). Vegetation within the permanent easement will be periodically maintained by mowing, cutting, and trimming (either by mechanical or hand methods). The permanent easement will be maintained in a condition where trees or shrubs greater than 6 feet tall will be controlled (cut or trimmed) within 15 feet either side of the centerline (for a total of 30 cleared feet). Maintenance activities are expected to occur approximately every 3 to 5 years depending on the growth rate. During maintenance, vegetation will be cut/trimmed in 4 to 6-foot lengths and scattered across the permanent easement to naturally decompose and to discourage OHV traffic. Occasionally where site conditions allow, chipping of this material may also occur. PCGP believes that the slash materials generated and scattered across the permanent easement during maintenance activities would not exceed the fuel loading specifications provided in Section 1.3.1.1.10.

If noxious weed infestation occurs on the permanent easement, selective use of herbicides would be used to control these species. All use of herbicides at aboveground facilities or on the permanent easement will be in accordance with federal, state, and local regulations and land managing agency requirements as well as landowner approval and will be consistent with FERC's Upland Plan and Wetland and Waterbody Procedures. The Noxious Weed Control Plan, provided in Section 12 of the ECRP (see Appendix 1B), and the Integrated Pest Management Plan (see Appendix N to the POD, Appendix 1F) provide additional details regarding noxious weed control on the permanent easement.

If OHV use on the permanent easement causes damage and erosion, PCGP will install or maintain OHV barriers or controls where necessary as specified in Section 1.3.1.2.15. PCGP will allow timber removal from the permanent easement; however, to ensure safety, PCGP will require a work plan including notification and information regarding the location, proposed activities, type of equipment, and weight-loading to ensure the Pipeline is not adversely affected. PCGP discourages digging, blading, grading, or similar activities over the permanent easement. Excavation of any type by a landowner or third party must utilize the One-Call System to notify PCGP prior to the activity.

Generally, repair of erosion control structures, drain tiles, and the need for additional fill may be required in the first year or two following construction in areas where the trench may have settled. Depending on the location of the trench settlement, minor repairs of waterbars or drain tiles may be necessary because the settlement could affect the drainage or proper function of these features and regrading and/or addition of fill material may be necessary. Erosion control structures, drain tiles, and the need for additional fill will be assessed by operations personnel along the right-of-way during routine inspections. Areas susceptible to damage from large storm events will be inspected and repaired as appropriate depending on the nature of damage. In addition, any areas of concern that are brought to the attention of the pipeline operator will be assessed and

repaired as necessary. Waterbody crossings will be inspected periodically. A supply of emergency replacement pipe, leak repair clamps, sleeves, and related materials will be stored at the local district office locally for repair activities.

1.5 FUTURE PLANS AND ABANDONMENT

At this time, PCGP has no plans for future expansion or abandonment of the facilities.

1.6 PERMITS, APPROVALS AND REGULATORY REQUIREMENTS

Table 1.6-1 provides a list of permits, approvals, and consultations required for construction and operation of the project. Anticipated application dates and agency contacts are provided in the table.

Table 1.6-1
Permits and Approvals Necessary for Construction and Operation

Agency	Permit/Approval	Contact	Filing Date	Anticipated Approval
Federal				
Federal Energy Regulatory Commission	National Environmental Policy Act Review and Certificate of Public Convenience and Necessity	Paul Friedman 202-502-8059	Aug/Sep 2017	
U.S. Army Corps of Engineers	CWA Section 404	Tyler Krug Regulatory Project Manager 541-756-2097 tyler.j.krug@usace.army.mil North Bend Field Office 2201 N. Broadway, Suite C North Bend, OR 97459	Aug/Sep 2017	
	Rivers and Harbors Section 10			
U.S. Fish and Wildlife Service	ESA Section 7 Consultation	Joe Zisa 503-231-6179 joe_zisa@fws.gov Oregon Fish and Wildlife Office 2600 SE 98th Ave., Ste. 100 Portland, OR 97266	Dec 2017	135 days from complete BA
	Fish and Wildlife Coordination Act		Aug/Sep 2017	
National Marine Fisheries Service	ESA Section 7 Consultation	Chuck Wheeler Fisheries Biologist 541-957-3379 chuck.wheeler@noaa.gov 2900 Stewart Parkway Roseburg, OR 97471	Dec 2017	135 days from complete BA
	Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)			
	Marine Mammal Protection Act			
USDI Bureau of Land Management	Right-of-Way Grant	Miriam Liberatore Planning and Environmental Coordinator 541-618-2412 mliberat@blm.gov 3040 Biddle Road Medford, OR 97504	TBD	
	Temporary Use Permit			
	Amendments to Existing Resource Management Plans			
USDA Forest Service	Right-of-Way Grant Letter of Concurrence Amendments to Existing Forest Plans	David Krantz PCGP Project Manager 541-618-2082 dkrantz@fs.fed.us 3040 Biddle Road Medford, OR 97525	TBD	

Agency	Permit/Approval	Contact	Filing Date	Anticipated Approval
USDI Bureau of Reclamation	Right-of-Way Grant Letter of Concurrence	Lila Black 541-880-7510 lblack@usbr.gov Klamath Basin Area Office 6600 Washburn Way Klamath Falls, OR 97603		
Tribal				
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians	NHPA Section 106 consultation with FERC acting as lead federal agency	Ms. Stacy Scott 541-888-9577x7513 sscott@ctclusi.org 1245 Fulton Avenue Coos Bay, OR 97420	TBD	
Coquille Indian Tribe		Kassie Rippee 541-756-0904x10216 kassandrarippee@coquilletribe.org 3050 Tremont Street North Bend, OR 97459		
Cow Creek Band of Umpqua Indians		Ms. Jessie Plueard 541-677-5575 ext. 5577 jplueard@cowcreek.com 2371 Stephens Street, Suite 500 Roseburg, OR 97470		
The Klamath Tribes		Mr. Perry Chocktoot Culture & Heritage Director 541-783-2219x159 Perry.Chocktoot@klamathtribes.com P.O. Box 436 Chiloquin, OR 97624		
Confederated Tribes of the Siletz Indians		Mr. Robert Kentta Cultural Resources Director 541-444-2532 rkentta@ctsi.nsn.us P.O. Box 549 Siletz, OR 97380		
Confederated Tribes of the Grand Ronde Community		David Harrelson 503-879-1630 david.harrelson@grandronde.org 9615 Grand Ronde Road Grand Ronde, OR 97347		

Agency	Permit/Approval	Contact	Filing Date	Anticipated Approval
State				
Oregon Division of State Parks Office of Historic Preservation	National Historic Preservation Act – Section 106 Consultation	John Pouley Assistant State Archaeologist 503-986-0675 john.pouley@oregon.gov 725 Summer St. NE, #C Salem, OR 97301		
Oregon Department of Environmental Quality	CWA 401 Water Quality Certification	Mary Camarata 541-687-7435 camarata.mary@deq.state.or.us 165 East 7th Ave., Ste. 100 Eugene, OR 97401	Aug/Sep 2017	Within 1 yr from complete app
	CWA 402 NPDES Stormwater Permit and Water Pollution Control Facility (WPCF) – Hydrostatic Test Water		1 yr prior to construction (or sooner for CZM)	
	Air Contaminant Discharge Permit for Compression Facilities			
Oregon Department of Water Resources	Permit to Appropriate Water	Jerry K. Sauter Water Rights Program Analyst 503-986-0817 jerry.k.sauter@state.or.us Water Right Services Division 725 Summer Street NE, Ste. A Salem, OR 97301	Year of construction (or sooner for CZM)	
Oregon Department of Fish and Wildlife	In-Water Blasting Permit Fish Passage	Sarah Reif Energy Coordinator, Wildlife Division 503-947-6082 sarah.j.reif@state.or.us 4034 Fairview Industrial Drive SE Salem, OR 97302		
Oregon Department of Transportation	State Highway Crossing Permit	Roger B. Allemand Permit Specialist – District 8 541-774-6360 roger.b.allemand@odot.state.or.us Dave Wells Permit Specialist – District 7 541-957-3588 david.wells@odot.state.or.us		
Oregon Department of State Lands	Joint Permit with the USACE Removal/Fill Permit	Bob Lobdell 503-986-5282 bob.lobdell@state.or.us 775 Summer Street NE, Ste. 100 Salem, OR 97301		
	Archaeological Permit			

Agency	Permit/Approval	Contact	Filing Date	Anticipated Approval
	Wetland Report Concurrence	Lynne McAllister Jurisdiction Coordinator 503-986-5300 lynne.mcallister@state.or.us 775 Summer Street NE, Ste. 100 Salem, OR 97301		
Oregon Department of Land Conservation and Development	Coastal Zone Management Consistency Determination	Elizabeth Ruther 503-934-0029 elizabeth.j.ruther@state.or.us 635 Capitol Street, Suite 150 Salem, Oregon 97301-2540	Aug/Sep 2017	
Oregon Department of Forestry	Operate Mechanical Equipment	Josh Barnard Field Support Unit Manager 503-945-7493 josh.w.barnard@oregon.gov 2600 State Street, Bldg. A Salem, OR 97310		
	Written Plan & Alternate Plan			
County				
Coos County Planning Department	Conditional Use	Jill Rolfe 541-396-7770 jrolfe@co.coos.or.us Coos County Planning Department 225 N. Adams Coquille, OR 97423		Approved 2010
	LUCS (JPA & NPDES)			
Douglas County Planning Department	Conditional Use	Cheryl Goodhue Planning Department 541-440-4289 cagoodhu@co.douglas.or.us Douglas County Courthouse Justice Building – Room 106 Roseburg, OR 97470		Approved 2010 and 2014
	LUCS (JPA & NPDES)			
Jackson County Planning Department	Conditional Use	Francisco Hernandez Planner 541-774-6903(7) hernanfm@jacksoncounty.org 10 S. Oakdale, Room 100 Medford, OR 97501		N/A
	LUCS (JPA & NPDES)			
Klamath County Planning Department	Conditional Use – Compressor Station	Mark Gallagher Planning Director 541-883-5121x3064 mgallagher@co.klamath.or.us 305 Main Street Klamath Falls, OR 97601		Approved 2015
	LUCS (JPA & NPDES)			

1.7 AFFECTED LANDOWNERS

Names and addresses of all affected landowners, towns, communities, and local, state, and federal governments and agencies involved with the Project are included in Appendix 1D (to be submitted in a subsequent filing). Affected landowners as defined in section 157.6(d)(2) include property owners directly affected (i.e., property crossed or used) by the proposed activity, adjacent landowners (landowners not directly affected but whose properties abut the edge of a proposed facility site or right-of-way that runs along a property line in the area in which the proposed facilities are to be constructed, or contains a residence within 50 feet of the proposed construction work area), landowners with property within 0.5 mile of proposed compressor stations or LNG terminals, tanks, and other facilities, and property owners within the area of proposed storage fields.

1.8 NONJURISDICTIONAL FACILITIES

Non-jurisdictional facilities associated with the Pipeline are limited to utilities (electrical power and telephone service) required for the meter stations, the compressor station and gas control communications.

The Pipeline scope currently includes interconnections with two interstate gas transmission pipeline systems. Consequently all facilities and actions necessary to effectuate these interconnections are jurisdictional.

1.9 CUMULATIVE IMPACTS

To be provided in later version of Resource Report 1.

1.10 REFERENCES

Bureau of Land Management. 2016a. Northwestern & Coastal Oregon Record of Decision and Approved Resource Management Plan. Coos Bay, Eugene, Salem Districts, and Swiftwater Field Office of Roseburg District. August.

Bureau of Land Management. 2016b. Southwestern Oregon Record of Decision and Approved Resource Management Plan. Klamath Falls Field Office of Lakeview District, Medford District, and South River Field Office of Roseburg District. August.

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Figure 1.1-1
General Location

Figure 1.2-1
Typical Construction Right-of-Way Configuration

Figure 1.3-1
Typical Construction Sequence