

1.0 INTRODUCTION

On June 5, 2006, Bradwood Landing LLC and NorthernStar Energy LLC (affiliates of NorthernStar Natural Gas, Inc.) filed applications with the Federal Energy Regulatory Commission (FERC or Commission) under sections 3(a) and 7(c) of the Natural Gas Act (NGA). The applications were noticed in the Federal Register on June 15, 2006. In Docket No. CP06-365-000, Bradwood Landing LLC seeks authorization to site, construct, and operate a liquefied natural gas (LNG) import terminal at Bradwood, about 38 miles up the Columbia River from its mouth, in Clatsop County, Oregon. In Docket No. CP06-366-000, NorthernStar Energy LLC seeks a Certificate of Public Convenience and Necessity (Certificate) to construct and operate a new natural gas pipeline and ancillary facilities to connect the proposed LNG terminal to the existing Williams Northwest Pipeline Corporation (Williams Northwest) interstate natural gas pipeline system in Cowlitz County, Washington. In Docket Nos. CP06-376-000 and CP06-377-000, NorthernStar Energy LLC also applied for a blanket certificate under Part 157, Subpart F of the Commission's regulations and requested issuance of a blanket certificate under Subpart G of Part 284, respectively. Hereafter, Bradwood Landing LLC and NorthernStar Energy LLC are referred to collectively as NorthernStar. The project, including the LNG terminal and pipeline components, is referred to as the Bradwood Landing Project.

The FERC is the federal agency responsible for authorizing applications to construct and operate onshore LNG import and interstate natural gas transmission facilities. For the Bradwood Landing Project, the FERC is the lead federal agency for the preparation of this environmental impact statement (EIS) in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing the NEPA (Title 40, Code of Federal Regulations (CFR) 1500-1508), and the FERC's regulations implementing the NEPA (18 CFR Part 380).

The U.S. Army Corps of Engineers (COE) and the U.S. Department of Homeland Security, Coast Guard (Coast Guard) are cooperating agencies for the development of this EIS. A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal, and is involved in the NEPA analysis. The Pipeline and Hazardous Materials Safety Administration (PHMSA) within the U.S. Department of Transportation (DOT) is participating in the NEPA analysis under the terms of an interagency agreement between the PHMSA, the FERC, and the Coast Guard, issued February 11, 2004.¹

The Coast Guard has authority over the safety and security of LNG carriers, the marine traffic route, and the LNG terminal. The Coast Guard determines the suitability of the waterway for LNG marine traffic by issuing a Letter of Recommendation (LOR) (see section 1.3.1). The COE has authority to issue dredging and wetland permits for the project (see section 1.3.2). The DOT has authority to enforce safety regulations and standards for the LNG terminal beginning at the last valve immediately before the storage tanks and the design and operation of the sendout pipeline.

The vertical line in the margin identifies text that has been modified in the final EIS and differs from the corresponding text in the draft EIS.

This final EIS discloses and assesses the potential environment impacts that may be associated with the construction and operation of the Bradwood Landing Project in Clatsop and Columbia

¹ The *Interagency Agreement Among the Federal Energy Regulatory Commission, United States Coast Guard, and Research and Special Programs Administration for the Safety and Security Review of Waterfront Import/Export Liquefied Natural Gas Facilities* is available for viewing by the public through the FERC Internet web page at www.ferc.gov, then clicking on Industries, LNG, Safety and Inspections.

Counties, Oregon, and Cowlitz County, Washington. NorthernStar's proposed facilities would transport up to 1.3 billion cubic feet per day (Bcfd) of imported natural gas to markets in the Pacific Northwest.

The LNG import terminal proposed by Bradwood Landing LLC would include:

- a dredged maneuvering area off of the Columbia River navigation channel;
- a berth capable of receiving LNG carriers with cargo capacities ranging from 100,000 to 200,000 cubic meters (m³);
- a set of four 16-inch-diameter LNG unloading arms, including two liquid unloading arms, one hybrid arm, and a vapor return arm on the wharf, and a 1,240-foot-long, 32-inch-diameter cryogenic LNG transfer pipeline and 6-inch-diameter LNG recirculation pipeline extending from the berth to the LNG storage tanks;
- two insulated LNG storage tanks, each with a useable volume of over 1 million barrels, or 160,000 m³;
- a vapor management system to handle the boil-off gas (BOG) that occurs during the unloading process, including vapor return blowers and knockout (KO) drum on the wharf, vapor handling pipework, two BOG compressors, and a BOG condenser;
- an LNG sendout system, consisting of six submerged in-tank LNG discharge pumps (three in each storage tank) and five sendout pumps;
- seven submerged combustion vaporizers (SCV), of which six would normally operate and one would be a back-up, to re-gasify the LNG and provide natural gas through a metering station to the inlet valve of the sendout pipeline;
- support buildings, including a warehouse/administrative building, control building, switch rooms, compressor building, and gatehouse/security building;
- utilities, including a 1.5-mile-long, 115-kilovolt (kV) power line and switchyard, and an 800-kilowatt (kW) emergency diesel-fueled generator;
- screened water intakes, pumps, and piping to supply water to unloading ships for cooling and ballast, and for other site uses; and
- a fire protection and detection system, including a firewater pumphouse, and
- a security system including fencing.

The natural gas pipeline facilities proposed by NorthernStar Energy LLC would include:

- a 36.3-mile-long, underground, high-pressure welded steel sendout pipeline consisting of approximately 18.9 miles of 36-inch-diameter pipeline in Clatsop and Columbia Counties, Oregon and 17.4 miles of 30-inch-diameter pipeline in Columbia County, Oregon and Cowlitz County, Washington;
- five meter stations, including at the LNG terminal, the Georgia-Pacific Wauna paper mill (Wauna Mill) delivery point, the interconnection with the Northwest Natural Gas

Company (Northwest Natural) interstate pipeline system, the Portland General Electric Company (PGE) Beaver Power Plant delivery point, and the interconnection with Williams Northwest pipeline system; and

- at least five mainline block valves (MLV), two pig² launchers, and two pig receivers.

Some commentors on our³ draft EIS questioned whether the Williams Northwest system has the capacity to transport the additional volumes of natural gas to be provided through the importation of LNG by the Bradwood Landing Project. In a February 9, 2006 data request to NorthernStar, we asked for a description of any expansions that may be necessary on either the Northwest Natural or Williams Northwest systems in order to accommodate the new volumes of natural gas proposed to be delivered through the Bradwood Landing pipeline. In a response dated March 28, 2006, NorthernStar stated that: “No expansions of the Northwest Natural pipeline system or the Williams-Northwest Pipeline system would be necessary in order to accommodate the new volumes of natural gas to be delivered by the Bradwood Landing LNG Project.”

In its motion to intervene in this proceeding, filed July 6, 2006, Williams Northwest stated that: “Although NorthernStar currently does not have an interconnect agreement with Northwest, Northwest is willing to accommodate an interconnect with the proposed Bradwood Landing Pipeline as long as the conditions outlined in the Commission’s interconnect policy...are satisfied.” While Williams Northwest acknowledges the value of enhanced gas supply diversity in the region, it pointed out that its existing pipeline capacity (both north and south flow) from the proposed interconnect point with NorthernStar is currently fully contracted on a long-term basis for transportation services from existing primary receipt points. Without an expansion of its system, Williams Northwest believes that the proposed interconnect with NorthernStar would only serve as an alternative receipt point for Williams Northwest’s existing shippers.

However, it is our opinion that just because a pipeline is fully subscribed does not mean that pipeline capacity is never available for new entrants. The Williams Northwest system could handle the additional new volumes provided by the Bradwood Landing Project without expansion, under several different sets of circumstances. Although the Bradwood Landing Project is designed for a maximum sendout capacity of 1.3 Bcfd, it should be noted that for the last few years existing LNG import terminals along the Eastern and Gulf coasts of the United States have been operating at about 50 percent capacity. Further, a significant amount of the volumes being imported are in the summer months when spare pipeline capacity is widely available. Even in the winter months, and the shoulder seasons, capacity can be made available on fully subscribed pipelines through various Commission programs such as reverse open seasons, capacity turnbacks, capacity releases, and interruptible capacity. By encouraging the use of these programs, the Commission ensures that, to the greatest extent possible, contracted pipelines are fully utilized. In addition, the FERC has recently proposed new rules which would further aid in efficient use of available capacity by allowing asset managers to tie capacity released on a pipeline with gas supplies.

The Bradwood Landing Project would require construction of some facilities that do not fall under the Commission’s jurisdiction. These include electric transmission facilities and three natural gas pipeline laterals. The waterway to the LNG terminal for the LNG carriers is an additional component of the project for the purpose of this EIS. The Bradwood Landing Project also would include development of several mitigation sites as well as a Salmon Enhancement Initiative (SEI).

² A pig is an internal tool used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

³ The pronouns “we,” “us,” and “our” refer to the environmental staff of the FERC’s Office of Energy Projects. The FERC issued the draft EIS for the Bradwood Landing Project on August 17, 2007.

1.1 PURPOSE AND NEED

The purpose of the Bradwood Landing Project is to provide a new source of natural gas to the Pacific Northwest through importation of LNG. LNG is natural gas that has been cooled to about -260 degrees Fahrenheit (°F) for shipment and storage as a liquid. As a liquid, LNG is about 600 times more compact than its equivalent amount of natural gas vapors. LNG is typically produced in foreign countries with excess supplies of natural gas, and transported long distances across oceans using specially designed ships. The 15 LNG exporting nations hold about 33 percent of the world's natural gas reserves (U.S. Department of Energy, Energy Information Administration (EIA); 2008a).

NorthernStar has not revealed its expected sources for the LNG, but most likely it would come from LNG exporting countries around the Pacific Basin, including Australia, Malaysia, Indonesia, and perhaps even the United States (Alaska has a liquefaction and LNG export facility). In 2006, Trinidad and Tobago was the largest supplier of LNG for the existing import terminals operating on the East and Gulf coasts, accounting for about 67 percent of all LNG imported into the United States (EIA, 2008a). At the Bradwood Landing import terminal, the LNG would be stored and then vaporized back into natural gas for transportation by pipeline into the existing national grid.

NorthernStar's project is specifically designed to provide up to 1.3 Bcfd of natural gas to the Pacific Northwest by:

- delivering natural gas to the Wauna Mill at Wauna, Oregon and the PGE Beaver Power Plant at Port Westward, Oregon;
- interconnecting with Northwest Natural's existing bidirectional intrastate pipeline facilities capable of transporting gas to their Mist underground storage facility; and
- interconnecting with Williams Northwest interstate pipeline system.

By creating access to new and competitively-priced LNG supplies, the proposed project would diversify available sources of energy and increase the supply of natural gas to meet estimated future demand in the region, which would contribute to natural gas price stabilization. The states of Washington and Oregon do not produce much natural gas.⁴ Natural gas is currently supplied to the region through the existing interstate pipeline systems operated by Williams Northwest and Gas Transmission Northwest Corporation (GTN). Williams Northwest is a subsidiary of the Williams Companies, Inc. (Williams), while GTN is part of the TransCanada Corporation (TransCanada). These systems bring to the Pacific Northwest natural gas produced in the provinces of British Columbia and Alberta, Canada, and the Rocky Mountain states of Wyoming, Colorado, and New Mexico. In total, these existing pipelines have a transportation capacity of 4.1 Bcfd as they enter the region (from Canada and Idaho), with 2.2 Bcfd in capacity targeted for the California market. In 2007, total natural gas consumption in Washington and Oregon was estimated to average about 1.2 Bcfd (ICF International (ICF), 2007).

In 2006, natural gas represented 22 percent of the total primary energy used in the United States. More than half of all American homes are heated with natural gas, and it is the fuel of choice for about 41 percent of the nation's industrial sector (James A. Baker III Institute for Public Policy (Baker Institute), 2008). In the Pacific Northwest, natural gas accounts for about 50 percent of the energy currently consumed. It is used for residential space and water heat, for commercial and industrial processes, and for electric generation. Industrial users account for about 28 percent of the natural gas

⁴ Oregon produced 621 MMcf of natural gas in 2006, or about 0.27 percent of its consumption (ODE, 2008b).

consumed in the region. However, industrial use of natural gas in the Pacific Northwest declined between 1995 and 2007. Residential use represents a little more than 24 percent of the natural gas market in the Pacific Northwest, but has grown about 23 percent between 1995 and 2007. The number of natural gas customers increased nearly 13 percent between 2000 and 2005, despite a regional economic slump and higher commodity prices. About 30 percent of the total gas market in the Pacific Northwest is for electric generation. This sector has shown the greatest growth since the early 1990s, as newly-built gas-fired electric generation plants increased total power outputs by 5.5 gigawatts (GW) or a factor of five (NWGA, 2007; ICF, 2007).

In the Pacific Northwest, use of natural gas should continue to grow in the future due to additional gas-fired electric generation, and population increases that will provide more residential customers. Currently, more than 20 percent of the region's electric generation is fueled by natural gas. About 60 percent of the total power generation capacity in the Pacific Northwest has been added since 2001 (NWGA, 2007). Between 2001 and 2003, about 3,350 megawatts (MW) of new power generation was added to the Northwest; most of it fueled by natural gas, including 1,675 MW in Oregon (ODE, 2005a). Over the last 3 years (2006-2008) about 1,438 MW in additional gas-fired electric generation was scheduled to come online in the Pacific Northwest (Northwest Power and Conservation Council, 2008). Nationally, about 52 percent of all new power plants built since 1995 have been gas fired, and natural gas accounts for 90 percent of all new MW of capacity installed over the last 12 years in the United States (Baker Institute, 2008). Natural gas is the cleanest burning fossil fuel, and demand from the electric generation industry should increase in the future as the government seeks to find ways to reduce air pollution and greenhouse gases, including carbon emissions, to address climate change issues.

Modeling conducted by the Baker Institute (2008) projected that natural gas demand in the United States will grow by about 1.3 percent per year for the next two decades. The NWGA (2007) estimated that natural gas consumption in the Pacific Northwest should increase at an average of 1.9 percent per year over the next 5 years, for a total rise of 7.2 percent through 2012, under normal weather conditions and expected economic and population growth. Under its base case, residential natural gas consumption is expected to increase about 9 percent in total by 2012, while natural gas use for power generation would increase about 12 percent over that period. According to a 2007 study produced by ICF for the Washington Energy Facility Siting Council, future natural gas use in the Pacific Northwest should grow at an annual rate in excess of 3 percent per year, with total consumption in Washington and Oregon combined reaching 741 Bcf per year by 2025. ICF expects residential demand for natural gas in Washington and Oregon to increase by a total of about 58 percent between 2007 and 2025, while gas used for electric generation would increase by about 180 percent in that same period.

The NWGA believes that existing natural gas interstate pipeline and local storage facilities may be adequate to meet demand in the Pacific Northwest through about 2012. However, weather dependent demand, including natural gas needed for residential heating in the winter and electric generation for air conditioning in the summer, may result in short-term spikes that cannot be met by current capacity. Weather-driven peak demand will grow faster than baseline (non-weather dependent) demand in the future. If the Bradwood Landing Project were authorized by the end of 2008, it may be ready to be placed into service by the end of 2011. Therefore, this project could help to ameliorate the predicted future gap between natural gas supply and regional demand, and assist in providing additional volumes during periods of peak demand when current interstate natural gas capacity may fall short.

Demand for natural gas in North America is expected to grow nearly 20 percent by 2030. The EIA predicts, in its 2008 Annual Energy Outlook, that natural gas use in the United States will increase from about 21.9 trillion cubic feet (Tcf) in 2006 to 24.3 Tcf by 2016 (EIA, 2007d). This is lower than previous EIA projections because of higher natural gas prices and slower growth in demand for natural

gas for electric generation. In its 2007 Outlook, the EIA predicted that natural gas consumption in the United States would reach 26.1 Tcf by 2030 (EIA, 2007a).

Since the early 1980s, natural gas production in the United States has fallen short of demand. Domestic production of natural gas in the United States has risen from about 17.5 Tcf in 1991 to about 19.3 Tcf in 2006 (EIA, 2007b). Meanwhile, natural gas consumption in the United States grew to about 21.9 Tcf by 2006. The shortfall between domestic production and consumption has been bridged by importing natural gas, mainly from Canada. In the future, the Pacific Northwest will have to increasingly compete with the rest of North America for its share of natural gas supplies from Western Canadian and Rocky Mountain producers (NWGA, 2007). Providing natural gas to meet future demands in the Pacific Northwest would be constrained by North American supplies and existing pipeline infrastructure.

The Western Canada Sedimentary Basin (WCSB), extending from British Columbia to Saskatchewan, produces nearly 98 percent of the natural gas used in Canada, and represents about 23 percent of the total production in North America. About 16 percent of all natural gas consumed in the United States is imported from foreign countries, with Canada being the source of almost 86 percent of the total amount imported in 2006 (EIA, 2008a). In 2007, about 90 percent of the natural gas imported into the Pacific Northwest came from Canada.

Since 2001, production from the WCSB has been relatively constant, at about 6 Tcf per year. While, in 2006, the Pacific Northwest received about 7 percent of the total natural gas imported into the United States from Canada (about 255 Bcf), the Midwest received about 46 percent (1,632 Bcf) and the Northeast got 28 percent (1,012 Bcf) (EIA, 2008a). However, the WCSB has been characterized as a “mature” production area, and it is forecasted to decline in the future from current production levels of about 17 Bcfd to less than 15 Bcfd by 2013 (ICF, 2007; NWGA, 2007). The EIA (2008a) believes that WCSB producers are having difficulties maintaining output because of rising production costs and declining well productivity. At the same time that WCSB production would be declining, natural gas consumption in Canada should be increasing. For example, natural gas is used for heavy oil and tar sand development in Alberta and for gas-fired power plants in Ontario. Imports of natural gas from Canada to the United States are predicted to fall from 3.6 Tcf in 2006 to 1.2 Tcf in 2030 (ODE, 2008b). Therefore, imports from the WCSB into the Pacific Northwest are expected to decrease over time, at a rate of about 50 million cubic feet per year through 2015 (ICF, 2007).

According to the EIA (2007a), most of the onshore natural gas resources in the continental United States have already been discovered. Over the last 20 years, the amount of federal lands open for new gas exploration has shrunk from 75 percent to 17 percent (Baker Institute, 2008). Production from conventional onshore sources in the lower 48 states is expected to decline from about 6.4 Tcf in 2005 to about 4.9 Tcf by 2030. Natural gas from deep water offshore wells in the Gulf of Mexico, currently accounting for about 15 percent of cumulative domestic marketed production, is predicted to peak at 3.1 Tcf by 2015 and decline to 2.1 Tcf by 2030. Increases in domestic production in the future would mainly come from Alaska and unconventional onshore resources, including coalbed methane, tight sandstones, and gas shale. However, natural gas from Alaska is currently shut in; although there are plans for a future natural gas pipeline from Alaska.⁵

Natural gas production in the Rocky Mountain states has shown steady growth, from 3.6 Bcfd in 1995 to 8.1 Bcfd in 2007. It now represents about 12 percent of U.S. production. The region is estimated to have about 142 Tcf remaining. Production in the Rockies is projected to increase to almost 10 Bcfd by 2013, and up to 12.2 Bcfd by 2025 (NWGA, 2007; ICF, 2007).

⁵ The ODE (2008a) indicated that a natural gas pipeline would not be completed from Alaska until 2018 at the earliest.

Currently, the Pacific Northwest receives about 10 percent of its natural gas from the Rockies. This gas is transported through the existing Williams Northwest system, which interconnects with TransCanada's existing GTN system at several locations in Washington and Oregon. Because of constraints in existing pipeline capacity, deliveries of Rocky Mountain natural gas into the Pacific Northwest are expected to stay at current levels, at about 300 MMcfd, for the next several years (ICF, 2007).

Most of the new production from the Rockies is currently transported to markets in the Midwest and Eastern United States. For example, the Rockies Express Pipeline LLC (REX), a joint venture between Kinder Morgan Energy Partners L.P. and Sempra Pipelines and Storage, recently installed a 718-mile-long, 42-inch-diameter pipeline capable of transporting 1.5 Bcfd from Colorado to Missouri, in Docket No. CP06-354-000. REX is proposing, in Docket No. CP07-208-000, to extend its pipeline an additional 639 miles eastward to Ohio. In addition, a partnership between Alliance Pipeline and Questar Overthrust Pipeline recently announced plans for an 800-mile-long pipeline between Wamsutter, Wyoming and Emerson, Minnesota that would transport Rocky Mountain gas to markets in the Midwest (Inside FERC, 2008b; Natural Gas Intelligence, 2008c).

However, there are also recently announced plans to bring additional volumes of Rocky Mountain gas to the West Coast in the future. Both the Bronco Project, proposed by Spectra Energy, and the Ruby Project, proposed by El Paso Corporation (El Paso) would have pipelines extending from the Opal hub in southwestern Wyoming to the California border near Malin, Oregon (Inside FERC, 2007; Natural Gas Intelligence, 2008g, 2008h; Gas Daily, 2007). The so-called Sunstone Project, proposed by Williams Northwest and TransCanada, would consist of a pipeline paralleling Williams Northwest existing mainline between Opal, Wyoming and Stanfield, Oregon. In partnership with Puget Sound Energy, Williams Northwest would then use the newly proposed Blue Bridge Project pipeline to connect to Seattle, Washington (Williams, 2008; Oregonian, 2008; Natural Gas Intelligence, 2008e, 2008i; Inside FERC, 2008b). GTN, which can receive Rocky Mountain gas from Williams Northwest for delivery to the Pacific Northwest, northern Nevada, and northern California, is planning an expansion of its system in Oregon through the newly proposed Palomar Project. All of these newly proposed pipelines, which are in different stages of development and review, are discussed further in section 3.1.2.2.

A number of commentors on our draft EIS stated that they believed the natural gas from the Bradwood Landing LNG terminal would go to markets in California rather than the Pacific Northwest. NorthernStar presented a study conducted by Wood Mackenzie Limited⁶ to support its position that the main purpose of its proposed Bradwood Landing Project is to provide a new source of natural gas to the Pacific Northwest through the importation of LNG. The Wood Mackenzie Limited study indicated that at an average sendout rate of 1 Bcfd, 50.2 percent of natural gas from the Bradwood Landing LNG terminal would go to Oregon consumers, 30.3 percent would go to Washington consumers, and less than 20 percent would go to Idaho, northern California, and Nevada combined. At an average sendout of 400 MMcfd, 73 percent of natural gas from the Bradwood Landing LNG terminal would go to end users in Oregon, 26 percent would go to Washington customers, and less than 1 percent would go to other states combined.

In its comments on our draft EIS, filed December 21, 2007, the Northwest Industrial Gas Users stated: "The uncontroverted fact is that the Pacific Northwest needs access to new gas supplies and that the LNG terminal proposed by NorthernStar would help meet those needs. What is abundantly clear is that the claims by opponents of LNG that new gas supplies are not needed in the Pacific Northwest are

⁶ The Wood Mackenzie study was filed by NorthernStar in its FERC proceeding on February 21, 2008 as part of a package of materials previously provided to Clatsop County during its land use hearings about the project. These materials (accession number 20008033-9121) are available to the public through the FERC's internet web page at www.ferc.gov using the elibrary link.

patently false. The energy supply picture in the Pacific Northwest overwhelmingly shows that our region will benefit from the siting of an LNG terminal in Oregon. To suggest, as some have, that the only beneficiaries of such a terminal would be California consumers ignores all the realities facing gas consumers in Oregon, Washington, and Idaho.”

The importation of LNG as a new supplemental source of natural gas to meet future demand in the Pacific Northwest would mitigate against the predicted decline of imports from Canada, and constraints of the current interstate pipeline system to bring in additional volumes from the Rocky Mountain region. Unlike North America, where much of the resource base has already been exploited, there is ample potential for growth in LNG supply from countries with large untapped natural gas reserves. LNG represented about 14 percent of all natural gas imported into the United States in 2006 (EIA, 2008a). The Baker Institute (2008) estimated that by 2030, the United States would rely on imported LNG to account for about 31 percent of its natural gas consumption. The EIA (2007a) projected that LNG imports into the United States will increase from about 584 Bcf in 2006 to 4.5 Tcf by 2030. Even the ODE (2008a) has conceded that the United States would have to import LNG from abroad in order to make up for declining domestic natural gas production.

The Pacific Northwest historically has enjoyed natural gas prices below the national average because of its relative proximity to the WCSB and the Rockies, and local competition from hydropower plants that provide a significant amount of energy for the region. Natural gas prices have recently increased dramatically in the Pacific Northwest, and this trend will continue unless additional new sources of natural gas can be imported into the region. Between 2002 and 2005, the wellhead price of natural gas more than doubled (NWGA, 2007). Wholesale natural gas prices in Oregon increased 168 percent between 1999 and 2004, and between 1999 and 2005 residential rates rose 84 percent (ODE, 2005a, 2008a). According to the Washington Utilities and Transportation Commission (WUTC) (2006), natural gas prices in that state have soared as much as 300 percent over the last several years. Nationally, natural gas prices increased between 73 to 128 percent from 1999 to 2006 for all end-users (EIA, 2007c).

In its 2007 Annual Energy Outlook reference case, the EIA projected that wellhead prices for natural gas in the lower 48 continental United States would rise from \$5.01 per thousand cubic feet (mcf) in 2005 to \$5.89 per mcf by 2030. The Northwest Power and Conservation Council (2007) forecasts price escalation for natural gas in the region after 2010. The EIA (2008b) estimated that the spot price of natural gas at the Henry Hub will rise from \$7.17 per mcf in 2007, to \$7.93 per mcf in 2009. The California Energy Commission (CEC) (2007a) predicted that by 2017 the price of natural gas at the Malin, Oregon Hub could exceed the price at the Henry Hub. ICF (2007) had a slightly different scenario, predicting that natural gas prices at the Henry Hub would cost \$9.83 per million British thermal unit (MMBtu) in 2021, and \$9.54 per MMBtu at Malin by the same date, assuming that a pipeline was in operation from Alaska by then.

Higher natural gas prices will have negative impacts on the regional economy. The ODE (2008a) admitted that any reduction in the sources of natural gas to Oregon would disrupt the state's economy; particularly the manufacturing segment. In 2000, 1.2 percent of total personal income in Oregon was spent on purchasing natural gas (ODE, 2005a). The EIA (2007c) indicated that higher natural gas prices up to 2006 adversely affected local distribution companies (LDC) and residential customers. The number of LDC natural gas customers in arrears and the dollar value of their overdue accounts have been rising. The U.S. Federal Reserve Bank estimated that a doubling of natural gas prices would result in a reduction of gross domestic product growth between 0.6 to 2.1 percent (Baker Institute, 2008). The U.S. Department of Commerce (2005) found that higher natural gas prices between 2000 and 2004 reduced national civilian employment by an average of almost one-half million jobs per year, with about 79,000 lost jobs in manufacturing. Higher natural gas prices push up

consumer costs, reduce real disposable income, slow industrial growth, affect the competitiveness of American manufacturing, and reduce the number of new jobs created in the national economy (U.S. Department of Commerce, 2006).

According to the NWGA (2007), an LNG import terminal located in the Pacific Northwest would promote regional natural gas supply diversity and reliability, lower shipping costs, stabilize prices, and may stimulate the economy. The CEC (2007a) believes that the insertion of LNG into the West Coast mix could produce natural gas price reductions. ICF (2007) agrees that the importation of LNG in the future would put downward pressure on Pacific Northwest natural gas prices. NorthernStar commissioned Dr. Philip Romero, of the Lunquist College of Business, University of Oregon, to perform an analysis of the impact of LNG on the economy of the Pacific Northwest. In Dr. Romero's opinion, an LNG import terminal with a capacity of 1 Bcfd would increase natural gas supplies to the region by 10.3 to 51.5 percent, depending on utilization, and reduce gas prices by between 6.7 and 33.7 percent. A stable supply of natural gas in the future would benefit manufacturing and other industries, and result in higher disposable incomes for Northwest households. His "top-down" macroeconomic estimates suggested that a 10 percent reduction in natural gas prices could result in an increase in regional gross domestic product in 2012 between \$222 million and \$826 million, increase regional employment by between 5,100 to 20,300 jobs, and raise total household incomes between \$54 million and \$214 million (Romero, 2007).

A recent study by the ODE (2008b)⁷ indicated that natural gas from imported LNG may cost more than natural gas produced in North America and transported to the Pacific Northwest by interstate pipelines. Currently, Atlantic Basin LNG imported to East and Gulf Coast existing LNG terminals is generally priced 8 to 9 percent higher than North American produced natural gas. The cost of Pacific Basin LNG may even be higher than that. The ODE cited a case where a contract between Indonesia and Japan priced LNG at twice the cost of North American LNG. The same report by the ODE stated that: "natural gas use in Oregon is likely to rise over the next twenty years. New sources of natural gas will be needed to meet this demand." However, if new interstate pipelines are authorized and built, and transport domestically produced gas at substantially lower costs than imported LNG, then the market may not support the construction of LNG import terminals in Oregon.

The above discussion of project purpose and need is merely a brief summary, to satisfy the requirements of the CEQ regulations for implementing the NEPA, which state that an EIS should only "briefly specify the underlying purpose and need" for a proposed project (40 CFR 1502.13). The Commission will more fully consider the need for the Bradwood Landing Project when making its decision about the project, and will fully disclose its determinations in the project Order.

1.2 PURPOSE AND SCOPE OF THIS STATEMENT

Different federal actions are to be undertaken by the cooperating agencies producing this EIS. The FERC must decide whether or not to authorize the construction and operation of the onshore facilities proposed for the Bradwood Landing Project. The COE must decide whether or not to issue dredging and wetland permits. The Coast Guard must decide whether or not the waterway is suitable for LNG marine traffic. However, all of the cooperating agencies must consider the potential environmental impacts of NorthernStar's proposal as disclosed in this EIS prior to making their decisions.

⁷ The ODE report was conveyed to the FERC through a letter from the Governor of Oregon filed May 9, 2008. It is available for viewing by the public through the FERC's Internet webpage at www.ferc.gov, using the eLibrary feature, and looking up accession number 20080512-5063.

A draft EIS was prepared and issued for public review and comment on August 17, 2007. This document is a final EIS that has been prepared to respond to comments received on the draft EIS. All substantive changes between the draft EIS text and this final EIS are indicated by vertical bars that appear in the margins. The distribution list for the final EIS is provided in Appendix A.

Our principal purposes in preparing this EIS are to:

- identify and assess potential impacts on the natural and human environment that would result from the implementation of the proposed actions;
- describe and evaluate reasonable alternatives to the proposed actions that would avoid or minimize adverse effects on the human environment;
- identify and recommend specific mitigation measures, as necessary, to minimize the environmental impacts; and
- facilitate public involvement in identifying the significant environmental impacts.

The FERC will use the results of the EIS as an element in its review of NorthernStar's applications. After this final EIS is released, the FERC will determine whether the project should be authorized. Commission approval will only be granted if, after a consideration of both environmental and non-environmental issues, the FERC finds that the proposed project is in the public interest. The environmental impact assessment and mitigation development discussed herein will be important factors in this determination. Likewise, the Coast Guard will base its LOR on the environmental analysis contained in this EIS, in addition to consideration of waterway navigational suitability. The COE will use the results of this EIS in its review of NorthernStar's applications for permits pursuant to section 404 of the Clean Water Act (CWA) and section 10 of the Rivers and Harbors Act (RHA).

Our analysis in this EIS focuses on the facilities that are under the FERC's jurisdiction (i.e., the LNG import terminal and sendout pipeline proposed to be constructed by NorthernStar). Because it would be an integral element of the project, this EIS will also address the potential environmental impacts associated with a nonjurisdictional power line to be built to provide electric services to the LNG terminal. The waterway to the LNG terminal is included to address the Coast Guard's proposed action of issuing an LOR for the project.

The topics addressed in this EIS include geology; soils and sediments; water use and quality; wetlands; vegetation; wildlife and aquatic resources; threatened, endangered, and special-status species; land use, recreation, and visual resources; cultural resources; socioeconomics and traffic; air quality and noise; reliability and safety; and cumulative effects. The EIS describes the affected environment as it currently exists, discusses the environmental consequences of the proposed project, and compares the project's potential impact to that of alternatives. The EIS also presents our conclusions and recommended mitigation measures.

1.3 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

The FERC, Coast Guard, and COE are required to comply with section 7 of the Endangered Species Act of 1973 (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and section 106 of the National Historic Preservation Act (NHPA). As the lead federal agency for the Bradwood Landing Project, the FERC has undertaken the lead role for consultations under these statutes for itself and the cooperating agencies. The status of compliance with those acts is described in this EIS.

At the federal level, other agency permits and approvals include compliance with the CWA, RHA, Clean Air Act (CAA), Coastal Zone Management Act (CZMA), and Coast Guard regulations relating to LNG waterfront facilities. Table 1.3-1 lists the major federal, state, and local permits, approvals, and consultations identified for construction and operation of the Bradwood Landing Project.

1.3.1 Coast Guard Review

The Coast Guard exercises regulatory authority over LNG facilities that affect the safety and security of port areas and navigable waterways under Executive Order 10173; the Magnuson Act (50 United States Code (USC) § 191; the Ports and Waterways Safety Act of 1972, as amended (33 USC § 1221 et seq); and the Maritime Transportation Security Act of 2002 (46 USC § 701). The Coast Guard is responsible for matters related to navigation safety, vessel engineering and safety standards, and all matters pertaining to the safety of the facilities or equipment located in or adjacent to navigable waters up to the last valve immediately before the receiving tanks. The Coast Guard also has authority for LNG facility security plan review, approval, and compliance verification as provided in 33 CFR 105, and siting as it pertains to the management of vessel traffic in and around the LNG facility. As required by its regulations, the Coast Guard is responsible for issuing an LOR as to the suitability of the waterway for LNG marine traffic. Issuance of the LOR would be based on the following items:

- density and character of marine traffic;
- locks, bridges, and other manmade obstructions in the waterway;
- environmental effects of LNG carriers during transit from open water to the facility;
- maritime security (MARSEC)/port security considerations; and
- the following factors adjacent to the facility:
 - depth of water;
 - tidal range;
 - protection from high seas;
 - natural hazards, including reefs, rocks, and sandbars;
 - underwater pipes and cables; and
 - distance of berthed vessels from the channel and the width of the channel.

In accordance with 33 CFR 127.007, each applicant must submit a Letter of Intent (LOI) to the local Captain of the Port (COTP) to begin the LOR process. NorthernStar submitted an LOI to the Coast Guard for the project on January 18, 2005.

On June 14, 2005, the Coast Guard issued a *Navigation and Vessel Inspection Circular – Guidance on Assessing the Suitability of a Waterway for Liquefied Natural Gas (LNG) Marine Traffic* (NVIC 05-05). The purpose of this NVIC is to provide guidance to applicants seeking to construct and operate shore-side LNG import terminals regarding the timing and scope of the Coast Guard process necessary for the consideration of safety and security issues, including LNG marine traffic. NVIC 05-05 itemizes data to be included in a Waterway Suitability Assessment (WSA) to be produced by an applicant, and outlines the roles of the COTP and Federal Maritime Security Coordinators (FMSC) in the review and validation of the WSA by the Coast Guard.

NorthernStar submitted its Preliminary WSA to the Coast Guard on December 29, 2005, and in response to Coast Guard comments, a Follow-on WSA was produced in May 2006. The Coast Guard provided the FERC with its Waterway Suitability Report (WSR) on February 28, 2007. See section 4.11.5 of this EIS for additional discussion of marine safety.

1.3.2 COE Review

The COE is the primary agency responsible for issuing dredging and wetland permits pursuant to section 404 of the CWA and section 10 of the RHA.

1.3.3 Clean Water Act and Rivers and Harbors Act

The CWA (33 USC § 1344) addresses the issue of managing developments to improve, safeguard, and restore the quality of the nation's waters, including coastal waters, and to protect the natural resources and existing uses of those waters. Under section 404 of the CWA, the COE issues permits (after notice and opportunity for public hearings) for the discharge of dredged or fill material into waters of the United States at specified disposal sites. The U.S. Environmental Protection Agency (EPA) has the authority to review and veto COE decisions on section 404 permits. Section 10 of the RHA (33 USC § 403) regulates any work or structures that potentially affect the course, condition, or capacity of a navigable waterway. It requires authorization from the COE for building any wharfs, piers, jetties, or other structures or excavating or filling in any port, navigable river, or other waters of the United States.

NorthernStar must obtain Water Quality Certifications pursuant to section 401 of the CWA and National Pollutant Discharge Elimination System (NPDES) permits pursuant to section 402 of the CWA. The federal authority to issue these certifications and permits has been delegated to the Oregon Department of Environmental Quality (ODEQ) in Oregon and the Washington State Department of Ecology (WDE) in Washington.

On March 8, 2007, NorthernStar submitted its NPDES permit application to the ODEQ. In a letter dated April 18, 2007, the ODEQ informed NorthernStar that it would not process the application until after it receives a Land Use Compatibility Statement (LUCS) from Clatsop County. To cover its proposed actions in Oregon, NorthernStar submitted a Joint Permit Application (JPA) to the COE and ODEQ in October 2006, seeking permits under sections 401 and 404 of the CWA. NorthernStar revised its JPA in March 2007. To obtain permits under sections 401 and 404 of the CWA for its actions in Washington, NorthernStar submitted, also in October 2006, a Joint Aquatic Resources Permit Application (JARPA) to the COE and the WDE. This JARPA was revised in March 2007, then withdrawn by NorthernStar, and resubmitted in October 2007. The COE issued a notice of these applications on October 18, 2007 and participated in a public meeting with the ODEQ regarding the applications on February 13, 2008 (see table 1.3-1). Section 4.3.2 of this EIS contains a more detailed discussion of potential project-related impacts on surface water, including addressing compliance with the CWA.

1.3.4 Clean Air Act

The primary objective of the CAA, as amended, is to establish federal standards for various pollutants from both stationary and mobile sources and to provide for the regulation of polluting emissions via state implementation plans. In addition, the CAA is designated to prevent significant deterioration in certain areas where air quality exceeds national standards and to provide for improved air quality in areas that do not meet federal standards (nonattainment areas).

The EPA has regulatory authority under the CAA. The EPA provides review and oversight of these regulations but has delegated permitting authority to the ODEQ in Oregon and the Southwest Clean Air Agency (SWCAA) in southwest Washington. Emissions from all phases of construction and operation of the proposed LNG terminal and pipeline would be subject to applicable federal and state air regulations. Section 4.10.1 of this EIS has a detailed discussion of air quality issues.

NorthernStar submitted an Air Contaminant Discharge Permit application for the Bradwood Landing Project to the ODEQ on March 28, 2007, and a revised application on April 9, 2007. On April 10, 2007, the ODEQ advised NorthernStar that it found the application incomplete because it did not contain a LUCS from Clatsop County under OAR 340-216-0040(1(k)).

1.3.5 Endangered Species Act

Section 7(a)(1) and (2) of the ESA, as amended, require that federal agencies use their authorities to further the conservation of listed species and that any project authorized, funded, or conducted by a federal agency should not “jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined...to be critical” (16 USC § 1536(a)(1) and (2)(1988)). The lead federal agency, or the applicant as a non-federal party, is required to consult with the U.S. Department of the Interior Fish and Wildlife Service (FWS) and the U.S. Department of Commerce National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) to determine whether any federally listed or proposed endangered or threatened species or their designated critical habitat occur in the vicinity of the proposed project. If, upon review of existing data or data provided by the applicant, the federal agency determines that these species or habitats may be affected by the proposed project, it is required to prepare a biological assessment (BA) to identify the nature and extent of adverse impacts, and to recommend measures that would avoid the habitat and/or species, or would reduce potential impacts to acceptable levels.

The FERC submitted a BA for the Bradwood Landing Project to the NMFS and FWS on March 19, 2007. Because we have found that the project is likely to adversely affect some listed species, our BA requested that the FWS and NMFS develop Biological Opinions (BO) as to whether authorizing the Bradwood Landing Project may jeopardize the continued existence of any listed species. The FWS and NMFS provided comments on the BA in letters dated April 20, and May 11, 2007, respectively. The FERC staff and our third-party environmental contractor participated in a series of meetings and conference calls with representatives of the NMFS, FWS, and NorthernStar to address comments on our BA. The FERC intends to revise its BA in response to the FWS’s and NMFS’s comments, including new information provided by NorthernStar. The FERC will only allow project construction to proceed after we have completed formal consultations with the FWS and NMFS in compliance with the ESA and MSA. See section 4.6 of this EIS for details of our ESA analysis.

1.3.6 Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a federal fisheries management plan. The MSA requires federal agencies to consult with the NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH (MSA §305(b)(2)). Although absolute criteria have not been established for conducting EFH consultations, the NMFS recommends consolidated EFH consultations with interagency coordination procedures required by other statutes, such as the NEPA, the Fish and Wildlife Coordination Act, or the ESA to reduce duplication and improve efficiency (50 CFR 600.920(e)). As part of the consultation process for this project, we consolidated an EFH Assessment with the BA, prepared pursuant to the ESA, on behalf of the FERC and the federal cooperating agencies for this project. See section 4.5.1.2 of this EIS for the status of the MSA review.

1.3.7 Marine Mammal Protection Act

All marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972. This act was amended by the United States Congress in 1994. The MMPA prohibits, with certain exceptions, the taking of marine mammals in United States waters and by United States citizens on the high seas and the importation of marine mammals and marine mammal products into the United States. The term “take,” as defined in section 3 of the MMPA, means “to harm, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal” (16 USC § 1362(13)). “Harassment” is also defined in the MMPA (at USC § 1362(18)) and in regulations promulgated by the NMFS (at 50 CFR 216.3).

Sections 101(a)(5)(A) and (D) of the MMPA direct the U.S. Secretary of Commerce, through the NMFS, to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specific geographic region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of authorization is provided to the public for review. Authorization would be granted by the NMFS if it finds that the taking will have a negligible impact on the species or stock, will not have an unmitigatable adverse impact on the availability of the species or stock for subsistence uses (where relevant), and it prescribes permissible methods of taking, and requirements pertaining to the mitigation, monitoring, and reporting of such taking. NMFS has defined “negligible impact” as “an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.”

NorthernStar has stated that it will apply for an Incidental Harassment Authorization pursuant to MMPA section 101(a)(5)(D). The NMFS may use relevant portions of this EIS during its review, and may adopt measures to protect marine mammals outlined in this EIS. It may also require additional mitigation and monitoring measures to ensure that the taking result in the least practicable adverse impact on affected marine mammal species or stocks. The public would have an opportunity to comment to the NMFS in response to its Notice of Receipt of an application for an Incidental Harassment Authorization, or a request for the implementation of regulations governing incidental taking, and following the publication of the proposed rule.

Impacts from the Bradwood Landing Project on marine mammals are discussed in section 4.6.2. In addition, marine mammals listed under the ESA will be discussed in detail in the revised BA and EFH Assessment.

1.3.8 National Historic Preservation Act

Section 106 of the NHPA requires the lead federal agency to take into account the effects of an undertaking on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Historic properties are cultural resources that are listed on or eligible for listing on the National Register of Historic Places (NRHP), including prehistoric or historic sites, districts, buildings, structures, objects, or properties of traditional religious or cultural importance. The ACHP promulgated regulations for the implementation of section 106 at 36 CFR 800. In accordance with those procedures, the FERC allowed NorthernStar, as a non-federal party, to assist in the preparation of information and analyses necessary for us to comply with the NHPA. Section 4.9 includes a summary of the status of investigations to comply with the NHPA.

1.3.9 Coastal Zone Management Act

In 1972, Congress passed the CZMA to “preserve, protect, develop, and where possible, to restore or enhance, the resources of the nation’s coastal zone for this and succeeding generations” and to “encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone” (16 USC § 1452, section 303 (1) and (2)).

Section 307 (c)(3)(A) of the CZMA states that “any applicant for a required federal license or permit to conduct an activity, in or outside the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide a certification that the proposed activity complies with the enforceable policies of the state’s approved program and that such activity will be conducted in a manner consistent with the program.” In order to participate in the coastal zone management program, a state is required to prepare a program management plan for approval by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Coast and Ocean Resource Management (OCRM). Once the OCRM has approved a plan and its enforceable program policies, a state program gains “federal consistency” jurisdiction. This means that any federal action (e.g., a project requiring federally issued licenses or permits) that takes place within a state’s coastal zone must be found to be consistent with state coastal policies before the federal action can take place.

The Columbia River Basin is exempt from the CZMA, except for the zone of significant tidal influence. The only part of the Bradwood Landing Project subject to federal CZMA review is the LNG import terminal at Bradwood. None of the proposed project facilities fall within the Washington coastal zone.

The Oregon Department of Land Conservation and Development (ODLCD) is the state’s designated coastal management agency and has established the Oregon Coastal Management Program (OCMP). The program’s mission is to work in partnership with coastal local governments, state and federal agencies, and other stakeholders to ensure that Oregon’s coastal and ocean resources are managed, conserved, and developed consistent with statewide planning goals. To accomplish this mission, the program combines various state statutes for managing coastal lands and waters into a single, coordinated package. These include: 1) the 19 Statewide Planning Goals, which are Oregon’s standards for comprehensive land use planning; 2) city and county comprehensive land use plans; and 3) state agencies and natural resource laws such as the Oregon Beach Bill and the Removal-Fill Law.

Under the provisions of the CZMA, NorthernStar must provide a certification to the FERC and the ODLCD that the project complies with and will be conducted in a manner consistent with the state’s approved management program (15 CFR 930.50 Subpart D). NorthernStar submitted its federal consistency certification to the ODLCD on December 8, 2006 with a request for a formal determination of consistency. In a letter to NorthernStar dated January 5, 2007, the ODLCD requested additional information before it would begin its consistency review. NorthernStar submitted a revised consistency certification on October 23, 2007. On November 21, 2007, ODLCD determined that its 6-month review period began with the submission of the revised consistency certification. On April 9, 2008, NorthernStar signed a Stay Agreement with the ODLCD that provides a 150-day extension period when NorthernStar can provide the ODLCD with additional information about its project. On May 9, 2008, the ODLCD issued a data request to NorthernStar seeking clarification about project elements. The ODLCD expects to make its decision regarding the project’s consistency with the CZMA on or before September 21, 2008. See section 4.7.2.4 of this EIS for further information regarding compliance with the CZMA.

1.3.10 U.S. Department of Defense Consultation

We have consulted with the U.S. Department of Defense (DOD), as required by the Energy Policy Act of 2005 (EPAct) and section 3 of the NGA, to determine if there would be any impacts associated with the project on military training or activities on any military installations. No comments or concerns were received from any branch of the military or a military installation in response to the FERC's scoping notice issued September 13, 2005.

In letters dated September 23, 2005 and January 11 2006, to appropriate property managers and installation supervisors at the Pentagon representing the Army, Air Force, and Navy, and the COE, we informed various offices of the DOD of the Bradwood Landing Project and requested any information on impacts on military installations. On August 17, 2007, the FERC provided the DOD with copies of the draft EIS, and requested comments. Since no effects have been identified, we conclude that there would be no impact on military installations associated with this project, and therefore, no concurrence from the Secretary of Defense is required under the EPAct.

1.3.11 Other State Permits and Approvals

In addition to the federal permitting authorities that have been delegated to the states, as discussed above, various laws and regulations promulgated by the States of Oregon and Washington have relevance to the Bradwood Landing Project. In addition to the permits, approvals, and consultations listed in table 1.3-1, the Coast Guard worked with representatives of the States of Oregon and Washington in reviewing the WSA for the project.

The FERC encourages cooperation between applicants and state and local authorities, but this does not mean that state and local agencies, through application of state and local laws, may prohibit or unreasonably delay the construction or operation of facilities approved by the FERC. Any state or local permits issued with respect to jurisdictional facilities must be consistent with the conditions of any Certificate the FERC may issue.⁸

Oregon

The ODE is the appropriate state agency designated by the Governor of Oregon to consult with the FERC on state considerations related to the Bradwood Landing Project according to the EPAct. On July 6, 2006, the ODE submitted a safety advisory report to the FERC for its consideration in reviewing the Bradwood Landing Project. On December 6, 2006, the ODE conveyed a Clatsop County Emergency Services Report, and requested that the Commission consider making the provision of resources outlined in the report a condition to the authorization for the project.

Under Oregon's Removal-Fill Law (Oregon Revised Statute (ORS) 196.795-990), permits are issued by the Oregon Department of State Lands (ODSL) for:

- projects requiring the removal or fill of 50 cubic yards or more of material in waters of the state;
- the removal or fill of any material regardless of the number of cubic yards affected in a stream designated as essential salmon habitat; and

⁸ See, e.g., *Schneidewind v. ANR Pipeline Co.*, 485 U.S. 293 (1988); *National Fuel Gas Supply v. Public Service Commission*, 894 F.2d 571 (2d Cir. 1990); and *Iroquois Gas Transmission System, L.P., et al.*, 52 FERC ¶ 61,091 (1990) and 59 FERC ¶ 61,094 (1992).

- the removal or fill of any material from the bed and banks of scenic waterways regardless of the number of cubic yards affected.

All permits include standard and special design and operating conditions that are intended to ensure the protection, conservation, and best use of the state's water resources and to prevent harm to fishery and recreational uses of the waters. A common condition is that the project be conducted during the "in-water work period" established by the Oregon Department of Fish and Wildlife (ODFW) for the specific waterbodies. For projects involving impacts on wetlands, compensatory mitigation to offset loss of wetland resources is required per Oregon Administrative Rule (OAR) 141-085-0121.

A JPA is used for the Oregon Removal-Fill Permit and the COE Permit under section 10 of the RHA and section 404 of the CWA as described above. However, the JPA must be submitted to both agencies and separate permits are issued.

The purpose of the Fish and Wildlife Habitat Mitigation Policy (HMP) (OAR 345-022-0060) is to apply consistent goals and standards to mitigate impacts on fish and wildlife habitat caused by land and water development actions. The policy provides goals and standards for general application to individual development actions, and for the development of more detailed policies for specific classes of development actions or habitat types. In implementing this policy, the ODFW will recommend or require mitigation for losses of fish and wildlife habitat resulting from development actions. Priority is given for native species. Section 4.5.2.4 includes a detailed discussion of NorthernStar's compliance with this policy.

Oregon permits and authorizations relevant to the Bradwood Landing Project are listed in table 1.3-1. On December 18, 2007, the State of Oregon filed consolidated comments on our draft EIS. We address those comments in Appendix K of this final EIS.

Washington

In Washington, state and county agencies conduct environmental reviews of proposed projects pursuant to the State Environmental Policy Act (SEPA) (Chapter 43.21C Revised Code of Washington (RCW)). The SEPA process involves the identification and evaluation of probable environmental impacts, and the development of mitigation measures that will reduce adverse environmental impacts. Cowlitz County is the lead SEPA agency for the Bradwood Landing Project and is responsible for compliance with SEPA procedural requirements as well as for compiling and assessing information on the environmental aspects of the proposal for all agencies with jurisdiction in Washington. As the lead SEPA agency, Cowlitz County is also responsible for the threshold determination⁹ and preparation and content of an EIS when required.

Cowlitz County could adopt this EIS for the Bradwood Landing Project if its independent review confirms that the document is adequate, meets the county's environmental review standards, and the requirements of the State of Washington Administrative Code (WAC) 197-11-610 and 197-11-630. If the county decides to adopt this EIS, it would fill out and circulate the adoption form in WAC 197-11-965 to agencies with jurisdiction and to persons or organizations that have expressed an interest in the proposal. No action may be taken on the proposal until 7 days after the statement of adoption form has been issued. Once the 7-day waiting period is completed, the state and local agencies could begin issuing permits.

⁹ A SEPA threshold determination is the formal decision as to whether or not the proposal is likely to cause a significant adverse environmental impact that requires review in an EIS.

The Growth Management Act was passed in 1990 to address what the Washington State Legislature referred to as uncoordinated and unplanned growth that posed a threat to the environment, sustainable economic development, and the quality of life in Washington. The Growth Management Act requires state mandated comprehensive planning for the most populated and fastest growing counties of the state. Because Cowlitz County is not such a county, it is not subject to most provisions of the act. However, the Growth Management Act also mandates that all counties develop and adopt an ordinance that classifies, designates, and protects critical areas. Cowlitz County has implemented a Critical Areas Ordinance, set forth as Chapter 19.15 of the Cowlitz County Code (CCC). Cowlitz County is currently in the process of updating this ordinance.

Critical areas may contain valuable natural resources; perform important ecological functions and processes; or, if developed, present potential hazards to life and property. In conjunction with other applications, the county reviews critical areas relative to the following:

- Wetlands – Provide numerous valuable functions, including but not limited to providing wildlife and fish habitat, water quality enhancement, flood and erosion control, and aquifer recharge and discharge.
- Geologic hazards – Pose a risk to public and private property and to the natural systems that make up the county’s environment. Such areas are susceptible to landslides, erosion, seismic activity, volcanic activity, or mining hazards. Future developments should be directed to more geologically stable areas and away from unsuitable ground.
- Aquifer recharge areas – Perform many important biological and physical functions that benefit the county and its residents, including storing and conveying groundwater. Protection of aquifer recharge areas is necessary to protect valuable groundwater resources.
- Fish and wildlife habitat conservation areas – Perform many physical and biological functions that include but are not limited to providing opportunities for food, cover, nesting, breeding, and movements for fish and wildlife; maintaining and promoting diversity of species and habitat; and helping to maintain air and water quality.
- Frequently flooded areas – Pose a risk to public and private property and public health. Regulation of these lands promotes efficient use of the land and water resources by allocating frequently flooded areas to the uses for which they are best suited and to discourage obstructions to flood flows.

Designated critical areas affected by the Bradwood Landing Project are identified and discussed in the applicable resource sections in section 4.0 of this EIS.

The Shoreline Management Act was passed by the Washington State Legislature in 1971. The Shoreline Management Act is the principal means of regulating shoreline land and water uses throughout the state and requires cities and counties to develop Shoreline Master Programs (SMP). The WDE reviews and formally adopts the programs. The SMPs must be consistent with statewide policies but contain specific regulations and polices that are tailored to local conditions to promote orderly and reasonable development of waterfront lands. The overall intent is to protect the resources and ecology of Washington’s largest streams, lakes, and marine waters. Shoreline permit decisions are made and issued by local governments; however, the WDE reviews those decisions. In addition, for shoreline conditional use or variance permits, the WDE is responsible for approving, denying, or approving with additional conditions, the local decision.

Requests for shoreline development permits in Cowlitz County are reviewed under the criteria established by the Shoreline Management Act through Cowlitz County's SMP adopted in 1977, and through the authority of Chapter 19.20 of the CCC. Detailed information on the designated shorelines crossed by the proposed pipeline is presented in section 4.3.2.1.

Other Washington permits and authorizations are listed in table 1.3-1. On December 18, 2007, Cowlitz County filed comments on our draft EIS. The Washington Department of Natural Resources (WDNR) provided comments in letters dated December 20, 2007 and January 3, 2008; the WDE commented on December 21, 2007; the WUTC provided comments in a letter dated December 11, 2007; and the Washington Department of Fish and Wildlife (WDFW) filed comments on January 2, 2008. We address these comment letters in Appendix K.

1.4 PUBLIC REVIEW AND COMMENT

The Commission developed its environmental Pre-filing Review Process to encourage the early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed with the FERC. The FERC issued regulations for our Pre-filing Review Process on October 7, 2005, in Docket No. RM05-31-000, Order No. 665. However, those procedures did not apply to NorthernStar because it came in for Pre-filing before the regulations were issued. Instead, NorthernStar followed preliminary guidance provided by the FERC's Office of Energy Projects (OEP) (prepared on February 10, 2004).

On February 23, 2005, NorthernStar filed a request with the FERC to implement the Commission's Pre-filing Process for the Bradwood Landing Project. On March 7, 2005, the FERC granted NorthernStar's request and established a Pre-filing docket number (PF05-10-000) to place information related to the project into the public record.

The FERC introduced NorthernStar's proposal to various stakeholders by issuing a Pre-filing Process Review Notice on March 18, 2005. This notice was sent to elected federal, state, and local government officials; agency representatives; environmental and public interest organizations; Native American tribes; and local libraries and newspapers.

As part of the Commission's Pre-filing Process, NorthernStar initiated a public outreach program during the preliminary design stage of the project. An article about the proposed project appeared in the Daily Astorian on February 23, 2005. NorthernStar established an internet webpage that described the project, mentioned key management team members, outlined potential environmental impacts, and addressed frequently asked questions. NorthernStar contacted and/or met with federal and state regulatory and resource agencies and interested environmental groups, and took agency representatives on site visits. The general public was given an opportunity to learn more about the project at a series of open houses held by NorthernStar including those in Astoria, Oregon (May 19, 2005), Longview, Washington (September 28, 2005), and Knappa, Oregon (September 29, 2005). The FERC staff also was in attendance at NorthernStar's open houses to answer questions from the public. On May 14, 2005, NorthernStar hosted a public tour of the Bradwood LNG terminal location. NorthernStar presented information about the project to an audience of 125 at a special meeting of the Board of Wahkiakum County Commissioners on May 17, 2005.

TABLE 1.3-1

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
FEDERAL			
FERC	NEPA 40 CFR 1500-1508	Prepare EIS.	FERC issued draft EIS on August 17, 2007.
	Sections 3 and 7 of the NGA 18 CFR 380 and Section 311 of EPAct 18 CFR 153, 157, 375, and 385 Order No. 687	Issue Approval of Place of Import and Authorization of Siting, Construction, and Operation of LNG Terminal Facilities (section 3a of NGA). Issue Certificate of Public Convenience and Necessity to construct, install, own, operate, and maintain a pipeline (section 7c of NGA).	NorthernStar filed applications with the FERC on June 5, 2006.
ACHP	Section 106 of the NHPA 36 CFR 800	Has opportunity to comment on the undertaking.	Pending FERC review of final cultural resources reports, after consultations with State Historic Preservation Offices (SHPO).
U.S. Department of Agriculture, Natural Resources Conservation Service	Farmland Protection Policy Act	Determine if the project would result in the permanent conversion of prime farmland.	Pending.
Coast Guard	33 CFR 127	COTP issues an LOR determining the suitability of the waterway for LNG marine traffic.	NorthernStar submitted LOI to the Coast Guard on January 18, 2005. LOR pending completion of the NEPA review.
	33 CFR 165	Establish safety and security zones for LNG vessels in transit and while docked.	Coast Guard issued WSR on February 28, 2007. NorthernStar issued first annual WSA update on February 28, 2008.
	Ports and Waterway Safety Act Maritime Transportation Act 33 CFR 101, 103, 104, 105	Ensure navigation safety. Develop LNG Vessel Management and Emergency Plan. Review and approve Facility Security Plan.	Pending. Pending.
	NVIC 05-05	Validate WSA and produce WSR.	NorthernStar submitted follow-up WSA to the Coast Guard in May 2006. Coast Guard issued its WSR on February 28, 2007.
COE	Section 10 of the RHA	Issue permit for activities that will occupy, fill, or grade land in a floodplain, streambed, or channel of a stream or other waters of the United States.	NorthernStar submitted its JPA and JARPA to the COE on October 10, 2006; revised JPA on March 2, 2007. NorthernStar withdrew and resubmitted the same JARPA in October 2007.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
	Section 404 of the CWA	Issue permit for the placement of dredged or fill material into waters of the United States, including wetlands.	NorthernStar submitted its JPA and JARPA to COE on October 10, 2006; revised JPA on March 2, 2007. NorthernStar withdrew and resubmitted the same JARPA in October 2007. COE issued its Public Notice on October 18, 2007. COE participated in public meeting on application in February 2008. COE issued information request to NorthernStar on January 14, 2008. NorthernStar submitted responses on February 13 and April 1, 2008.
DOD	Section 311 of the EPA Act and Section 3 of the NGA	Provide information regarding project effects on military installations.	FERC sent letters to DOD dated September 23, 2005, January 11, 2006, and August 17, 2007.
EPA	Section 404 of the CWA	Can veto wetland permits issued by the COE.	NorthernStar submitted its JPA and JARPA to the COE on October 10, 2006; revised on March 2, 2007. NorthernStar withdrew and resubmitted the same JARPA in October 2007. EPA commented on the draft EIS in a letter dated December 19, 2007.
FWS	Section 7 of the ESA	Consider lead agency determination of effects on federally listed species and their habitat. Provide a BO if the project is likely to adversely affect such species or their habitat.	FERC submitted initial BA on March 19, 2007. FWS requested additional information in letter dated April 20, 2007. FERC's revised BA and EFH Assessment in preparation.
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.	Pending review of the FERC's revised BA and EFH Assessment.
	Migratory Bird Treaty Act	Review the proposed project for consistency with Executive Order 13186.	Pending review of this final EIS.
NMFS	Section 7 of the ESA	Consider lead agency determination of effects on federally listed species and their habitat. Provide a BO if the project is likely to adversely affect such species or their habitat.	FERC' submitted initial BA March 19, 2007. NMFS requested additional information in letter dated May 11, 2007. FERC's revised BA and EFH Assessment in preparation.
	MMPA 50 CFR 216	Consult on protected marine mammals.	Pending review of the FERC's revised BA and EFH Assessment and this final EIS. NorthernStar intends to apply for an Incidental Harassment Authorization post-FEIS.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
	MSA	Provide conservation recommendations for projects that may adversely impact EFH.	FERC's revised EFH Assessment will be included with revised BA.
DOT, PHMSA	LNG Facilities Petition for Approval	Issue approval that the new LNG facility meets standards governing siting, design, installation, personnel qualifications, and training.	Pending.
	Natural Gas Pipeline Safety Act 49 USC 601 49 CFR Parts 190-199	Administer national regulatory program to ensure the safe transportation of natural gas.	Pending.
U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms	Explosives User Permit 27 CFR 555	Issue permit to purchase, store, and use explosives during project construction.	Permit to be obtained by NorthernStar before construction.
STATE – OREGON			
Oregon Department of Agriculture (ODA)	Oregon Endangered Species Act Oregon Senate Bill 533 and Oregon Revised Statute (ORS) 564	Consult on Oregon listed plant species, and ODA would review botanical survey reports covering non-federal public lands where state listed plant species are likely to occur prior to ground disturbing activities.	Pending review of the FERC's revised BA and EFH Assessment and submittal by NorthernStar of preconstruction botanical species surveys.
ODE	Section 311 of the EPA Act	Furnish an advisory report to the FERC on state and local safety considerations, and conduct operational safety inspections.	Letters from ODE to the FERC dated July 6, 2006 and December 6, 2006. Consolidated comments of all Oregon agencies on the draft EIS dated December 13, 2007. Provided report on LNG and natural gas review through the Governor on May 9, 2008.
ODEQ	Section 401 of the CWA	Water quality certification.	JPA for water quality and wetlands submitted by NorthernStar on October 10, 2006; revised on March 2, 2007. NorthernStar withdrew and resubmitted the same JARPA in October 2007. Public meeting on permit application held in February 2008.
	Section 402 of the CWA	Issue NPDES permits for discharge of hydrostatic test water, SCV condensate, and stormwater.	NPDES application submitted by NorthernStar on March 8, 2007. ODEQ requested LUCS in letter dated April 18, 2007.
	CAA	Issue air quality permit.	Air Contaminant Discharge Permit application submitted by NorthernStar on March 28, 2007; revised April 9, 2007. ODEQ requested LUCS in letter dated April 10, 2007.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
	Water Pollution Control Facility Permit under OAR 340-045 and ORS 4688 et seq.	Issue permit for the disposal of solid waste and waste water into public waters, including hydrostatic test water release.	Pending.
ODFW	Fish and Wildlife Coordination Act and the Oregon Endangered Species Act under OAR 635 and ORS 496, 506, and 509	Consult on sensitive species and habitats that may be affected by the project and, in general, regarding conservation of fish and wildlife resources. Fish passage approval from ODFW for stream crossings.	Pending review of the FERC's revised BA and EFH Assessment and NorthernStar's submittal of preconstruction fish and wildlife species surveys.
	Fish and Wildlife HMP OAR 345-022-0060	Consult on and approve fish and wildlife mitigation plan.	Pending review of revised Compensatory Mitigation Plan to be submitted by NorthernStar in May 2008.
Oregon Department of Forestry	Oregon Forest Practices Act OAR 629, ORS 477 and 527	Monitors timber harvests on private lands and protects non-federal public and private lands from wildfires.	
ODLCD	CZMA 15 CFR 930 ORS 196.435	Consider consistency with CZMA program policies.	NorthernStar submitted its consistency certification to the ODLCD on December 8, 2006 and submitted a revised consistency certification on October 23, 2007. On November 21, 2007, ODLCD determined that its 6-month review period began with the submission of the revised consistency certification. ODLCD participated in public meeting about application in February 2008. On April 9, 2008 ODLCD signed a Stay Agreement with NorthernStar, adding 150 days to the application review period. ODLCD issued a data request to NorthernStar on May 9, 2008.
SHPO	Section 106 of the NHPA ORS 338.920	Review cultural resources reports and comment on recommendations for NRHP eligibility and project effects. Issue permits for surveys on non-federal public lands and permits for excavations on non-federal public and private lands.	In a letter dated April 4, 2006, the SHPO commented on NorthernStar's first draft survey reports. NorthernStar filed revised reports with the FERC on November 16, 2006, and SHPO commented on those reports in a letter dated November 22, 2006. Final SHPO comments pending NorthernStar's submittal of results of post-Order cultural resources surveys.
ODSL	Submerged and Submersible Land Easement OAR 141-122	Grant submerged land easements (e.g., waterbody crossings).	Pending.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
	Sand & Gravel Lease or License OAR 141-014	Grant lease or license for removal of material (and payment of royalties) in connection with turning basin dredging.	Pending.
	Joint Removal-Fill Permit ORS 196.795-990	Approve removal or fill of material in waters of the state.	JPA submitted by NorthernStar on October 10, 2006 and revised on March 2, 2007. NorthernStar withdrew and resubmitted the same JARPA in October 2007.
	Compensatory Wetland Mitigation Rules OAR 141-085-0121	Review and approve wetland mitigation plans.	Pending review of the revised Compensatory Mitigation Plan to be filed by NorthernStar in May 2008.
Oregon Department of Transportation (ODOT)	Section 303(c) DOT Act 49 CFR 303	Consultation and clearance letter regarding recreational land disturbance and construction-related traffic impacts.	Pending.
	Access Permit ORS 184, OAR 734-051	Issue permits to cross state funded roadways.	Permit application pending.
Oregon Department of Water Resources (ODWR)	ORS 537, OAR 690-310	Issue permits to appropriate surface water and groundwater during project operation.	Applications for Permit to Use Surface Water and Permit to Use Ground Water submitted by NorthernStar on February 28, 2006. ODWR drafted proposed orders on September 4, 2007. Final orders pending.
	ORS 537, OAR 690-340	Issue limited licenses for temporary use of surface waters for hydrostatic testing and suction dredging.	Limited licenses (LL-947, LL-948, LL-949) issued April 25, 2006.
Oregon Public Utilities Commission	OAR 860-031	Inspect the natural gas facilities for safety.	Pending.
STATE – WASHINGTON			
SHPO	Section 106 of the NHPA	Review cultural resources reports and comment on recommendations for NRHP eligibility and project effects.	SHPO commented on definition of area of potential effect (APE) in a January 19, 2006 letter. NorthernStar filed a revised pipeline survey report with the FERC on November 16, 2006. The FERC requested consultation in a letter to the SHPO dated November 24, 2006. SHPO commented on revised report on November 27, 2006. Final SHPO comments pending NorthernStar's submittal of results of post-Order cultural resources surveys.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
WDE	Section 401 of the CWA	Water Quality Certification.	NorthernStar submitted its JARPA on October 10, 2006 and revised its JARPA in March 2007. NorthernStar withdrew and resubmitted the same JARPA in October 2007. WDE commented on draft EIS in a letter dated December 21, 2007.
	Section 402 of the CWA	Issue NPDES permits for hydrostatic test water discharge and construction stormwater discharge.	NPDES applications to be submitted by NorthernStar prior to construction.
Washington State Department of Labor and Industries	Explosives User Permit WAC 291-52-64005	Issue permit to purchase, store, and use explosives during pipeline construction.	Permit to be obtained by NorthernStar before construction.
WDNR	Forest Practices Act RCW 76.09 and WAC 222	Issue Forest Practices Permit.	Permit application pending. WDNR commented on the draft EIS in letters dated December 20, 2007 and January 3, 2008.
	Aquatic Lands Use and Lease Authorization RCW 79.105 and WAC 332-30	Authorize use of state-owned aquatic lands for waterbody crossings.	Application pending.
Washington State Department of Transportation (WDOT)	State Highway Crossing Permit RCW 47.44 and WAC 468-34	Consider issuance of permits to cross state highways.	Permit application pending.
WUTC	WAC 480-93	Inspect the natural gas pipeline for safety.	Inspections would begin during construction. WUTC commented on the draft EIS in a letter dated December 11, 2007.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
LOCAL			
Clatsop County, Oregon	Multiple Land-use Permits and Approvals	Review consolidated application for compliance with local and state land use plans and regulations. Issue permits and approvals, including LUCS.	Initial consolidated application submitted by NorthernStar in December 2006; supplemental information provided February 2007. County determined application complete on February 14, 2007. County Planning Commission held public hearings on application in July 2007. In August 2007, the Planning Commission recommended approval of the application to the Board of County Commissioners. Board of County Commissioners held public hearings in October 2007. Preliminary approval by Board of County Commissioners in December 2007. Final decision accepting NorthernStar's proposed land use changes made by the Board of County Commissioners on March 20, 2008. County wrote letters to the FERC dated November 12, 2007 and February 22, 2008, and the FERC responded in a letter dated April 4, 2008.
	Section 311 of EPA Act	Review and provide consultation regarding NorthernStar's Emergency Response Plan (ERP).	Draft ERP distributed February 2007. Final ERP pending.
Pacific County, Washington	Section 311 of EPA Act	Review and provide consultation regarding NorthernStar's ERP.	Draft ERP distributed February 2007. Final ERP pending.
Wahkiakum, Washington	Section 311 of EPA Act	Review and provide consultation regarding NorthernStar's ERP.	Draft ERP distributed February 2007. Final ERP pending. Wahkiakum County wrote a letter to the FERC dated December 18, 2007.
Cowlitz County, Washington	SEPA Chapter 43.21C RCW	Complete SEPA review of the proposed project.	County would do SEPA review concurrent with the NEPA review. County submitted comments on draft EIS in a letter dated December 11, 2007.
	Shoreline Management Act	Issue Shoreline Development Permit to cross waterbodies covered by the Shoreline Management Act.	NorthernStar submitted an Environmental Criteria Consistency Evaluation in October 2007.

TABLE 1.3-1 (cont'd)

Major Permits, Approvals, and Consultations for the Bradwood Landing Project

Agency	Authority/Regulation/Permit	Agency Action	Status
	Critical Areas Ordinance under State of Washington Growth Management Act	Review consistency of the project with the county Critical Areas Ordinance.	NorthernStar submitted an Environmental Criteria Consistency Evaluation in October 2007.
	Floodplain Management Ordinance	Consider issuance of permit to cross floodplains covered by the Floodplain Management Ordinance.	NorthernStar submitted an Environmental Criteria Consistency Evaluation in October 2007.
	Gas and Oil Pipeline Ordinance	Consider issuance of a General Permit under the Gas and Oil Pipeline Ordinance.	NorthernStar submitted an Environmental Criteria Consistency Evaluation in October 2007.
	Forest Lands Conversion Ordinance	Consider issuance of a Class IV-General Forest Practice Permit.	NorthernStar submitted an Environmental Criteria Consistency Evaluation in October 2007.
All Counties	Road Crossing Permits	Consider issuance of permits to cross county roads.	Permits to be obtained by NorthernStar before construction.
	Grading Permits	Consider issuance of permits for excavation and grading activities.	Permits to be obtained by NorthernStar before construction.
	Solid Waste Disposal	Consider approvals to dispose of solid waste generated by construction.	Permits to be obtained by NorthernStar before construction.

On September 13, 2005, the FERC and Coast Guard jointly issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Bradwood Landing LNG Project, Request for Comments on Environmental Issues, and Notice of Joint Public Meeting, and Site Visit* (NOI). The NOI was sent to 1,093 interested parties including federal, state, and local elected officials; government agency representatives; environmental and public interest groups; Native American tribes; local libraries and newspapers; landowners adjacent to the proposed LNG terminal; and property owners along the proposed pipeline route. The FERC's comment period for the NOI closed on October 17, 2005. A total of 60 letters were received during the NOI comment period.

The Coast Guard issued an NOI for preparing an LOR as to the suitability of the Columbia River for LNG marine traffic on September 9, 2005. The NOI requested comments specifically related to the maritime safety and security aspects of the proposed Bradwood Landing LNG facility. The Coast Guard's comment period for the NOI closed on October 6, 2005 and 22 letters were received. These letters were filed with the FERC public record on November 1, 2005.

On September 29, 2005, the Coast Guard and FERC staff conducted a joint public scoping meeting in Knappa, Oregon, to provide an opportunity for the general public to learn more about the proposed project. The meeting also allowed the public to comment on issues to be included in the EIS and issues related to the LOR. Thirty-seven people commented at the meeting. A transcript of these comments is part of the public record for the Bradwood Landing Project and is available for viewing on the FERC internet website (<http://www.ferc.gov>).¹⁰ FERC staff went on a site visit, open to the public, to selected points along the proposed pipeline route and the LNG terminal location on September 29, 2005. The FERC held a public informational meeting in Cathlamet, Washington on October 26, 2005 to answer questions regarding the Commission's Pre-filing and the NEPA review processes and to describe steps the public could take to participate in those processes. Notes from that meeting were placed into the public record for this proceeding.

In addition to the public notice and scoping processes discussed above, the FERC conducted agency consultations or participated in interagency meetings to identify issues that should be addressed in this EIS. On April 7, 2005, the FERC sent letters to the COE, Coast Guard, NMFS, EPA, FWS, and ODE requesting their cooperation in the preparation of the EIS. A letter was also sent to the WDE on June 24, 2005 requesting that they become a cooperating party, and our September 13, 2005 NOI invited any other federal, state, local, or tribal agency with jurisdiction or special expertise with respect to environmental issues to formally cooperate with us. The COE and Coast Guard agreed to be cooperating agencies. The NMFS, EPA, FWS, ODE, and WDE declined our invitation. Nevertheless, various agencies acted in a cooperative manner during the Pre-filing process, engaging in consultations, attending meetings, and filing comments on NorthernStar's draft environmental resource reports. Interagency meetings held during the Pre-filing period that were attended by the FERC staff are listed in table 1.4-1.

Throughout the public scoping period (coinciding with the Pre-filing Review Process) we received comments on a wide variety of environmental issues. Between March 7, 2005 and June 5, 2006, we received 102 letters about the project, including 43 letters from individuals, 18 letters from organizations, 2 letters from an Indian tribe, 12 letters from federal agencies, and 27 letters from state and local agencies. In these letters, the most frequently mentioned environmental topics were safety (15.8 percent of comments); socioeconomics (12.7 percent of comments); and biological resources, particularly with respect to salmon in the Columbia River (19.2 percent of comments). Table 1.4-2

¹⁰ Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number, excluding the last three digits, in the "Docket Number" field (i.e., CP06-365, CP06-366, CP06-376, and CP06-477). Be sure to select an appropriate date range.

summarizes the environmental issues identified during the Pre-filing public scoping process for the Bradwood Landing Project.

On June 5, 2006, NorthernStar formally filed applications seeking authorizations under section 3(a) and 7(c) of the NGA to construct and operate the Bradwood Landing Project. In response to the FERC's Notice of Application (issued June 15, 2006), a total of 38 parties submitted motions to intervene. Intervenors receive all documentation filed in a proceeding, and have the right to seek rehearing of the Commission's decision. The intervening parties are listed in table 1.4-3. Additionally, between the application's filing date of June 5, 2006 and July 13, 2007, when we finished writing text for the draft EIS, the FERC received 27 letters from individuals, 13 letters from organizations, 3 letters from another LNG developer, 9 letters from members of the U.S. Congress, 3 letters from federal agencies, 7 letters from state or local agencies, and 374 form letters commenting on the project.

After the applications were filed, the FERC staff continued to consult with various federal, state, and local agencies that have regulatory or permitting authorities. The FERC staff participated in a number of post-application interagency meetings, telephone conference calls, and site visits, as shown in table 1.4-1. All of the post-application interagency meetings related to preparation of documentation to comply with the NEPA and other environmental laws and regulations, and are, therefore, exempt from the Commission's ex-parte rules in accordance with section 385.2201(e)(1)(iv). In keeping with the FERC's regulations, notes of all post-application interagency meetings, telephone calls, and site visits were placed into the public record for this proceeding.

The FERC issued a Notice of Availability (NOA) of the draft EIS on August 17, 2007. The NOA established a 120-day period for comments on the draft EIS, ending on December 24, 2007 (later extended to December 26, 2007). A formal notice was also published by the EPA in the Federal Register on August 24, 2007, indicating that the draft EIS was available. The FERC mailed approximately 1,200 copies of the draft EIS to interested parties, including federal, state, and local officials and agencies; special interest groups; parties to the proceedings; area libraries and newspapers; and individuals and affected landowners who requested a copy of the draft EIS.

On October 5, 2007, the FERC issued a notice announcing the time, date, and location of four public comment meetings to take comments on the draft EIS. At the request of the State of Oregon, the FERC added two more public meetings, with details provided in a notice issued on October 25, 2007. Dates and locations of the public meetings are shown in table 1.4-1. A total of about 70 individuals spoke at the public meetings. Transcripts of the six public meetings are part of the public record for the Bradwood Landing Project.

Comments from the public meetings, as well as written comments on the draft EIS submitted by the public and agencies, are provided along with our responses in Appendix K. Excluding the oral comments from the public meetings, the FERC received a total of about 128 individual written letters commenting on the draft EIS (not including attachments, form letters, or filings by the applicants) by the comment closing date of December 26, 2007, including 4 letters from federal agencies, 15 letters from state and local agencies, and 15 letters from non-government organizations. The issues raised in comments on our draft EIS are listed in table 1.4-4. We have made changes in this final EIS, from the draft EIS text, both in response to comments received on the draft EIS and as a result of updated information that became available after issuance of the draft EIS. This final EIS is being mailed to the agencies, individuals, and organizations on the mailing list that is provided in Appendix A, and was submitted to the EPA for formal issuance of a NOA.

Prior to the publication of both the draft and final EIS, the FERC prepared an administrative draft that was distributed in whole or in part to the COE and the Coast Guard for review. Sections of the EIS were written with the cooperation and assistance of these agencies.

TABLE 1.4-1

Public and Interagency Meetings for the Bradwood Landing Project Attended by the FERC Staff

Date	Location	Purpose	Attendees
PRE-FILING MEETINGS			
March 8, 2005	Washington, D.C.	Applicant/Interagency Meeting	FERC, NorthernStar, and ODE
May 18, 2005	Portland, OR	Interagency Meeting	FERC, NorthernStar, EPA, Coast Guard, COE, NMFS, DOT, FWS, ODE, WDE, Oregon Public Utility Commission, Oregon Department of Geology and Mineral Industries (DOGAMI), ODEQ, ODFW, ODOT, WDNR, WDE, Port of Portland, Clatsop County, Wahkiakum County, and Cowlitz County
May 19, 2005	Bradwood, OR	Site visit	FERC, NorthernStar, DOT, EPA, ODOT, and WDE
May 19, 2005	Knappa, OR	Open House and ODOE Public Meeting	FERC, NorthernStar, ODOE, and Public
June 7, 2005	Salem, OR	Meeting with Oregon State Agencies	FERC, NorthernStar, ODE, ODFW, ODSL, ODLCD, Oregon Department of Justice, and DOGAMI
June 7, 2005	Portland, OR	Meeting with Federal Fishery Agencies	FERC, NorthernStar, FWS, and NMFS
June 8, 2005	Portland, OR	Meeting with COE	FERC, NorthernStar, and COE
July 7, 2005	Longview, WA	Meeting with Washington State Agencies	FERC, NorthernStar, Coast Guard, ODE, WUTC, WDE, WDNR, WDFW, Cowlitz County, Wahkiakum County, Port of Kalama, and Port of Longview
July 7, 2005	Portland, OR	Meeting with Fishery Agencies	FERC, NorthernStar, NMFS, ODFW, and WDE
August 25, 2005	Portland, OR	Interagency Meeting	FERC, NorthernStar, COE, FWS, ODFW, Columbia River Intertribal Fisheries Commission (CRITFC), WDE, Nez Perce Tribe, and ODE
September 28, 2005	Portland, OR	Interagency Meeting	FERC, NorthernStar, Coast Guard, COE, NMFS, FWS, EPA, WDFW, ODE, WDE, ODLCD, ODSL, and Cowlitz County
September 28, 2005	Longview, WA	Open House	FERC, NorthernStar, and Public
September 29, 2005	WA and OR	Site Visit	FERC, NorthernStar, and Public
September 29, 2005	Knappa, OR	Public Scoping Meeting	FERC, Coast Guard, NorthernStar, and Public
October 21, 2005	Portland, OR	Interagency Meeting	FERC, NorthernStar, Coast Guard, NMFS, COE, FWS, EPA, ODE, WDE, ODLCD, WDFW, ODFW, ODSL, and Cowlitz County
October 25, 2005	Kelso, WA	SEPA Meeting	FERC, NorthernStar, WDE, WDFW, and Cowlitz County
October 26, 2005	Portland, OR	Interagency Meeting	FERC, NorthernStar, Coast Guard, COE, NMFS, FWS, EPA, ODE, ODLCD, ODFW, ODSL, Cowlitz County, and CRITFC
October 26, 2005	Cathlamet, WA	Public Meeting	FERC, NorthernStar, and Public
November 16, 2005	Lacy, WA	Meeting with Washington State Agencies	FERC; NorthernStar; NMFS; FWS; EPA; WDE; WDNR; WDOT; Washington Department of Community, Trade, and Economic Development; WDFW; Washington SHPO; and Washington Attorney General's Office
November 17, 2005	Portland, OR	Meeting with CRITFC	FERC and CRITFC
January 24, 2006	Portland, OR	Meeting with Warm Springs Tribe	FERC and Warm Springs Tribal Council
January 25, 2006	Portland, OR	Interagency Meeting	FERC, NorthernStar, COE, NMFS, FWS, EPA, ODE, ODLCD, ODFW, ODEQ, ODSL, WDNR, WDE, WDFW, Cowlitz County, CRITFC, Nez Perce Tribe, and Port of Portland

TABLE 1.4-1 (cont'd)

Public and Interagency Meetings for the Bradwood Landing Project

Date	Location	Purpose	Attendees
POST-APPLICATION MEETINGS			
September 12, 2006	Cathlamet, WA	Vessel Transit Visit	FERC and Coast Guard
September 12, 2006	Portland, OR	Meeting with COE	FERC and COE
September 13, 2006	Portland, OR	Cryogenic Conference	FERC, Coast Guard, NorthernStar, ODE, Oregon Office of the State Fire Marshall, WDNR, Clatsop County, Port of Astoria, and other parties
September 13, 2006	Bradwood, OR	Site Visit	FERC, NorthernStar, WDNR, Clatsop County, CRITFC, Nez Perce Tribe, and public
December 13, 2006	Longview, WA	Meeting with Washington State Agencies	FERC, FWS, WDE, WUTC, WDFW, WDNR, and Cowlitz County
December 13, 2006	Kelso, WA	SEPA Meeting	FERC, NorthernStar, and Cowlitz County
December 14, 2006	Portland, OR	Interagency Meeting on BA	FERC, NorthernStar, Coast Guard, COE, FWS, NMFS, ODFW, ODLCD, CRITFC, and Nez Perce Tribe
August 2007 through January 2008	NA	Series of Conference Calls to Discuss BA and EFH Assessment	FERC, NMFS, FWS, and NorthernStar
November 5, 2007	Clatskanie, OR	Public Comment Meeting on the DEIS	FERC and Public
November 6, 2007	Clatskanie, OR	Public Comment Meeting on the DEIS	FERC and Public
November 6, 2007	Cathlamet, WA	Public Comment Meeting on the DEIS	FERC and Public
November 7, 2007	Longview, WA	Public Comment Meeting on the DEIS	FERC and Public
November 7, 2007	Longview, WA	Public Comment Meeting on the DEIS	FERC and Public
November 8, 2007	Knappa, OR	Public Comment Meeting on the DEIS	FERC and Public

TABLE 1.4-2

**Environmental Issues Identified During the Pre-filing Public Scoping Process
for the Bradwood Landing Project**

Specific Issue/Comment	EIS Section Where Comments are Addressed
PURPOSE AND NEED (3.6 percent of comments)	1.0
Purpose and need for proposed project; economic viability of LNG, natural gas market.	
Environmental costs versus need; local benefits.	
Need for multiple LNG import facilities.	
ALTERNATIVES (7.0 percent of comments)	3.0
Alternative energies and alternative energy sources.	
LNG terminal at alternative onshore sites.	
Alternative pipeline routes.	
Offshore LNG terminal alternatives.	
Alternative LNG storage tank designs and vaporization technologies.	
GEOLOGY (5.5 percent of comments)	4.1
Geologic stability of proposed LNG terminal site; potential for earthquakes and tsunamis.	
Full geotechnical analysis needed.	
Geo-stabilization may need to be increased due to area seismic conditions.	
Potential for flooding to impact project and vice versa.	
SOILS AND SEDIMENTS (2.3 percent of comments)	4.2
Environmental impacts of dredged material placement; best management practices for dredging.	
Potential contamination of soils and sediments.	
Sediment sampling plan is needed.	
Increased erosion due to project.	
Control of the wake from LNG carriers.	
Feasibility of dredging Clifton Channel.	
WATER RESOURCES (7.8 percent of comments)	4.3
Dredging impacts on water quality of Columbia River.	
Impacts on waterbodies (e.g., waterbody crossings); the number of waterbody crossings should be minimized.	
WETLANDS (5.7 percent of comments)	4.4
Impacts on wetlands; wetland delineation required.	
Wetland crossings should be minimized; compensatory wetland mitigation plan should be developed.	
BIOLOGICAL RESOURCES (19.2 percent of comments)	4.5 and 4.6
Direct, indirect, and cumulative impacts on endangered and threatened species, EFH, and other non-listed species.	
Short-term and long-term impacts on fishery resources in Columbia River and Hunt Creek.	
Direct and indirect habitat impacts from dredging and pier construction.	
Impacts on Native American tribal fisheries.	
Project should follow Oregon's Fish and Wildlife HMP.	
BA and EFH Assessment should be prepared.	
Impacts from increased ship traffic, changes in water and air temperature, noise, light, exotic and invasive species, spills of pollutants, and withdrawal of river water.	
LAND USE (4.0 percent of comments)	4.7
Consistency with current land use and zoning.	
Residences are within 0.5 mile of LNG terminal and less than 1,000 feet from LNG carriers.	
Project is within Oregon's coastal zone.	
Impacts on recreation, national historic sites, forestry resources, property rights.	

TABLE 1.4-2 (cont'd)

**Environmental Issues Identified During the Pre-filing Public Scoping Process
for the Bradwood Landing Project**

Specific Issue/Comment	EIS Section Where Comments are Addressed
VISUAL RESOURCES (3.6 percent of comments)	4.7
Visual impacts on residents within 5 miles.	
Alteration/degradation of existing shoreline aesthetic.	
Light pollution.	
SOCIOECONOMICS (12.7 percent of comments)	4.8
Impacts on recreational and commercial fishing, tourism, and property values.	
Additional costs of providing security and emergency response services.	
Project would provide increased revenues and jobs to the area.	
Use of eminent domain; environmental justice issues.	
Economic costs of reduced/constrained shipping on the Columbia River.	
TRANSPORTATION (5.7 percent of comments)	4.8
LNG marine traffic impacts on other ship traffic, railroad traffic, commercial fishing, and recreational boating and fishing.	
Increased vehicle traffic on LNG terminal access road.	
Impacts on local traffic if Astoria Bridge is closed during LNG carrier transits.	
Areas of the LNG carrier safety and security zones need to be defined.	
AIR QUALITY / NOISE (5.5 percent of comments)	4.10
Air emissions from LNG terminal and ships need to address: dust and odors, acidification of regional watersheds, and total air emissions for the life of the project.	
Air quality impacts need to be determined for both Washington and Oregon.	
Impacts of super-cooled air.	
Assess noise impacts on residents within 5 miles of project.	
Accurate assessment of background noise and total noise levels is needed.	
Underwater blasting should be avoided.	
Assess noise impacts (such as pile driving) on aquatic species; provide noise mitigation.	
RELIABILITY AND SAFETY (15.8 percent of comments)	4.11
LNG carrier and terminal are targets for terrorists.	
LNG carrier navigation issues on Columbia River; proximity of populated areas along transit channel; safety and security zone issues.	
Risks and consequences of LNG spill; history of LNG accidents.	
Limited evacuation routes; limited emergency response services.	
CUMULATIVE IMPACTS (1.7 percent of comments)	4.12
Cumulative impacts on biological resources in the Columbia River.	
Cumulative effects for vegetation, wildlife, aquatic species, and their habitats.	
Cumulative impacts on global warming.	

TABLE 1.4-3

Parties Intervening on the Bradwood Landing Project

Interveners	Date Intervention Filed with FERC	Protest or Neutral
FEDERAL AGENCIES		
NMFS	July 5, 2006	Neutral
U.S. Department of the Interior	July 6, 2006	Neutral
NATIVE AMERICAN		
Nez Perce Tribe	June 29, 2006	Neutral
CRITFC	July 7, 2006	Neutral
STATE AGENCIES		
WDE	July 5, 2006	Neutral
WDFW	July 5, 2006	Neutral
WDNR	July 6, 2006	Neutral
WUTC	July 6, 2006	Neutral
ODE	July 7, 2006	Neutral
COUNTIES		
Columbia County, Oregon and the Columbia County Development Agency	July 5, 2006	Neutral
Clatsop County, Oregon	July 6, 2006	Protest
Cowlitz County, Washington	July 6, 2006	Neutral
Wahkiakum County, Washington	July 6, 2006	Neutral
LOCAL GOVERNMENT		
Port of St. Helens	June 30, 2006	Neutral
City of Astoria	July 5, 2006	Neutral
City of Warrenton	July 5, 2006	Neutral
Knappa-Svensen-Burnside Rural Fire Protection District	July 5, 2006	Neutral
Port of Kalama	July 5, 2006	Neutral
City of Clatskanie, Oregon	July 6, 2006	Neutral
Port of Astoria	July 6, 2006	Neutral
Port of Vancouver	July 6, 2006	Neutral
PRIVATE COMPANIES		
Port Westward LNG, LLC	June 20, 2006	Neutral
Northwest Natural	June 30, 2006	Neutral
GTN	July 5, 2006	Neutral
Greenwood Resources	July 6, 2006	Neutral
Williams Northwest	July 6, 2006	Neutral
Renewable Resources	July 6, 2006	Neutral
Southwest Gas Corporation	July 6, 2006	Neutral
PGE	August 29, 2006	Neutral
ORGANIZATIONS/GROUPS		
Columbia Riverkeeper, Sierra Club, Landowners and Citizens for a Safe Community, Rivervision, Wahkiakum Friend's of the River, Friends of Living Oregon Waters, Willapa Hills Audubon Society, Fisherman's Protective Union, Peter Huhtala, and Christian Bock	July 6, 2006	Neutral
Salmon For All	July 10, 2006	Neutral
Northwest Industrial Gas Users	July 6, 2006	Neutral
INDIVIDUALS		
Roy and Minerva Christison and Greg Roy Christison	June 19, 2006	Neutral
Taryn Edwards	June 19, 2006	Neutral
Lawrence and Wanda Derby	June 22, 2006	Neutral
Stephen Rasmussen	June 28, 2006	Stated opposition, but not official protest
William and Doris Dragich Trust	July 6, 2006	Stated opposition, but not official protest
Stephen Fulton	July 7, 2006	Neutral

TABLE 1.4-4

Topics of Comments on the Draft EIS

Topic	Percentage of Comments
Purpose and Need	4
Project Description	1
Pipeline Construction Techniques	1
Palomar Pipeline	1
Alternatives	7
Geology	7
Soils and Sediments	2
Dredging	1
Water Resources	4
Wetlands	3
Upland Vegetation	3
Aquatic Wildlife, Salmonids, and EFH	7
Terrestrial Wildlife	1
Threatened and Endangered Species	1
Mitigation	1
Land Use	3
Socioeconomics	8
Transportation	1
Cultural Resources	1
Air Quality	1
Noise	1
Safety and Security	14
Cumulative Impacts	13
Wording of the EIS	3
EIS Process	1
State Permits/Approvals	1
Miscellaneous	9