Exhibit AA

FERC
FEDERAL ENERGY REGULATORY COMMISSION

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News Release: April 16, 2012
Docket Nos. CP07-441-001, CP07-442-001, CP07-443-001, CP07-444-001

FERC Vacates Order Authorizing Jordan Cove LNG Project

The Federal Energy Regulatory Commission (FERC) today vacated, without prejudice, an order authorizing Jordan Cove Energy Project, L.P. to site, construct and operate a liquefied natural gas (LNG) import terminal in Coos County, Oregon, and the related Pacific Connector pipeline from the terminal to a point near the Oregon/California border.

Jordan Cove had notified FERC on Feb. 29, 2012, that due to current market conditions it no longer intends to implement a Dec. 17, 2009, authorization to construct and operate an import terminal. In the same filing, Jordan Cove sought pre-filing status to explore the feasibility of a liquefaction export project that would be built and operated at the same site. FERC granted that status (Docket No. PF12-7-000).

FERC is not changing its longstanding policy of allowing the market to determine which gas infrastructure projects go forward, once the Commission has determined that a project would not result in substantial adverse impacts. But as Jordan Cove no longer intends to import LNG, the Commission is vacating that authorization. Jordan Cove may submit a new application to construct and/or operate facilities to import natural gas if it determines there is a market need for import service in the future.

Further, FERC said that Jordan Cove's pre-filing application for export authorization will be considered on its merits in that proceeding.

In light of these actions, FERC dismissed as moot requests for rehearing.

Commissioner Philip Moeller dissented on today's order.

R-12-14

(30)

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Updated: April 16, 2012

Exhibit BB

http://www.bloomberg.com/news/2012-01-19/lng-exports-may-spur-higher-u-s-natural-gas-prices-report-says.html

Exports of LNG May Raise U.S. Prices as Much as 54%, Agency Says

By Katarzyna Klimasinska – Jan 19, 2012

Jan. 19 (Bloomberg) -- Exporting liquefied natural gas may increase U.S. prices for the fuel as much as 54 percent, the Energy Information Administration said in a report sought by the Energy Department for its review of export permits.

The findings support manufacturers who oppose sales overseas, saying their production costs would rise. Sempra Energy, owner of the Cameron gas terminal in Louisiana, Freeport LNG in partnership with Macquarie Group Ltd., and Dominion Resources Inc. are seeking permits to ship the fuel, as hydraulic fracturing boosts production.

U.S. natural-gas prices, at record lows this month, will increase under all scenarios considered by the agency, which provides research to the Energy Department, even without any shipments to foreign countries.

“Rapid increases in export levels lead to large initial price increases that moderate somewhat in a few years,” the agency said in the report. “Slower increases in export levels lead to more gradual price increases but eventually produce higher average prices during the decade between 2025 and 2035.”

After Cheniere Energy Inc. won a U.S. permit in May to ship gas from its Sabine Pass facility in Louisiana, manufacturers using natural gas, led by the Washington-based Industrial Energy Consumers of America, complained that sales to foreign countries may raise prices at home.

LNG exports were criticized by congressional Democrats including Representative Edward Markey of Massachusetts and Senator Ron Wyden of Oregon.

‘Economic Advantage’

In allowing more exports, the U.S. may be "trading away the enormous economic advantage of having large, low-cost domestic natural gas supply," Wyden said in an e-mailed statement on Jan. 6.

Daily exports of 6 billion cubic feet, phased in over six years, would produce an increase as high as 14 percent in 2022. Boosting exports to 12 billion cubic feet over four years would drive prices up 36 percent in 2018, the report said.

While natural gas exports would spur production, prices at the well would rise 54 percent in 2018 under a more pessimistic estimate by the agency of total gas resources, according to the report.

Price changes for industrial consumers, on a percentage basis, tend to be lower than adjustments at the wellhead, the agency said in the report.

Natural gas futures settled at a 10-year low yesterday, pushed down by low demand as milder weather during mild U.S. weather, and abundant supply from gas extracted from shale formations such as Marcellus in Pennsylvania.

Natural gas for February delivery fell 1.6 cents to $2.472 per million British thermal units on the New York Mercantile Exchange, the lowest settlement since March 2002. Gas futures have tumbled 44 percent from a year ago.

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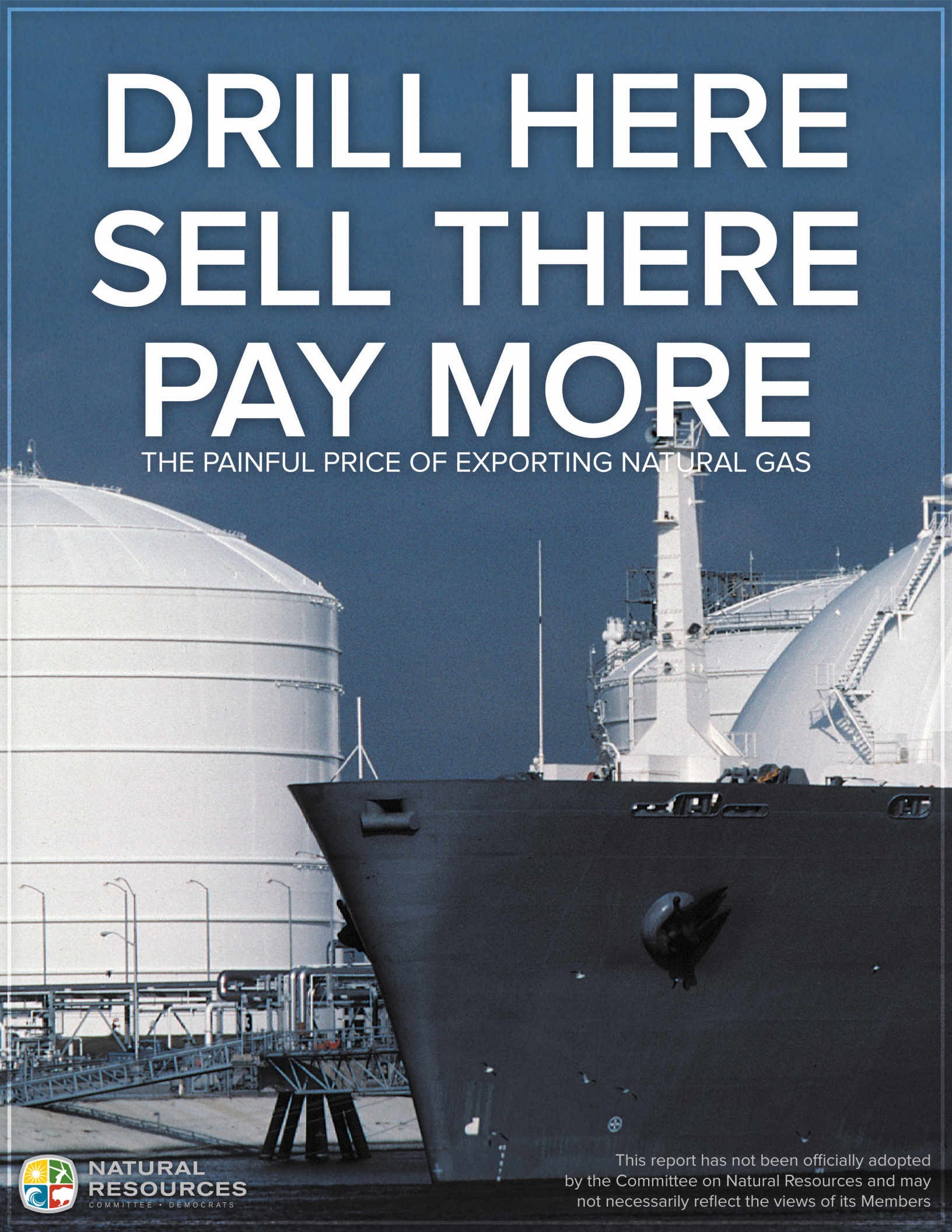
DRILL HERE SELL THERE PAY MORE

THE PAINFUL PRICE OF EXPORTING NATURAL GAS



NATURAL RESOURCES
COMMITTEE • DEMOCRATS

This report has not been officially adopted by the Committee on Natural Resources and may not necessarily reflect the views of its Members

Executive Summary

The United States faces a critical decision about whether to export natural gas following the rapid expansion of domestic production in recent years. The Department of Energy has already approved one export application and is currently considering eight others. If these applications are approved and the companies export at full capacity, the United States could soon be exporting more than 20 percent of current consumption. The Energy Information Administration has estimated that exporting even less natural gas than what is currently under consideration could raise domestic prices 24 to 54 percent, which would substantially increase energy bills for American consumers and could potentially have catastrophic impacts on U.S. manufacturing.

In a February 24th letter to Massachusetts Congressman Edward J. Markey, Department of Energy (DOE) official Christopher Smith made clear that no additional export permits will be approved by the Department at least until an additional evaluation of the macroeconomic impact of these prospective exports is completed and reviewed by DOE this spring.[1] This decision represents an important deliberative step that ensures deeper consideration will be given to the ramifications of energy exporting.

In examining energy markets and the impacts of higher natural gas prices, the House Natural Resources Democratic Staff found that:

- Unlike the oil market, natural gas prices are not determined on a global market. Natural gas prices in Europe and Asia are 3 to 7 times higher than in the United States. This provides the American economy with a competitive advantage in the manufacture of energy-intensive goods.

- From 2000 to 2008, the price of natural gas rose more than 400 percent, and was a major contributor to the U.S. manufacturing sector losing 3.7 million jobs. While larger macroeconomic forces were also at work during this period, it is clear that the cost of natural gas for industries like steel, plastics, chemicals, paper, glass, fertilizer, cement, and refining is a very significant determinant in whether facilities are sited domestically or overseas. Keeping American natural gas resources in America and keeping prices low will support a more diversified domestic economy and provide greater domestic job benefits than pursuing an export strategy.

- Keeping natural gas resources at home will allow greater amounts of natural gas to be used in the domestic electric power and transportation sectors. Greater natural gas utilization in these sectors could lead directly to a 1.2 million barrel per day reduction in

[1] Included as an appendix to this report.

foreign oil imports and a 9 percent reduction in coal consumption by 2035, which would measurably enhance America's national, economic, and environmental security.

Legislation introduced by Rep. Markey would prevent companies from exporting natural gas extracted from public lands (H.R. 4025) and would place a moratorium on the Federal Energy Regulatory Commission approving the siting and development of LNG export terminals before 2025, except under special circumstances (H.R. 4024).

Background

On June 10, 2003, the Chairman of the Federal Reserve Board, Alan Greenspan, testified before the House Energy and Commerce Committee that rising natural gas prices were harming domestic manufacturers and that large numbers of liquefied natural gas (LNG) terminals were needed to import more natural gas and stabilize prices. He said:

> *The updrift and volatility of the spot price for gas have put significant segments of the North American gas-using industry in a weakened competitive position. …The perceived tightening of long-term demand-supply balances is beginning to price some industrial demand out of the market. …Access to world natural gas supplies will require a major expansion of LNG terminal import capacity. …As the technology of LNG liquefaction and shipping has improved, and as safety considerations have lessened, a major expansion of U.S. import capability appears to be under way. These movements bode well for widespread natural gas availability in North America in the years ahead.*[2]

Chairman Greenspan was half right. Since natural gas is both the primary fuel source for the industrial sector and a primary feedstock for the production of plastics, chemicals, fertilizers, and many other products, low-price natural gas is essential to our industrial competitiveness. The increase in natural gas prices of more than 400 percent between 2000 and 2008 significantly undermined American industrial competitiveness and was a major factor in the loss of 3.7 million manufacturing jobs during that time.[3]

But Chairman Greenspan turned out to be wrong about our need to import large amounts of LNG. Subsequent discoveries of domestic shale gas deposits and advances in horizontal drilling and hydraulic fracturing techniques, have led to expanded domestic gas reserves and production and the lowest well-head prices[4] in 10 years. Of the nearly 50 LNG import terminals that have been certified for construction,[5] only 12 facilities were ultimately built.[6] And of this 6.95 trillion cubic feet (Tcf) of LNG import capacity, only 0.35 Tcf of natural gas was actually

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[2] Testimony of Alan Greenspan, Chairman, Federal Reserve, before the House Committee on Energy and Commerce, June 10, 2003, available at http://www.federalreserve.gov/boarddocs/testimony/2003/20030610/default.htm

[3] Testimony of Rich Wells, Vice President Energy, The Dow Chemical Company, before the House Select Committee on Energy Independence and Global Warming, July 30, 2008, available at http://globalwarming.house.gov/files/HRG/FullTranscripts/110-46_2008-07-30.pdf

[4] The well-head price is the price charged by the producer for petroleum or natural gas without transportation costs. See http://www.merriam-webster.com/dictionary/wellhead+price#

[5] Testimony of Kenneth B. Medlock III, Rice University, before the Senate Committee on Energy and Natural Resources, Nov. 8, 2011, available at http://energy.senate.gov/public/_files/MedlockTestimony110811.pdf.

[6] Federal Energy Regulatory Commission, North American LNG Import Terminals – Existing, January 10, 2012, available at http://ferc.gov/industries/gas/indus-act/lng/LNG-existing.pdf

imported in 2011, a utilization rate of 5 percent.[7] Several of these import terminals are now mothballed entirely and their owners are looking to turn them into LNG export terminals. [8]

The Natural Gas Market Today

Natural gas production in the United States reached a historical high in November 2011, when producers withdrew an average of 82.7 billion cubic feet per day, 18 percent higher than five years earlier.[9] This expansion in domestic natural gas supplies has led to a reduction in domestic prices. Even while consumption of natural gas has been increasing, the average wellhead price has stayed below $5 per million cubic feet (Mcf) for more than two years. Shale gas now accounts for more than a third of total U.S. gas resources.[10] The Energy Information Administration (EIA) estimates that shale gas will provide 49 percent of total U.S. natural gas supply by 2035, up from 23 percent in 2010.[11] Net imports now represent 10 percent of total U.S. consumption, the lowest proportion since 1993, and this share is expected to continue to shrink.

Unlike oil, natural gas prices are not set on a global market. Natural gas cannot currently be moved cheaply in volumes great enough to efficiently link low-cost producing regions with high-demand regions. With massive deployment of expensive infrastructure—international natural gas pipelines, special cryogenic LNG tankers, liquefaction equipment—regional natural prices would converge to a global price in the same way that global oil prices have emerged. However, like the oil market, a global natural gas market could be manipulated by nations, national companies, and cartels in the same way that the Organization of Petroleum Exporting Countries (OPEC) now manipulates the global oil market.

Regional variation in natural gas prices is considerable, as seen in Figure 1. For example, natural gas prices are six to seven times higher in Asia than they are in the United States. Prices are more than three times higher throughout most of Europe. The regional nature of the natural gas market clearly benefits American consumers and businesses.

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[7] Federal Energy Regulatory Commission, North American LNG Import Terminals – Existing, January 10, 2012, available at http://ferc.gov/industries/gas/indus-act/lng/LNG-existing.pdf; Energy Information Administration, *U.S. Natural Gas Imports by Country,* available at http://www.eia.gov/dnav/ng/ng_move_impc_s1_a.htm

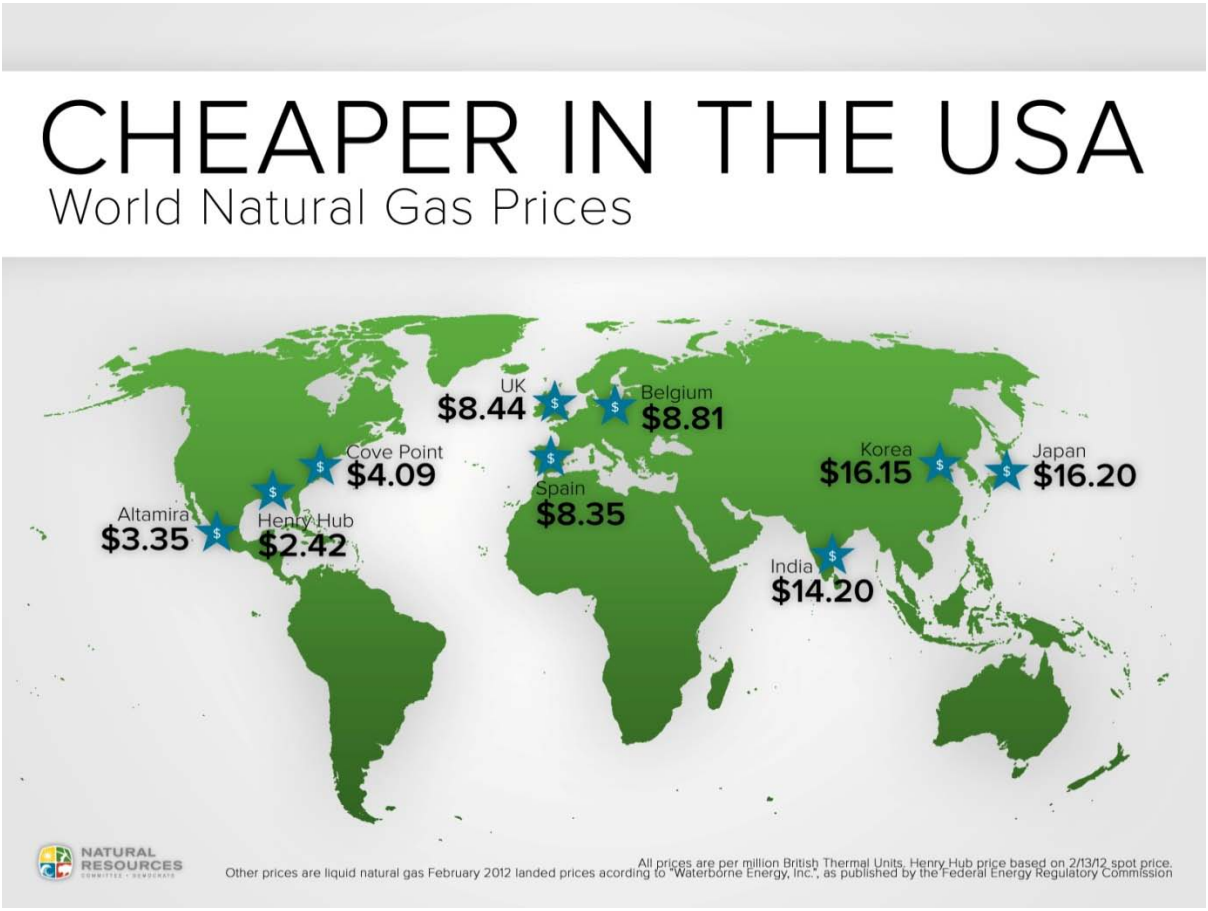
[8] Energy Information Administration, *U.S. Natural Gas Imports by Point of Entry*, available at http://www.eia.gov/dnav/ng/ng_move_poe1_a_EPG0_IML_Mmcf_a.htm

[9] Energy Information Administration, *Monthly Natural Gas Gross Production Report,* February, 2012, available at *http://www.eia.gov/oil_gas/natural_gas/data_publications/eia914/eia914.html*

[10] U.S. Geological Survey, *Total Oil and Gas Resources*, available at http://certmapper.cr.usgs.gov/data/noga00/natl/tabular/2011/2011_FINAL_TABLE.xls

[11] Energy Information Administration, *Annual Energy Outlook 2012*, available at *http://www.eia.doe.gov/oiaf/aeo/*

Figure 1. Natural Gas Prices around the World

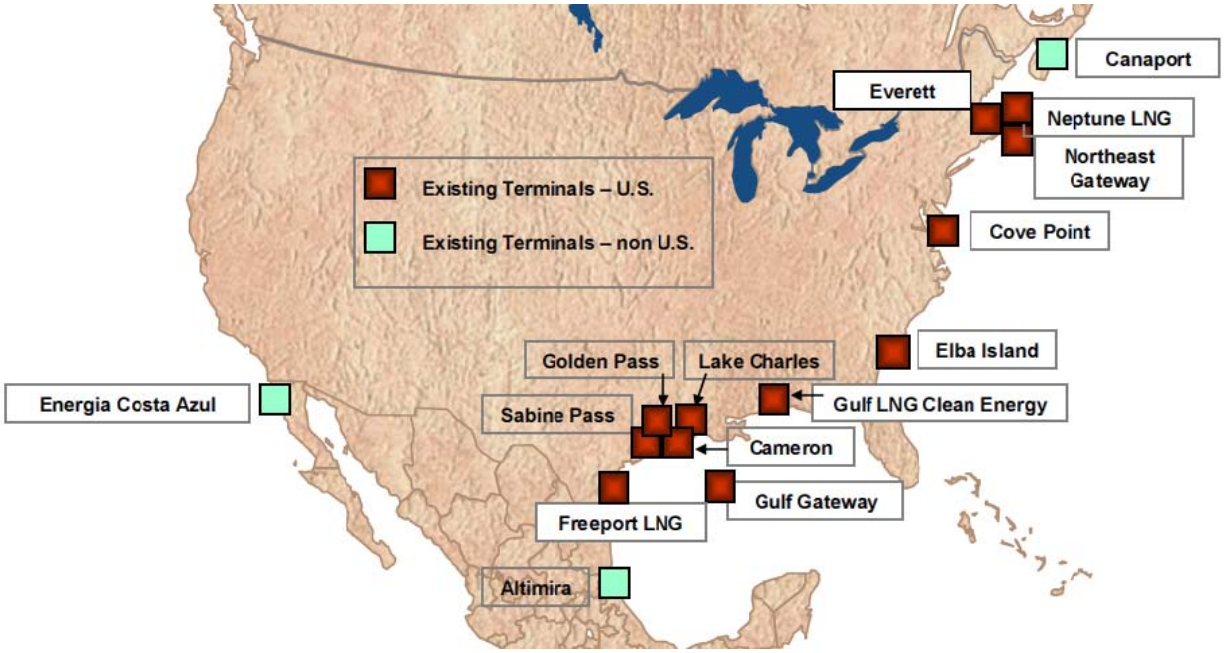


The Department of Energy Considers Export Permits

Export Applications Pour In

As a result of high domestic natural gas production and higher prices in foreign markets, several companies have submitted applications to the Department of Energy over the past year seeking permits to export domestically produced natural gas. Most of these applications are planning to use LNG terminals that were originally built for importing. Existing terminals can be seen in Figure 2.

Figure 2. Existing North American LNG Terminals



Source: U.S. Department of Energy. Available at:
http://fossil.energy.gov/programs/oilgas/storage/publications/Complete_LNG_Terminal_Status_Maps_Q2_201.pdf

DOE has already approved a plan from a Cheniere Energy subsidiary, Sabine Pass Liquefaction, to export LNG through a terminal originally built for importing the fuel. This export facility, which is still at least four years away from becoming operational, has booked major deals to export American natural gas to Indian and Korean markets and, in total, has long-term agreements in place to export 89 percent of its approved capacity.[12] DOE is now considering eight other LNG export applications. If all nine export applications are approved and this export capacity is fully utilized, the companies would export an amount equal to 20.6 percent of current U.S. consumption, according to data provided by DOE to Democratic staff on the House Natural Resources Committee.

After the Sabine Pass approval in May of 2011 and the subsequent rush of new applicants, DOE commissioned the EIA and a private contractor to undertake separate studies on the cumulative impacts of pending natural gas export applications. DOE has since committed to withhold approval of the pending export applications until these studies are completed. EIA released its study in January, finding that domestic natural gas prices could rise more than 50 percent if exports take off (see summary below). The second study is scheduled to be completed this spring.

[12] Edward Klump, *Korea Gas to Buy U.S. LNG as Gas Slump Attracts Asian Importers*, available at http://www.bloomberg.com/news/2012-01-30/cheniere-agrees-to-sabine-pass-export-deal-with-korea-gas-1-.html

Roles and Authorities

Section 3(a) of the Natural Gas Act of 1938 defines the process for DOE's reviews of most LNG export applications. In particular, the Secretary of Energy must approve an export application "unless after opportunity for hearing, [the Secretary] finds that the proposed exportation… will not be consistent with the public interest." Thus, there is "a rebuttable presumption that a proposed export of natural gas is in the public interest," according to DOE. This presumption must be overcome for DOE to deny an export application. For export approvals, DOE may also attach terms or conditions that it considers necessary to protect the public interest.

The Energy Policy Act of 1992 amended the Natural Gas Act to further limit DOE's ability to deny natural gas export applications. Specifically, DOE *must* approve applications to export natural gas to the 15 countries that have free trade agreements (FTAs) with the United States covering natural gas.[13] Such applications are automatically deemed in the public interest, and DOE cannot add any terms or conditions to approvals.

In addition to DOE authorization to export LNG, companies must receive authorization from the Federal Energy Regulatory Commission (FERC) for the actual siting and development of LNG projects, as specified under Section 3 of the Natural Gas Act.[14] FERC is also the lead agency responsible for the preparation of the analysis and decisions required under National Environmental Policy Act for the approval of new facilities, including tanker operation, marine facilities, and terminal construction and operation, environmental and cultural impacts.[15]

The Energy Information Administration Study

If DOE approves the pending applications and exports rise as expected, domestic natural gas prices could increase 24 to 54 percent, depending on recoverable shale resources and how quickly exports are ramped up, according to the EIA's January report.[16] About three-quarters of the increased natural gas production needed to satisfy such export demand would come from shale sources, according to an EIA export scenario. That would require a dramatic expansion of hydraulic fracturing, or "fracking," which is necessary to access these resources.

Higher prices are also expected to substantially reduce U.S. demand for natural gas. Around 30 to 40 percent of natural gas export demand would be met through reduced domestic consumption, not increased production, according to EIA. Consequently, EIA projects that dirty

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[13] These countries are Australia, Bahrain, Canada, Chile, Dominican Republic, El Salvador, Guatemala, Honduras, Jordan, Mexico, Morocco, Nicaragua, Oman, Peru, and Singapore. Three other countries, South Korea, Colombia, and Panama, will soon join this club when their Senate-ratified trade agreements take effect.

[14] 15 U.S.C. § 717

[15] Interagency Agreement Among the FERC et al. Available at: www.ferc.gov/legal/maj-ord-reg/mou/mou-24.pdf

[16] Energy Information Administration, *Effect of Increase Natural Gas Exports on Domestic Energy Markets*, available at http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf

coal-fired power generation will rise in the United States to make up for the expected decline in natural gas-fired electricity generation.

Energy Department Responds to Markey Letter

Rep. Markey, Ranking Member on the House Natural Resources Committee, wrote to Energy Secretary Steven Chu in January asking about the consequences of exporting greater amounts of natural gas, including the consequences for prices, manufacturing and economic growth, energy security, and the environment.

Deputy Assistant Secretary Christopher Smith responded on behalf of Secretary Chu. This response, delivered February 24th, noted that DOE has already approved the export of 10.93 billion cubic feet of natural gas per day (Bcf/d) to countries with free trade agreements with the United States.[17] The EIA report looked at export scenarios associated with the approval of additional exports to counties without free trade agreements. The second report by the private contractor is still being completed, but Smith wrote that it would provide important information about the macroeconomic consequences resulting from EIA's export scenarios, including:

- Consequences for domestic energy consumption, production, and prices;
- Effects on gross domestic product, job creation, and balance of trade; and
- Impacts on U.S. manufacturers, especially energy intensive industries.

Smith made clear that DOE would not approve the pending export applications until this study is finished and DOE has considered the findings. "We are mindful of the need for prompt action in each of the non-FTA LNG export proceedings before us," Smith wrote. "We are equally mindful that a sound evidentiary record is essential to reach a reasoned decision in these proceedings. As such, DOE will not issue a final order addressing the pending applications to export LNG to non-FTA countries until the full study has been completed and the Department has had an opportunity to review the results."

Economic Ramifications of Exporting

The United States currently enjoys affordable natural gas that benefits consumers and also provides us with a competitive advantage that is felt up and down the U.S. economy. Affordable natural gas keeps energy prices low for consumers that rely on natural gas for heating, cooking, and electricity. Increasing those energy costs on American consumers and businesses by exporting would have a direct impact on their disposable income and reduce their purchasing power.

Industrial and manufacturing facilities are the largest consumers of natural gas in the United States—ahead of the electricity, commercial, and residential sectors—and would be especially hard hit. These facilities may require natural gas not only as a primary energy source

[17] DOE now has pending or approved permits for exports to FTA countries totaling 12.51 Bfc/d. DOE LNG docket available at: http://fossil.energy.gov/programs/gasregulation/LNG_Summary_Table_2-29-12_2.pdf

but also use it as a physical input into product. In some sectors, like fertilizers and chemicals, natural gas can constitute 80 to 90 percent of the cost of production. For businesses like these, the cost of energy may be the number one determining factor in whether to site production in the United States and employ American workers or whether to move production overseas.

In the past, high natural gas prices have had a disastrous effect on U.S. manufacturing. From 2000 to 2008, the price of natural gas rose more than 400 percent, and was a major contributor to the U.S. manufacturing sector losing 3.7 million jobs.[18] Other variables were certainly relevant to this undermining of manufacturing competitiveness as well, including the 2001 recession in the global trend of moving manufacturing to countries with lower labor costs. However, for energy intensive industries—like aluminum, steel, plastics, chemicals, paper, glass, fertilizer, food processing, cement, and refining—the cost of energy is a far greater share of production costs than labor and a more significant determinant in facility siting.

The experiences of some specific energy-intensive industries below illustrate the dangers that natural gas exporting could have on sectors of the U.S. economy.

Fertilizer Industry

An important use of natural gas is as a feedstock in fertilizer production. In this process, natural gas is used to produce ammonia, which has a high nitrogen content, and the ammonia becomes the primary component of nitrogen fertilizers. It takes 33,500 cubic feet of natural gas to manufacture 1 ton of anhydrous ammonia fertilizer.[19] As a result, natural gas can account for up to 90 percent of the cost to produce ammonia fertilizer.[20]

The fertilizer sector is the largest industrial consumer of natural gas in the United States, consuming 60 percent of U.S. industrial demand.[21] The period between 2000 and 2006 was a devastating one for the U.S. fertilizer industry, as seen in Figure 3. Domestic ammonia fertilizer production declined 44 percent, and more than a third of all U.S. fertilizer production capacity shuttered. At the same time, imports skyrocketed 115 percent.[22]

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[18] Dow Jones Industrial Average Basic Chart, Yahoo! Finance, available at http://finance.yahoo.com/q/bc?s=%5EDJI&t=my&l=on&z=l&q=l&c=;

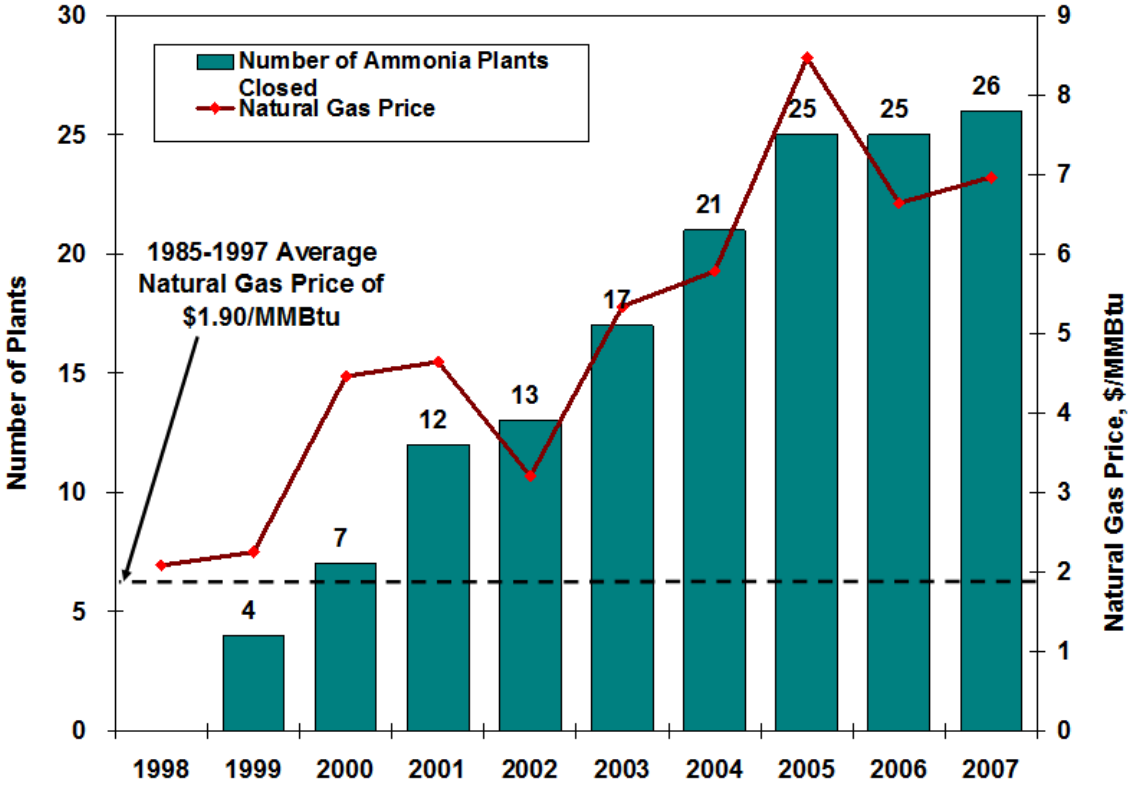
[19] Eddie Funderberg, *Why are Natural Gas Prices So High?*, available at http://www.noble.org/ag/soils/nitrogenprices/index.htm

[20] *Domestic Nitrogen Fertilizer Production Depends on Natural Gas Availability and Prices*, U.S. General Accounting Office, GA)-03-1148, September 2003.

[21] Robert Pirog, Specialist in Energy Economics, Congressional Research Service, *Industrial Demand and the Changing Natural Gas Market* February 10, 2011, available at http://www.crs.gov/pages/Reports.aspx?PRODCODE=R41628&Source=author

[22] Wen-yuan Huang, USDA, *Impact of Rising Natural Gas Prices on U.S. Ammonia Supply*, available at http://www.ers.usda.gov/publications/wrs0702/wrs0702.pdf

Figure: 3. U.S. Ammonia Plant Closures Increase as Natural Gas Prices Rise



Source: Blue, Johnson and Associates, IFDC, Natural Gas Week and The Fertilizer Institute

The harm to the U.S. economy and domestic jobs was not limited to merely the fertilizer industry. The cost of buying fertilizer to farmers rose 130 percent between 2000 and 2006, from $227 per ton to $521. Farmers get especially squeezed with higher fertilizer costs because they are often times unable to pass along higher fertilizer costs in what they charge for their commodity crops. According to the U.S. Department of Agriculture, "With lower crop prices, high fertilizer prices would place downward pressure on farmers' net returns. Farms with higher than average fertilizer costs, a greater need to use fertilizers on the crops they grow, and/or a limited ability to either move away from fertilizer-intensive crops or substitute other inputs will be especially vulnerable if fertilizer prices increase once again."[23]

[23] Wen-yuan Huang, USDA, Recent Volatility in U.S. Fertilizer Prices, available at http://www.ers.usda.gov/AmberWaves/March09/Features/FertilizerPrices.htm

With U.S. natural gas prices at 10-year lows, fertilizer production is coming back to the United States, albeit slowly. Over the past two years, several facilities have returned to production and a series of large expansions are under consideration:[24]

- Oklahoma-based LSB Industries reopened its Pryor, Oklahoma ammonia facility in 2009 and two smaller units at Pryor will restart soon as well.

- Orascom Construction has purchased and reopened a large ammonia plant in Beaumont, Texas. The company announced earlier this year that "Low natural gas prices in the U.S. were a deciding factor in the company's decision to acquire and rehabilitate the plant."

- PCS Corporation is in the process of reopening its large plant in Geismar, Louisiana with an online target in the third quarter this year. It is also considering expansions at its Lima, Ohio and Augusta, Georgia plants.

- CF Industries has reopened portions of its giant Donaldsonville, Louisiana, facility in the past two years and has purchased an additional facility. The company announced last year that it plans to invest $1 billion to $1.5 billion over the next four years to expand its production capacity for ammonia and other products.

For farmers waiting to see a drop in fertilizer prices, this new domestic production cannot come online fast enough. Even though U.S. natural gas prices have fallen to 10-year lows, fertilizer prices remain high because the United States now imports more than half of its fertilizer. Imported fertilizer comes from regions which do not have the low natural gas prices that the United States is currently enjoying, increasing the prices for farmers.[25]

Chemicals and Plastics Industry

Chemical manufacturers rely on natural gas for 58 percent of their fuel and natural gas liquids for 58 percent of their feedstock.[26] Natural gas constitutes upwards of 80 percent of the total cost to produce plastic.[27] The high natural gas prices the U.S. chemical and plastics industry faced throughout much of the last decade significantly eroded the U.S. chemicals industry's competitive position. As detailed in Figure 4, the U.S. chemical industry was essentially wiped out as an export sector between 1997 and 2006, as net exports fell from $16.8 billion annually to $218 million. Of the largest 120 chemical plants being built around the world in 2005, exactly one was located in the United States. According to the U.S. Commerce Department, "The

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[24] Stephanie Seay, Platts, *Low gas costs may not be enough to spur large fertilizer expansion*, available at http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/3915346

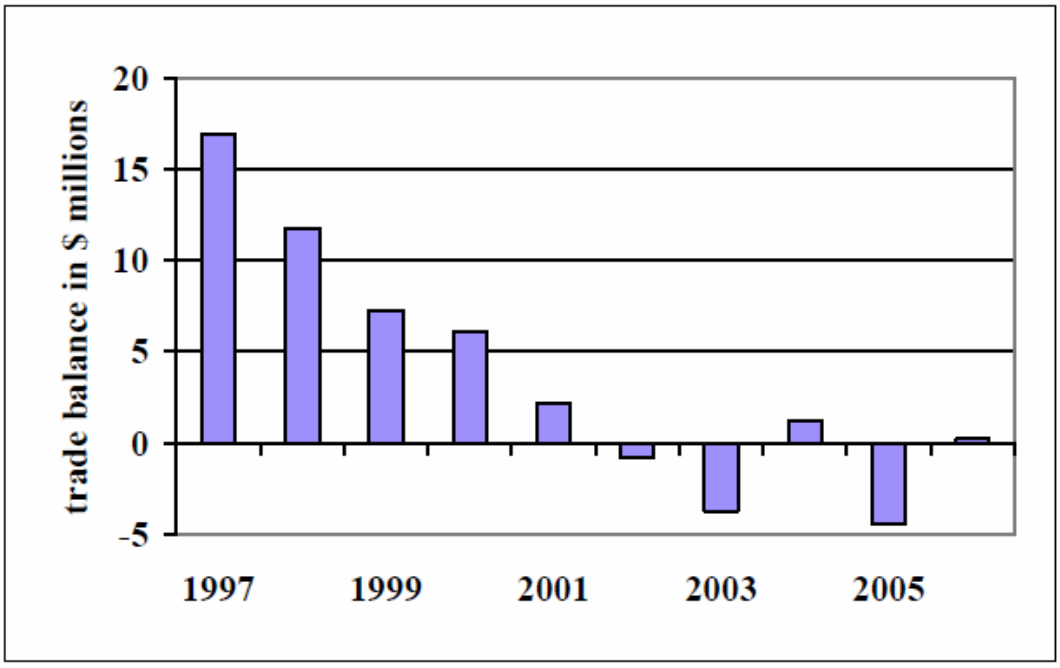
[25] Jonathan Knutson, Agweek, *Will tile drainage pay off?,* available at http://www.agweek.com/event/article/id/19564/

[26] American Chemistry Council, *Guide to the Business of Chemistry*, 2005.

[27] PowerPoint presentation "Manufacturing Competitiveness and Jobs Depend Upon Affordable and Reliable Electricity and Natural Gas," Industrial Energy Consumers of America, February 2012.

increase in U.S. natural gas prices has helped reduce and even eliminate in some recent years the United States' trade surplus in bulk chemicals."[28]

Figure 4. U.S. Trade Balance for Chemicals (not including pharmaceuticals)



Source: U.S. Department of Commerce, *Energy Policy and U.S. Industry Competitiveness. Available at:* *http://ita.doc.gov/td/energy/energy%20use%20by%20industry.pdf*

Appearing before the Select Committee on Energy Independence and Global Warming in 2008, the Dow Chemical Company's Vice President for Energy, Rich Wells, testified to the difficulties that the domestic chemical industry was facing. Dow had shut down dozens of uncompetitive U.S. plants in the previous decade as natural gas prices had skyrocketed. They were investing preferentially in the Middle East and other parts of the world where energy costs were lower. Wells explained that it was cheaper for chemical companies to move their manufacturing to where energy is cheap than to move cheap energy to their manufacturing.[29]

Once again, like the fertilizer sector, low domestic natural gas prices are driving a resurgence in the domestic chemical industry. According to the American Chemistry Council, "A new competitive advantage has already emerged for U.S. petrochemical producers."[30] Dow has

[28] Rachel Halpern, International Trade Administration, *Energy Policy and U.S. Industry Competitiveness*, available at http://ita.doc.gov/td/energy/energy%20use%20by%20industry.pdf

[29] Rich Wells, Vice President Energy, The Dow Chemical Company http://globalwarming.house.gov/files/HRG/FullTranscripts/110-46_2008-07-30.pdf

[30] American Chemistry Council, *Shale Gas and New Petrochemicals Investment: Benefits for the Economy, Jobs, and US Manufacturing, March, 2011, available at* http://www.americanchemistry.com/ACC-Shale-Report

announced it will increase key chemical processing capability along the Gulf Coast by 20 to 30 percent over the next two to three years. The American Chemistry Council estimates that if natural gas-based feedstock prices stay low and supply expands, the U.S. chemical industry is projected to invest $49 billion in new plants and equipment in the United States in the coming years and spur the creation of more than 400,000 jobs across the U.S. economy. Such investments would generate $44 billion in new federal, state, and local tax revenue over the next decade.[31] Low-priced natural gas is the key to unlocking these economic benefits.

Steel Industry

The domestic steel sector's fuel reliance is split mostly between natural gas, electricity, and coal-derived coke, and the sector's natural gas consumption makes up 4 percent of U.S. industrial natural gas use.[32] The steel industry is highly energy-intensive with very tight margins, and small changes in energy prices can have a significant impact on the cost of downstream manufactured goods like automobiles, construction equipment, and wind turbines. Recycled steel is especially energy intensive, and energy can account for 25 percent or more of the cost of production.[33]

Integrated steelmakers, which produce steel from raw iron ore, use natural gas as the primary energy source for the reheating and rolling procedures at the end of the steelmaking process. Recent low natural gas prices have allowed companies to replace costly and dirty coal-derived coke with natural gas, which has become a far more cost-effective way of melting iron ore. U.S. Steel estimates that with natural gas prices around what they are today, substituting natural gas for coal-derived coke translates to savings of $7 per ton of steel.[34] A $1 per million BTU increase in the price of natural gas would increase costs by more than $100 million for U.S. Steel, based on current gas usage and steel production levels.

Another American steel producer, Nucor, has utilized low natural gas prices to build new "direct reduced iron" facilities,[35] which combine natural gas with iron ore pellets to create a steady feedstock for the company's electric arc furnaces. This is a growing technology that now accounts for more than 60 percent of steel production in the United States. Low natural gas prices are critical to operating these types of facilities. Seven years ago, as U.S. natural gas prices

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[31] Id.

[32] American Iron and Steel Institute, *2010 Annual Statistical Report*, Table 37

[33] PowerPoint presentation "Manufacturing Competitiveness and Jobs Depend Upon Affordable and Reliable Electricity and Natural Gas," Industrial Energy Consumers of America, February 2012.

[34] U.S. Steel, second quarter conference call, July 26, 2011, available at http://seekingalpha.com/article/282049-united-states-steel-s-ceo-discusses-q2-2011-results-earnings-call-jul-26-2011-transcript

[35] Nucor press release, March 7, 2011, available at http://www.nucor.com/investor/news/releases/?rid=1536511

were much higher than today, Nucor relocated a facility to Trinidad in order to take advantage of "a low cost supply of natural gas."[36]

Conclusion

If we keep natural gas here at home, and keep prices low, we will accelerate the transition away from coal and foreign oil, making U.S. energy consumption not only cheaper, but cleaner and more secure.

Natural gas could eventually overtake coal as America's primary source of electricity. In just the last six years, coal's share of the U.S. electricity market has dropped from 50 percent to 43 percent, with natural gas displacing most of this production, along with wind. At the same time, buses and commercial fleet vehicles, which consume large amounts of fuel, are increasingly powered by natural gas instead of gasoline. "Replacing 3.5 million of these heavy vehicles with natural gas vehicles by 2035 would save more than 1.2 million barrels of oil per day compared to business as usual, which is more than we imported from either Venezuela or Saudi Arabia in 2009," according to a report by the Center for American Progress.[37]

Using more natural gas for electricity and transportation is expected to drive up U.S. demand by 18 percent by 2035 under current policies and commitments, "causing coal demand to drop by around 9% and oil demand by around 6%," according to the International Energy Agency.[38] This transition away from coal and foreign oil, however, could be slowed or jeopardized if we undermine our affordable domestic natural gas supply by exporting it to foreign markets.

To address these concerns Rep. Ed Markey has introduced two bills to stop natural gas from being exported. H.R. 4025 would prevent oil and gas companies from exporting natural gas extracted from public lands, and H.R. 4024 would place a moratorium on the Federal Energy Regulatory Commission approving the siting and development of LNG export terminals until 2025, except under special circumstances. Markey also offered a floor amendment to H.R. 3408, the so-called PIONEERS Act, that would have stopped the exporting of natural gas extracted from the public lands and waters opened up by the bill. That amendment failed by a vote of 173 to 254.

Instead of starting with a presumption in favor of exports, they should be evaluated against the following goals for American energy policy:

1. Keep energy affordable for American consumers;
2. Grow U.S. manufacturing and support its competitive position in the global economy;
3. Reduce America's dependence on foreign oil; and

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[36] Nucor press release, January 16, 2007, available at http://www.nucor.com/investor/news/releases/?rid=950793

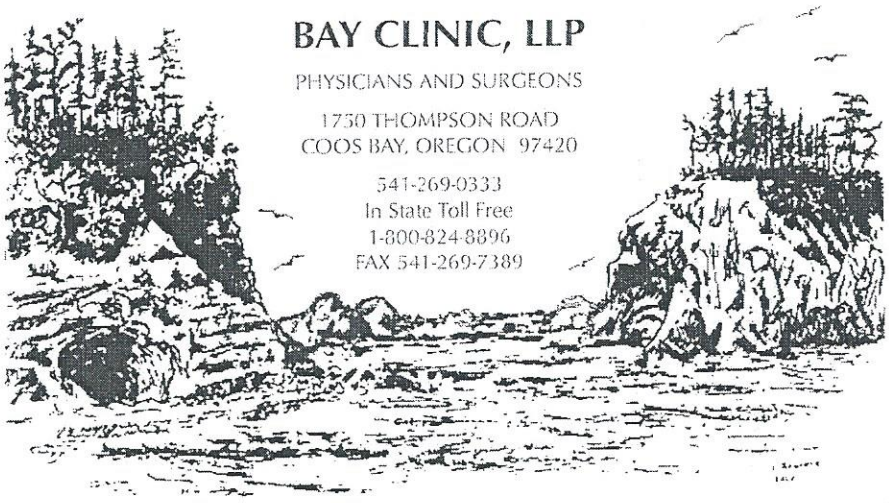
[37] Center for American Progress, *American Fuel: Developing Natural Gas for Heavy Vehicles*, available at http://www.eia.gov/analysis/requests/fe/pdf/fe_lng.pdf

[38] International Energy Agency, *Are We Entering a Golden Age of Gas?*, World Energy Outlook 2011, page 22, available at http://www.iea.org/weo/docs/weo2011/WEO2011_GoldenAgeofGasReport.pdf.

4. Reduce dangerous environmental pollution.

These goals are now being advanced because natural gas supplies are abundant; prices are cheaper here than abroad; and natural gas is becoming more economical than dirtier coal and imported oil. If we keep natural gas here, these benefits will continue. If we export it abroad, we will undermine each goal.

Exhibit CC



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Administrator
DANIEL E. WALSH

Nov. 26, 2013

Editor
The World
Coos Bay, OR 97420

Dear Sir:

It was gratifying to see so many members of the community turn out for Sen. Wyden's Town Hall meeting on Nov. 24, and thank you, Chelsea Davis, for your balanced coverage of the meeting as published in The World the following day. I was distressed by the lack of courtesy shown by some in the audience when opinions they disgreed with were expressed.

First, I want to repeat the disclaimer I gave at the Town Hall meeting. I do not belong to, represent, or speak for any group or organization addressing or dealing with the Jordan Cove project. What I have to say is based on nearly fifty years of clinical experience and a diligent effort to stay abreast of current medical and scientific knowledge.

Sen. Wyden commendably stated the position that he wanted the LNG terminal to receive fair and balanced consideration and to be understood. I agree, but that said, there are some points worthy of further comment. The originally proposed LNG export terminal had submitted to the DEQ figures for a total of approximately 800 tons (1,600,000 pounds) per year of total airborne emissions, including oxides of nitrogen, oxides of sulfur, volatile organic compounds, and fine particulates from the plant and from the tankers and service vessels entering and leaving the bay. These are all harmful air pollutants. While permitting requests are incomplete at this time, according to information I received on 11/22/13, the DEQ anticipates about the same total from the proposed LNG export facility. In addition, another 2.2 million tons (tons, not pounds) per year of greenhouse gases will be discharged, primarily from the gas-fired electrical generating plant, which would be built to supply power for the LNG terminal. Jordan Cove is directly up wind from North Bend and Coos Bay for much of the year. The wind will not dilute and dissipate these toxic air pollutants sufficiently to mitigate the fact that we will all be breathing them. I fully expect that there would be a significant exposure at Coquille and possibly Myrtle Point. Those at greatest risk are the very young, the elderly, and those with chronic illnesses, especially asthma, COPD, heart disease and sinus problems. There wouldn't be a body count in weeks or even months, but some especially susceptible individuals may develop problems early on. For others, it may take years or even a couple of decades. But I am not exaggerating when I say that there will sooner or later be a price to pay. I have already spent too many years dealing with these types of illnesses to want to have more cases which can be avoided in the community.

Sen. Wyden made the statement that natural gas is 50% cleaner than coal-fired power plants.

I'm sure this is true, but, with all due respect, it is not a fair comparison. It is like asking us if we want 800 tons of air pollutants from a gas installation or 1600 tons from a coal-fired facility. I firmly believe the correct answer, for the sake of everyone's health, is neither. Methane was also mentioned a number of times as if it were something apart from or incidental to producing liquified natural gas, and I am not sure if I completely understood the point or the context. Methane, CH_4, is natural gas, or at least it is the main constituent of natural gas.

Executive Editor Larry Campbell, in his excellent editorial in The World on 11/26/13 described the experience of the Kenai Peninsula with an LNG export terminal. I don't know the exact location of this plant, proximity to population, and wind directions, but I have to wonder if this, too, is a fair comparison. With its isolated location and its climate, can it possibly see the number of tourists or be as popular for retirement as the Bay Area? Our pristine environment and, especially, our clean air are major attractions. It was stated that retirement is one of our major industries, along with tourism. It would have a negative effect on our economy if we are less attractive to tourists. Retirees often seek out this area to escape from urban air pollution. This is a very important consideration for those with the illnesses mentioned above. It has been shown (I can provide references, if anyone wishes) that one retiree family has the economic impact on a community of 3.2 to 3.4 industrial family wage jobs. If we discourage new retirees from coming here, and if some already here find it necessary to move because of aggravated illnesses, it could easily offset the number of permanent employees at an LNG terminal. Many others who live here and have no immediate health problems would be at long term risk.

We are looking at a worsening physician shortage in the Bay Area, and I have talked to many individuals who are currently having a great deal of difficulty finding a primary physician. Recruiting and retaining good physicians has a been a problem for at least two decades, and it has been much more acute in the last five years. At the time the LNG export terminal was first proposed, two different physicians who had recently come into the community, told me that if they had known of even the possibility that such a terminal might be built, they would have not considered moving to the Bay Area. As medical professionals, concerned about their own health and the health of their families and understanding the long term risks, there were too many other places they could have gone. If the terminal is actually built, it will make physician recruitment even more difficult than it is now.

While efforts to site the LNG terminal in the Bay Area are, I am sure, well intentioned, it is a very ill-advised project for the overall stability and well being of the area.

Joseph T. Morgan, M.D.

LNG plant poses too many health issues

THE WORLD 12/2/13

Your Views

By Joseph T. Morgan, M.D.

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Sen. Wyden commendably stated the position that he wanted the LNG terminal to receive fair and balanced consideration and to be understood. I agree, but that said, there are some points worthy of further comment.

The originally proposed LNG expert terminal had submitted to the DEQ figures for a total or approximately 800 tons per year of total airborne emissions, including oxides of nitrogen, oxides of sulfur, volatile organic compounds, and fine particulates from the plant and from the tankers and service vessels entering and leaving the bay. These are all harmful air pollutants. While permitting requests are incomplete at this time, according to information I received Nov. 22, the DEQ anticipates that about the same total from the proposed LNG export facility. In addition, another 2.2 million tons per year of greenhouse gases will be discharged, primarily from the gas-fired electrical generating plant, which would be built to supply power for the LNG terminal.

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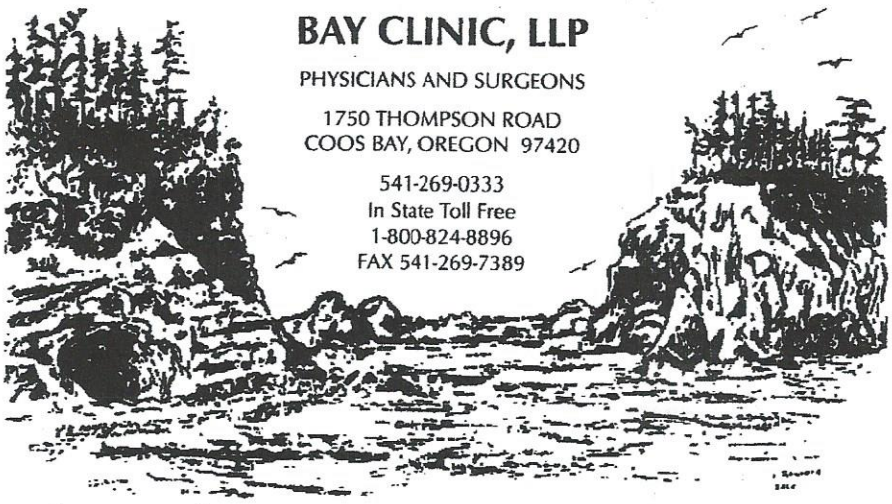
We are looking at a worsening physician shortage in the Bay Area, and I have talked to many individuals who are currently having a great deal of difficulty finding a primary physician. Recruiting and retaining good physicians has been a problem for at least two decades, and it has been much more acute in the last five years. At the same time LNG export terminal was first proposed, two different physicians who had recently come into the community told me that if they had known of even the possibility that such a terminal might be built, they would have not considered moving to the Bay Area. If the terminal is actually built, it will make physician recruitment even more difficult than it is now.

While efforts to site the LNG terminal in the Bay Area are, I am sure, well intentioned, it is a very ill-advised project for the overall stability and well-being of the area.

Joseph T. Morgan, M.D., a physician with Bay Clinic, LLP, since 1966, has practiced medicine for 50 years, specializing exclusively in adult and pediatric allergy and environmental medicine since 2003. Among his credentials, he is certified by the American Board of Pediatrics and the American Board of Environmental Medicine; is a member and past president of medical staff at Bay Area Hospital; and is fellow emeritus of the American College of Allergy, Asthma and Immunology.



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Administrator
DANIEL E. WALSH

November 24, 2013

The Hon. Ron Wyden
U.S. Senator For Oregon
1220 S.W. 3rd Ave.
Portland, OR 97204

Dear Sen. Wyden:

On Jan 28, 2008 I had the privilege of attending a meeting you convened in Salem to consider issues pertaining to a proposed LNG import terminal at Jordan Cove on the north spit of Coos Bay. At that time I had serious concerns about the negative health effects which such an installation would have created for the residents the Bay Area. Enclosed are copies of my letter to you of Feb.3, 2008 and testimony presented to a FERC hearing held in North Bend on Oct. 29, 2008. Also enclosed are copies of a personal note to Mr. Clark Walworth, then editor of the World newspaper. Two letters to the editor were subsequently published, the second of which is enclosed.

The situation is now reversed, and the current proposal is for an LNG export terminal. Health concerns are still there and may be worse for an export terminal. I was able to obtain figures for the air pollutants which would have been released by the import facility (enclosed and also addressed in my letter to you and the FERC testimony). The data are not complete for an export terminal, and final figures will probably not be available until Jan., 2014. However, information obtain verbally from Mr. Tom Peterson, Air Quality Engineer at the Oregon DEQ office in Medford on Nov.22 indicates that the overall levels of oxides of nitrogen and sulfur, volatile organic compounds and fine particulates are expected to be about the same as for the export terminal, about 800 tons per year, including about 200 tons per year generated by the tankers and support vessels. All of the concerns raised in my previous statements and letters remain unchanged. In addition about 2.2 million tons per year of greenhouse gasses will emanate from an export terminal. An export facility would not have produced these greenhouse gasses. As far

back as 2004 the Center for Health and Global Environment at the Harvard Medical School tagged greenhouse gasses as a likely factor in the rising incidence of asthma seen over the last several decades.

Jordan Cove is directly upwind from the cities of Coos Bay and North Bend for a significant part of the year, and the wind will not adequately dissipate these gasses and pollutants over distances of one to one and a half miles at the north end of the bay to about five miles at the south end of the City of Coos Bay.

Infants and young children, the elderly, and those with heart and respiratory illnesses would be the most directly affected. For otherwise healthy adults, the toll in chronic illness might take years or even decades to manifest.

I also fear a negative economical impact that would far outweigh the permanent jobs at an export terminal. Retirement is one of the main supports for our local economy, and the bay area would be much less attractive as a place to retire. We have had a major problem with physician recruitment and retention in the bay area for a number of years. As far back as 2009, as addressed in my note to Mr. Walworth, two physicians who had come recently to the community told me that they would not even have considered coming here had they know about the possibility of an LNG terminal.

I urge you to make every effort within your power to help the citizens of the Bay Area avoid having this well-intentioned but incredibly bad idea imposed on us.

Respectfully,

Joseph T. Morgan, M.D.

enc: 6

cc: Senator Jeff Merkley
Congressman Peter DeFazio
Sate Senator Arnie Roblan
State Representative Caddy McKeown

Exhibit DD

Jordan Cove LNG Tanker Hazard Zones (FEIS Page 4.7-3)

Zone 1 (yellow) - No one is expected to survive in this zone. Structures will self ignite just from the heat.
Zone 2 (green) - People will be at risk of receiving 2nd degree burns in 30 seconds on exposed skin in this zone.
Zone 3 (blue) - People are still at risk of burns if they don't seek shelter but exposure time is longer than in Zone 2.
Map does not include the hazard zones for the South Dunes Power Plant and the Pacific Connector Gas Pipeline.

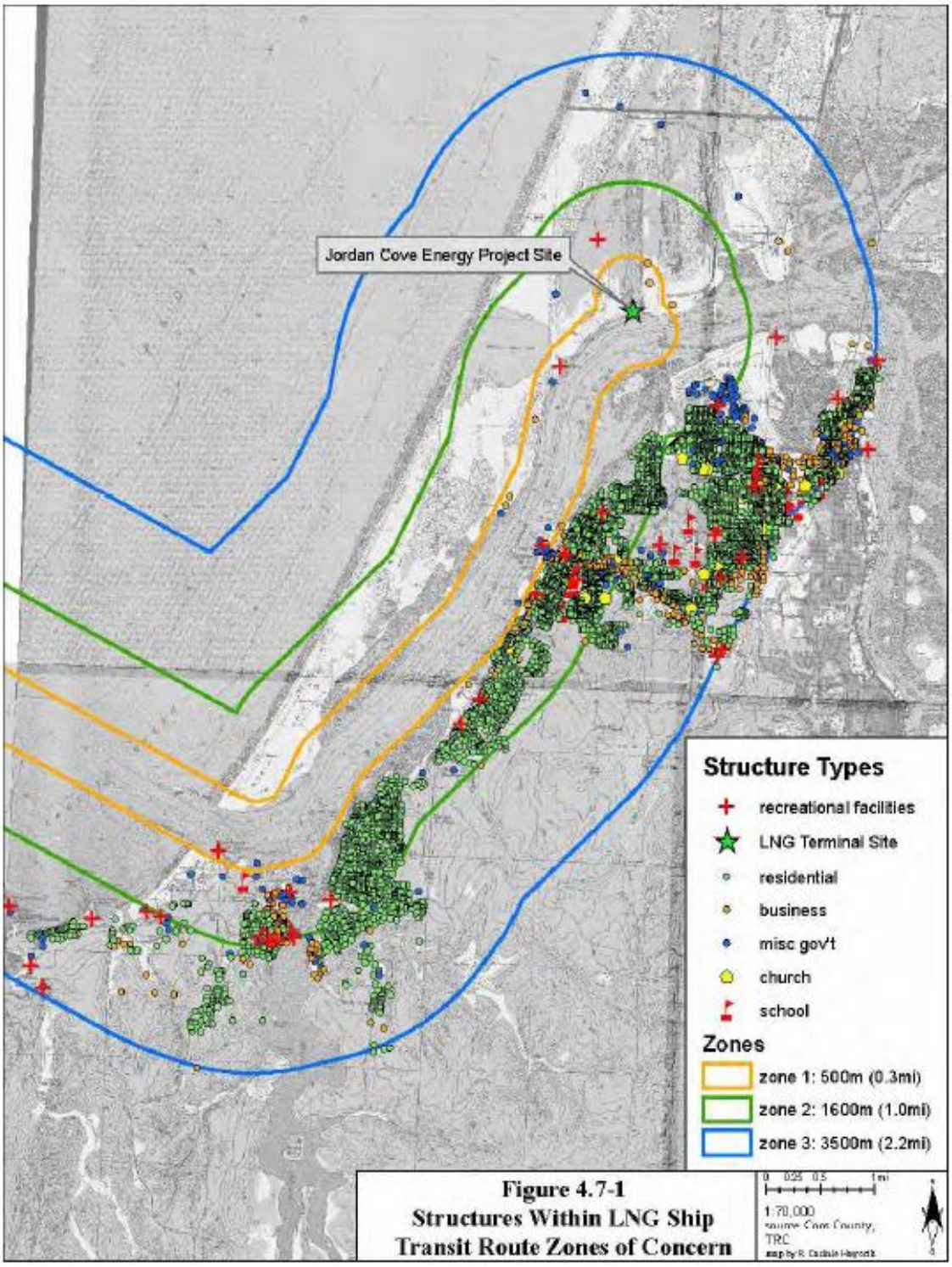


Exhibit EE

The Oregon Resilience Plan Executive Summary

Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami

Report to the 77th Legislative Assembly
from Oregon Seismic Safety
Policy Advisory Commission (OSSPAC)

Salem, Oregon
February 2013

Note: This Executive Summary selects from the large number of detailed recommendations in the chapters of the Oregon Resilience Plan. The full report is available online at the Oregon Office of Emergency Management website: http://www.oregon.gov/OMD/OEM/Pages/index.aspx

Foreword

"If we cannot control the volatile tides of change, we can learn to build better boats."
—Andrew Zolli and Ann Marie Healy, *Resilience: Why Things Bounce Back* (2012)

For more than 300 years, a massive geological fault off America's northwest coast has lain dormant. Well into that interval, Meriwether Lewis and William Clark journeyed to the mouth of the Columbia River and returned to Washington, D.C. to tell the new United States about what came to be known as the Oregon Country. Tens of thousands of settlers crossed the Oregon Trail to establish communities throughout the Willamette Valley, in coastal valleys, and beside natural harbors. With the provisional government established in 1843 followed by statehood in 1859, the modern history of Oregon began. Industries rose and fell, cities and towns grew . . . and still the fault lay silent.

Not until the 1980s did scientists recognize the Cascadia subduction zone as an active fault that poses a major geological hazard to Oregon. A decade later, the state's building codes were updated to address this newly revealed earthquake threat to the built environment.

Since that time, scientists have documented a long history of earthquakes and tsunamis on the Cascadia subduction zone, and state and local officials have urged Oregonians to prepare for the next one. In 1999, the state's Department of Geology and Mineral Industries published a preliminary statewide damage and loss study identifying the dire consequences of a Cascadia earthquake and tsunami for Oregon's infrastructure and for public safety.

One official who took that warning seriously was Senator Peter Courtney, Oregon's unchallenged champion of earthquake safety and advocate for measures to protect students who attend unsafe schools. His legislative efforts over more than a decade launched a statewide assessment of schools and emergency response facilities, and established a state grant program to help fund seismic upgrades to hazardous schools and other critical facilities. Other than California, no state has done as much—yet the hazard surpasses the commitments Oregon has made to date.

In early 2011, we suggested in the pages of *The Oregonian* that Oregon should take new steps to make itself resilient to a big earthquake. Less than two months later, the Tohoku earthquake and tsunami disaster in Japan provided the occasion for Representative Deborah Boone to introduce a House Resolution calling on Oregon to plan for the impacts of a Cascadia earthquake and tsunami here.

House Resolution 3 directed Oregon Seismic Safety Policy Advisory Commission to lead the planning effort. Chairman Kent Yu, Ph.D., has skillfully guided more than 150 volunteer professionals, including noted experts, to develop a landmark report on Oregon's priorities to survive and bounce back from a magnitude 9.0 Cascadia earthquake and tsunami.

The authors of this Oregon Resilience Plan set out to help Oregonians know what to expect from the state's infrastructure should that disaster strike this year, and to propose the level of infrastructure reliability that a resilient state should provide. The plan's recommendations highlight ways to close the gap that separates expected and desired performance.

Business leaders engaged in this resilience planning effort have indicated that in a major disaster, interruptions of infrastructure services lasting longer than two weeks will put their enterprises at risk. Yet, under present conditions, we can expect some interruptions to last much longer, in some cases from 18 to 36 months or more. The state, in tandem with the private sector, has much to do to improve the reliability of basic services. Citizens, too, need to plan to be self-sufficient for far longer than the 72-hour period commonly advised for disaster preparedness.

The most recent Cascadia earthquake struck at around 9:00 p.m. on a late January evening; the next could shake a mid-July morning when hundreds of thousands of Oregonians and visitors are enjoying coastal beaches and towns. No one can predict the next time the Cascadia fault will rupture, and *today* is just as likely as fifty years from now. If we begin now, it is possible to prevent that natural disaster from causing a statewide catastrophe. Now is the time to have a plan. Now is the time to close Oregon's resilience gap.

The Oregon Resilience Plan maps a path of policy and investment priorities for the next fifty years. The recommendations offer Oregon's Legislative Assembly and Governor immediate steps to begin a journey along that path. The plan and its recommendations build on the solid foundation laid over the past quarter century by some of Oregon's top scientists, engineers, and policymakers.

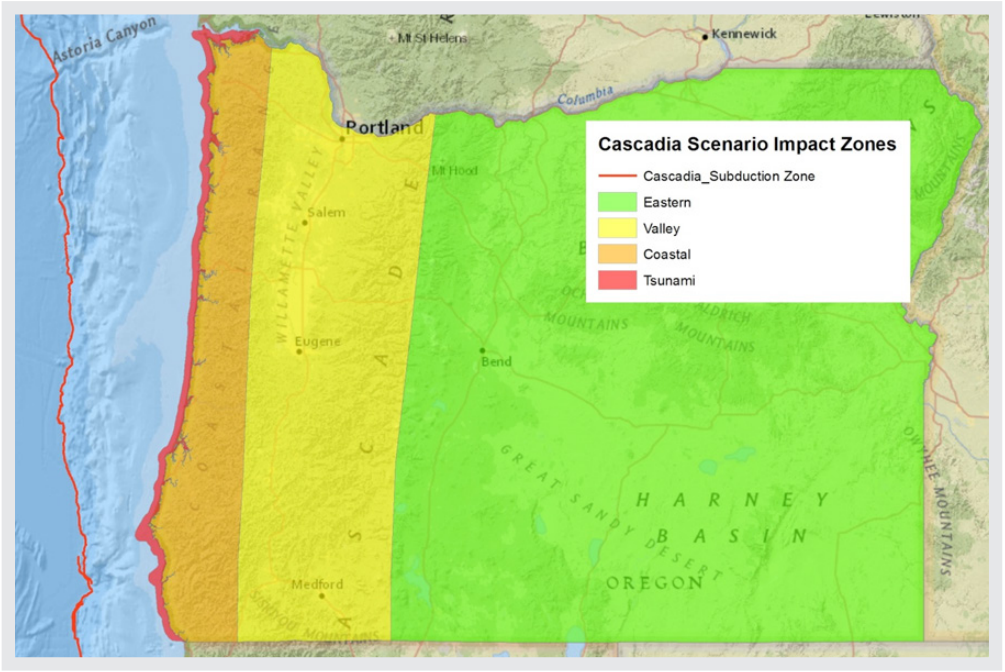
As we wrote two years ago, adopting and implementing such a plan can show "Oregon at its best, tackling a risk with imagination and resourcefulness while sharing the knowledge gained."

Yumei Wang, Jay Raskin, and Edward Wolf
Portland, Oregon, November 2012

Yumei Wang, Jay Raskin, and Edward Wolf are the co-authors of "Oregon should make itself resilient for a big quake," *The Sunday Oregonian*, January 9, 2011.

Executive Summary

Very large earthquakes will occur in Oregon's future, and our state's infrastructure will remain poorly prepared to meet the threat unless we take action now to start building the necessary resilience. This is the central finding of the Oregon Resilience Plan requested by Oregon's 76th Legislative Assembly.



Impact zones for the magnitude 9.0 Cascadia earthquake scenario. Damage will be extreme in the Tsunami zone, heavy in the Coastal Zone, moderate in the Valley zone and light in the Eastern zone.

About the Plan

House Resolution 3, adopted in April 2011, directed the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) "to lead and coordinate preparation of an Oregon Resilience Plan that reviews policy options, summarizes relevant reports and studies by state agencies, and makes recommendations on policy direction to protect lives and keep commerce flowing during and after a Cascadia earthquake and tsunami." OSSPAC assembled eight task groups, comprising volunteer subject-matter experts from government, universities, the private sector, and the general public. An Advisory Group of public- and private-sector leaders oversaw the Task Groups' work, assembled in the portfolio of chapters that make up the plan.

OSSPAC offered the following definition of the seismic resilience goal:

> "Oregon citizens will not only be protected from life-threatening physical harm, but because of risk reduction measures and pre-disaster planning, communities will recover more quickly and with less continuing vulnerability following a Cascadia subduction zone earthquake and tsunami."

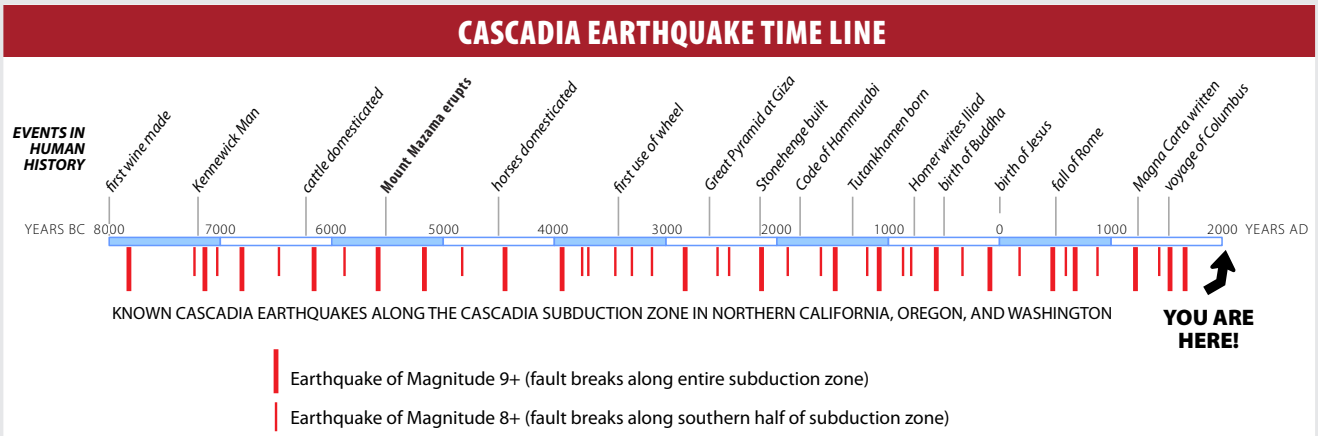
Each group was charged with three tasks for four affected zones (tsunami, coastal/earthquake only, valley, and central/eastern Oregon):

1. Determine the likely impacts of a magnitude 9.0 Cascadia earthquake and tsunami on its assigned sector, and estimate the time required to restore functions in that sector if the earthquake were to strike under present conditions;
2. Define acceptable timeframes to restore functions after a future Cascadia earthquake to fulfill expected resilient performance; and
3. Recommend changes in practice and policies that, if implemented during the next 50 years, will allow Oregon to reach the desired resilience targets.

The purpose of the analysis is to identify steps needed to eliminate the gap separating current performance from resilient performance, and to initiate that work through capital investment, new incentives, and policy changes so that the inevitable natural disaster of a Cascadia earthquake and tsunami will not deliver a catastrophic blow to Oregon's economy and communities.

Overview of the Task Groups

The **Cascadia Earthquake Scenario Task Group** (Chapter One) reviewed current scientific research to develop a detailed description of the likely physical effects of a great (magnitude 9.0) Cascadia subduction zone earthquake and tsunami, providing a scenario that other task groups used to assess impacts on their respective sectors.



Comparison of the history of subduction zone earthquakes along the Cascadia Subduction Zone in northern California, Oregon, and Washington, with events from human history. Ages of earthquakes are derived from study and dating of submarine landslides triggered by the earthquakes. Earthquake data provided by Chris Goldfinger, Oregon State University; time line by Ian P. Madin, DOGAMI.

This timeline compares the 10,000-year-long history of Cascadia earthquakes to events in human history.

The **Business and Workforce Continuity Task Group** (Chapter Two) sought to assess the workplace integrity, workforce mobility, and building systems performance – along with customer viability – needed to allow Oregon's businesses to remain in operation following a Cascadia earthquake and tsunami and to drive a self-sustaining economic recovery.

The **Coastal Communities Task Group** (Chapter Three) addressed the unique risks faced by Oregon's coast, the region of the state that will experience a devastating combination of tsunami inundation and physical damage from extreme ground shaking due to proximity to the subduction zone fault.

Critical Facilities in the Tsunami Zone – Minamisanriku, March 14, 2011. Because their hospital, emergency operation center, and other government and community service facilities were located in the tsunami inundation zone, the surviving community lost nearly all of its capacity to respond and implement recovery efforts. Source: Asia Air Survey Co., Ltd.

Tsunami Vulnerability: City of Seaside with 83% of its population, 89% of its employees and almost 100% of its critical facilities in the tsunami inundation zone. Source: Horning Geosciences

The **Critical and Essential Buildings Task Group** (Chapter Four) examined the main classes of public and private structures considered critical to resilience in the event of a scenario earthquake, and sought to characterize the gap between expected seismic performance (current state) and desired seismic resilience (target state). The group also assessed buildings deemed vital to community resilience, and addressed the special challenges posed by unreinforced masonry (URM) and non-ductile concrete structures.

Many of existing public and private buildings such as the State Capitol Building were built prior to our knowledge of the Cascadia subduction earthquake. They are not seismically safe, and pose significant life-safety threat to the building occupants.

The **Transportation Task Group** (Chapter Five) assessed the seismic integrity of Oregon's multi-modal transportation system, including bridges and highways, rail, airports, water ports, and public transit systems, examined the special considerations pertaining to the Columbia and Willamette River navigation channels, and characterized the work deemed necessary to restore and maintain transportation lifelines after a Cascadia earthquake and tsunami. The group's scope included interdependence of transportation networks with other lifeline systems.

The approach (foreground) to the 1966 Astoria-Megler Bridge that spans the Columbia River has major structural deficiencies that could lead to a collapse following an earthquake. Damaged bridge sections could block waterway access to the Critical Energy Infrastructure Hub. (DOGAMI photo)

The **Energy Task Group** (Chapter Six) investigated the seismic deficiencies of Oregon's energy storage and transmission infrastructure, with a special emphasis on the vulnerability of the state's critical energy infrastructure (CEI) hub, a six-mile stretch of the lower Willamette River where key liquid fuel and natural gas storage and transmission facilities and electricity transmission facilities are concentrated.

Left: Site map of the Critical Energy Infrastructure (CEI) Hub on the western bank of the Lower Willamette River area in NW Portland, Oregon. The CEI Hub, outlined in red, stretches for six miles. (Google Earth)
Right: Oil terminals in the CEI Hub. (DOGAMI photo)

The **Information and Communications Task Group** (Chapter Seven) examined the inherent vulnerabilities of Oregon's information and communications systems and the consequences of service disruptions for the resilience of other sectors and systems. The group explored the implications of co-location of communications infrastructure with other vulnerable physical infrastructure (*e.g.,* bridges), and specified the conditions needed to accomplish phased restoration of service following a Cascadia earthquake and tsunami.

The **Water and Wastewater Task Group** (Chapter Eight) reviewed vulnerabilities of the pipelines, treatment plants, and pump stations that make up Oregon's water and wastewater systems, and discussed the interventions needed to increase the resilience of under-engineered and antiquated infrastructure at potential failure points. The group proposed a phased approach to restoration of water services after a Cascadia earthquake and tsunami, beginning with a backbone water and wastewater system capable of supplying critical community needs.

Left: These high voltage electrical transmission towers are built on a river bank in the Critical Energy Infrastructure (CEI) Hub susceptible to lateral spreading. (DOGAMI photo)

Right: Structural damage to a high voltage transmission tower located at a river crossing in 2010 Chile earthquake (ASCE Technical Council on Lifeline Earthquake Engineering – TCLEE)

Key Findings

Oregon is far from resilient to the impacts of a great Cascadia earthquake and tsunami today. Available studies estimate fatalities ranging from 1,250 to more than 10,000 due to the combined effects of earthquake and tsunami, tens of thousands of buildings destroyed or damaged so extensively that they will require months to years of repair, tens of thousands of displaced households, more than $30 billion in direct and indirect economic losses (close to one-fifth of Oregon's gross state product), and more than one million dump truck loads of debris.

A particular vulnerability is Oregon's liquid fuel supply. Oregon depends on liquid fuels transported into the state from Washington State, which is also vulnerable to a Cascadia earthquake and tsunami. Once here, fuels are stored temporarily at Oregon's critical energy infrastructure hub, a six-mile stretch of the lower Willamette River where industrial facilities occupy liquefiable riverside soils. Disrupting the transportation, storage, and distribution of liquid fuels would rapidly disrupt most, if not all, sectors of the economy critical to emergency response and economic recovery.

- After the February 27, 2010 M8.8 Maule Earthquake, Chile was able to restore 90% communication services and 95% power supply within two weeks, and re-start commercial flights after ten days.
- After the March 11, 2011 M9.0 Tohoku Earthquake, Japan was able to restore more than 90% power supply in ten days, 90% telephone lines in two weeks, and 90% cellular base stations in 19 days.

Business continuity planning typically assumes a period of two weeks to be the longest disruption of essential services (*i.e.*, utilities, communications, etc.) that a business can withstand, and service disruptions lasting for one month or longer can be enough to force a business to close, relocate, or leave the state entirely. Analysis in the *Oregon Resilience Plan* reveals the following timeframes for service recovery under present conditions:

Critical Service	Zone	Estimated Time to Restore Service
Electricity	Valley	1 to 3 months
Electricity	Coast	3 to 6 months
Police and fire stations	Valley	2 to 4 months
Drinking water and sewer	Valley	1 month to 1 year
Drinking water and sewer	Coast	1 to 3 years
Top-priority highways (partial restoration)	Valley	6 to 12 months
Healthcare facilities	Valley	18 months
Healthcare facilities	Coast	3 years

Resilience gaps of this magnitude reveal a harsh truth: a policy of business as usual implies a post-earthquake future that could consist of decades of economic and population decline – in effect, a "lost generation" that will devastate our state and ripple beyond Oregon to affect the regional and national economy.

Recommendations

Based on the findings in this *Oregon Resilience Plan*, OSSPAC recommends that Oregon start now on a sustained program to reduce our vulnerability and shorten our recovery time to achieve resilience before the next Cascadia earthquake inevitably strikes our state.

OSSPAC urges systematic efforts to assess the Oregon's buildings, lifelines, and social systems, and to develop a sustained program of replacement, retrofit, and redesign to make Oregon resilient.

Sector-by-sector findings and detailed recommendations are presented in each chapter of the *Oregon Resilience Plan*. Overarching priorities, illustrated with examples selected from the chapters, include new efforts to:

1. Undertake **comprehensive assessments** of the key structures and systems that underpin Oregon's economy, including
   a. Completing a statewide inventory of critical buildings (those needed for emergency response and the provision of basic services to communities) in both public and private sectors (Chapter Four);
   b. Completing an updated inventory of the local agency, transit, port, and rail assets that assure access to school buildings and hospitals and could be used during emergencies (Chapter Five);
   c. Charging the Oregon Public Utility Commission to define criteria for seismic vulnerability assessments that can be applied by operating companies in the energy and information and communications sectors (Chapters Six and Seven); and
   d. Requiring all water and wastewater agencies to complete a seismic risk assessment and mitigation plan as part of periodic updates to facility plans (Chapter Eight).
2. Launch a sustained **program of capital investment** in Oregon's public structures, including
   a. Fully funding Oregon's Seismic Rehabilitation Grants Program for K-12 schools, community colleges, and emergency response facilities (Chapters Two and Four);
   b. Seismically upgrading lifeline transportation routes into and out of major business centers statewide by 2030 (Chapter Five); and
   c. Establishing a State Resilience Office to provide leadership, resources, advocacy, and expertise in implementing statewide resilience plans (Chapter Four).
3. Craft a **package of incentives** to engage Oregon's private sector in efforts to advance seismic resilience, including
   a. Developing a seismic rating system for new buildings to incentivize construction of buildings more resilient than building code compliance requires and to communicate seismic risk to the public (Chapters Two and Four);
   b. Tasking the Oregon Public Utilities Commission to provide oversight for seismic preparedness of the energy providers currently under its jurisdiction (Chapter Six); and
   c. Working with the hospitality industry to develop plans to assist visitors following a major earthquake and tsunami and to plan strategies to rebuild the tourism industry (Chapter Three).
4. **Update Oregon's public policies**, including
   a. Revising individual preparedness communications to specify preparation from the old standard of 72 hours to a minimum of two weeks, and possibly more (Chapters Two and Three);
   b. Developing a policy and standards for installation of temporary bridges following earthquake disruption (Chapter Five); and
   c. Adopting a two-tiered ratings system that indicates the number of hours/days that a citizen in a community can expect to wait before major relief arrives, and the number of days/months that a citizen can expect to wait before the community itself achieves 90 percent restoration of roads and municipal services (Chapter Two).

These and other recommendations may be refined and implemented via a combination of new legislation, regulations, administrative rules, budget priorities, and in consultation with private sector leaders as appropriate.

Looking Ahead

This *Oregon Resilience Plan* emphasizes the resilient physical infrastructure needed to support business and community continuity. The policy recommendations presented here, if implemented over the next 50 years, will enhance our infrastructure resilience, help preserve our communities, and protect our state economy.

This is a timeframe much longer than typical of government planning efforts. To affirm Oregon's commitment, OSSPAC needs to work with the Joint Ways & Means Committee of Oregon's Legislative Assembly to track and report on progress toward seismic resilience at the beginning of each legislative session, to keep the 50-year goal in view.

Local Oregon communities can use the framework and gap-analysis methodology developed by the *Oregon Resilience Plan* to conduct more refined assessments that consider local seismic and tsunami hazards, and develop community-specific recommendations to meet their response and recovery needs.

A Cascadia earthquake and tsunami will affect both Oregon and Washington. Both states share common challenges, among them the interstate bridges and the Columbia River navigation channel as well as the regional power grid and liquid fuel supply. In particular, Oregon gets almost one hundred percent of its liquid fuel from suppliers in Washington, delivered via pipeline and river. We believe that it would be beneficial for both states to work together at a regional level to address the common challenge of resilience to a region-wide seismic event.

OSSPAC recommends expanding future resilience planning efforts to include:

1. Community-level planning
2. Human resilience
3. Civic infrastructure
4. Joint regional planning with Washington State

With resilient physical infrastructure, a healthy population, and functioning government and civic infrastructure to provide services to those in need, Oregon will be ready to withstand a Cascadia earthquake and tsunami, and to expedite response and recovery efforts quickly.

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2012-2013 Oregon Seismic Safety Policy Advisory Commission (OSSPAC) Members

CHAIR: Kent Yu - Structural Engineer Stakeholder, Degenkolb Engineers
VICE CHAIR: Jay Wilson - Public Member, Clackamas County Emergency Management
Deborah Boone - Representative, Legislative Assembly
Greg Ek-Collins - Oregon Department of Transportation
Carl Farrington - Multifamily Housing Stakeholder
Fred Girod - Senator, Legislative Assembly
David Holton - American Red Cross*
Francisco Ianni - American Red Cross
Ian Madin - Department of Geology and Mineral Industries

*Retired from the commission in June 2012.

Michael Mumaw - Local Government Stakeholder, Emergency Manager, City of Beaverton
Jay Raskin - Public Member, Ecola Architects
Althea Rizzo - Oregon Emergency Management
Richard Rogers - Building Codes Division
Stephen Lucker - Department of Land Conservation & Development
Susan Steward – Building Owners Stakeholder, BOMA
Mark Tyler - Schools Stakeholder
Bryce Ward – Banking Stakeholder, ECONorthwest
Stan Watters – Utilities Stakeholder, Port of Portland
Gerry Williams - Public Member, Construction & Engineering Management Research, Inc.
Bev Hall - OSSPAC Secretary, Oregon Emergency Management

Project Team and Acknowledgments

On behalf of my fellow OSSPAC Commissioners, I want to thank several individuals whose vision and support have made our resilience planning work possible. First and foremost, we thank our colleague Rep. Deborah Boone, who introduced House Resolution 3 and won the unanimous support of her colleagues on April 18, 2011. We are also grateful to Governor John Kitzhaber, who encouraged OSSPAC's efforts on resilience, and to President Barack Obama's Senior Director for Resilience Richard Reed, who took the time to express his support for the preparation of Oregon's resilience plan.

We are very grateful to members of the project Steering Committee, who have offered their advice, counsel, and support at every stage of our work: **Jay Wilson** (Vice Chair)**, Ian Madin, Dr. Althea Rizzo, and Stan Watters**.

We appreciate the commitment of our Advisory Panel, whose members participated in meetings on January 26th, 2012 and October 5th, 2012 and have made themselves available for informal consultation over the past year: **Prof. Scott Ashford, Sen. Lee Beyer, Sen. Peter Courtney, Ed Dennis, JR Gonzalez, Prof. Chris Goldfinger, Dave Harlan, Onno Husing, Bruce Johnson, Dr. Leon Kempner, Jr., Prof. Andre LeDuc, Dr. Vicki McConnell, Dr. Jean O'Connor, Cameron Smith, Jeffrey Soulages, Yumei Wang, Edward Wolf, and Dr. Nate Wood**. In particular, we want to thank Dr. Vicki McConnell, Yumei Wang and Edward Wolf for their guidance and support.

We owe the creation of the *Oregon Resilience Plan* to diligent efforts by our eight Task Groups and the capable leadership and project management performed by our Task Group leaders, who may not have fully realized the magnitude of the project when they agreed to serve:

Earthquake and Tsunami Scenario Task Group: *Ian Madin* (Chair), Bill Burns, Art Frankel, Chris Goldfinger, Matthew Mabey, George Priest, Yumei Wang, and Ivan Wong.

Business and Work Force Task Group: *Susan Steward* (Co-Chair), ***Gerry Williams*** (Co-Chair), Lori Chamberlain, Patrick Estenes, Kelley Okolita, Patrick Slabe, Bert Sorio, Jeffrey Soulages, Rick Van Dyke, and Bryce Ward.

Coastal Communities Task Group: *Jay Wilson* (Co-Chair), ***Jay Raskin*** (Co-Chair),Jacque Betz, Rep. Deborah Boone, Josh Bruce, Lori Christiansen,Charlie Davis, Sue Graves, Dave Harlan, Jeffrey Hepler, Maggie Kirby, Sen. Jeff Kruse, Margo Lalich, Jack Lenox, Gary Milliman, Sam Steidel, Wayne Stinson, and Laren Woolley.

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Energy Task Group: *JR Gonzalez* (Co-Chair), ***Stan Watters*** (Co-Chair), Heide Caswell, Rick Carter, Brian Doherty, Michael Dougherty, Del Draper, Dave Ford, Debbie Guerra, Teresa Hagins, Marion Haynes, Leon Kempner, Jr., Brian Knight, Lori Koho, Christy Munro, Bruce Paskett, Robbie Roberts, Dave Stuckey, Jack Vranish, Yumei Wang, Tashiana Wanger, and Grant M. Yoshihara.

Information and Communications Task Group: *Mike Mumaw* (Chair), Rick Carter, Michael Dougherty, Walter Duddington, JR Gonzalez, Alexis Kwasinki, Devon Lumbard, Kelley Stember, Alex Tang, Yumei Wang, Stan Watters, and Geoffery Williams.

Water and Waste Water Task Group: *Mike Stuhr* (Co-Chair), ***Mark Knudson*** (Co-Chair), Don Ballantyne, Steve Behrandt, James Bela, Andy Braun, Scott Burns, Mel Damewood, Jim Doane, Michael Doane, Tom Hickman, Gary Irwin, Gwynne Johnson, Jeff Leighton, Arturo Leon, Ian Madin, Jim Male, Jim Newell, Bob Patterson, Sherry Patterson, Todd Perimon, Brad Phelps, Jeff Rubin, Rob Schab, Ken Schlegel, Brian Stahl, and Jeffrey Winchester.

Dr. Kyra L. Nourse compiled and edited the *Oregon Resilience Plan*, with assistance from my OSSPAC colleagues Dr. Althea Rizzo, Jay Wilson, Ian Madin, Bev Hall and from Edward Wolf. We are grateful to FEMA for financial support, through a grant administered by Oregon Emergency Management, for the technical editing of the plan.

The Port of Portland hosted our workshops on January 26, 2012 and October 5, 2012 in its headquarter building. We want to thank Michelle Walker for her planning and coordination to make the workshops successful. Cascadia Region Earthquake Workgroup (CREW) provided their endorsement for our resilience planning efforts, and also helped sponsor our January 26, 2012 workshop. We want to thank Cale Ash (then President of CREW) and John Schelling (Washington State Emergency Management) for their participation and for sharing their resilience planning experience with us.

On a personal note, I wish to thank my colleagues at Degenkolb Engineers, particularly Chris Poland in San Francisco and Stacy Bartoletti in Seattle, for their inspiration on resilience, and colleagues in our Portland office including Liz Francis and Karla Richards who helped me to manage my resilience plan responsibilities without leaving my other professional obligations too far behind.

Finally, I want to acknowledge the leadership of OSSPAC's Vice Chair Jay Wilson, who has in every respect been a full partner in the vision and execution of the *Oregon Resilience Plan*, and who is a great champion for resilience.

Many other individuals have generously shared their expertise and perspective with us during the creation of this plan. OSSPAC bears the sole responsibility for any errors or omissions it contains.

Kent Yu, Ph.D.
Chairman, Oregon Seismic Safety Policy Advisory Commission
Portland, Oregon
January 2013

*Note: The **full Oregon Resilience Plan report** is available online at the Oregon Office of Emergency Management website:* http://www.oregon.gov/OMD/OEM/Pages/index.aspx

The Oregon Resilience Plan

Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami

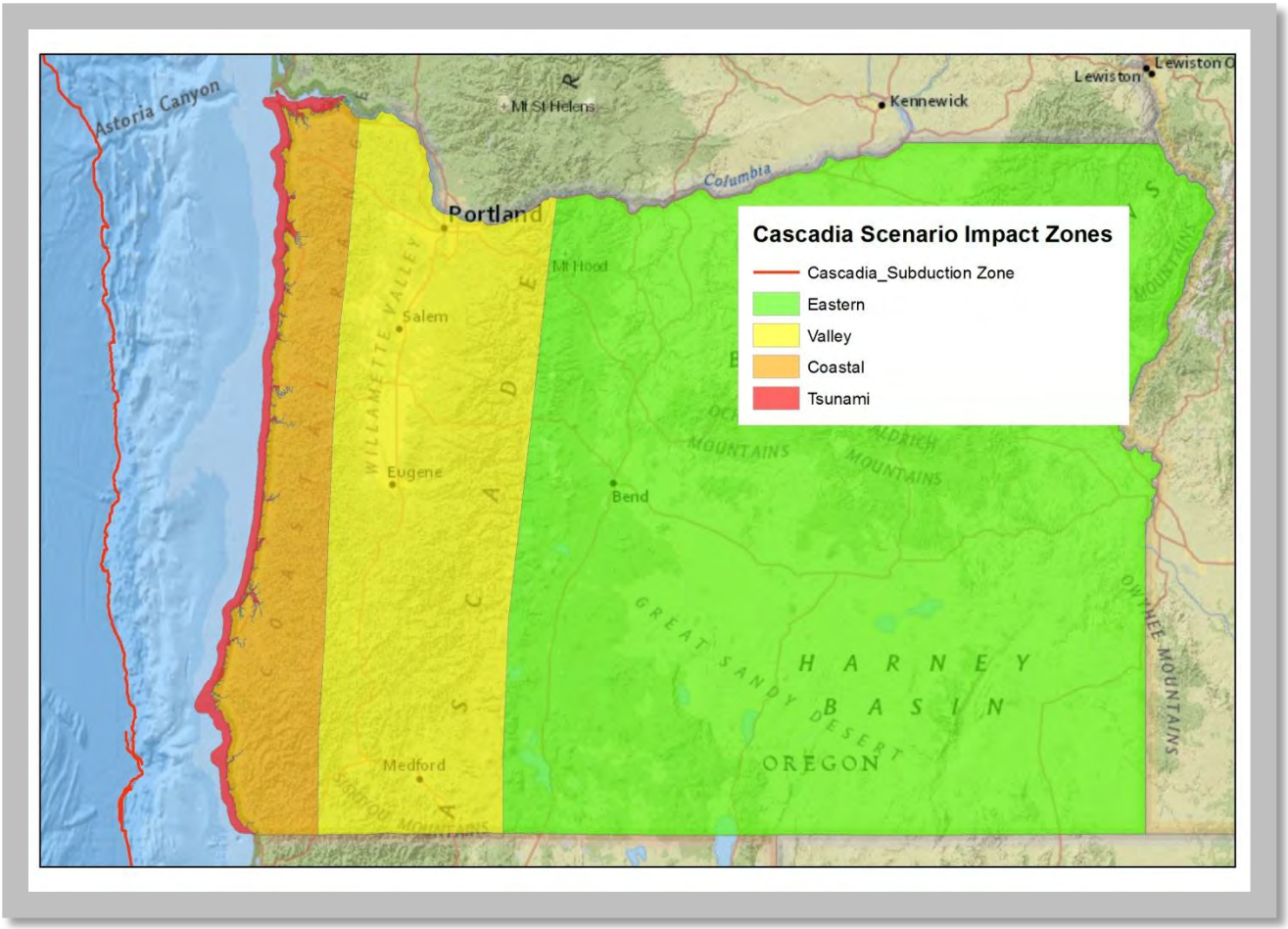
Report to the
77th Legislative Assembly

from
Oregon Seismic Safety Policy
Advisory Commission (OSSPAC)

Salem, Oregon
February 2013

Executive Summary

Very large earthquakes will occur in Oregon's future, and our state's infrastructure will remain poorly prepared to meet the threat unless we take action now to start building the necessary resilience. This is the central finding of the *Oregon Resilience Plan* requested by Oregon's 76th Legislative Assembly.



Impact zones for the magnitude 9.0 Cascadia earthquake scenario. Damage will be extreme in the Tsunami zone, heavy in the Coastal zone, moderate in the Valley zone, and light in the Eastern zone.

1. Cascadia: Oregon's Greatest Natural Threat

Introduction

When, not if, the next great Cascadia subduction zone earthquake strikes the Pacific Northwest, Oregon will face the greatest challenge in its history. Oregon's buildings, transportation network, utilities, and population are simply not prepared for such an event. Were it to occur today, thousands of Oregonians would die, and economic losses would be at least $32 billion. In their current state, our buildings and lifelines (transportation, energy, telecommunications, and water/wastewater systems) would be damaged so severely that it would take three months to a year to restore full service in the western valleys, more than a year in the hardest-hit coastal areas, and many years in the coastal communities inundated by the tsunami. Experience from past disasters has shown that businesses will move or fail if services cannot be restored in one month; so Oregon faces a very real threat of permanent population loss and long-term economic decline.

We cannot avoid the future earthquake, but we can choose either a future in which the earthquake results in grim damage and losses and a society diminished for a generation, or a future in which the earthquake is a manageable disaster without lasting impact. We need to start preparing now by assessing the vulnerability of our buildings, lifelines, and social systems, and then developing and implementing a sustained program of replacement, retrofit, and redesign to make Oregon resilient to the next great earthquake. We know how to engineer buildings, roads, and power lines to withstand this earthquake; the hard part will be to find the will, commitment, and persistence needed to transform our state.

The Oregon legislature recognized the scale of this problem when it passed House Resolution 3 in 2011 (see Appendix I for details of House Resolution 3), noting the likely impact of a Cascadia earthquake and the need for a plan to move the state towards resilience to that event. The Oregon Seismic Safety Policy Advisory Commission (OSSPAC) was charged with developing a resilience plan, which is described in this report. The report summarizes the science of Cascadia subduction zone earthquakes and estimates their impacts; it then provides detailed analysis of the current vulnerability of our buildings and business community, and our transportation, energy, communication, and water/wastewater systems. The report defines the performance targets that each sector must meet to achieve adequate resilience, and provides detailed recommendations for the actions required to meet those targets over the next 50 years.

How OSSPAC Developed This Plan

House Resolution 3 passed by the 2011 legislature directed OSSPAC to "lead and coordinate preparation of an Oregon Resilience Plan that reviews policy options, summarizes relevant reports and studies by state agencies and makes recommendations on policy direction to protect lives and keep commerce

flowing during and after a Cascadia earthquake and tsunami". To meet this challenge OSSPAC first defined what resilience would mean for Oregon:

Oregon citizens will not only be protected from life-threatening physical harm, but because of risk reduction measures and pre-disaster planning, communities will recover more quickly and with less continuing vulnerability following a Cascadia subduction zone earthquake and tsunami.

OSSPAC identified existing and ongoing earthquake resilience planning from San Francisco, California (SPUR, 2009) and the State of Washington (Washington Seismic Safety Committee, 2012) as good models to follow. These studies outlined an approach that included estimating the current earthquake vulnerability of systems and structures, defining the performance standards that structures and systems would need to meet over fifty years in order to be sufficiently resilient, and then identifying changes in practice and policy that would help attain those performance standards. One difference for the Oregon Resilience Plan was that it needed to encompass the entire state unlike the City of San Francisco study, and that it focused on the Cascadia earthquake threat, unlike the Washington study which considered multiple earthquake scenarios.

To complete the plan without funding and on a one-year schedule, OSSPAC chose to tap into volunteer expertise from Oregon's academic, professional, governmental and public communities. Over one hundred volunteer experts drawn from a broad section of Oregon society were organized into eight work groups to survey the following parts of the problem:

- Cascadia Earthquake Scenario
- Business and Workforce
- Coastal Communities
- Critical and Essential Buildings
- Energy
- Transportation
- Information and Communications
- Water and Wastewater

The purpose of the task group assigned to the Cascadia Earthquake Scenario was to develop a detailed description of the likely physical effects throughout Oregon of a major Cascadia subduction earthquake so that the other groups could assess the impact on their respective sectors. Each of the remaining seven groups focused on one of the sectors of society or parts of the built environment listed above. The Coastal Task Group was included to recognize the unique risk along the coast: this region will experience a combination of tsunami damage and damage from extreme shaking.

Each group was charged with three primary tasks: First, determine the likely impact of the scenario earthquake on the assigned sector and estimate the time required to restore functions in that sector if

the earthquake were to happen under current conditions. Second, define performance targets for the sector. The targets represent the desired timeframes for restoring functions in a future Cascadia earthquake—in other words, the timeframes within which functions must be restored if Oregon is to be resilient. Finally, provide a series of recommendations to OSSPAC for changes in practice and policy that, if implemented, would ensure that Oregon reaches the desired resilience targets over the next 50 years.

The products from the various task groups were reviewed by an advisory group of subject matter experts to ensure that the material was accurate, complete, and up-to-date. OSSPAC then reviewed the recommendations and selected and endorsed those that the commission felt offered the most effective way to achieve resilience to a great Cascadia disaster.

Great Earthquakes on the Cascadia Subduction Zone

For the last twenty-five years, the scientific community has been aware of the possibility that a great earthquake caused by the Cascadia subduction zone could strike the Pacific Northwest. Now, after decades of research and recent great earthquakes in Sumatra, Chile, and Japan, awareness of this threat is widespread in Oregon, and we know enough to paint a picture of what Oregon might look like after such an earthquake. Oregon is a geologic mirror image of northern Japan (see Figure 1.1). In both places, the Pacific Ocean floor is sliding beneath the adjacent continents along giant faults called subduction zones. The scientific understanding of the Cascadia threat makes it clear that very large earthquakes will occur in Oregon's future, and that our societal and physical structures are poorly prepared to meet the threat unless we take action now to start building the necessary resilience.

What Are Subduction Zone Earthquakes?

The surface of the earth is broken into dozens of tectonic plates—continent-sized slabs of rigid rock that slowly slide across the more pliant mantle of the earth beneath. Moving at speeds of a few inches per year, the plates can pull apart, slide past each other, or collide head on. Where an oceanic and a continental plate collide, a subduction zone forms, as one plate is forced beneath the other, deep into the softer rock of the mantle. A great arc of subduction zones surrounds the Pacific Ocean, producing what geologists call the "Ring of Fire." In Japan, the ocean floor of the Pacific Plate moves towards the west, sliding beneath the Eurasian Plate that supports the islands of Japan. The Pacific Northwest is a geologic mirror image of Japan, with the Pacific Ocean floor moving towards the east, sliding beneath Oregon, Washington, and Northern California along a 600-mile fault called the Cascadia subduction zone.

In Japan, there has never been any doubt that great subduction earthquakes are possible: Japan's long written history has recorded many such events, with the 2011 Tohoku earthquake being the most recent and one of the most powerful and destructive. In that earthquake, a section of the Pacific Ocean floor measuring 300 miles long and 125 miles wide lurched as much as 100 feet down the subduction zone, causing a great magnitude 9.0 earthquake. The eastern edge of the Eurasian Plate, which had been slowly bending for centuries under the relentless pressure of subduction, snapped back during the

earthquake, displacing trillions of tons of seawater and triggering a catastrophic tsunami. The release of the bent Eurasian Plate caused land along the coast of Japan to permanently sink several feet, and the strong shaking from the earthquake caused widespread landslides on steep slopes (both on land and undersea) and widespread liquefaction of soft sediments on land.

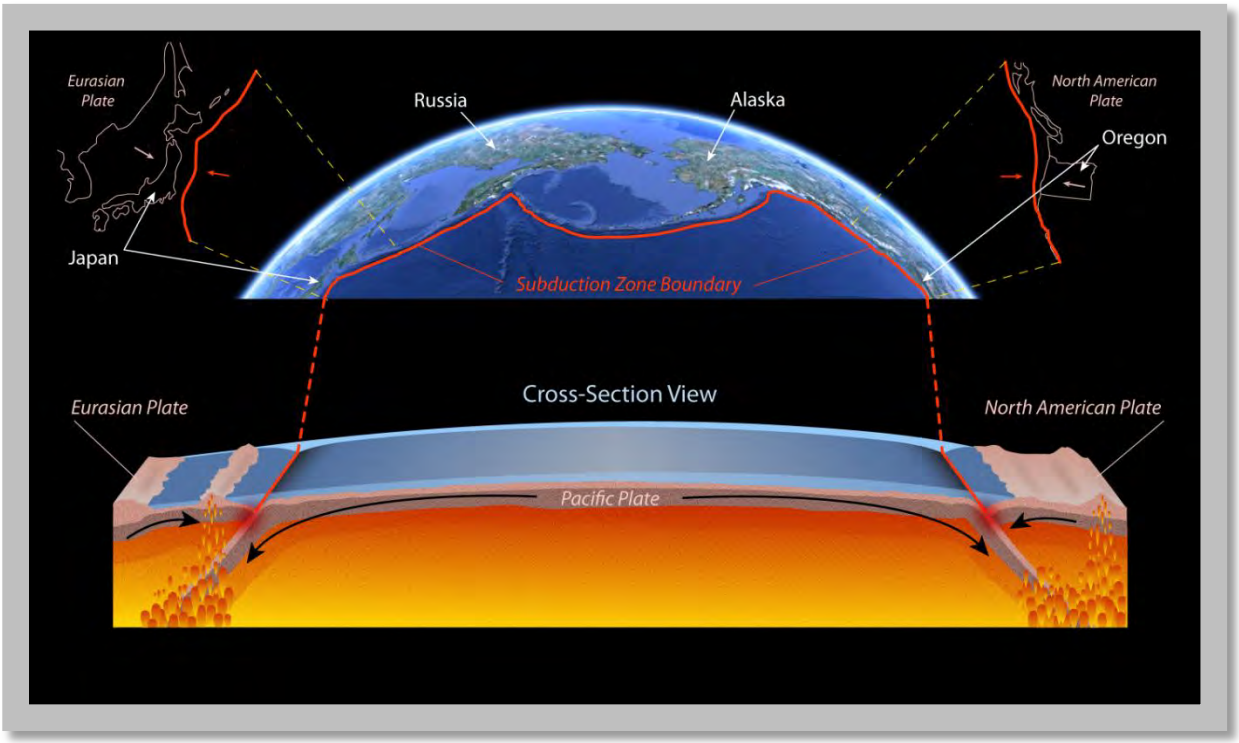


Figure 1.1: Oregon is a geologic mirror-image of Northern Japan. In both places, the Pacific Ocean floor is sliding beneath the adjacent continents along giant faults called subduction zones (Source: Graphic by Dan Coe, DOGAMI).

In 1984, when seismologists first proposed that Cascadia might produce similar earthquakes, there was considerable doubt. Research since then has confirmed that Cascadia has a long history of great subduction earthquakes and that energy for the next great earthquake is currently building along the fault. Geologic studies (see Figure 1.2) have uncovered evidence of the coastal subsidence, tsunamis, landslides, and liquefaction that were produced by past Cascadia earthquakes, and ultra-sensitive GPS measurements show that the Oregon coast is moving eastward a few inches per year along with the Pacific Ocean floor, motion that will be abruptly reversed during the next great subduction earthquake. There is no scientific doubt that another great subduction earthquake will strike the Pacific Northwest; the questions now are how soon, how large, and how destructive that earthquake will be.

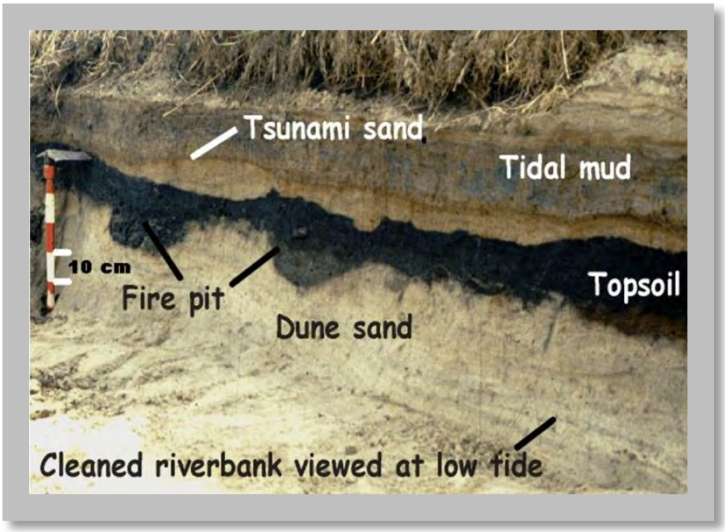


Figure 1.2: This photo (Source: Brian Atwater, USGS) shows a riverbank from the Salmon River estuary where Native American firepots were found in a forest soil that subsided in the 1700 AD earthquake and was buried by tsunami sand and tidal mud.

Geologists have assembled a ten thousand year record of past Cascadia earthquakes (see Figure 1.3) by studying sediments in coastal marshes and on the ocean floor. This record shows that past earthquakes have occurred at highly variable intervals and can range widely in size and in which parts of the Pacific Northwest they affect. About half of the past earthquakes have been very large (estimated magnitude 8.3 to 8.6) and centered on the southern Oregon coast, while the other half have been great (estimated magnitude 8.7 to 9.3) and extending from northern California to British Columbia. The most recent event occurred on January 26, 1700 AD, and was a great earthquake with a magnitude of 9.0. The time interval between previous earthquakes has varied from a few decades to many centuries, but most of the past intervals have been shorter than the 313 years since the last event. It is simply not scientifically feasible to predict, or even estimate, when the next Cascadia earthquake will occur, but the calculated odds that a Cascadia earthquake will occur in the next 50 years range from 7-15 percent for a great earthquake affecting the entire Pacific Northwest to about 37 percent for a very large earthquake affecting southern Oregon and northern California. The likelihood of a M 9 Cascadia earthquake during our lifetimes and the consequences of such an earthquake are both so great that it is prudent to consider this type of earthquake when designing new structures or retrofit of existing structures, evaluating the seismic safety of existing structures, or planning emergency response and preparedness.

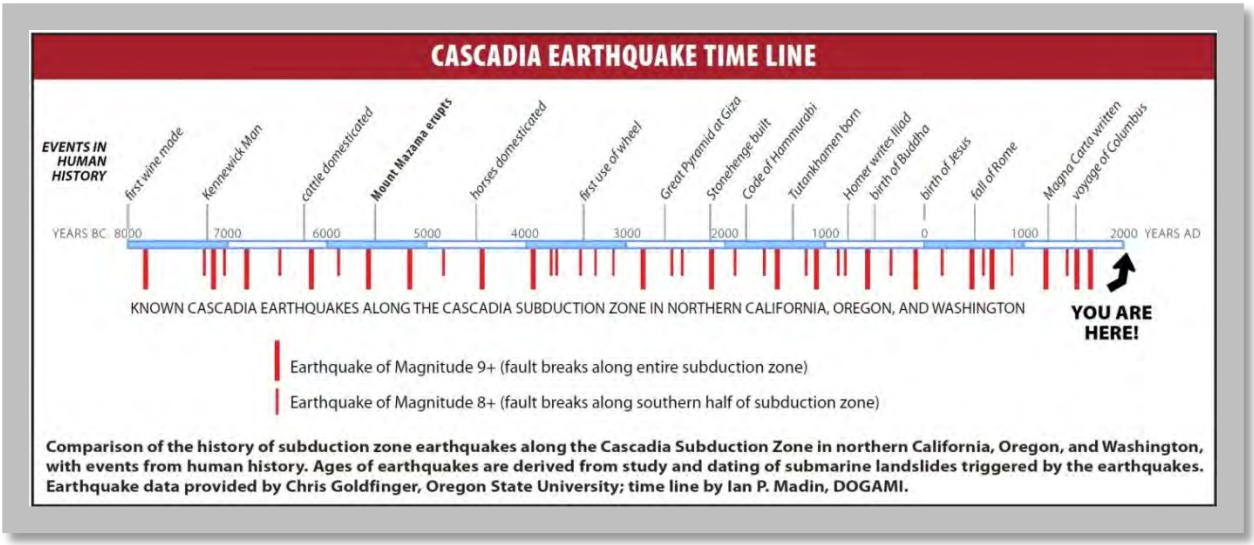


Figure 1.3: This timeline compares the 10,000-year-long history of Cascadia earthquakes to events in human history.

Resilience Plan Earthquake Scenario

For the purpose of this resilience planning effort, we chose to look at the effects of a great earthquake of magnitude 9.0, because it is a very real possibility that would affect all of Oregon and is directly comparable to the 2011 Tohoku earthquake, the effects of which are all too well known. Using the latest models from the United States Geological Survey (USGS), we simulated the strong shaking that is likely to occur during the region's next magnitude 9.0 event. The simulated shaking map was then used to estimate the amount of ground failure due to liquefaction and landsliding that would result from such an earthquake. For the tsunami, we used a model of the inundation from a magnitude 9.0 event. This model, which was produced by the Oregon Department of Geology and Mineral Industries (DOGAMI), was applied to maps of the coast to show which areas and facilities would be inundated. The tsunami models also provided estimates of the permanent coastal subsidence that would accompany the earthquake and tsunami. These maps of simulated earthquake effects were used to evaluate the likely performance of Oregon's critical buildings and infrastructure.

The simulation shows that Oregon would experience shaking very similar to the shaking that northern Japan endured in 2011. As indicated in Figure 1.4, areas along Oregon's coast would experience severe to violent shaking, while cities along the I-5 corridor would experience strong or very strong shaking. East of the Cascades, shaking would be light to moderate. In all areas, the strong shaking would last from two to four minutes.

This expected pattern of damage led OSSPAC to evaluate the state in four distinct zones (see Figure 1.5):

- The Tsunami Zone, where severe shaking and tsunami inundation would cause near total damage, and threaten the lives of thousands of residents.

- The Coastal Zone, where severe shaking and damage to transportation systems would severely disrupt and isolate communities and where the major challenge after the earthquake would be to keep the population sheltered, fed and healthy.
- The Valley Zone, where widespread moderate damage would severely disrupt daily life and commerce and where restoring services to business and residents would be the main priority.
- The Eastern zone where light damage would allow rapid restoration of services and functions, and where communities would become critical hubs for the movement of response recovery and restoration personnel and materials for the rest of the state.

The results of the ground failure simulation (see Figure 1.6) suggest that large areas of western Oregon would be severely affected. Strong shaking causes ground failure in two ways. Along rivers, lakes, and the coast, where there are deposits of loose water-saturated sand, shaking causes the sand to liquefy, and the weakened soil readily settles or spreads. On steep slopes with weak soil and rock, or in areas of existing landslides, the shaking can cause new or renewed landslide movement, with very damaging results. Ground failure can cause severe damage to buildings and is particularly damaging to lifelines, which by their nature must often cross wide areas of affected ground.

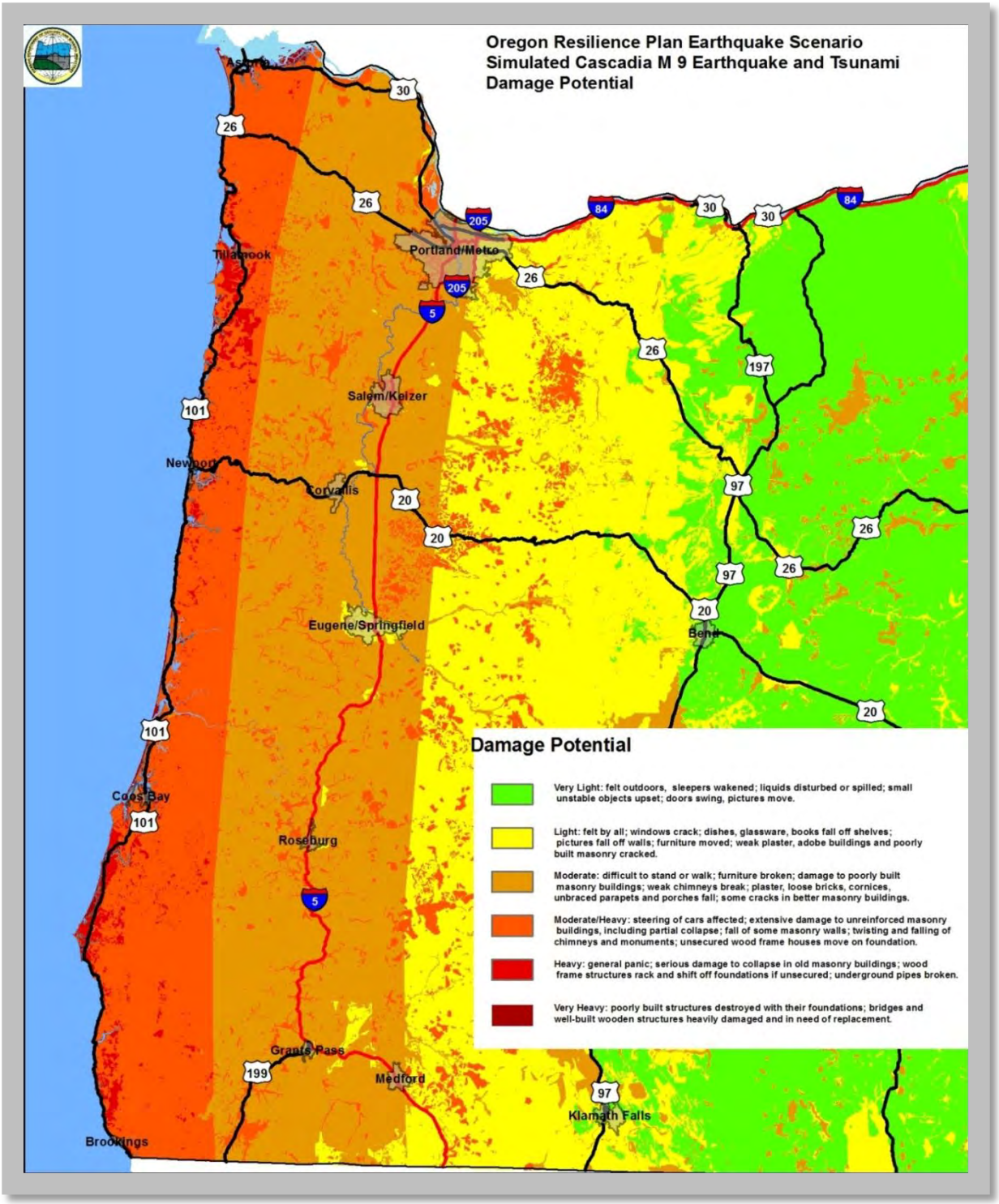


Figure 1.4: Simulated shaking for the magnitude 9.0 Cascadia scenario.

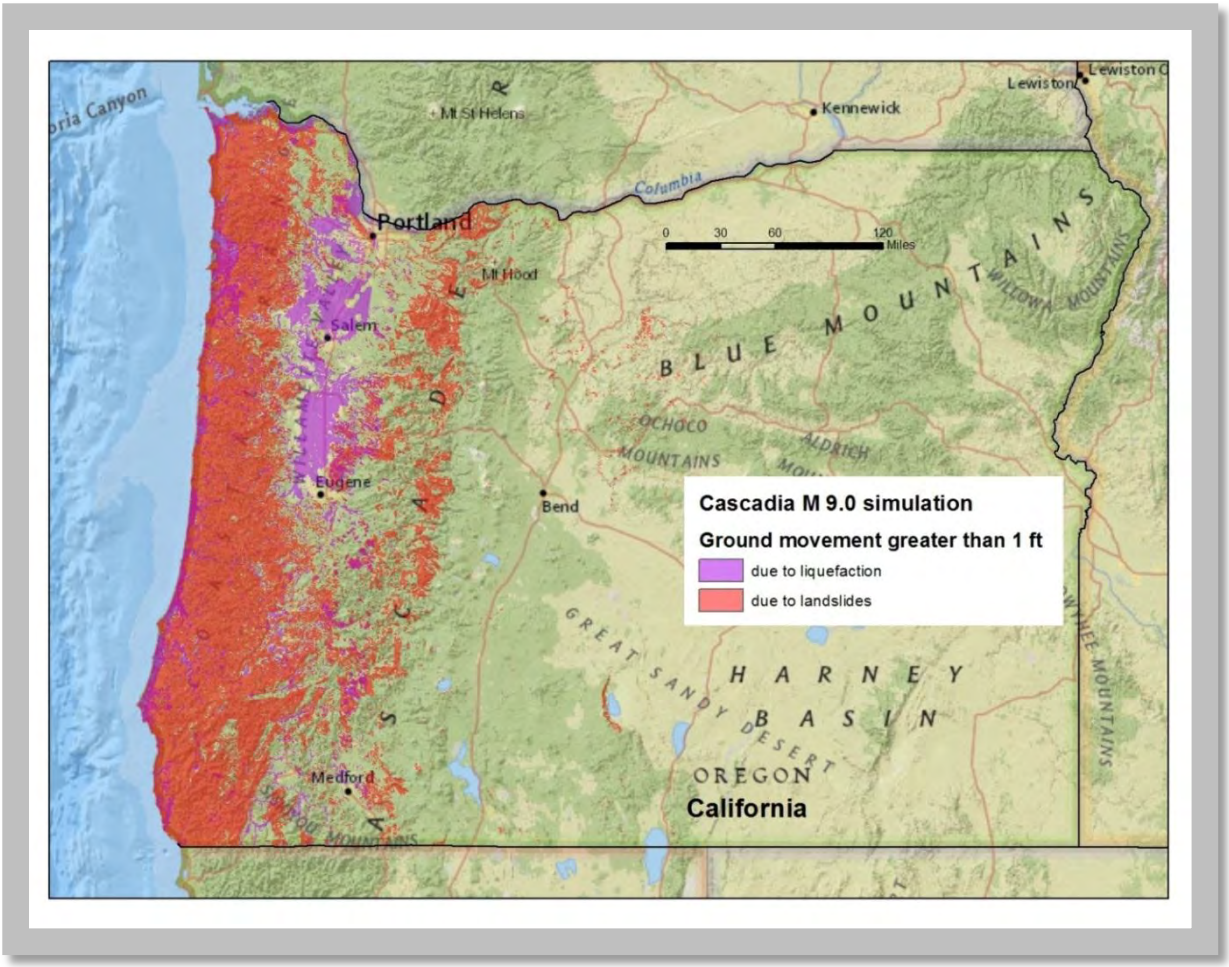


Figure 1.6: Ground failure and movement for the magnitude 9.0 Cascadia earthquake scenario. Colored areas could experience more than one foot of ground movement due to earthquake-induced landslides in steep areas and liquefaction failure in lowlands. Both forms of ground failure can cause severe damage.

The amount of tsunami inundation that would be experienced along the coast due to the scenario magnitude 9.0 earthquake is quite variable and depends on local topography. Large parts of many low-lying communities, such as Warrenton, Seaside, Rockaway Beach, and Neskowin (see Figure 1.7), will be inundated.

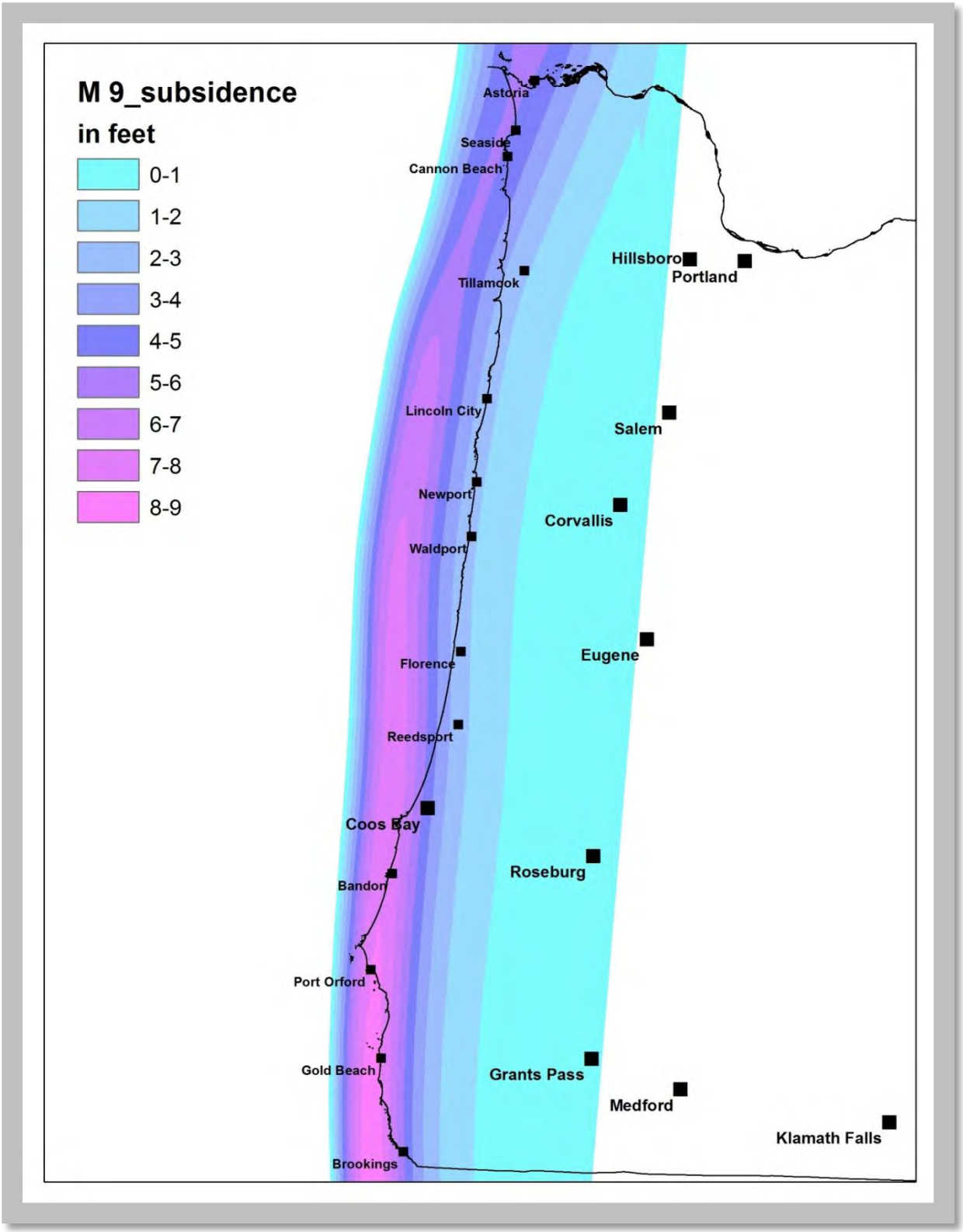


Figure 1.8: Estimated permanent land subsidence from the scenario magnitude 9.0 earthquake for the Oregon Coast. Subsidence would occur during the earthquake.

Oregon's Infrastructure and Risk

The estimated impacts of a Cascadia subduction earthquake in Oregon are catastrophic. This is partly due to the sheer size and power of a magnitude 9.0 earthquake, but it is also the result of the inherent vulnerability of our buildings and lifelines. In 1974, Oregon adopted a statewide building code that mandated some seismic resistance for new construction. Prior to that date, the majority of buildings in Oregon had been designed without regard to earthquake forces. In 1993, Oregon's building codes were changed to require designs that would accommodate shaking from a Cascadia subduction zone earthquake, almost doubling the earthquake forces used in earlier codes. This means that the majority of buildings in Oregon have not been designed to resist the shaking from a magnitude 9.0 Cascadia earthquake. This widespread vulnerability of Oregon's buildings is grimly illustrated in the *Statewide Seismic Needs Assessment* completed by the Oregon Department of Geology and Mineral Industries (DOGAMI) in 2007. This study surveyed public schools and public safety buildings (police and fire stations, hospitals, and emergency operation centers) in Oregon and assessed their potential for collapse in a major earthquake. Almost half of the 2,193 public school buildings examined had a high or very high potential for collapse, as did almost a quarter of the public safety buildings. Of the 2,567 highway bridges in the Oregon Department of Transportation (ODOT) system, 982 were built without seismic considerations, and of the rest, only 409 were designed specifically with consideration of Cascadia subduction zone earthquakes. The list goes on: old, brittle iron water pipes in the Portland water system, century-old bridges over the Willamette River, and highways and power transmission lines that traverse landslide-prone terrain. The core of our vulnerability to a Cascadia earthquake is not the earthquake alone, but the inadequacy of our built environment.

The experience of the Tohoku earthquake shows that few structures are likely to survive in the tsunami inundation zone. In Oregon, the USGS estimates that almost 1,900 businesses employing nearly 15,000 people are located in the scenario inundation zone. The inundation zone also contains almost 10,500 housing units with a total population of just over 22,000. This exposure to the extreme hazard posed by the tsunami is unavoidable.

Another major factor that amplifies the effects of a Cascadia earthquake is the interdependency of our lifeline systems, coupled with the wide geographic spread of a Cascadia disaster. Unlike a severe storm, a Cascadia subduction earthquake would simultaneously damage power, natural gas, and petroleum lines, roads and bridges, water and sewer systems, critical buildings, and communications over large parts of three states (i.e., California, Oregon and Washington). Restoration of communication service would require that electric power be restored, which would require that roads and bridges be repaired, which in turn would require that the petroleum delivery and distribution system be repaired. These interdependencies between lifeline systems would be made even more difficult by the broad geographic extent of the damage. The nearest undamaged urban areas from which assistance could be organized would be Spokane, Washington, Boise, Idaho, and Redding, California. Virtually all of the resources required for the recovery of lifeline systems would have to come from outside the affected states.

Estimated Impacts

The scenario Cascadia earthquake would be an unprecedented catastrophe for Oregon and for the United States. It would impact every aspect of life for all Oregonians and for the residents of northern California, Washington, and British Columbia. The effects of a Cascadia subduction earthquake will be greatest on the coast, which is right next to the subduction zone fault, and will diminish as one goes inland. This, in combination with Oregon's mountainous geography, divides the state into four impact zones: within the tsunami zone, damage will be nearly complete. In the coastal zone, shaking will be severe, liquefaction and landsliding will be widespread and severe, and damage will be severe. In the valley zone, shaking will be strong, liquefaction and landsliding will be common but less severe, and moderate damage will be widespread. In the eastern zone, shaking will be mild, landslides and liquefaction sporadic, and damage generally light.

The impacts of a great subduction earthquake on Oregon are impossible to predict accurately, but several studies have estimated damage and casualties, and those estimates give a sense for how far-reaching a disaster the next great earthquake will be. Estimated consequences include:

- Earthquake deaths ranging from 650 to 5,000, with another 600 to 5,000 deaths due to the tsunami.
- 24,000 buildings completely destroyed, and another 85,000 with extensive damage requiring months to years of repair.
- Approximately $32 billion in economic losses.
- 27,600 displaced households.
- Almost 10 million tons of debris (1 million dump truck loads).

These high levels of damage and loss reflect both the great size of the earthquake and the fact that many buildings, roads, bridges, and utility networks were designed before Oregon's building codes and practices recognized any significant earthquake threats, and most were designed before codes began to take great subduction earthquakes into account. Lifeline systems, such as highways and pipelines, are particularly vulnerable to ground failure, which will be widespread in the next great earthquake. As a result, the vulnerability analyses done for this plan are grim. For example, if the earthquake were to happen tomorrow, the estimated time to restore function would be:

- One to three years to restore drinking water and sewer service in the coastal zone.
- One month to one year to restore water and sewer in the valley zone.
- Six to twelve months to restore partial function of the top-priority highways in the valley zone.
- Two to four months to restore police and fire stations in the valley zone.
- Eighteen months to restore healthcare facilities in the valley zone, three years or more in the coastal zone.

- One to three months to restore electricity service in the valley zone.
- Three to six months to restore electricity service in the coastal zone.

These estimates of the time it will take to restore the functions necessary to maintain our population and economy are sobering, particularly when coupled with the likelihood that businesses will start to leave the state if services are not restored within one month. If we pursue a policy of "business as usual," our future after the next Cascadia earthquake will include decades-worth of declining economy and population. We can only avoid this future and achieve resilience by starting now on a sustained program to reduce our vulnerability and decrease our recovery time before the next earthquake inevitably occurs.

Recommendations

The Cascadia Scenario workgroup prepared a description of the likely effects of a magnitude 9 subduction earthquake for the other workgroups to use in their evaluations. The scenario used the best currently available data, and well-established methods, but still provides an estimate that has a lot of uncertainty and little detail. For an improved understanding of the threat posed by Cascadia earthquakes, we recommend that the state:

- ► Support Oregon universities and state agencies to carry out research into the effects of future Cascadia subduction earthquakes and tsunamis on Oregon's landscape, population, buildings and lifelines;
- ► Support Oregon universities and state agencies in preparing more detailed and accurate estimates of damage and loss in Oregon from future Cascadia subduction earthquakes and tsunamis; and
- ► Provide ready access to the best available Cascadia earthquake information for emergency responders and planners, architects and engineers, and the general public.
- ► In order to ensure that design of future structures, retrofit of existing structures, seismic vulnerability evaluations and preparedness planning will provide adequate resilience, we also recommend that all of these efforts use, as a minimum, the ground motion parameters provided by the most current version of the International Building Code, which reflect the most current USGS seismic hazard maps.

Reference

1. DOGAMI (2007), *Statewide Seismic Needs Assessment Using Rapid Visual Screening (RVS)*. For detailed information, see http://www.oregongeology.com/sub/projects/rvs/default.htm#overview

2. Oregon Department of Transportation (2009), *Seismic Vulnerability of Oregon State Highway Bridges: Mitigation Strategies to Reduce Major Mobility Risks*. For detailed information, see ftp://ftp.odot.state.or.us/Bridge/bridge_website_chittirat/2009_Seismic_Vulnerability_final.pdf.

3. SPUR (2009). *The Resilient City: Defining What San Francisco Needs from Seismic Mitigation Policies*. For detailed information, see http://www.spur.org/initiative/resilient-city

4. Washington Seismic Safety Committee (2012). *Resilient Washington State: A Framework for Minimizing Loss and Improving Statewide Recovery after an Earthquake*. November. See http://www.emd.wa.gov/about/SeismicSafetyCommittee.shtml

Water for Fire Suppression

In the current state of readiness, existing water systems would experience extensive leaks and breaks in water supply pipelines. These leaks, coupled with loss of water supply facilities, such as treatment plants and pump stations, would drain the water systems. This loss of volume and pressure would critically limit the availability of water supply for conventional urban firefighting: fire hydrants would be rendered useless, and many fire sprinkler systems would be inoperable (even those sprinkler systems that remain intact).

Urban and suburban firefighting strategies would resemble those commonly used in rural areas: water for fire suppression would only be available from lakes, rivers, streams, swimming pools, and any surviving local water storage reservoirs. Fire engines would draft from these sites and rely on tankers to move water to fires. The combination of transportation infrastructure damage, compromised emergency communications systems, and high emergency incident volumes, would limit the ability of fire departments to respond to individual incidents. Fire departments would have to identify, assess, and prioritize responses and would focus on life safety and containment rather than trying to extinguish every fire. Photos of previous earthquake-relate fire events are shown in Figures 8.8–8.10.

Figure 8.8: Fire in the Marina District required a fireboat to pump water for suppression, Loma Prieta earthquake, San Francisco, 1989. Over 100 pipeline failures occurred within the immediate area. (Source: Photo Source Unknown)

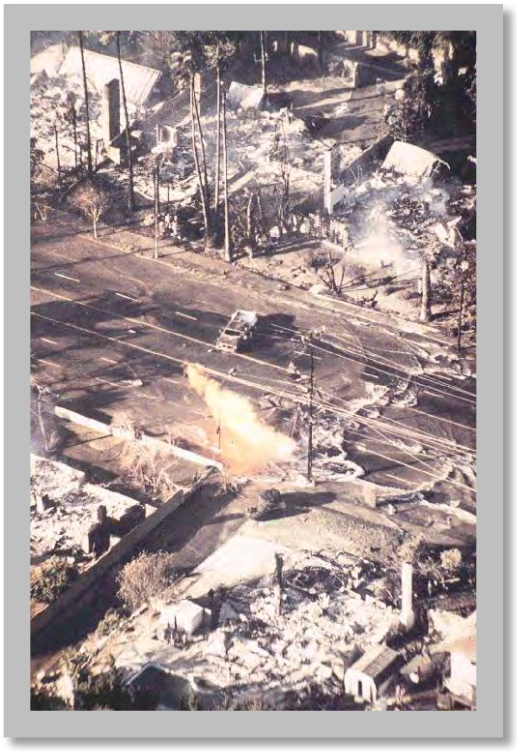


Figure 8.9: Fire from a gas line explosion on Balboa Boulevard, Northridge earthquake, California, 1994 (Source: Photo Source Unknown)

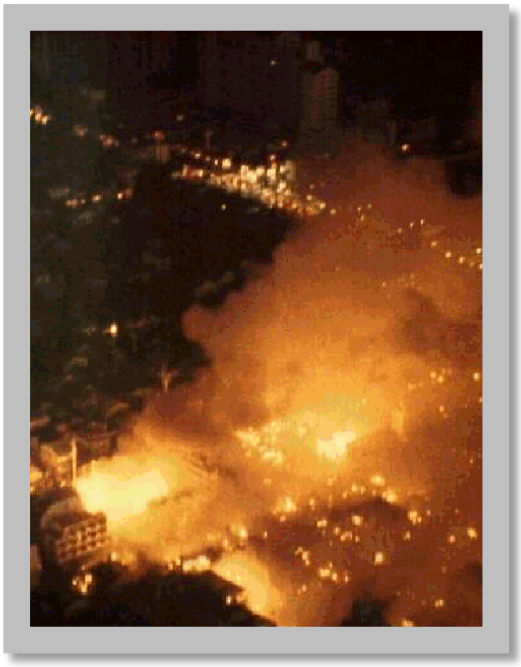


Figure 8.10: Conflagration resulting from water system failures, Great Hanshin earthquake, Kobe, Japan, 1995 (Source: Photo Source Unknown)

Potable Water Supplies

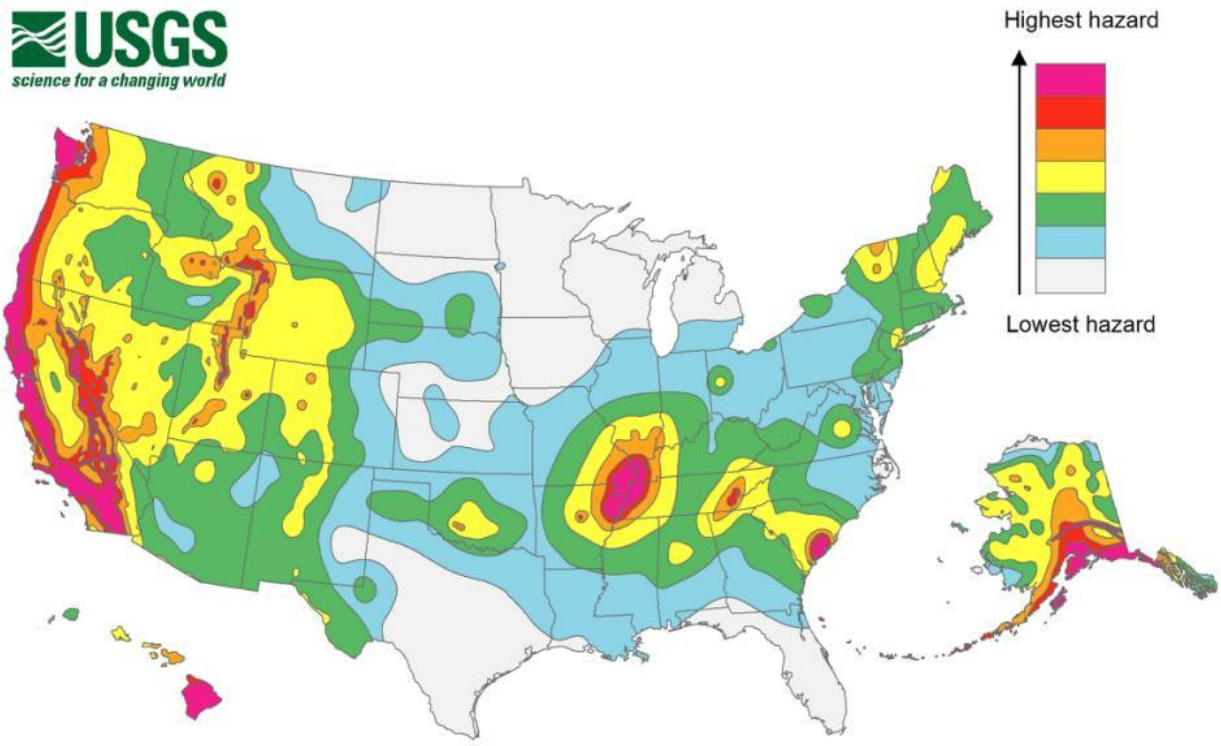
In the current state of readiness, water utilities would be unable to provide water from the existing distribution system. Communities would rely on emergency supplies for the first one to two weeks, depending on location and on the condition of transportation infrastructure. Some areas would have *no* water supplies during that time. Water for healthcare facilities such as hospitals would be severely restricted. Emergency water supplies would meet only subsistence needs (for example, direct consumption and very limited bathing). For the first one to two months, water would be delivered via tankers to smaller tanks and bladders distributed throughout the community. People would wait in line to fill their containers and then carry the water home. Some water would come from portable water

Exhibit FF

Risk of earthquake increased for one-third of US

AP

By **SETH BORENSTEIN**July 18, 2014 5:36 AM



[This undated handout image provided by the US Geological Survey (USGS) shows an updated federal earthquake risk map. A new map dials up the shaking hazard just a bit for about half of the US and lowers it for nearly a quarter of the nation. The U.S. Geologic Survey updated Thursday its national seismic hazard maps for the first time since 2008, taking into account research from the devastating 2011 earthquake and tsunami off the Japanese coast and the surprise 2011 Virginia temblor. (AP Photo/USGS)]

WASHINGTON (AP) — A new federal earthquake map dials up the shaking hazard just a bit for about one-third of the United States and lowers it for one-tenth.

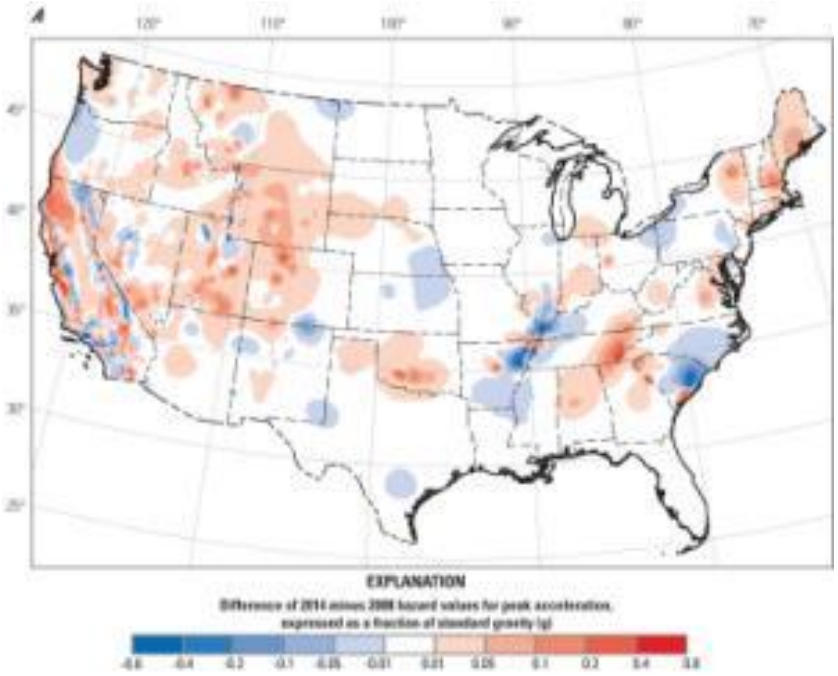
The U.S. Geological Survey on Thursday updated its national seismic hazard maps for the first time since 2008, taking into account research from the devastating 2011 earthquake and tsunami off the Japanese coast and the surprise 2011 Virginia temblor.

The maps are used for building codes and insurance purposes and they calculate just how much shaking an area probably will have in the biggest quake likely over a building's lifetime.

The highest risk places have a 2 percent chance of experiencing "very intense shaking" over a 50-year lifespan, USGS project chief Mark Petersen said. Those with lower hazard ratings would experience less intense swaying measured in gravitational force.

"These maps are refining our views of what the actual shaking is," Petersen said. "Almost any place in the United States can have an earthquake."

Parts of 16 states have the highest risk for earthquakes: Alaska, Hawaii, California, Oregon, Washington, Nevada, Utah, Idaho, Montana, Wyoming, Missouri, Arkansas, Tennessee, Illinois, Kentucky and South Carolina. With the update, new high-risk areas were added to some of those states.



[This undated handout image provided by the US Geological Survey (USGS) shows where the earthquake hazard increased and decreased from 2008. Red/brown increased. Blue decreased. A new federal earthquake risk map dials up the shaking hazard just a bit for about half of the United States and lowers it for nearly a quarter of the nation. The U.S. Geologic Survey updated Thursday its national seismic hazard maps for the first time since 2008, taking into account research from the devastating 2011 earthquake and tsunami off the Japanese coast and the surprise 2011 Virginia temblor. (AP Photo/USGS)]

Also, Colorado and Oklahoma saw increased risk in some parts and moved up to the second of the seven hazard classifications, he said.

There are major faults and quake hazards along the entire west coast, with an increased concern in the Cascadia region around Oregon. Southern Alaska, the big island of Hawaii, the Missouri-Tennessee-Arkansas-Illinois New Madrid fault area and Charleston round out the biggest hazard areas.

But shaking hazards are nearly everywhere.

Much of the country west of the Rockies, along with parts of Oklahoma and Tennessee and sections of central Arkansas, northern Alabama, Georgia, South Carolina, Indiana, Illinois, Ohio, Michigan, Virginia, New York and New England saw an increase in shaking hazards for small buildings like houses.

At the same time much of North Carolina, the northern tip of South Carolina, patches of Texas, New Mexico, Oregon, Utah, Nebraska, Arkansas, Kentucky, Tennessee, Ohio, Pennsylvania and New York saw hazard levels lower slightly. And using a different type risk analysis for tall buildings the shaking hazard in New York City dropped ever so slightly, Petersen said.

Petersen said the maps sidestep the issue of earthquakes created by injections of wastewater from oil and gas drilling in Oklahoma and other states, saying those extra quakes weren't included in the analysis. So far this year, nearly 250 small to medium quakes have hit Oklahoma.

Much of the research and cataloging was done by the nuclear industry in response to the quake and tsunami that crippled Japan's Fukushima reactor. And researchers at the University of California, Berkeley came up with a better model to simulate shaking, Petersen said.

"I see it as a big improvement," said Cornell University seismologist Rowena Lohman. "They brought in more information."___

Online:

USGS map: http://pubs.usgs.gov/of/2014/1091/

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http://pubs.usgs.gov/of/2014/1091/

Documentation for the 2014 Update of the United States National Seismic Hazard Maps

By Mark D. Petersen, Morgan P. Moschetti, Peter M. Powers, Charles S. Mueller, Kathleen M. Haller, Arthur D. Frankel, Yuehua Zeng, Sanaz Rezaeian, Stephen C. Harmsen, Oliver S. Boyd, Ned Field, Rui Chen, Kenneth S. Rukstales, Nico Luco, Russell L. Wheeler, Robert A. Williams, and Anna H. Olsen

Abstract

The national seismic hazard maps for the conterminous United States have been updated to account for new methods, models, and data that have been obtained since the 2008 maps were released (Petersen and others, 2008). The input models are improved from those implemented in 2008 by using new ground motion models that have incorporated about twice as many earthquake strong ground shaking data and by incorporating many additional scientific studies that indicate broader ranges of earthquake source and ground motion models. These time-independent maps are shown for 2-percent and 10-percent probability of exceedance in 50 years for peak horizontal ground acceleration as well as 5-hertz and 1-hertz spectral accelerations with 5-percent damping on a uniform firm rock site condition (760 meters per second shear wave velocity in the upper 30 m, V_{S30}). In this report, the 2014 updated maps are compared with the 2008 version of the maps and indicate changes of plus or minus 20 percent over wide areas, with larger changes locally, caused by the modifications to the seismic source and ground motion inputs.

Suggested citation:

Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 update of the United States national seismic hazard maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p., *http://dx.doi.org/10.333/ofr20141091*.

ISSN 2331-1258 (online)

Exhibit GG

Oregon Department of Transportation
Region 3 Geology-Environmental Section
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FAX TRANSMITTAL

To: Richard Knablin

Fax Number:

4 page(s), (5), including this cover sheet

Notes:

SOILS AND GEOLOGICAL EXPLORATION LOG

HIGHWAY DIVISION

Project	JORDAN COVE ROAD - SEVENMILE CREEK		Hole No. 89-1
Highway	OREGON COAST	County COOS	Prefix C006 1420
Purpose of Work	PRELIMINARY BORING EMPIRE TUNNEL ALTERNATE		Bridge No. —
Equipment	MOBILE B-53 (RE760893)		Tube Elev. —
Geologist	F. N. TOOR	Driller J. ARONSON	Recorder R. KOBERNIK
Hole Location	Line, Sta. 60+31 Lt.	C.L. (RT) 208 ft.	Ground Elev. 14.2

Tests		Drilling Method		Groundwater Level	
"N" — Standard Penetration,	No. 14	—	Auger Depth —	Date	Depth
"M" — Oregon Miniature Pile,	No. —	0' 160'	Casing Depth 160'	6-20-89	1.5
"C" — Core, Barrel Type NQWL	No. 19		Open Depth 10'	6-23-89	artesian
"U" — Undisturbed Sample, Size —	No. —		Total Depth 170'	6-26-89	13.4
				6-27-89	6.7
				6-28-89	11.0

Date Started 6-19-89 Date Completed 6-29-89 Sample Data Sheet No.

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery.	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description
								Color Wet-Dry Consistency Jointed-Broken Plasticity Angular-Rounded Organic Content Drill Remarks etc.
1	N-1	4-8-13-19	1½	60				(N-1) 0'-2' SAND, medium to fine grained, clean, with some shell fragment medium dense, brown
		2'						
	AC-1							(AC-1) 0'-4' advance casing
		4'						
5	N-2	8-8-25-26	1'	50				(N-2) 4'-6' SAND, medium to fine grained, clean, with some shell fragments dense, brown
		6'						
	AC-2							(AC-2) 4'-9' advance casing
		9'						
10	N-3	6-10-12-13	1'	50				(N-3) 9'-11' SAND, medium to fine grained, clean, with some shell fragments, medium dense, brown
		11'						
	AC-3							(AC-3) 9'-14' advance casing
		14'						
15	N-4	1-1-2-3	1½	70				(N-4) 14'-16' SAND, Trace to some silt, very loose, gray, fine grained
		16'						
	AC-4							(AC-4) 14'-19' advance casing
		19'						

Hole No. 89-1 Page 2 of 7

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery,	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description (Color, Consistency, Plasticity, Organic Content; Wet-Dry, Jointed-Broken, Angular-Rounded, Drill Remarks etc.)
		19'						(N-5) 19'-21' SAND, fine, medium dense, gray, trace of shell fragments
20	N-5	3-7-7-10	1.4'	70				
		21'						
	AC-5							(AC-5) 19'-24' advance casing
		24'						
								(N-6) 24'-26'
25	N-6	11-17-29-26	1.8'	60				SAND, fine, dense, brown
		26'						
	AC-6							(AC-6) 24'-29' advance casing
		29'						
								(N-7) 29'-31'
30	N-7	10-10-12-18	1.6'	80				SAND, fine medium dense, trace of shell fragments, brown + gray
		31'						
	AC-7							(AC-7) 29'-34' advance casing
		34'						
								(N-8) 34'-36'
35	N-8	11-21-25-34	1.5'	70				SAND, fine, dense, gray
		36'						
	AC-8							(AC-8) 34'-39' advance casing
		39'						
								(N-9) 39'-41'
40	N-9	13-28-34-49	1.5'	75				SAND, fine, very dense, brown
		41'						
	AC-9							(AC-9) 39'-49' advance casing
45								

Hole No. 89-1 Page 3 of 7

JORDAN COVE ROAD - SEVENMILE CREEK EMPIRE TUNNEL

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery,	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description (Color, Consistency, Plasticity, Organic Content; Wet-Dry, Jointed-Broken, Angular-Rounded, Drill Remarks etc.)
		49°						
50	N-10	12-29-35-45	1'	85				(N-10) 49° - 51° SAND, fine, very dense, gray
		51°						
55	AC-10							(AC-10) 49° - 59° advance casing
		59°						
60	N-11	19-59-60	1'	73				(N-11) 59° - 60° SAND, fine, very dense, brown to gray
		60°						
65	AC-11							(AC-11) 59° - 69° advance casing
		69°						
70	N-12	32-60	1°	100				(N-12) 69° - 70° SAND, fine, very dense, gray with trace of shell fragments
		70°						
75	AC-12							(AC-12) 69° - 79° advance casing

Hole No. 89-1 Page 4 of 7

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery,	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description (Color, Consistency, Plasticity, Organic Content; Wet-Dry, Jointed-Broken, Angular-Rounded, Drill Remarks etc.)
75								
		79⁵						(N-13) 79⁵ - 80⁵ SAND, fine, very dense, gray, some wood
80	N-13	17-60-60	1⅔	80	RQD			SANDSTONE, RD, extremely soft, gray
		80⁵						
	AC-13							(AC-13) 79⁵ - 81⁵ advance casing
		81⁵						
	N-14	23 - 60/0⅓	0⅜	100	RL			(N-14) 81⁵ - 82⅓ SANDSTONE, very soft, gray
		82⅓						
								(C-1) 82⅓ - 86⅝ SANDSTONE, very soft, gray
	C-1		3⅝	86	R1 / 0			
85								
		86⅝						
								(C-2) 86⅝ - 91⅝ SANDSTONE, soft, gray, some fine grained zones evident
	C-2		5⅜	100	RQ / 56			
90								
		91⅝						
								(C-3) 91⅝ - 96⅝ SANDSTONE/MUDSTONE, soft gray layers alternate, generally less than 6 inches thick
	C-3		5⅜	100	RQ / 50			
95								
		96⅝						
								(C-4) 96⅝ - 101⅝ SANDSTONE, soft, gray
	C-4		4⅜	84	RQ / 10			
100								
		101⅝						

Hole No. 89-1 Page 5 of 7

JORDAN COVE ROAD - SEVENMILE CREEK EMPIRE TUNNEL

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery.	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description (Color, Consistency, Plasticity, Organic Content; Wet-Dry, Jointed-Broken, Angular-Rounded, Drill Remarks etc.)
	C-5		4.0	80	R2/20			(C-5) 101.5 - 106.5 SANDSTONE, soft, gray
105		106.5						
	C-6		5.0	100	R2/40			(C-6) 106.5 - 111.5 SANDSTONE, soft, gray
110		111.5						
	C-7		4.0	80	R2/10			(C-7) 111.5 - 116.5 SANDSTONE, soft, gray
115		116.5						
	C-8		1.6	52	R2/0			(C-8) 116.5 - 118.6 SANDSTONE, soft, gray, fractured DRILLER NOTES THIS AS A SIGNIFICANT WATER LOSS ZONE
		118.6						
120	AC-14	120.1						(AC-14) 0.0 - 120.1 advance and set casing
	C-9		4.1	88	R2/70			(C-9) 120.1 - 125.1 SANDSTONE, soft, gray gradation varies
125		125.1						
	C-10		5.0	100	R2/40			(C-10) 125.1 - 130.1 SANDSTONE, soft, gray
130		130.1						

Hole No. 89-1 Page 6 of 7

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery,	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description (Color, Consistency, Plasticity, Organic Content; Wet-Dry, Jointed-Broken, Angular-Rounded, Drill Remarks etc.)
	C-11		5.0	100	R2/60			(C-11) 130'–135' SANDSTONE soft, gray, gradation varies
135		135'						
	C-12		5.0	100	R2/30			(C-12) 135'–140' MUDSTONE, soft, gray
140		140'						
	C-13		5.0	100	R2/50			(C-13) 140'–145' MUDSTONE soft gray, with sandstone lenses
145		145'						
	C-14		5.0	100	R2/35			(C-14) 145'–150' MUDSTONE soft, gray with sandstone lenses
150		150'						
	C-15		4.0	80	R2-A/0			(C-15) 150'–155' SANDSTONE/MUDSTONE interbedded soft, gray DRILLER NOTES A SIGNIFICANT WATER LOSS ZONE NEAR END OF RUN (last foot)
155		155'						
	C-16		0.8	23	R1/0			(C-16) 155'–158.6' SANDSTONE/MUDSTONE, very soft, gray
		158.6						

Hole No 87-1 Page 1 of 1

JORDAN COVE ROAD – SEVENMILE CREEK EMPIRE TUNNEL

Depth, ft.	Test Type No.	Driving Resistance	Measured Recovery	% Recovery	Hardness R.Q.D.	Graphic Log	% Natural Moisture	Material Description (Color, Consistency, Plasticity, Organic Content; Wet-Dry, Jointed-Broken, Angular-Rounded, Drill Remarks etc.)
	AC-15							(AC-15) 120' – 160' advance casing
160		160'						
	C-17		1'	100	R2/63			(C-17) 160' – 161.2' SANDSTONE, soft, gray
		161.2'						
	C-18		5.0'	100	R2/90			(C-18) 161.2' – 166.2' SANDSTONE, soft, gray
165								
		166.2'						
	C-19		4.7'	100	R3/90			(C-19) 166.2' – 170.9' SANDSTONE, soft, gray
170								
		170.9' BOTTOM						
								NOTE: BEDDING dip varied from 48° to 70°
								Hole was bailed to 74.2 feet Yield is about 2.3 GPM at this level. Water level recovered to 16.2 feet in 80 minutes.
175								

Exhibit HH

Wetland Delineation Report
Linerboard Mill Site

Gateway Marine Terminal Project

Prepared for:

Oregon International Port of Coos Bay
125 Central Avenue
Suite 300
Coos Bay, Oregon 97420

Prepared by:

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon 97201

June 2007

DAVID EVANS AND ASSOCIATES INC.

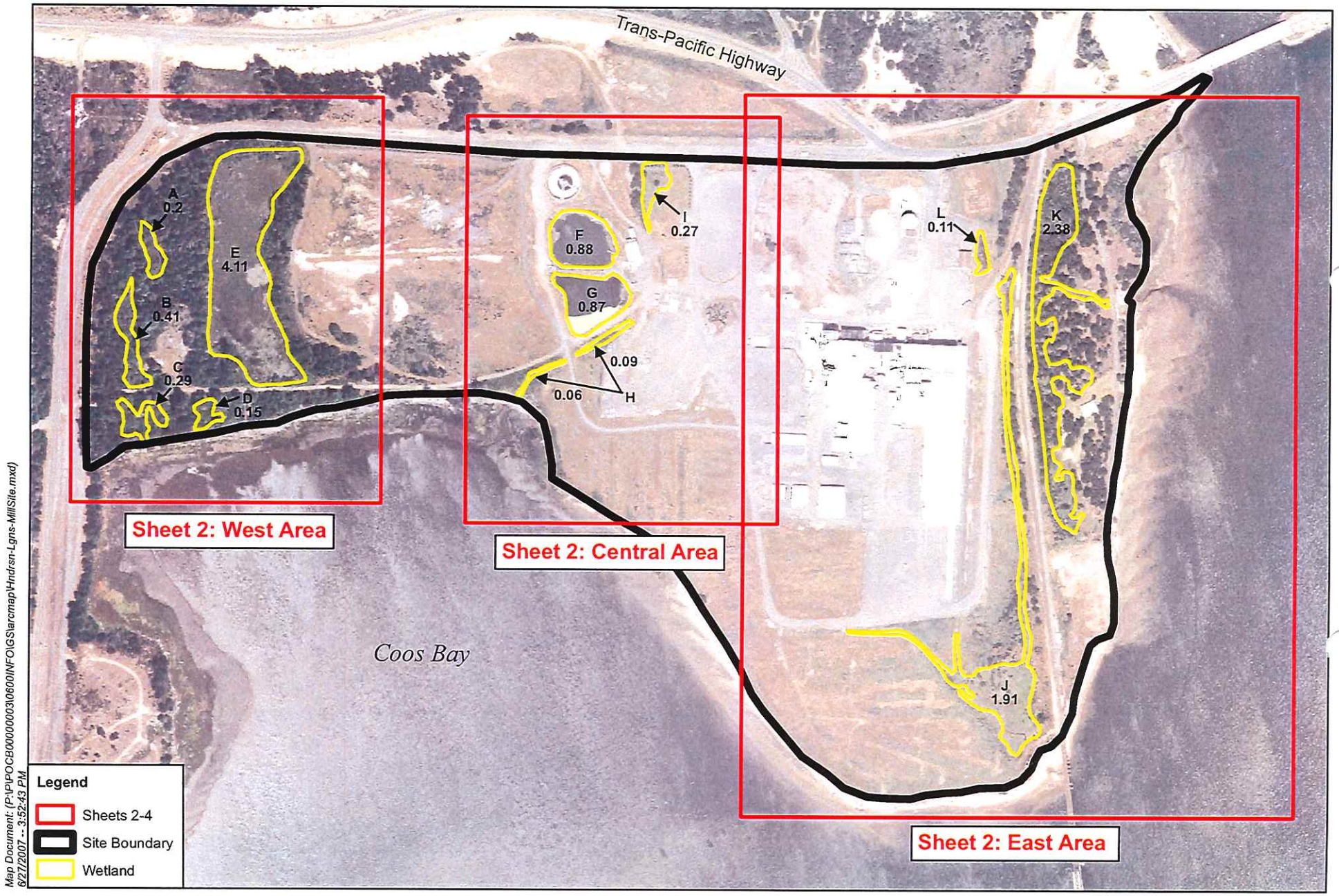


Figure 4 (Sheet 1 of 4)

Liner Board Mill Site Wetland Delineation (KEY)

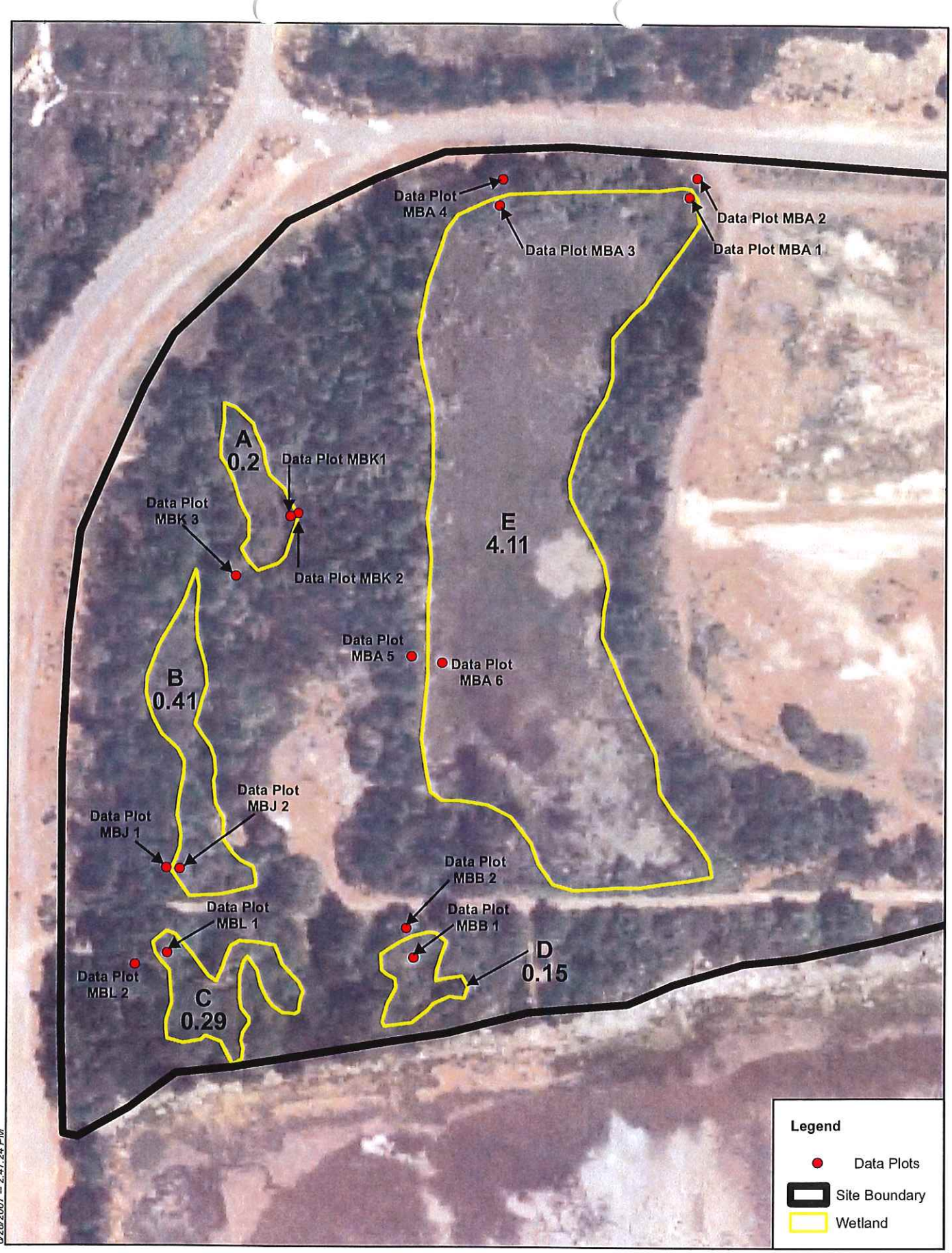


Figure 4 (Sheet 2 of 4)
Liner Board Mill Site Wetland Delineation (West Area)

Exhibit II

LEGEND

- Manhole
- Pump Station
- Settling Pond
- Landfill

Leachate Lines

- Existing Leachate Line
- New Leachate Line
- Disconnect Leachate Line

City Water Lines

- Existing City Water Line
- New Water Line
- Disconnect City Water Line

BASIN DETAIL PLAN FROM FILE BY GSI WATER SOLUTIONS, INC., DATED FEBRUARY 28, 2012

North

0 180 360 FT

GRI

JORDAN COVE ENERGY PROJECT
FORMER WEYERHAEUSER MILL SITE AND INGRAM YARD
WORK PLAN FOR JOINT PROGRAM REGULATORY CLOSURE

BASIN DETAIL PLAN

JULY 2013 JOB NO. 4277-S FIG. 3

RESIDUAL MILL CONTAMINATION FROM FILE BY DEQ (2012)

North

0 400 800 FT

GRI

JORDAN COVE ENERGY PROJECT
FORMER WEYERHAEUSER MILL SITE AND INGRAM YARD
WORK PLAN FOR JOINT PROGRAM REGULATORY CLOSURE

RESIDUAL MILL CONTAMINATION

JULY 2013 JOB NO. 4277-S FIG. 4

Exhibit JJ

The Following from – http://timrileylaw.com/LNG.htm

January 19, 2004

LNG BLAST

LNG Explosion In Algeria Industrial Zone

Port was designed to load only small LNG Tankers for short distances
Death Toll Currently: 27
Workers Injured: 74
Blast Felt Miles Away
Facility Destroyed
Fires Raged For 8 Hours
Property Damage: Approx. $ 1 Billion
Cause: Initially: "Defective Boiler" Which Had Earlier Received "Superficial Repairs"
Cause: Currently: Liquefied Natural Gas Leak in Pipe

SEE NEWS STORY EXCERPTS ABOUT THE ACCIDENT FURTHER BELOW

BBC NEWS

Four killed in Algeria gas blast

Monday, 19 January, 2004, 21:35 GMT
Full Story: http://news.bbc.co.uk/1/hi/world/africa/3411651.stm

ABSTRACTS:

An explosion at a natural gas complex in Algeria has killed at least four people and injured about 60 others. The blast took place at a state-owned liquefied natural gas unit in the industrial zone of the north-eastern coastal town of Skikda.

"We're still fighting the fires but we have yet to determine the cause of the explosion," a civil defense official in Skikda told Reuters news agency.

One witness told Reuters the explosion was felt miles away. © BBC MMIV

Reuters

At least 27 dead in Algeria blast, refinery shut

January 20, 2004
By Zohra Bensemra
Full Story:
http://www.reuters.com/locales/newsArticle.jsp;:400d65e8:2f1f10da5ee06141?type=worldNews&locale=en_IN&storyID=4165226

SKIKDA, Algeria (Reuters) - At least 27 workers died when a gas plant blew up...
The powerful blast and consequent fires devastated...
It was the worst LNG accident since 1975 when about 40 people died in an explosion in Staten Island, U.S., according to Andrew Flower, an independent gas consultant...

Channelnewsasia.com

Algerian gas plant explosion kills 27, injures 72

21 January 2004 0044 hrs (SST)
Full Story: http://www.channelnewsasia.com/stories/afp_world/view/67231/1/.html

ALGIERS : At least 27 people were killed and 72 injured when a huge explosion, apparently caused by a defective boiler, ripped through a liquefied natural gas plant ...

He said specialists had filed a report "more than a year ago" indicating that the boiler in question was defective. "Superficial repairs" had been carried out on the boiler, he said.

A woman living close to the plant, about 10 kilometres (six miles) outside Skikda, said: "There was a heavy blast and everything started to shake and the windows of my apartment were blown out."

Speaking haltingly, she said the complex was engulfed in smoke and flames. "We all ran out, we helped the handicapped and the old people," she said, adding: "Many of them were in shock and the children were crying."

... fire at the plant had been brought under control early Tuesday after raging for almost eight hours. (*Emphasis added*)

1/21/04
MOBILE REGISTER

More bodies found at LNG blast scene

At least 27 dead at facility similar to terminals proposed for Mobile Bay
Full Story: http://www.al.com/news/mobileregister/index.ssf?/base/news/1074680100132040.xml

Searchers discovered 10 more bodies at a liquefied natural gas complex in Algeria leveled by an explosion, raising the death toll to at least 27... Seventy-four people were injured... dozen workers were believed missing...

Information available from the Halliburton Co. of Texas shows that the oil construction giant had in recent years revamped the Algerian facility to the latest performance standards...

Industry officials and some government officials have said that such facilities have a spotless safety record, could not explode, and would pose little risk to surrounding communities. But in recent months, the Mobile Register has reported that government officials have sometimes used faulty studies to make their case to the public...

LNG industry officials maintained that the accident in Algeria should not affect how the public perceives LNG terminals in the United States.

"I would not make a direct link between the accident and any U.S. site, Mobile included," said ExxonMobil spokesman Bob Davis in Houston. "As tragic as the Algerian accident is, I don't think it negates the outstanding 40-year safety record of LNG in the world."

Davis said that the Algerian facility is "one of the oldest LNG facilities in the world, vintage 1970s. I think certainly from our point of view, the technology on these facilities has advanced substantially in that 30-year period."

But a Halliburton Co. Web site states that its engineering branch, KBR, updated the entire Skikda terminal as recently as 1999. The Web site touts the project as a model of modern American workmanship.

"Halliburton Company is pleased to announce that its recently completed Liquefied Natural Gas Revamp Project at Skikda, Algeria, has passed all its performance tests," reads the **company press release announcing the project's completion. "KBR's work included extensive revamp of the three LNG trains and associated utilities and auxiliaries and a complete revamp of the complex's electrical power and control systems. ... Over 9,000,000 construction man-hours were expended. "**

Lyons said the reports he read Tuesday claim a high-pressure boiler in need of maintenance was the cause of the accident.

"They wouldn't have high-pressure boilers at an LNG receiving terminal. I don't see any parallel in any respect to what is being contemplated anywhere along the Gulf Coast as far as LNG receiving terminals," Lyons said.

Register research, however, indicates that most existing LNG receiving terminals employ numerous boilers, many of them generating high pressure. For instance, a newly proposed LNG terminal in Freeport, Texas, would use six high-pressure vaporizers connected to 12 boilers, according to documents posted on a U.S. Environmental Protection Agency Web site.

Most LNG tankers are also powered by steam turbine engines that require large high-pressure boilers. Scientists say that an accident or terrorist attack involving a tanker could produce a fire that is much larger than an LNG fire on land... (*Emphasis added*)

(Mobile Register Staff Reporters Bill Finch, Ben Raines and Lee Davidson contributed to this article.)

Copyright 2004 al.com.

UpstreamOnline.com
February 3, 2004

Industry opponents have a field day

Full Story: http://www.upstreamonline.com/news/article.jsp?Id=EPS_52937
By Dann Rodgers

Opponents of LNG import projects in the US have wasted no time in pointing to last week's tragedy in Algeria as highlighting safety concerns about such facilities

"The Algerian explosion destroyed more than an LNG facility -- it destroyed the industry myth that LNG is safe," said consumer protection advocate Tim Riley, who hosts the website TimRileyLaw.com that documents what he sees as the dangers of the fuel.

"Quite simply, LNG is too damn dangerous and the energy industry has always known it. The American communities facing LNG proposals have listened to the LNG 'safety spin' but have now heard the explosive truth, galvanizing opposition.

"The blast was felt around the world and serves as a wake-up call to private investors, financial institutions and insurance carriers who would risk major losses from another inevitable LNG disaster," Riley declared.

In Weaver's Cove, Massachusetts, Mayor Edward Lambert opposes a local LNG import terminal proposal precisely because of the Algerian disaster.

"This speaks to the credibility of those people who are running around saying how safe this stuff is, saying it doesn't explode. It clearly points to the safety concerns that these terminals don't belong in populated areas."

Local Fire Chief Ed Dawson noted that fires at LNG import terminals are rare but that the Algerian situation illustrates the danger they present. "The chances of it happening here are very remote. But the reality of it is we just had an incident in Algeria. The devastation speaks for itself." (*Emphasis added*)

April 14, 2004

Report sheds new light on LNG blast in Algeria

Full Story: http://www.al.com/news/mobileregister/index.ssf?/base/news/1081934271102960.xml
Document suggests that deadly explosion was caused by gas vapor, not boiler
By BEN RAINES

“A newly released document provides important insights into the chain of events that led to the January explosion of a liquefied natural gas facility in the African nation of Algeria.”

"Several scientists who specialize in LNG research said the document indicates that a similar accident could occur at LNG plants like those proposed for Mobile Bay and elsewhere in the United States."

"Initial reports blamed a faulty steam boiler for the massive explosion and fire at the government-owned Skikda, Algeria, plant. Those reports were incorrect, according to the new document presented by Sonatrach, owner of the destroyed LNG plant."

"A PowerPoint display titled "'The Incident at the Skikda Plant: Description and Preliminary Conclusions' indicates, instead, that **a large amount of liquid gas escaped from a pipe and formed a cloud of highly flammable and explosive vapor that hovered over the facility. The cloud exploded after coming into contact with a flame source.**"

"Most of the 27 people who died were killed by the force of the blast, according to the report. The report lists a "'few casualties by fire,' though the fire burned for eight hours."

"But several scientists who examined the new report told the Mobile Register that the type of accident described in it could occur at an LNG facility in this country, regardless of the type or number of boilers present. Almost any source of ignition, from a cigarette lighter to a pilot light, could have ignited a vapor cloud."

"'I think this tells us that dealing with LNG is a tricky and dangerous business,' said James Fay, professor emeritus at the Massachusetts Institute of Technology and one of the nation's leading LNG scientists. 'It was apparently a very large gas leak that went on for a while before the explosion. That certainly doesn't give you a lot of faith in their gas detection equipment, with all this gas leaking out. I guess this means sometimes that equipment doesn't work.'"

"'The fact that there was a vapor cloud is huge," said Bill Powers, an engineer based in California who has studied LNG terminals, siting issues for both onshore and offshore proposals. "We don't know if it was an LNG vapor cloud or an LPG cloud or a mix of both, but, either way, it means it is the kind of accident that could happen here.'"

"Powers also felt it was noteworthy that Halliburton had conducted a major renovation of the Skikda plant in 1999, updating all of the key safety equipment and computer systems."

"A Halliburton Co. Web site touts the revamped LNG terminal as a model of modern American workmanship."

"'Halliburton Company is pleased to announce that its recently completed Liquefied Natural Gas Revamp Project at Skikda, Algeria, has passed all its performance tests," reads the company news release announcing the project's completion. "KBR's work included extensive revamp of the three LNG trains and associated utilities and auxiliaries and a complete revamp of the complex's electrical power and control systems. ... Over 9,000,000 construction man-hours were expended.'"

"The three separate LNG regasification plants or "trains" that were revamped by Halliburton were destroyed in the explosion."

"Powers said Halliburton's engineers had missed a weak link in their safety planning for the facility." (*Emphasis added*) Copyright 2004 al.com.

Exhibit KK

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE:	August 19, 2013
TO:	Ron Hughes, Oregon Department of Transportation John Rowe, Coos County, Oregon Bob Dillard, City of North Bend, Oregon
AUTHOR:	Josh Anderson, PE, PTOE
SUBJECT:	**Addendum to Jordan Cove Energy Project Transportation Impact Analysis Regarding the North Point Workforce Housing (NPWH) Project**
PROJECT:	**Jordan Cove Energy Project – JCEP0000-0004**
COPIES TO:	Greg Blackard (Kiewit), Bob Braddock (Jordan Cove Energy Project)

This memorandum serves as an addendum to the Jordan Cove Energy Project Transportation Impact Analysis (TIA), dated July 2012. The intent is to address concerns raised after the submittal of the TIA around the transportation impacts of construction workforce housing. As demonstrated by this memorandum, if the North Point site in North Bend were to be used for Temporary Workforce Housing in support of the Jordan Cove Energy Project. Nearby intersections would not fail to meet applicable transportation operations standards set forth by the Oregon Department of Transportation (ODOT) or the City of North Bend (City).

After submittal of the TIA, Jordan Cove Energy Project has further refined plans for the construction of the project. The maximum assumed number of construction workers on site has dropped from a peak of 2,612 workers to 2,100 workers. The peak month of construction has shifted from February of 2016 to July of 2017. The single largest change in assumptions from the July 2012 TIA to this addendum is that the contractor who has been hired to construct the project is now planning on using temporary workforce housing to accommodate the expected non-local workforce. School type busses are planned to be used to transport workers between the camp and the construction site. Workers will not be allowed to use personal vehicles. The housing site is proposed to be located on the North Point Site to the west of US101 on the south bank of Coos Bay, as shown inFigure 1 (on the following page) and will be referred to as North Point Workforce Housing (NPWH).

The methodology used in the following analysis is unchanged from that of the TIA. The following assumptions were agreed upon at a pre-application meeting, held at the City of North Bend on June 26, 2013 at 1:00 PM in the City Council Chambers;

- Analysis will be focused on the PM peak hour only.
- Analysis will focus on the intersection of US 101 at Ferry Road.
  - Follow up communications with Mr. Windham (North Bend) lead to an expansion of the study area to include the intersection of Ferry Road at Chappell Parkway.
- Counts from June 26, 2013 will be acceptable for summer weekday traffic conditions.
- Methodology will be consistent with that of the 2012 TIA.

- Trip generation and distribution for the NPWH project will be based on 24 busses making two round trips during the PM peak as well as 200 single occupancy vehicles (primarily supervisors and senior staff level employees) returning to the NPWH site in the PM peak.
    - To be conservative all 296 trips will be assumed to happen during the PM peak hour even though they will likely occur over roughly a two hour period due to the staggering of shifts.
- For analysis purposes, the busses will be assumed to be heavy vehicles.

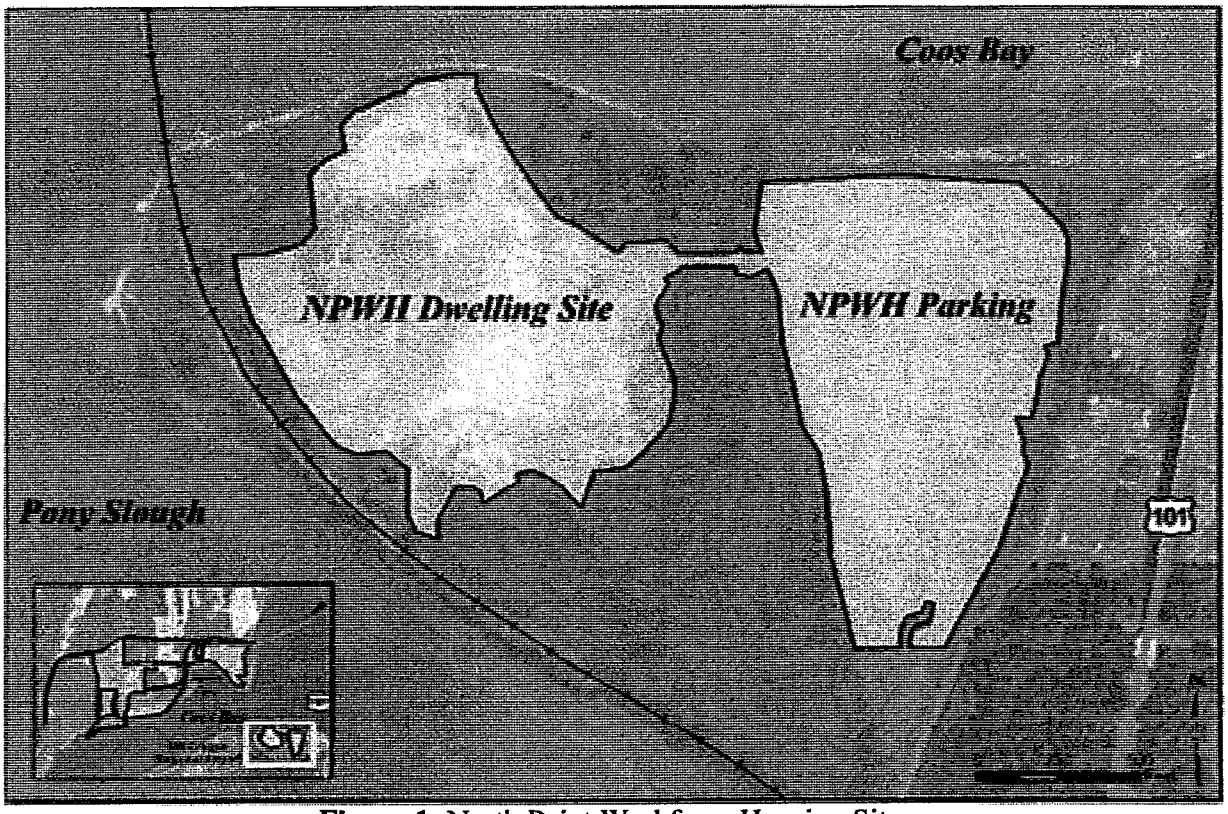


Figure 1: North Point Workforce Housing Site

The following mobility targets will govern the analysis:

- City of North Bend – Peak hour LOS D based on HCM compliant delay calculations.
- ODOT – Peak hour v/c target of 0.85 assuming a freight route on a statewide highway.

The project has been developed to a point where the following information has been refined and has been incorporated into this analysis:

- Peak construction activity of 2,100 workers will occur in July of 2017.
- The workforce will be split into two shifts staggered by 45 minutes.
- A standard work week will consist of five days (Monday to Friday) with 10-hour workdays. The beginning of the workday is assumed to occur before the AM peak hour of travel on US101. The end of the workday is assumed to coincide with the PM peak hour of travel on US 101.

Existing Conditions

Manual traffic counts were conducted at the two study area intersections on June 26th between 4:30 and 5:30 PM. The volume development worksheet and the raw turn movement count are attached in Appendix A.

Existing turn movement volumes and lane configurations are shown in **Figure 2.** Existing traffic operations are shown in **Figure 3.** Today, no movements are exceeding the applicable standards at either intersection in the study area. While v/c ratios are calculated for all movements, delays and LOS can only be calculated for traffic that stops or yields to other traffic movements; otherwise the information is not available (n/a).

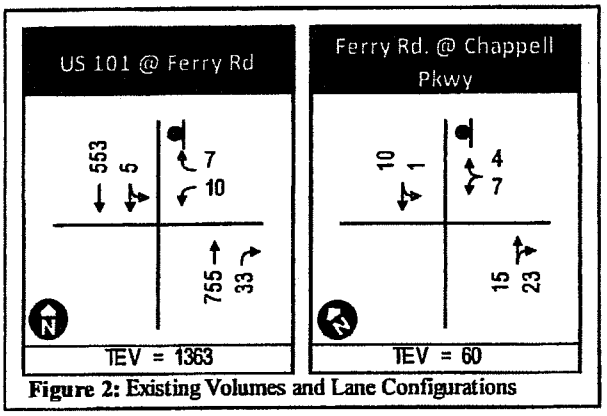


Figure 2: Existing Volumes and Lane Configurations

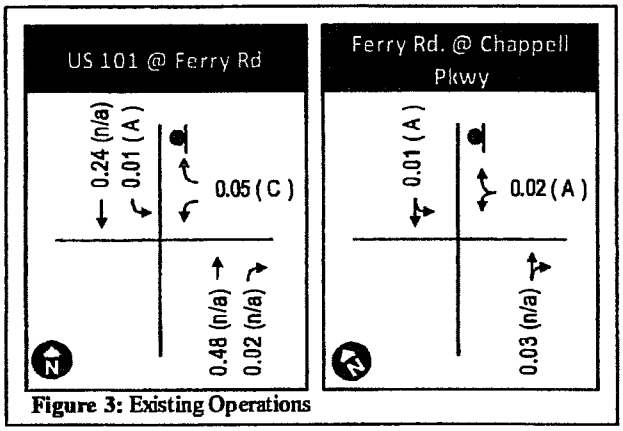


Figure 3: Existing Operations

Summer 2017 Background Conditions WITHOUT the Project

Existing summer 2013 counts were grown at a rate of 0.8 percent per year for four years to estimate year 2017 volumes without construction activity. The resulting volumes were rounded to the nearest five. Year 2017 turn movement volumes are shown in **Figure 4** below. Future background traffic operations are shown below in **Figure 5.** No movements are expected to exceed the applicable standards at either intersection in the study area by the year 2017.

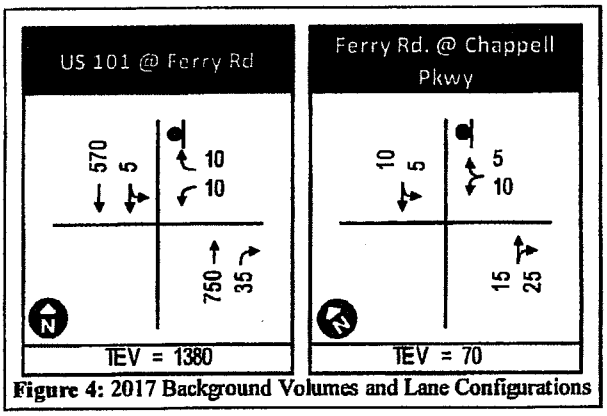


Figure 4: 2017 Background Volumes and Lane Configurations

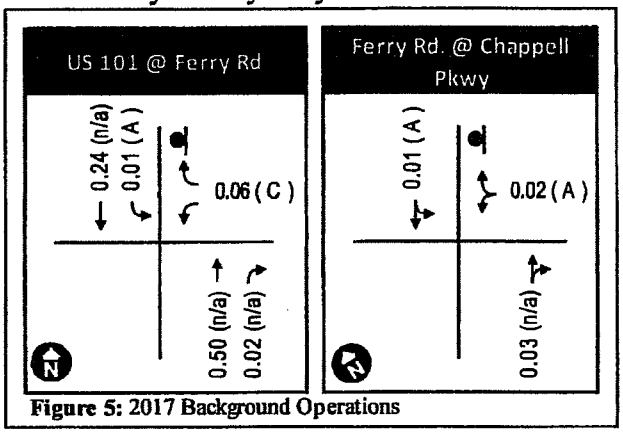


Figure 5: 2017 Background Operations

Summer 2017 Build Conditions WITH the Project

For this scenario, the 48 bus trips (both inbound and outbound) and the 200 single occupancy trips (inbound) were added to the year 2017 turn movement volumes to create a WITH the project conditions. The resulting turn movement volumes are shown in **Figure 6** below. Future traffic operations WITH the project are shown below in **Figure 7.** With the addition of the workforce vehicles, the westbound approach of Ferry Road to US 101 is expected to exceed the City of North

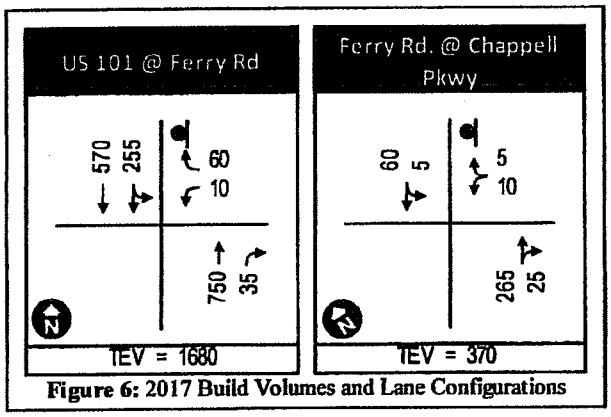


Figure 6: 2017 Build Volumes and Lane Configurations

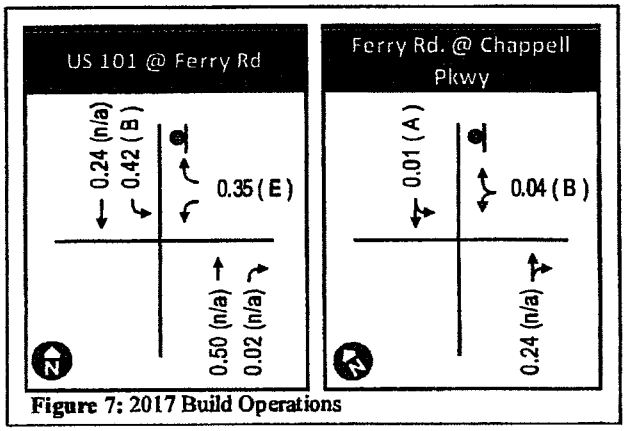


Figure 7: 2017 Build Operations

Bend level of service standard of D.

Summer 2017 Mitigated Conditions WITH the Project

Installation of a temporary traffic signal at the intersection of US 101 at Ferry Road could alleviate the substandard operations found in the Build conditions scenario. Figures 8 and 9 below summarize turning movement volumes as well as operation. Without the installation of the traffic signal, the westbound approach to would be expected to operate at LOS E. After the installation of the signal, all movements are expected to operate at LOS C or better with all v/c ratios below 0.80.

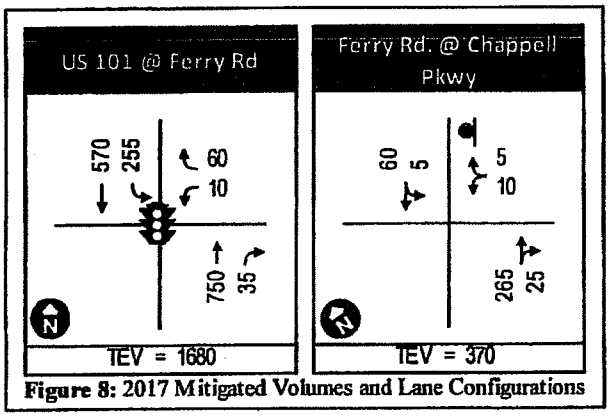


Figure 8: 2017 Mitigated Volumes and Lane Configurations

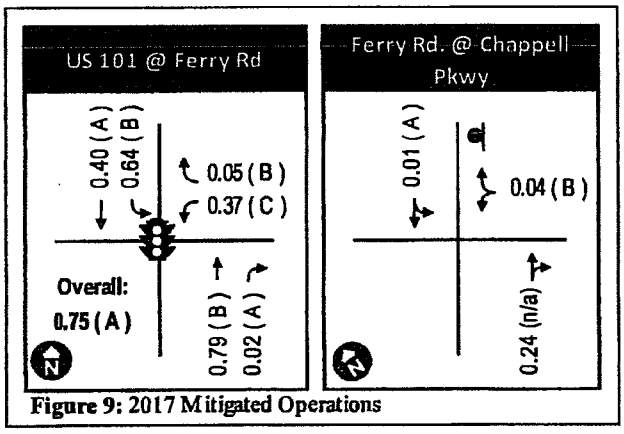


Figure 9: 2017 Mitigated Operations

Synchro output summaries for all three scenarios can be found in **Appendix B.**

Goal 12 (Transportation Planning Rule) Compliance

The North Point Workforce Housing (NPWH) Project is proposed to occupy approximately 49 acres of land within the City of North Bend that is currently zoned as heavy industrial (M-H). The NPWH project would generate 296 PM peak hour trips. This results in a trip rate of 6.04 trips per acre. Industrial trip rates (ITE based 9th edition) generate between 2.16 and 8.69 PM peak hour trips per acre with an average of 6.43 trips per acre.

Since development under the proposed conditional use permit would generate less traffic than development allowed under the existing zoning, the proposed use cannot significantly affect nearby transportation facilities and the TPR criteria are, therefore, met.

This approach has been confirmed through the judicial system in the following three cases:

- ODOT v. Clackamas County, 27 OR LUBA 141(1994)
- Friends of Marion County v. City of Keizer, 45 OR LUBA 236 (2003)
- Mason v. City of Corvallis, 49 OR LUBA 199 (2005)

Conclusions and Recommendations

With the installation of a temporary traffic signal at the intersection of US 101 at Ferry Road, the PM peak hour impacts due to the additional vehicle trips associated with the NPWH project will be mitigated. Drivers entering and exiting Ferry Road will be able to safely and efficiently gain access to US 101.

DAVID EVANS
AND ASSOCIATES INC.

APPENDIX A

Traffic Volumes and Development

Project: Addendum to Jordan Cove TIA Update
Job #: JCEP00000-007
Subject: *PM 2013 Turning Movement Volumes*
Created: 7/16/2013
Rev. Date: 7/23/2013

Growth:
Years 4
Rate 0.80%

Int No.	Synchro ID	Intersection	Direction	Movement	2013 PM Summer 2013 Existing PM Peak	2016 PM Summer 2017 Background (No Build)	PM Bus Trips	2017 PM Summer 2017 Construction (with trips)
10	10	Ferry Rd @ US 101		EBL				
	10		EB	EBT				
	10	Count Date: 6/26/2013		EBR				
	10	2013		WBL	10	10		10
	10		WB	WBT				
	10			WBR	7	10	48	60
	10			NBL				
	10	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	755	780		780
	10	Existing PHF:		NBR	33	35		35
	10	0.92		SBL	5	5	48	55
	10	Future PHF:	SB	SBT	553	570		570
	10	0.92		SBR				
			TEV		1363	1410		1510
20	10	Ferry Rd @ Chappell Pkwy		EBL	15	15	48	65
	10		EB	EBT	23	25		25
	10	Count Date: 6/26/2013		EBR				
	10	2013		WBL				
	10		WB	WBT	7	10		10
	10			WBR	4	5		5
	10			NBL				
	10	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT				
	10	Existing PHF:		NBR				
	10	0.71		SBL	1	5		5
	10	Future PHF:	SB	SBT	10	10	48	60
	10	0.71		SBR				
			TEV		60	70		170

Manual turn movement counts were conducted on 06-26-2013 by Josh Anderson, PE, PTOE

US 101 @ Ferry Rd

TOTAL VEHICLES

	NBT	NBR	SBT	SBL	WBL	WBR
4:30	54	1	41	0	2	1
4:35	82	2	53	1	1	1
4:40	57	3	53	1	2	0
4:45	60	2	52	0	0	1
4:50	59	3	33	2	1	1
4:55	63	5	60	0	1	0
5:00	52	5	45	0	0	1
5:05	65	0	49	0	0	1
5:10	64	1	42	0	2	1
5:15	71	3	35	0	0	0
5:20	66	2	50	0	0	0
5:25	62	6	40	1	1	0
4:30-5:30	**755**	**33**	**553**	**5**	**10**	**7**

PHF = 0.92

HEAVY VEHICLE VOLUME

	NBT	NBR	SBT	SBL	WBL	WBR
4:30	5	0	4	0	0	0
4:35	3	0	1	0	0	0
4:40	0	0	0	0	0	0
4:45	3	0	0	0	0	0
4:50	0	0	2	1	0	0
4:55	0	0	3	0	0	0
5:00	3	0	2	0	0	0
5:05	2	0	1	0	0	1
5:10	2	0	2	0	0	0
5:15	1	0	1	0	0	0
5:20	0	0	1	0	0	0
5:25	1	1	2	0	0	0
4:30-5:30	**20**	**1**	**19**	**1**	**0**	**1**

HEAVY VEHICLE PERCENTAGE

	NBT	NBR	SBT	SBL	WBL	WBR
4:30	9%	0%	10%	--	0%	0%
4:35	4%	0%	2%	0%	0%	0%
4:40	0%	0%	0%	0%	0%	--
4:45	5%	0%	0%	--	--	0%
4:50	0%	0%	6%	50%	0%	0%
4:55	0%	0%	5%	--	0%	--
5:00	6%	0%	4%	--	--	0%
5:05	3%	--	2%	--	--	100%
5:10	3%	0%	5%	--	0%	0%
5:15	1%	0%	3%	--	--	--
5:20	0%	0%	2%	--	--	--
5:25	2%	17%	5%	0%	0%	--
4:30-5:30	**3%**	**3%**	**3%**	**20%**	**0%**	**14%**

Chappell Pkwy @ Ferry Rd

TOTAL VEHICLES

	NET	NER	WBL	WBR	SWL	SWT
4:30	0	1	1	0	0	2
4:35	1	2	1	0	0	1
4:40	1	3	1	0	0	1
4:45	0	2	1	0	0	0
4:50	2	3	0	0	0	2
4:55	2	3	1	1	0	1
5:00	4	1	0	0	0	1
5:05	0	0	0	0	1	1
5:10	1	0	1	1	0	1
5:15	1	2	0	1	0	0
5:20	1	1	0	1	0	0
5:25	2	5	1	0	0	0
4:30-5:30	**15**	**23**	**7**	**4**	**1**	**10**

PHF = 0.71

HEAVY VEHICLE VOLUME

	NET	NER	WBL	WBR	SWL	SWT
4:30	0	0	0	0	0	0
4:35	0	0	0	0	0	0
4:40	0	0	0	0	0	0
4:45	0	0	0	0	0	0
4:50	1	0	0	0	0	0
4:55	0	0	0	0	0	0
5:00	0	0	0	0	0	0
5:05	0	0	0	0	0	1
5:10	0	0	0	0	0	0
5:15	0	0	0	0	0	0
5:20	0	0	0	0	0	0
5:25	1	0	0	0	0	0
4:30-5:30	**2**	**0**	**0**	**0**	**0**	**1**

HEAVY VEHICLE PERCENTAGE

	NET	NER	WBL	WBR	SWL	SWT
4:30	--	0%	0%	--	--	0%
4:35	0%	0%	0%	--	--	0%
4:40	0%	0%	0%	--	--	0%
4:45	--	0%	0%	--	--	--
4:50	50%	0%	--	--	--	0%
4:55	0%	0%	0%	0%	--	0%
5:00	0%	0%	--	--	--	0%
5:05	--	--	--	--	0%	100%
5:10	0%	--	0%	0%	--	0%
5:15	0%	0%	--	0%	--	--
5:20	0%	0%	--	0%	--	--
5:25	50%	0%	0%	--	--	--
4:30-5:30	**13%**	**0%**	**0%**	**0%**	**0%**	**10%**

DAVID EVANS
AND ASSOCIATES INC.

APPENDIX B

Synchro Output Summaries

Synchro Output Data available upon request.

February 7, 2014

Daly • Standlee & Associates, Inc.
4900 S.W. Griffith Drive
Suite 205
Beaverton, Oregon 97005
(503) 646-4420
Fax (503) 646-3385

SHN Consulting Engineers & Geologists, Inc.
275 Market Ave.
Coos Bay, OR 97420

Attn: Steven K. Donovan, PE

From: Daly-Standlee & Associates, Inc.

Michael Raley

Mike Raley, Acoustical Consultant
Kerrie G. Standlee P.E., Principal

REGISTERED PROFESSIONAL ENGINEER 11,982 OREGON FEB 3, 1983 KERRIE G. STANDLEE
EXPIRES: 6/30/2014

Re: Jordan Cove Energy Project
Project #: 102141

Introduction

Daly-Standlee and Associates (DSA) was asked to determine if the proposed workforce housing facility for the Jordan Cove Energy Project (JCEP) will comply with the noise regulations outlined in Section 18.56.080 (1) of the North Bend City Code (NBCC). The following sections of this letter discuss the noise criteria set forth in the NBCC, the aircraft noise levels on the site shown in the North Bend Municipal Airport Land Use Plan, the housing facility design analyzed by DSA, and DSA's determination of compliance with the NBCC criteria.

Noise Criteria

Section 18.56.080 (1) of the NBCC states that "Within airport noise impact boundaries, land uses shall be established consistent with the levels identified in OAR 660, Division 13, Exhibit 5." The airport noise impact boundary is defined in Section 18.56 of the code as "areas located within 1,500 feet of an airport runway or within the most current, established noise contour boundaries exceeding 55 Ldn" (NBCC 18.56.030 (5)). Exhibit 5 of OAR 660, Division 13 says residential land use and development are compatible, without restriction, in areas where the yearly average day-night noise levels (DNL) is less than 65 dBA. However, Section 18.56.080 (1) of the NBCC states that, in North Bend, "...the permit applicant shall be required to demonstrate that a noise abatement strategy will be incorporated into the building design that will achieve an indoor noise level equal to or less than 55 Ldn" within those developments located within the airport noise impact boundary. Please note that DNL and Ldn denote the same noise metric, typically measured in dBA.

Aircraft Noise Levels at Proposed JCEP Workforce Housing Site

According to information in the 2002 Port of Coos Bay, North Bend Municipal Airport Master Plan, the northwest portion of the proposed JCEP workforce housing facility will be constructed between the DNL 55 dBA and DNL 60 dBA noise contour lines on the airport noise contour map. In order to provide a conservative analysis of the noise levels expected inside the housing units at the facility, DSA has assumed that aircraft noise exposure levels outside the structures would be at a DNL 60 dBA level.

Proposed Workforce Housing Facility Design

Construction details included in DSA's analysis are based on information obtained through conversations with Mr. Steven Donovan of SHN Consulting Engineers & Geologist, Inc. and Dan McGinnis, a representative of ATCO, a modular housing manufacturer. Based on the information provided to DSA, the workforce housing unit construction is proposed, as a minimum, to include the design and materials described below:

- Basic Layout
  - The housing buildings will consist of two "dormitory" type modules placed, facing one another, approximately five feet apart and connected by an open exterior walkway.
  - A module will consist of individual rooms constructed side-by-side that have at least two walls exposed to directly to exterior noise and in some instances three walls exposed to exterior noise (the end rooms of the module).
  - Each room will have a door which opens to the exterior walkway located between modules, and a window and a through-the-wall air-conditioning unit in the exterior wall located opposite the door.
- Walls – elements listed from exterior to interior
  - 29ga steel siding
  - 3/8" oriented strand board (OSB) sheathing
  - 2x6 wood studs at 16" O.C.
  - R-21 batt insulation
  - ½" type "x" gypsum wallboard
- Roof – elements listed from exterior to interior
  - 0.045 EPDM over 15/32" OSB
  - 2x10 joists at 16" O.C.
  - Double layer R-21 batt insulation
  - 5/8" type "X" VCG (vinyl coated gypsum board)

- Windows
  - 4' x 3.5" in size
  - 1/8" glass - ¼"air space - 1/8" glass
  - Vinyl, low-E, horizontal sliding
- Doors
  - 32" x 80" in size
  - Insulated steel
- HVAC
  - Through-the-wall PTAC type unit

Analysis

DSA predicted interior noise exposure levels using the method outlined in Controlling Sound Transmission into Buildings by J.D. Quirt published by the National Research Council Canada. This is the same method used by DSA to analyze structures being proposed within the City of Portland, Portland International Airport Noise Overlay Zone. Noise reduction properties for the construction materials included in the structures was taken from reference texts and data retained in DSA files from past projects.

With the building construction described above and an exterior DNL noise exposure level of 60 dBA DSA predicts an interior DNL noise exposure level of 46 dBA within the residential rooms of a module that have three exterior walls (two end rooms of a module). As stated above, all other rooms within the module will have only two exterior walls exposed directly to aircraft noise; the window wall and exterior walkway wall. Thus the noise level in those rooms will be slightly lower than DNL 46 dBA. In either case, the predicted interior noise exposure level is well below the maximum level of 55 dBA required in the NBCC.

DSA would like to point out that, at this time, the construction details for the housing modules have not been finalized. It is possible that the units could have construction details that provide more sound isolation than the minimum discussed above. In those cases, increasing the thickness of wall layers, roof layers or window glazing above that included in the analysis will increase the sound transmission loss of the structure and further reduce the interior noise levels.

Conclusion

Based on the results of our analysis, DSA concludes that the proposed workforce housing for the Jordan Cove Energy Project will comply with the noise regulation requirements in Section 18.56.080 (1) of the North Bend City Code.

DAVID EVANS
AND ASSOCIATES INC.

January 23, 2014

Mark D. Whitlow
Perkins Coie LLP
1120 NW Couch Street, 10th Floor
Portland, OR 97209

SUBJECT: Proposed Workforce Housing Project – Conditional Use Application

Dear Mr. Whitlow:

I am a licensed engineer currently employed at David Evans & Associates, Inc. (DEA). I have been employed at DEA in that capacity for the past six years. My training and experience as a licensed engineer provides expertise with respect to the type of lighting and lighting fixtures required for various developments and, further, how to select, locate and provide shielding to reflect light away from sensitive areas.

This letter is written in support of the application filed by Jordan Cove Energy Project, L.P., for a conditional use application to allow a proposed workforce housing project in the MH zone in the City of North Bend, Oregon, on a development site covered by the City of North Bend's Airport Overlay zoning district set forth in Chapter 18.56 of the North Bend City Code (Code). Specifically, this letter will provide evidence regarding the applicant's ability to satisfy the land use compatibility requirements of the Code regarding outdoor lighting and glare.

With respect to the relevant provisions of the Code, please accept the following evidence in satisfaction of the related provisions of Code Section 18.56.080:

(2) Outdoor Lighting.

The lighting selected for the proposed workforce housing project will not project lighting directly onto an existing runway or taxiway or into existing airport approach surfaces. Lighting for the project will be full cutoff fixtures. Full cutoff fixtures aim light downward and have no up-light. The lens is contained fully within the fixture housing. The Illuminating Engineering Society (IES) has developed a rating system for Backlight, Uplight, and Glare (BUG). The rating system evaluates each fixture for backlight, uplight, and glare. All fixtures for the workforce housing site will have an uplight rating of zero. By using full cutoff fixtures with uplight ratings of zero, all light will be projected below the horizontal plane of the fixture.

Additional external shielding was not assumed at this point but could be provided if necessary. The lighting selected for the proposed workforce housing project has been selected to avoid lighting which imitates airport lighting or which impedes the ability of pilots to distinguish between airport lighting and other lighting.

3990 Southwest Bluff Parkway Portland Oregon 97201 Telephone: 503.223.6663 Facsimile: 503.223.2701

A preliminary lighting analysis was performed using AGi32, a lighting analysis software, to evaluate the impacts of lighting from the workforce housing. Because this analysis assumes that all buildings are constructed and in place, this analysis captured the maximum amount of light the housing would produce. This analysis measured full cutoff 150 watt High Pressure Sodium (HPS) light fixtures mounted on 20 foot tall light poles as shown on the conceptual plans developed by SHN. The analysis also measured, a 100 watt high pressure sodium light fixture mounted at 15 feet above every entrance/exit to each module. The use of full cutoff fixtures will result in no direct light being projected onto the existing airport approach surfaces. The results of the analysis showed no additional visible light would be expected to reach the airport runway or taxiways. All calculation points on the airport property returned a reading of less than 0.001 foot-candles from the workforce housing, which is an amount not visible to the human eye. For comparison purposes, a typical collector roadway will have an average illuminance of 0.9 foot-candles.

(3) Glare.

The materials used for the workforce housing project will be selected to avoid glare from the exterior of buildings located within an approach surface or on nearby lands where glare could impede a pilot's vision. The current plan calls for 100 watt HPS above every entrance/exit within the workforce housing. The number of fixtures needed and/or the type of fixture will be modified to further reduce light levels as the project enters final design. Luminaires near the waterline will be directed away from the bay and could have bay side shields installed to further reduce the light reflecting off the bay. The parking lot and pedestrian walkways will be designed to meet IES guidelines.

Thank you for the opportunity to provide evidence in support of the application regarding lighting and glare. I am available to provide additional information upon your request. You are authorized to submit this letter into the record in support of the applicant's conditional use application in the City of North Bend.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

Cameron Grile, PE, PTOE
Transportation Engineer

Initials: CMG

File Name: P:\U\JCEP0000004\0600INFO\TT\LTR_Workforce_ Housing_Illumination_2014-01-23.docx

Project Number: JCEP0000-0004

Exhibit LL

Oregon
John A. Kitzhaber, M.D., Governor

Department of Transportation
Region 3 Planning
3500 NW Stewart Parkway
Roseburg, OR, 97470-1687
Phone: 541.957.3692/Fax: 541.672.6148

David Voss, City Planner
City of North Bend
P.O. Box B
North Bend, OR 97459

March 14, 2014

Re: North Point Workforce Housing Conditional Use Permit & Variance (CUP-1-14 & VAR-1-14)

David
~~Mr. Voss:~~

Thank you for sending agency notice of a proposed Conditional Use Permit (CUP) to develop a temporary work force housing camp to house up to 1,400 workers located on the two vacant dredge material sites and lagoon between the McCullough Bridge and the railroad bridge west of US 101. It's my understanding that workers would be bussed to and from the camp to their job site. The east portion of the site would be used for off-street parking and the west half would house the camp living quarters, consisting of modular units. The Variance request is to avoid development requirements for paving, drainage collection and marking the off-street parking area so that the site could be put to other uses in the future.

ODOT reviewed the proposed project and determined it may significantly affect US 101's safety and operations. We recommend the following conditions of approval.

1. Prior to City issuance of development permits, the applicant shall provide proof of ODOT approval for construction of intersections improvements at the US 101/Ferry Road intersection including, but not limited to, a temporary traffic signal and left-turn lane when warranted. The applicant shall remove the temporary signal upon expiration of the CUP and/or removal of the temporary housing units, whichever occurs first.

2. Prior to City issuance of development permits, the applicant shall provide proof of an executed Cooperative Improvement Agreement (CIA) with ODOT for approval and maintenance of any roadway improvements affecting US 101 including, but not limited to, the installation, monitoring and any modifications to US 101 intersection improvements.

3. Prior to City issuance of development permits, the applicant shall provide proof of an ODOT Miscellaneous Permit for any work, including utilities, within US 101 rights-of-way.

Please enter this letter into the public record and send me a copy of the City's final decision and conditions of approval.

Sincerely,

Thomas Guevara Jr.

THOMAS GUEVARA JR.
Development Review Planner

Attachments
CC: SWDRT
Dave Perry, DLCD
Jill Rolfe, Coos County Planning

135
124

Oregon
John A Kitzhaber, Governor

Oregon Department of Transportation
Region 3 Planning Section
3500 NW Stewart Parkway
Roseburg, OR 97470-1600
(541) 957-3500
FAX (541 672-6148

November 1, 2013

Josh Anderson, PE, PTOE
David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon 97201

Subject: **Traffic Analysis Addendum Review:**
Jordan Cove Energy Project
North Bend, Oregon
Coos County

The Oregon Department of Transportation (ODOT) staff has reviewed your draft addendum to the Traffic Impact Analysis and agrees with the proposed conclusions.

The next step in the ODOT portion of the process is your submittal of a signal engineering analysis as outlined in Oregon Administrative Rule (OAR) 734-020-0450 to 0490 with a Signal Approval Request Form (SARF) We will need this information for both signal locations.

The proposed locations of the two temporary signals are far enough removed from existing signals that progression analysis will not be required.

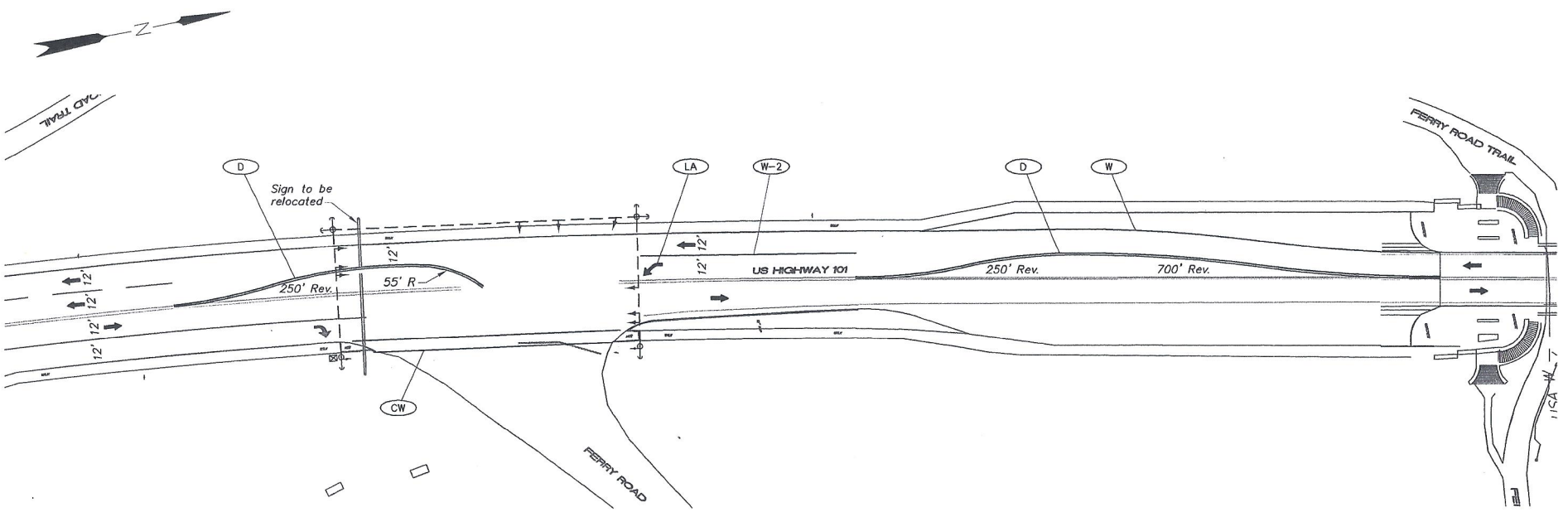
At the Ferry Street location it is noted there may be a potential conflict with an existing overhead city sign and widening of the highway will be necessary to accommodate the length of the proposed left-turn lane.

Please contact me directly at (541) 957-3539, or Mr. Ron Hughes at (541) 957-3696 if you have comments or questions.

Thank you.
Sincerely,

J.W. Oltman, P.E. Development Review Engineer

CC: H. Ronald Hughes, P.E., Region 3 Access Management Engineer
Ray Lapke, P.E. Region 3 Traffic Operations Engineer
Aaron Brooks, Traffic Analyst



JORDAN COVE WORKERS CAMP
HIGHWAY 101 AT FERRY ROAD
LEFT TURN LANE AND TEMPORARY SIGNALS

(W-2) *Inst. 8" white line Shown thus:*

(D) *Inst. double yellow Shown thus:* ═══

(W) *Inst. 4" white line Shown thus:* ———

(CW) *Inst. standard crosswalk Shown thus:* ———

(LA) *Inst. left turn arrow (white)*

Note:
Concept plan only. Subject to review and approval by the City Of North Bend and ODOT.

DAVID EVANS AND ASSOCIATES INC.
530 Center St. Suite 605, Salem Oregon, 97301 Ph: 503.361.8635

\\Pdxfs1\project\J\JCEP00000004\0400CAD\EB\CHKBRD\DJAL\JCEP0004_turn_lane_260T8.dwg 2:26pm

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DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: July 23, 2013

TO: Ron Hughes, Oregon Department of Transportation
John Rowe, Coos County, Oregon
Bob Dillard, City of North Bend, Oregon

AUTHOR: Josh Anderson, PE, PTOE

SUBJECT: **Addendum to Jordan Cove Energy Project Transportation Impact Analysis – Regarding the North Point Workforce Housing (NPWH) Project**

PROJECT: JCEP 00000004 – Jordan Cove Energy

COPIES: Greg Blackard (Kiewit), Bob Braddock (Jordan Cove Energy Project)

This memorandum serves as an addendum to the Jordan Cove Energy Project Transportation Impact Analysis (TIA), dated July 2012. The intent is to address concerns raised after the submittal of the TIA around the transportation impacts of construction workforce housing. As demonstrated by this memorandum, if the North Point site in North Bend were to be used for Temporary Workforce Housing to support the Jordan Cove Energy Project. Nearby intersections would not fail to meet applicable transportation operations standards set forth by ODOT or the City of North Bend.

After submittal of the above mentioned TIA, the Jordan Cove Energy Project has further refined plans for the construction of the project. The maximum assumed number of construction workers on site has dropped from a peak of 2,612 workers to 2,100 workers. The peak month of construction has shifted from February of 2016 to July of 2017. The single largest change in assumptions from the July 2012 TIA to this addendum is that the contractor who has been hired to construct the project is now planning on using temporary workforce housing (TWH) to accommodate the expected non-local workforce. School type busses are planned to be used to transport workers between the camp and the construction site. Workers will not be allowed to use personal vehicles. The TWH site is proposed to be located on the North Point Site to the west of US101 on the south bank of Coos Bay, shown below in **Figure 1**.

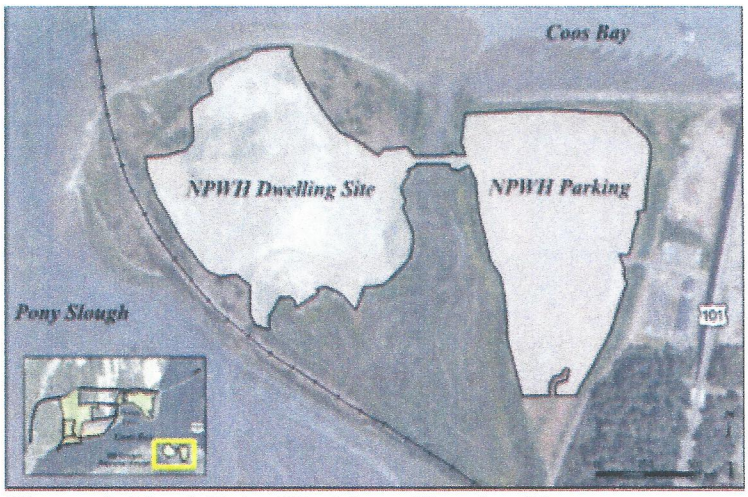

Figure 1: North Point Workforce Housing Site

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The methodology used in the following analysis is unchanged from that of the TIA. The following assumptions were agreed upon at a pre-application meeting, held at the City of North Bend on June 26, 2013 at 1:00 PM in the City Council Chambers;

- Analysis will be focused on the PM peak hour only.
- Analysis will focus on the intersection of US 101 at Ferry Road.
    - Follow up communications with Mr. Windham (North Bend) lead to an expansion of the study area to include the intersection of Ferry Road at Chappell Parkway.
- Counts from June 26, 2013 will be acceptable for summer weekday traffic conditions.
- Methodology will be consistent with that of the 2012 TIA.
- Trip generation and distribution for the TWH will be based on 24 busses making two round trips during the PM peak hour.
    - This is a conservative approach as the trips will likely occur over roughly a two hour period to accommodate travel times and the staggered shifts.
- For analysis purposes, the busses will be assumed to be heavy vehicles.

The following mobility targets will govern the analysis:

- City of North Bend – Peak hour LOS D based on HCM compliant delay calculations.
- ODOT – Peak hour v/c target of 0.85 assuming a freight route on a statewide highway.

The project has been developed to a point where the following information has been refined and has been incorporated into this analysis:

- Peak construction activity of 2,100 workers will occur in July of 2017.
- The workforce will be split into two shifts staggered by 45 minutes.
- A standard work week will consist of five days (Monday to Friday) with 10-hour workdays.
    - The beginning of the workday is assumed to occur before the AM peak hour of travel on US101.
    - The end of the workday is assumed to coincide with the PM peak hour of travel on US 101.

Existing Conditions

Manual traffic counts were conducted at the two study area intersections on June 26th between 4:30 and 5:30 PM. The volume development worksheet and the raw turn movement count are attached in **Appendix A**.

Existing turn movement volumes and lane configurations are shown in **Figure 2** below. Existing traffic operations are shown below in **Figure 3.** Today, no movements are exceeding the applicable standards at either intersection in the study area. While v/c ratios are calculated for all movements, delays and LOS can only be calculated for traffic that stops or yields to other traffic movements; otherwise the information is not available (n/a).

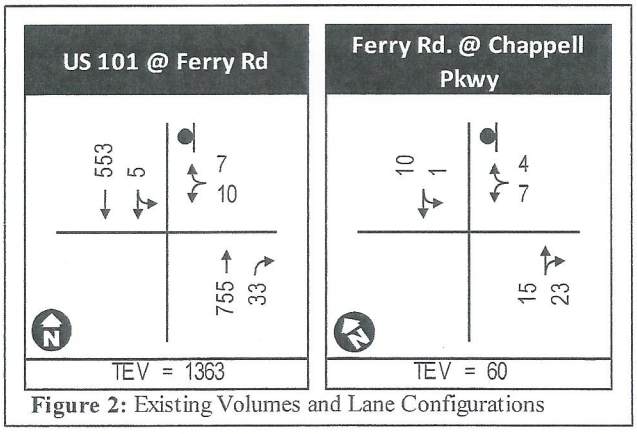

Figure 2: Existing Volumes and Lane Configurations

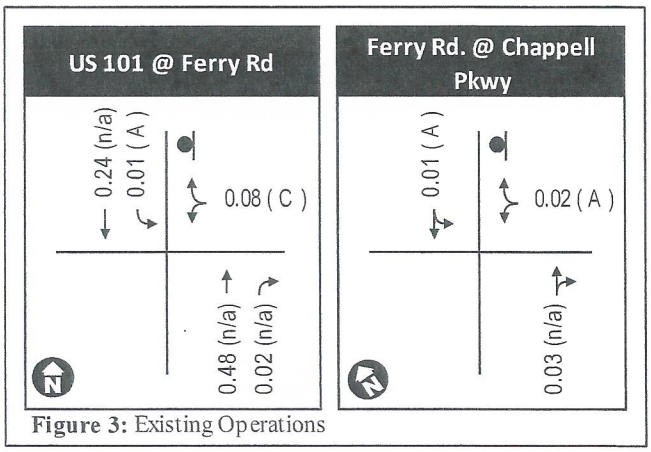

Figure 3: Existing Operations

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Summer 2017 Background Conditions WITHOUT the Project

Existing summer 2013 counts were grown at a rate of 0.8 percent per year for four years to estimate year 2017 volumes without construction activity. The resulting volumes were rounded to the nearest five. Year 2017 turn movement volumes are shown in **Figure 4** below. Future background traffic operations are shown below in **Figure 5.** No movements are expected to exceed the applicable standards at either intersection in the study area by the year 2017.

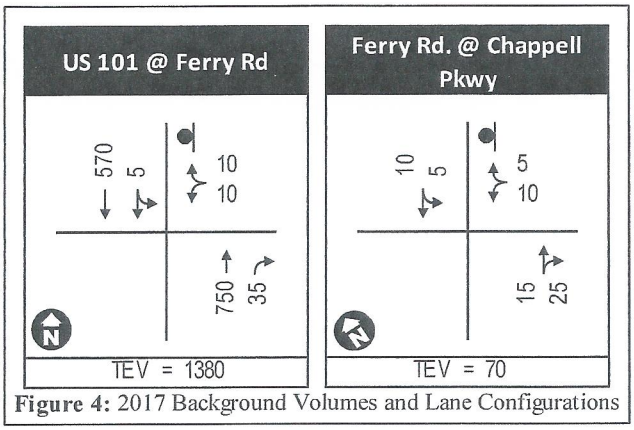

Figure 4: 2017 Background Volumes and Lane Configurations

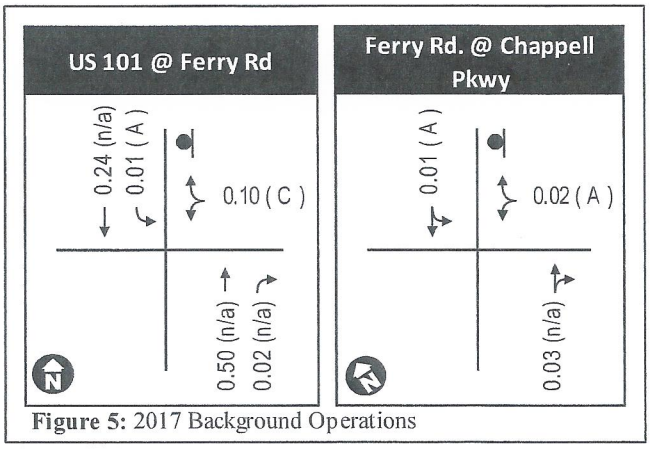

Figure 5: 2017 Background Operations

Summer 2017 Build Conditions WITH the Project

For this scenario, the 48 bus trips (both inbound and outbound) were added to the year 2017 turn movement volumes to create a WITH the project conditions. The resulting turn movement volumes are shown in **Figure 6** below. Future traffic operations WITH the project are shown below in **Figure 7.** Even with the addition of the bus traffic, no movements are expected to exceed the applicable standards at either intersection in the study area.

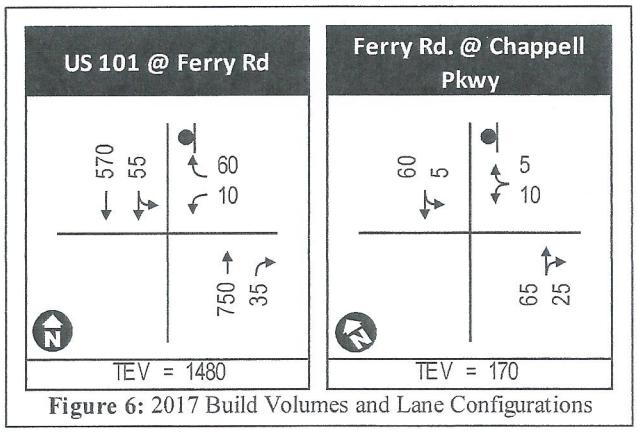

Figure 6: 2017 Build Volumes and Lane Configurations

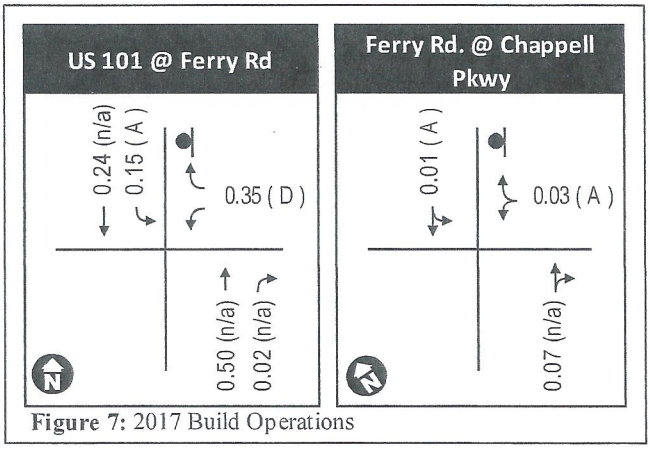

Figure 7: 2017 Build Operations

Synchro output summaries for all three scenarios can be found in **Appendix B.**

Transportation Planning Rule Compliance

The North Point Workforce Housing (NPWH) Project is proposed to occupy approximately 49 acres of land within the City of North Bend that is currently zoned as heavy industrial (M-H). The NPWH project would generate 96 PM peak hour trips. This results in a trip rate of 1.96 trips per acre. Industrial trip rates (ITE based 9th edition) generate between 2.16 and 8.69 PM peak hour trips per acre with an average of 6.43 trips per acre.

Since development under the proposed zoning amendment would generate less traffic than development allowed under the existing zoning, the amendment cannot significantly affect nearby transportation facilities and the TPR criteria are, therefore, met.

This approach has been confirmed through the judicial system in the following three cases:

- ODOT v. Clackamas County, 27 Or LUBA 141(1994)
- Friends of Marion County v. City of Keizer, 45 Or LUBA 236 (2003)
- Mason v. City of Corvallis, 49 Or LUBA 199 (2005)

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DAVID EVANS AND ASSOCIATES INC.

APPENDIX A

Traffic Volumes and Development

Project: Addendum to Jordan Cove TIA Update
Job #: JCEP00000-007
Subject: *PM 2013 Turning Movement Volumes*
Created: 7/16/2013
Rev. Date: 7/18/2013

Growth:
Years 4
Rate 0.80%

Int No.	Synchro ID	Intersection	Direction	Movement	2013 PM Summer 2013 Existing PM Peak	2016 PM Summer 2017 Background (No Build)	PM Bus Trips	2017 PM Summer 2017 Construction (with trips)
10	10	Ferry Rd @ US 101		EBL				
	10		EB	EBT				
	10	Count Date: 6/26/2013		EBR				
	10	2013		WBL	10	10		10
	10		WB	WBT				
	10			WBR	7	10	48	60
	10			NBL				
	10	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	755	780		780
	10	Existing PHF:		NBR	33	35		35
	10	0.92		SBL	5	5	48	55
	10	Future PHF:	SB	SBT	553	570		570
	10	0.92		SBR				
			TEV		1363	1410		1510
20	10	Ferry Rd @ Chappell Pkwy		EBL	15	15	48	65
	10		EB	EBT	23	25		25
	10	Count Date: 6/26/2013		EBR				
	10	2013		WBL				
	10		WB	WBT	7	10		10
	10			WBR	4	5		5
	10			NBL				
	10	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT				
	10	Existing PHF:		NBR				
	10	0.71		SBL	1	5		5
	10	Future PHF:	SB	SBT	10	10	48	60
	10	0.71		SBR				
			TEV		60	70		170

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Manual turn movement counts were conducted on 06-26-2013 by Josh Anderson, PE, PTOE

US 101 @ Ferry Rd

TOTAL VEHICLES

	NBT	NBR	SBT	SBL	WBL	WBR
4:30	54	1	41	0	2	1
4:35	82	2	53	1	1	1
4:40	57	3	53	1	2	0
4:45	60	2	52	0	0	1
4:50	59	3	33	2	1	1
4:55	63	5	60	0	1	0
5:00	52	5	45	0	0	1
5:05	65	0	49	0	0	1
5:10	64	1	42	0	2	1
5:15	71	3	35	0	0	0
5:20	66	2	50	0	0	0
5:25	62	6	40	1	1	0
4:30-5:30	**755**	**33**	**553**	**5**	**10**	**7**

PHF = 0.92

HEAVY VEHICLE VOLUME

	NBT	NBR	SBT	SBL	WBL	WBR
4:30	5	0	4	0	0	0
4:35	3	0	1	0	0	0
4:40	0	0	0	0	0	0
4:45	3	0	0	0	0	0
4:50	0	0	2	1	0	0
4:55	0	0	3	0	0	0
5:00	3	0	2	0	0	0
5:05	2	0	1	0	0	1
5:10	2	0	2	0	0	0
5:15	1	0	1	0	0	0
5:20	0	0	1	0	0	0
5:25	1	1	2	0	0	0
4:30-5:30	**20**	**1**	**19**	**1**	**0**	**1**

HEAVY VEHICLE PERCENTAGE

	NBT	NBR	SBT	SBL	WBL	WBR
4:30	9%	0%	10%	--	0%	0%
4:35	4%	0%	2%	0%	0%	0%
4:40	0%	0%	0%	0%	0%	--
4:45	5%	0%	0%	--	--	0%
4:50	0%	0%	6%	50%	0%	0%
4:55	0%	0%	5%	--	0%	--
5:00	6%	0%	4%	--	--	0%
5:05	3%	--	2%	--	--	100%
5:10	3%	0%	5%	--	0%	0%
5:15	1%	0%	3%	--	--	--
5:20	0%	0%	2%	--	--	--
5:25	2%	17%	5%	0%	0%	--
4:30-5:30	**3%**	**3%**	**3%**	**20%**	**0%**	**14%**

Chappell Pkwy @ Ferry Rd

TOTAL VEHICLES

	NET	NER	WBL	WBR	SWL	SWT
4:30	0	1	1	0	0	2
4:35	1	2	1	0	0	1
4:40	1	3	1	0	0	1
4:45	0	2	1	0	0	0
4:50	2	3	0	0	0	2
4:55	2	3	1	1	0	1
5:00	4	1	0	0	0	1
5:05	0	0	0	0	1	1
5:10	1	0	1	1	0	1
5:15	1	2	0	1	0	0
5:20	1	1	0	1	0	0
5:25	2	5	1	0	0	0
4:30-5:30	**15**	**23**	**7**	**4**	**1**	**10**

PHF = 0.71

HEAVY VEHICLE VOLUME

	NET	NER	WBL	WBR	SWL	SWT
4:30	0	0	0	0	0	0
4:35	0	0	0	0	0	0
4:40	0	0	0	0	0	0
4:45	0	0	0	0	0	0
4:50	1	0	0	0	0	0
4:55	0	0	0	0	0	0
5:00	0	0	0	0	0	0
5:05	0	0	0	0	0	1
5:10	0	0	0	0	0	0
5:15	0	0	0	0	0	0
5:20	0	0	0	0	0	0
5:25	1	0	0	0	0	0
4:30-5:30	**2**	**0**	**0**	**0**	**0**	**1**

HEAVY VEHICLE PERCENTAGE

	NET	NER	WBL	WBR	SWL	SWT
4:30	--	0%	0%	--	--	0%
4:35	0%	0%	0%	--	--	0%
4:40	0%	0%	0%	--	--	0%
4:45	--	0%	0%	--	--	--
4:50	50%	0%	--	--	--	0%
4:55	0%	0%	0%	0%	--	0%
5:00	0%	0%	--	--	--	0%
5:05	--	--	--	--	0%	100%
5:10	0%	--	0%	0%	--	0%
5:15	0%	0%	--	0%	--	--
5:20	0%	0%	--	0%	--	--
5:25	50%	0%	0%	--	--	--
4:30-5:30	**13%**	**0%**	**0%**	**0%**	**0%**	**10%**

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DAVID EVANS
AND ASSOCIATES INC.

APPENDIX B

Synchro Output Summaries

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HCM Unsignalized Intersection Capacity Analysis
3: Ferry Rd & US 101

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	7	755	33	5	553
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	8	821	36	5	601
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1132	821			857	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1132	821			857	
tC, single (s)	6.8	7.2			4.5	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.4	
p0 queue free %	95	97			99	
cM capacity (veh/h)	198	294			675	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	821	36	206	401
Volume Left	11	0	0	5	0
Volume Right	8	0	36	0	0
cSH	337	1700	1700	675	1700
Volume to Capacity	0.05	0.48	0.02	0.01	0.24
Queue Length 95th (ft)	4	0	0	1	0
Control Delay (s)	21.5	0.0	0.0	0.4	0.0
Lane LOS	C			A	
Approach Delay (s)	21.5	0.0		0.1	
Approach LOS	C				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	7	4	15	23	1	10
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	10	6	21	32	1	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	54	37			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54	37			54	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	958	1041			1565	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	54	15
Volume Left	10	0	1
Volume Right	6	32	0
cSH	986	1700	1565
Volume to Capacity	0.02	0.03	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

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HCM Unsignalized Intersection Capacity Analysis
3: Ferry Rd & US 101

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	10	780	35	5	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	848	38	5	620
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1168	848			886	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1168	848			886	
tC, single (s)	6.8	7.2			4.5	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.4	
p0 queue free %	94	96			99	
cM capacity (veh/h)	188	282			656	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	22	848	38	212	413
Volume Left	11	0	0	5	0
Volume Right	11	0	38	0	0
cSH	376	1700	1700	656	1700
Volume to Capacity	0.06	0.50	0.02	0.01	0.24
Queue Length 95th (ft)	5	0	0	1	0
Control Delay (s)	21.8	0.0	0.0	0.4	0.0
Lane LOS	C			A	
Approach Delay (s)	21.8	0.0		0.1	
Approach LOS	C				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	5	15	25	5	10
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	14	7	21	35	7	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	67	39			56	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	67	39			56	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	939	1039			1561	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	21	56	21
Volume Left	14	0	7
Volume Right	7	35	0
cSH	970	1700	1561
Volume to Capacity	0.02	0.03	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.8	0.0	2.5
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	2.5
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	15.0%	ICU Level of Service	A
Analysis Period (min)	15		

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HCM Unsignalized Intersection Capacity Analysis
3: Ferry Rd & US 101

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	60	780	35	55	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	65	848	38	60	620
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1277	848			886	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277	848			886	
tC, single (s)	6.8	8.5			5.9	
tC, 2 stage (s)						
tF (s)	3.5	4.1			3.1	
p0 queue free %	92	65			85	
cM capacity (veh/h)	136	184			391	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	76	848	38	266	413
Volume Left	11	0	0	60	0
Volume Right	65	0	38	0	0
cSH	214	1700	1700	391	1700
Volume to Capacity	0.35	0.50	0.02	0.15	0.24
Queue Length 95th (ft)	38	0	0	13	0
Control Delay (s)	34.8	0.0	0.0	5.7	0.0
Lane LOS	D			A	
Approach Delay (s)	34.8	0.0		2.2	
Approach LOS	D				

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

Exhibit MM

U.S. Department of Homeland Security

United States Coast Guard

Commanding Officer
United States Coast Guard
Sector Portland

6767 N. Basin Avenue
Portland, OR 97217
Phone: (503) 240-9307
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16611
July 1, 2008

Lauren O'Donnell
Director of Gas – Environmental & Engineering, PJ-11
Federal Energy Regulatory Commission
888 First Street, N.E., Room 62-45
Washington, DC 20426

WATERWAY SUITABILITY REPORT FOR THE JORDAN COVE ENERGY PROJECT

Dear Ms. O'Donnell:

This Waterway Suitability Report (WSR) fulfills the Coast Guard's commitment under the Interagency Agreement among the Federal Energy Regulatory Commission (FERC), the Research and Special Programs Administration (RSPA), and the Coast Guard for the Safety and Security Review of the Waterfront Import/Export Liquefied Natural Gas Facilities that was signed in February 2004. Under this agreement, our agencies work together to ensure that both land and maritime safety and security risks are addressed in a coordinated and comprehensive manner. In particular, the Coast Guard serves as a subject matter expert on maritime safety and security issues.

On June 11, 2008, the Coast Guard completed a review of the Waterway Suitability Assessment (WSA) for the Jordan Cove Energy Project (JCEP) that was submitted in September of 2007. This review was conducted following the guidance provided in Navigation and Vessel Inspection Circular (NVIC) 05-05 of June 14, 2005. The review focused on the navigation safety and maritime security risks posed by LNG marine traffic, and the measures needed to responsibly manage these risks. During the review, the Coast Guard consulted a variety of stakeholders including state and local emergency responders, marine pilots, towing industry representatives, members of the Ports and Waterways Safety Committee and the Area Maritime Security Committee.

Based upon this review, I have determined that Coos Bay is not currently suitable, but could be made suitable for the type and frequency of LNG marine traffic associated with this proposed project. Additional measures are necessary to responsibly manage the maritime safety and security risks. The specific measures, and the resources needed to implement them, where applicable, are described below and in a separate supplementary report which is being provided to you under the terms and conditions established for handling Sensitive Security Information (SSI). This supplemental report includes a copy of the Jordan Cove Waterway Suitability Assessment. This determination is preliminary as the NEPA analysis has not yet been completed.

The following is a list of specific risk mitigation measures that must be put into place to responsibly manage the safety and security risks of this project. Details of each measure, including adequate support infrastructure, will need further development in consultation with the Coast Guard and state and local agencies through the creation of an Emergency Response Plan as well as a Transit Management Plan that clearly spell out the roles, responsibilities, and specific procedures for the LNG vessel and all agencies responsible for security and safety during the operation.

Navigational Measures:

LNG Tanker Size Limitations: Based on the Ship Simulation Study conducted by Moffatt & Nichol on March 17-20, 2008, the maximum size LNG tanker permitted to transit through the Port of Coos Bay is a spherical containment LNG carrier with the physical dimensions of a 148,000 m^3 class vessel. The ship dimensions used in the study reflect a length overall of 950 feet, beam of 150 feet and a loaded draft of 40 feet. The channel must demonstrate sufficient adequacy to receive LNG carriers for any single dimension listed. Consequently, prior to approving the transit of an LNG ship larger than 148,000 m^3, or any increase in the physical dimensions cited, additional simulator studies must be conducted in order to assure the sufficiency of the channel.

- Safety/Security Zone: A moving safety/security zone shall be established around the LNG vessel extending 500-yards around the vessel but ending at the shoreline. No vessel may enter the safety/security zone without first obtaining permission from the Coast Guard Captain of the Port (COTP). The expectation is that the COTP's Representative will work with the Pilots and patrol assets to control traffic, and will allow vessels to transit the Safety/Security zone based on a case-by-case assessment conducted on scene. Escort resources will be used to contact and control vessel movements such that the LNG Carrier is protected.

  While the vessel is moored at the facility there shall be a 150 yard security zone around the vessel, to include the entire terminal slip. In addition, while there is no LNG vessel moored, the security zone shall cover the entire terminal slip and extend 25-yards into the waterway.

  Resource Gap: Resources required to enforce the safety/security zone are discussed under Security Measures in the supplemental report.

- Vessel Traffic Management: Due to a narrow shipping channel, navigational hazards, and the proximity to populated areas, LNG vessels will be required to meet the following additional traffic management measures:
  - A Transit Management Plan must be developed in coordination with the Coos Bay Pilot Association, Escort Tug Operators, Security Assets and the Coast Guard prior to the first transit.
  - This plan must be submitted to the COTP no less than 6 months to initial vessel arrival, and followed by an annual review to ensure that it reflects the most current conditions and procedures.
  - For at least the first six months, all transits will be daylight only, unless approved in advance by the COTP.
  - The LNG Vessel must board Pilots at least 5 miles outside the sea buoy.
    - Overtaking or crossing the LNG tanker within the security zone is prohibited for the entire transit from the Coos Bay Sea Buoy to mooring the vessel at the LNG terminal.
  - Vessel transits and bar crossings will be coordinated so as to minimize conflicts with other deep draft vessels, recreational boaters, seasonal fisheries, and other Marine Events.
  - 24 hours prior to arrival, the Coast Guard, FBI, Coos Bay Pilot Association, Escort Tug Masters, and other Escort assets will meet to coordinate inbound and outbound transit details.

Resource Gaps: The Vessel Transit Management Plan must be approved by the COTP at least 60 days prior to the first vessel arrival.

- Vessel Traffic Information System /Vessel Traffic System: The Port of Coos Bay does not have the capacity to receive Automatic Identification System (AIS) signals. AIS receiving capability must be established and must have the capacity to be used by appropriate agencies, port authorities and ship husbandry companies. Additionally, the Port does not have any means for continuous monitoring the navigable waterway. In order to ensure vessel safety and security, a robust camera system capable of monitoring the entire transit route must be established. Due to weather concerns, these cameras must be equipped with the means to adequately monitor vessel traffic in wind, rain and fog conditions.

  Resource Gaps: AIS receiver and camera systems including necessary hardware, software, staffing and training. Camera system must have complete coverage of the entire transit route, capable of detecting vessel traffic in wind, rain, fog, and dark conditions. Equipment and access to data feed of video imagery must be provided to state and local emergency operations centers impacted by the project.

- Tug Escort and Docking Assist: Due to the confined channel and high wind conditions, each LNG Carrier must be escorted by two tractor tugs, which will join the vessel as soon as safe to do so. The primary tug will be tethered at the direction of the pilot. A third tractor tug is required to assist with turning and mooring. Based on the Ship Simulation Study conducted by Moffatt & Nichol on March 17-20, 2008, vessels are limited to transiting during periods of high tide and 25 knot winds or less. While unloading, all three tugs will remain on standby to assist with emergency departure procedures.

  All three tractor tugs must be at least 80 Ton Astern Bollard Pull or larger and equipped with Class 1 Fire Fighting equipment.

  Resource Gaps: Three 80 Bollard Ton Tractor Tugs with Class 1 Fire Fighting capability.

- Navigational Aids:
  - Based on the Ship Simulation Study conducted by Moffatt & Nichol on March 17-20, 2008, four aids to navigation must be added and eight aids to navigation relocated on the waterway (pg. 12-17).

  - Physical Oceanographic Real-Time System (PORTS) must be contracted with NOAA to provide real time river level, current and weather data.

- LNG Carrier familiarization training for Pilots and Tug Operators: Prior to the arrival of the first vessel, simulator training must be provided for pilots and tug operators identified as having responsibility for LNG traffic.

Safety Measures:

Emergency Response Planning: Regional emergency response planning is limited in the region. Emergency response planning resources will need to be augmented to adequately develop

emergency response procedures and protocols as well as continuously update those plans as conditions change.

Resource Gap: To be determined in conjunction with local and regional response agencies through the Emergency Response Planning process.

- Vessel and Facility Inspections: LNG tankers and facilities are subject to (at a minimum) annual Coast Guard inspections to ensure compliance with federal and international safety, security and pollution regulations. In addition, LNG vessels and facilities are typically required to undergo a pre-arrival inspection, and transfer monitor.

  Resource Gap: Additional Coast Guard Facility and Vessel Inspectors.

- Shore-Side Fire-Fighting: Firefighting capability is limited in the area surrounding the proposed LNG terminal. Shore side firefighting resources and training will need to be augmented in order to provide basic protection services to the facility as well as the surrounding communities along the transit route.

  Resource Gap: To be determined in conjunction with local and regional response agencies through the Emergency Response Planning process.

- In-Transit Fire-Fighting: Firefighting capability is limited along the entire transit route for proposed LNG vessels.

  Resource Gap: A plan must be developed for managing underway firefighting, including provisions for command and control of tactical fire fighting decisions as well as financial arrangements for provision of mutual aid and identification of suitable locations for conducting fire fighting operations along the transit route. To be determined in conjunction with local and regional response agencies through the Emergency Response Planning process.

  Public Notification System and Procedures: Adequate means to notify the public along the transit route, including ongoing public education campaigns, emergency notification systems, and adequate drills and training are required. Education programs must be tailored to meet the various needs of all waterway users, including commercial and recreational boaters, local businesses, local residents, and tourists.

  Resource Gap: A comprehensive notification system, including the deployment of associate equipment and training, must be developed. To be determined in conjunction with local and regional response agencies through the Emergency Response Planning process.

- Gas Detection Capability: No gas detection capability exists at the Port of Coos Bay, along the transit route and at the site of the proposed facility. Emergency response personnel require appropriate gas detection equipment, maintenance, and training. Additionally, the use of fixed detection equipment will ensure accurate and expedited gas detection in the event of a large scale LNG release. The installation of these detectors at strategic points along the waterway must be developed.

Resource Gap: Gas Detectors, appropriate training, and maintenance infrastructure. To be determined in conjunction with local and regional response agencies through the Emergency Response Planning process.

Security Measures:

- Security Boardings, Waterway Monitoring, and Vessel Escorts: Extensive security measures will be required to provide adequate protection for LNG vessels in transit to and while moored at the facility. The details of these measures are SSI, and are outlined in a separate supplementary report.

- Facility Security Measures: LNG facilities are subject to the security regulations outlined in 33 CFR 105, and are required to submit a Facility Security Plan (FSP) for Coast Guard approval, and undergo (at a minimum) an annual Coast Guard security inspection. The facility shall also develop a plan to provide for appropriate security measures from the start of construction through implementation of the Coast Guard approved FSP.

- Sandia Study: The WSA proposes the potential to receive vessels with up to 217,000 m^3 cargo capacity. The Sandia Report is based on consequences of LNG breaches, spills and hazards associated with LNG vessels having a cargo capacity no greater than 148,000 m^3 and spill volumes of 12,500 m^3. There remains some question as to the size of hazard zones for accidental and intentional discharges and the potential increased risk to public safety from LNG spills on water for larger vessels. Based on these existing uncertainties, Jordan Cove must either complete a site-specific analysis for the largest sized LNG vessel or limit arrivals to vessels with a cargo capacity no greater than 148,000 m^3 until additional analysis addressing vessels with higher cargo capacities is completed. However, this requirement is contingent on the requirement for US Coast Guard approval to receive LNG tankers larger than 148,000 m^3.

In the absence of the measures described in this letter and the resources necessary to implement them or changes in Coast Guard policy upon which the resource decisions are based, Coos Bay would be considered unsuitable for the LNG marine traffic associated with the Jordan Cove LNG Terminal. The applicant shall be required to submit an annual update to the Waterway Suitability Assessment to the Coast Guard which shall be revalidated by the COTP and AMSC. For further information, please contact Mr. Russ Berg of Coast Guard Sector Portland at (503) 240-9374.

Sincerely,

F. G. Myer
Captain, U.S. Coast Guard
Captain of the Port
Federal Maritime Security Coordinator

Copy: Thirteenth Coast Guard District (dp)
Coast Guard Pacific Area (Pp)
Commandant, Coast Guard Headquarter (CG-52), (CG-522), (CG-544)
Maintenance and Logistics Command Pacific (Sm)

Exhibit NN

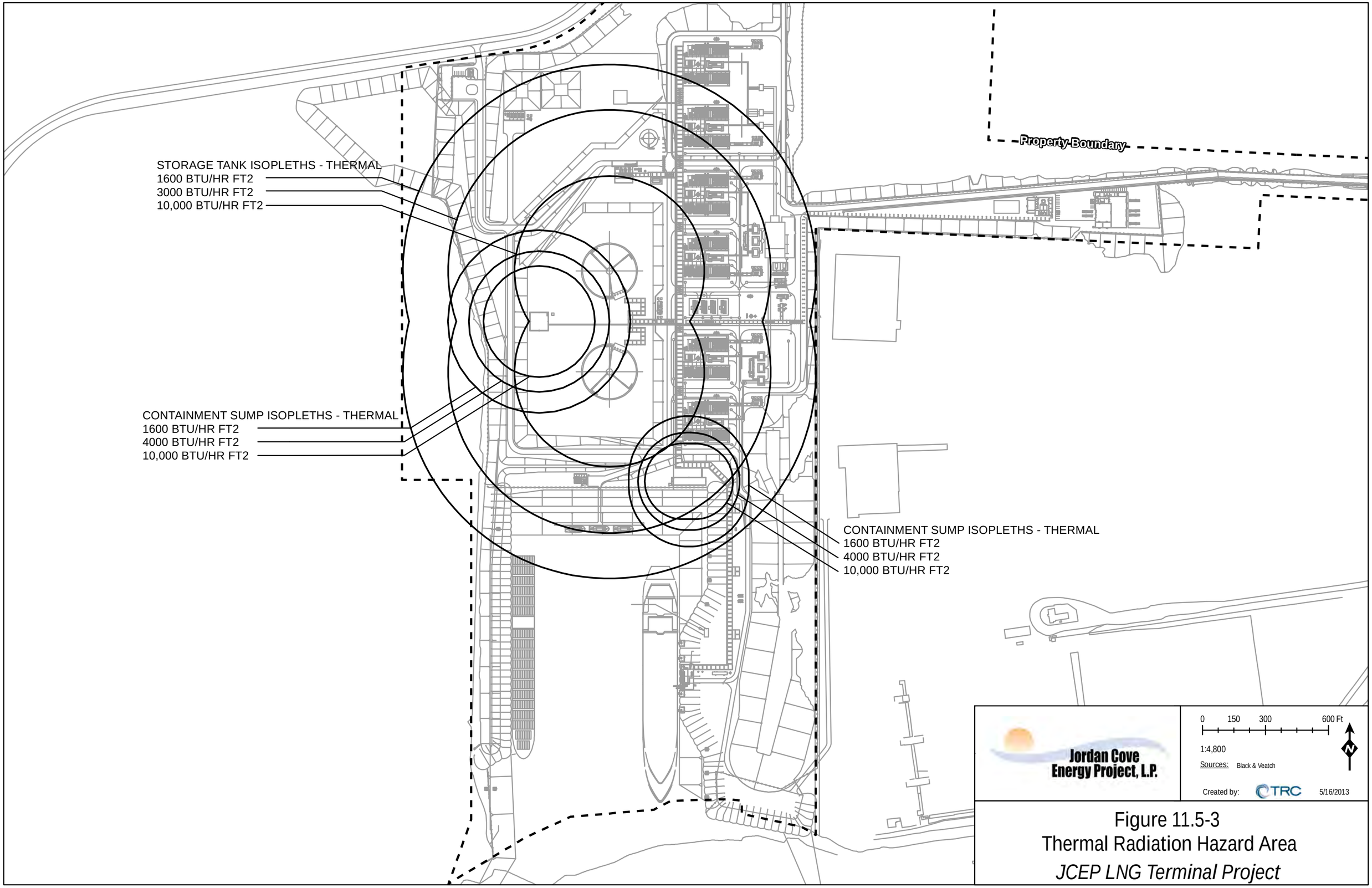

Figure 11.5-3
Thermal Radiation Hazard Area
JCEP LNG Terminal Project

Exhibit OO

Perkins Coie

Mark D. Whitlow
PHONE: (503) 727-2073
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1120 N.W. Couch Street, Tenth Floor
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FAX: 503.727.2222
www.perkinscoie.com

October 29, 2007

RECEIVED
OCT 29 2007
COOS COUNTY
PLANNING DEPARTMENT

VIA EMAIL

Ms. Anne Corcoran Briggs, Hearing Officer
c/o Coos County Planning Department
Coos County Courthouse Annex
250 N. Baxter
Coquille, OR 97423

Re: Applicant's Final Argument: Oregon International Port of Coos Bay
County File No. HBCU-07-03

Dear Ms. Briggs:

This letter is submitted on behalf of the Oregon International Port of Coos Bay (the Port or Applicant) regarding the Port's combined administrative conditional use (ACU) permit application requesting authorization to construct a portion of the Oregon Gateway Marine Terminal (Marine Terminal) which consists of a two ship berth, or Port Slip, an Access Waterway, a Receiving Site and a Mitigation Site.

At the public hearing conducted on September 17, 2007, you established the open record period for this matter and identified October 29, 2007 as the deadline for the Port's final argument. This letter constitutes the Port's final argument and, as such, it does not provide new evidence but relies on and refers to only evidence already contained in the Coos County (County) record of proceedings. We request that you include this letter in County's record for this matter.

As explained in our testimony at the public hearing, the County's planning decision to use the North Spit for water-dependent (WD) industrial use with access to the adjacent navigation channel was made many years ago when that area was originally zoned in the County's comprehensive planning process. This application merely implements that decision. As also explained at the public hearing, much of the County's role in the ACU process is principally one of coordination with state and federal permitting agencies.

Specifically, this application is a low-level land use request for administrative conditional use approval for related activities to establish an Industrial and Port Facilities use. Opponents

challenge the application as if it were an application for a comprehensive plan amendment and zone change, which it is not. The County's decisions to utilize the bay side of the North Spit in the Lower Bay for water-dependent industrial uses (WD) and to designate the adjacent aquatic areas of the bay as aquatic development (DA) allowing access to the existing navigation channel were made by the County and the State when the County adopted its Comprehensive Plan in 1984. The Coos Bay Estuary Management Plan (CBEMP) was then acknowledged by the State as being consistent with the Statewide Planning Goals (Goals). Accordingly, the balancing of priorities between resource protection and development under Goals 16 and 17 was done at the time of plan adoption and acknowledgement, and those prior decisions are not subject to collateral attack in this ACU proceeding.

Additionally, the County's role in this process is described in both the acknowledged CBEMP and the implementive Coos County Zoning and Land Development Ordinance (ZLDO) as being largely one of coordination with state and federal permitting agencies regulating the same uses and activities proposed in the Port's application. (See, for example, ZLDO Section 5.2.300 referencing the Department of State Lands waterway permit process.)

The Port's application for an ACU requests County approval of the following uses and activities:

- Creation of a two-ship berthing slip by excavating upland property.
- Dredging an Access Waterway between the existing federal navigation channel and the proposed slip.
- Disposal of dredged and excavated materials on two upland locations and as beach nourishment along the ocean front (with one upland location and the beachfront site only needing a county land use compatibility statement from the County).
- Conduct compensatory mitigation at the Lyon's site to offset impacts to the aquatic environment expected from the project. Mitigation at a second site within the City of Coos Bay (City) has been approved.

Opponents of the project continue to mistakenly assert that the Port's application also requests approval of the following activities:

- Deepening the existing federal navigation channel.
- A turning basin in Coos Bay.
- Placing fill in Henderson Marsh.
- A pipeline to ship natural gas from the proposed Jordan Cove Energy Project (JCEP)

Exhibit PP

Oregon Gateway Marine Terminal

Estuarine Resource (Intertidal and Shallow Subtidal) Mitigation Plan

Prepared for

Oregon International Port of Coos Bay

and

Moffatt and Nichol

Prepared by

David Evans and Associates, Inc.

January 2007

DAVID EVANS AND ASSOCIATES INC.

Appendix D

1.5 NON-EELGRASS ESTUARINE RESOURCE MITIGATION SITE SELECTION

1.5.1 Siting and Opportunities Evaluation

A reconnaissance of the bay revealed that there is no practicable unvegetated flat and algal flat mitigation available in Coos Bay. The Pierce Property, Dredge Islands A, B, and C, and the Old Hatchery Site (see Figure 3) were specifically reviewed for potential mitigation (i.e. creation or restoration opportunities). Mudflat and/or algal flat could be created or restored in these locations. However, such mitigation was determined to be impracticable due to either the substantially large volume of material that would need to be removed and disposed, the land was not available for mitigation purposes (i.e. Pierce Property is zoned industrial), and/or adverse impacts would likely occur to surrounding resources as a result. Because in-kind opportunities for unvegetated flat and algal flat mitigation are not practicable, various types of out-of-kind mitigation were considered and are describe below. DEA coordinated with the South Slough Estuarine Reserve (SSNER) and the Coos Bay Watershed Council to identify potential mitigation sites and opportunities within the historic estuarine influenced environment of Coos Bay.

Unvegetated flat and algal flat resources are not limited in the bay. However, low- and high-salt marsh resources are limited relative to historical conditions (Graybill pers comm. 2006). It is estimated that 90 percent of the salt marsh resources within the Coos Bay estuary have been diked or filled since European settlement (Hoffnagle and Olson 1974 as cited in ODFW 1979). One proposed mitigation strategy is to pursue out-of-kind mitigation in the form of low-marsh and high-marsh restoration/enhancement. There are no suitable sites within the SSNER (Graybill pers comm. 2006); however, potential sites are available within other portions of the bay and its other slough systems. These opportunities include the potential purchase of existing mitigation credits available from a former mitigation project, in addition to new dike breaching type projects.

The second potential mitigation opportunity is as follows. The Pierce Property contains a significant area of low and high marsh that would likely be difficult to develop due to regulatory constraints. Mike Graybill (pers comm. 2006) noted this area may contain a population of the sensitive plant species salt marsh bird's-beak (*Cordylanthus maritimus* spp. *palustris*). Most remaining populations are found on private property and would not be afforded protection even if the species were to be listed as endangered by the State of Oregon (Center for Plant Conservation 2006). Purchase and placement of a conservation easement on this portion of the Pierce Property may be a viable mitigation strategy.

The third potential mitigation strategy would be to put existing functioning tidelands into a conservation easement or similar protective covenant. There are intertidal areas within South Slough (not the SSNER) and possibly within Coos Bay that were sold into private ownership (i.e. not owned by the State) many years ago. It may be possible for the Port to purchase these lands and then donate them back to the State, with the South Slough

Estuarine Reserve as potential custodian. A conservation easement could be placed on these areas.

1.5.2 Proposed Mitigation Strategy

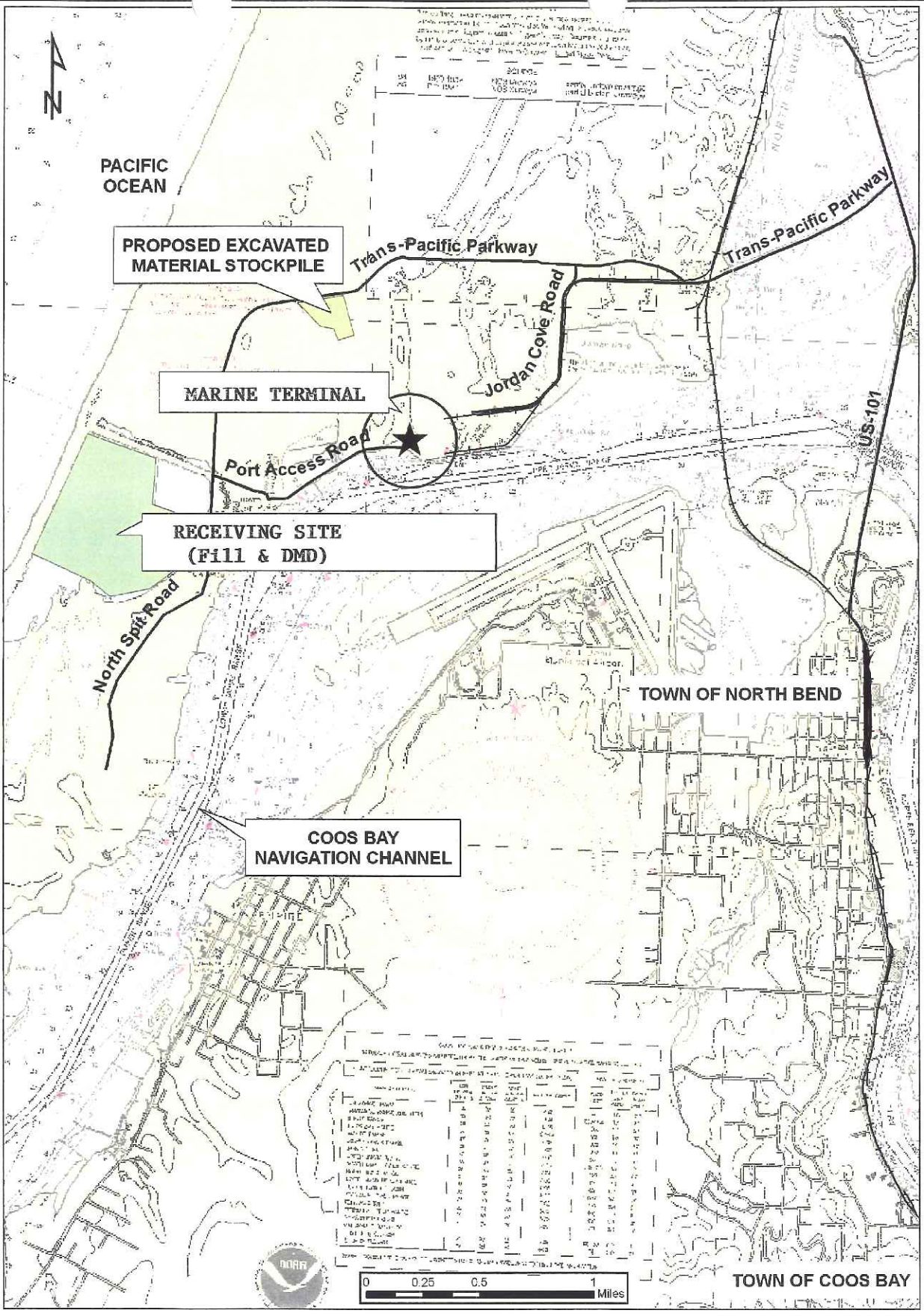
Of the three mitigation strategies discussed above, low- and high-marsh restoration, enhancement, or creation would likely be the preferred strategy by the agencies, as ecological functions, historically lost to the estuary from diking, would be replaced. Conservation easement type strategies are generally viewed less favorably by regulatory agencies. When the agencies do allow conservation strategies, they typically require conservation area to impact area ratios well in excess of one to one.

For the above stated reasons, the **proposed mitigation strategy for offsetting impacts to unvegetated flats and algal flats is to restore and enhance low- and high-marsh within the greater Coos Bay system**. The following is proposed:

- Purchase of existing mitigation credits from a site commonly referred to as the Lyons Mitigation Site, which is located at roughly river mile 5.6 along Isthmus Slough. Isthmus Slough is a tributary to Coos Bay. The Lyons Mitigation Site is not a formal wetland mitigation bank; however, the site has previously been recognized by the Corps and DSL as a viable source of mitigation credits for offsetting impacts to estuarine resources (i.e. Oregon Department of Transportation Isthmus Slough Bridge Project). Additional information regarding this site is provided in Chapter 3 of this report.

- Because remaining credits at the Lyons Mitigation Site are not sufficient to cover all mitigation requirements, additional low- and high-marsh restoration/ enhancement will take place. This will take the form of new restoration/ enhancement actions. The Port has identified two potential land owners with whom to conduct this work and is currently going through the due diligence process. The first site is located within Isthmus Slough and is adjacent to the Lyons Property described above. The second site is located along Coalbank Slough, which is a tributary to Isthmus Slough.

Details of the proposed mitigation credit purchase are provided in Chapter 3 of this report. Chapter 3 also provides the conceptual design, success criteria, and monitoring protocols for the new mitigation work that will need to be performed.



REV	REVISION DESCRIPTION	DATE	APPVD
0	PERMIT APPLICATION SET	1/15/07	MW
B	REISSUED FOR REVIEW	11/9/06	MW
A	IINTERNAL REVIEW 404 PERMIT	10/11/06	MW

DRAWN BY: SLH | CHECKED BY:
DESIGN ENG. | PROJ. MGR.
SCALE: HORZ. 1"=300' VERT. NTS | DATE: Jan 15, 07

MOFFATT & NICHOL

OREGON GATEWAY MARINE TERMINAL
OREGON INT'L. PORT OF COOS BAY
COOS BAY
LOCATION MAP

FIGURE NO: FIGURE 1 | SHEET NO: 1 OF 11 | REV. NO: 0

P:\6021 Port of Coos Bay\CADD\602100_SFIGURE_8.dwg

Figure 1

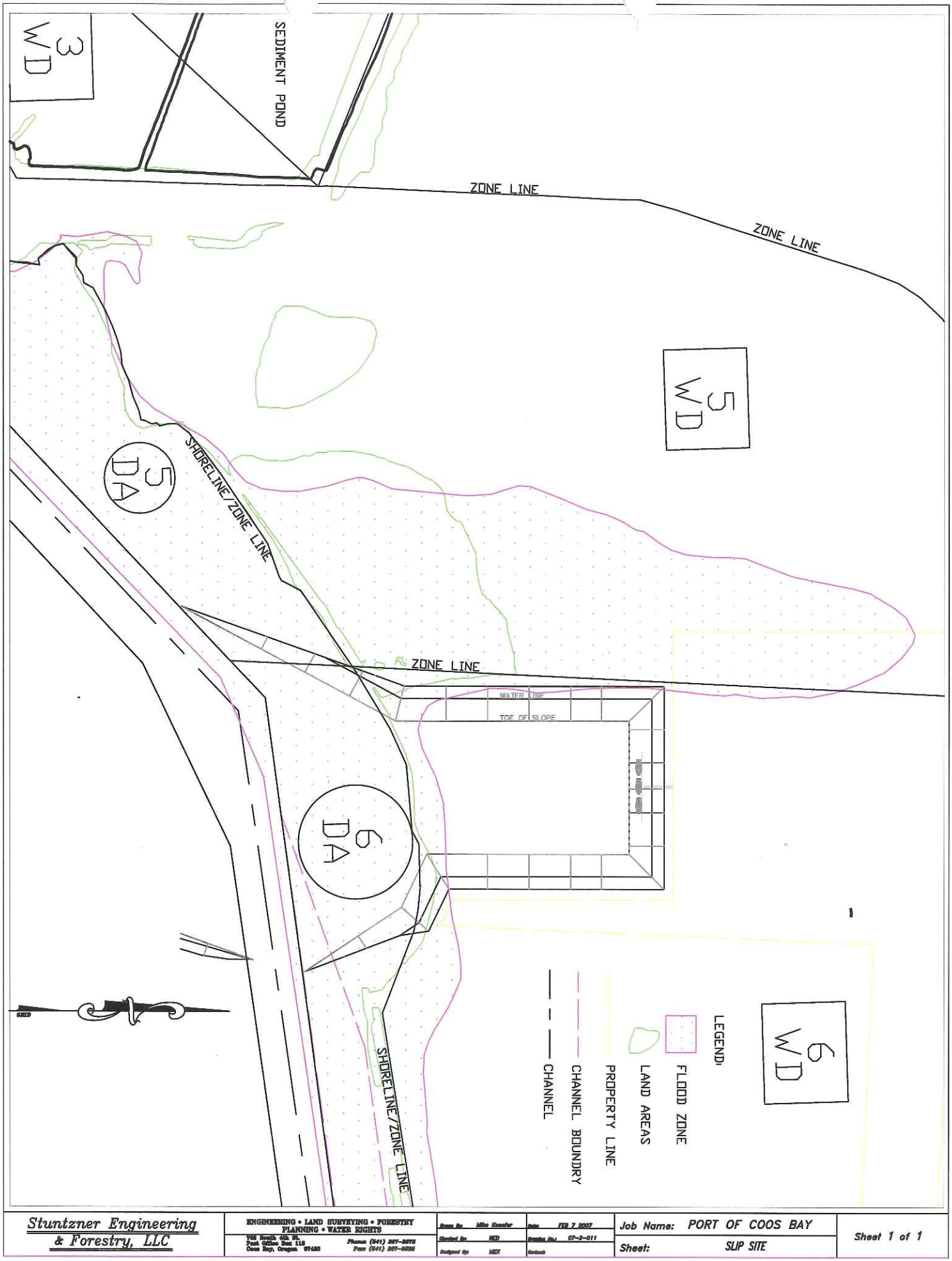

3 WD
SEDIMENT POND
ZONE LINE
ZONE LINE
5 WD
5 DA
SHORELINE/ZONE LINE
ZONE LINE
WATER LINE
TOE OF SLOPE
6 DA
6 WD
SHORELINE/ZONE LINE
LEGEND
FLOOD ZONE
LAND AREAS
PROPERTY LINE
CHANNEL BOUNDRY
CHANNEL
Stuntzner Engineering & Forestry, LLC
ENGINEERING • LAND SURVEYING • FORESTRY
PLANNING • WATER RIGHTS
Job Name: PORT OF COOS BAY
Sheet: SLIP SITE
Sheet 1 of 1

Figure 2

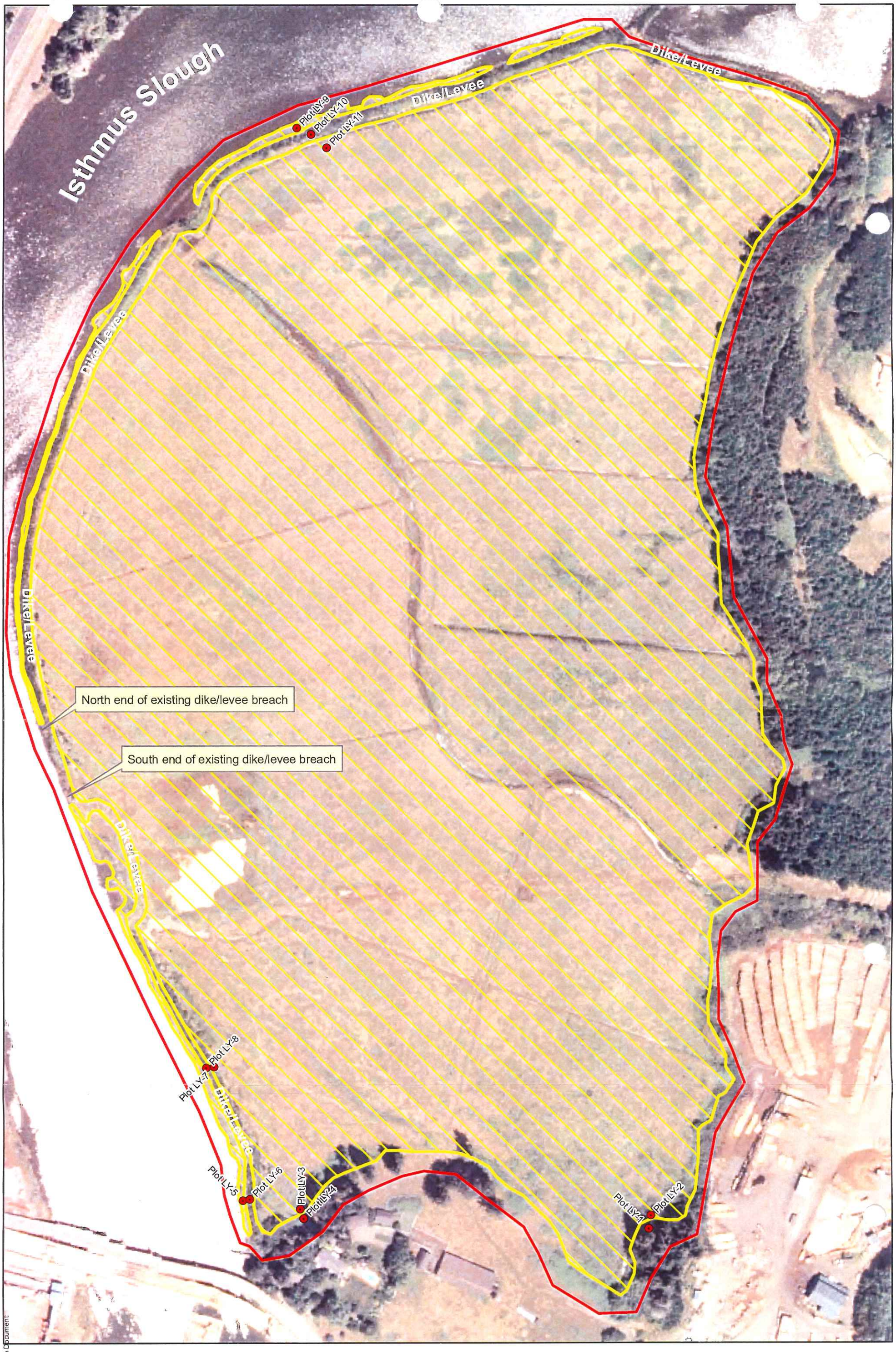


Figure 4. Lyons Property Wetland Delineation Map

Exhibit QQ

OREGON INTERNATIONAL PORT OF COOS BAY

OREGON GATEWAY MARINE TERMINAL

DRAFT EXCAVATED & DREDGED MATERIAL MANAGEMENT PLAN

Prepared for:

OREGON INTERNATIONAL Port of Coos Bay

Rev No	A	B	C	D	0	1
Issue Purpose	For Review	Revised for Port Use	Revised Placement Sites	Revised	Project Name Revision	Revised
Date	5/4/06	08/30/06	11/17/06	12/4/06	1/9/07	8/14/07
By	MUL	MUL	MUL	MUL	MUL	MUL
Checked	JF	JF	LW	LW	LW	TM
Approved	MW	MW	MW	MW	MW	MW

Prepared by:

MOFFATT & NICHOL
INTERNATIONAL

5.4 Feasible Confined Placement Alternatives

5.4.1 Weyerhauser Linerboard Site

5.4.1.1 Description

The Weyerhauser Linerboard Site is the former location of a linerboard production mill that has since been demolished. The site is approximately 110-ac in size and located immediately to the north and east of Jordan Cove along the Coos Bay Navigation Channel, as shown in Figure 5-5. It is approximately 1.25 mi east of the OGMT and was identified as a confined upland placement alternative for material excavated and dredged from the OGMT basin and access channel.

Placement of material within the site is restricted as to avoid significant jurisdictional wetlands and some of the remaining existing facilities. The two potential placement areas have been identified as Linerboard West and Linerboard East. Excavated material would be transported to the site in dump trucks where a portion of the material would be used to construct a containment berm around the site. Dredged material would be transported via pipeline along an existing pipeline corridor and placed within the containment berm.

5.4.1.2 Capacity

Capacity of the site is calculated assuming that the site is reasonably uniform and level. Linerboard West assumes a 3,000 LF containment berm will be constructed around a 14-ac parcel of land in the upper western portion of the property. The berm has a height of 19 ft above the existing grade, a crest width of 10 ft, and 3V:1H side slopes. The volume of the berm is 140,000 cy. For excavated material in which material is placed to the top of the crest (19 ft), the CDF can receive an additional 220,000 cy of material for a total capacity (containment berm and placement volume) of 0.36 mcy. Dredged material would be placed within the containment berm in a lift of 14 ft to provide 5 ft of freeboard below the top of the crest. The in-place volume for dredged material is 156,000 cy.

Linerboard East assumes that a 7,500 LF containment berm will be constructed around a 52-ac parcel along the eastern portion of the property. It also assumes that material may be placed atop the existing electrical substation. The berm has a height of 19 ft above the existing grade, crest width of 10 ft, and 3V:1H side slopes. The volume of the berm is 350,000 cy. For excavated material in which material is placed to the top of the crest (19 ft), the CDF can receive an additional 1.09 mcy of material for a total capacity (containment berm and placement volume) of 1.44 mcy. Dredged material would be placed within the containment berm in a lift of 14 ft to provide 5 ft of freeboard below the top of the crest. The in-place volume for dredged material is 735,000 cy.

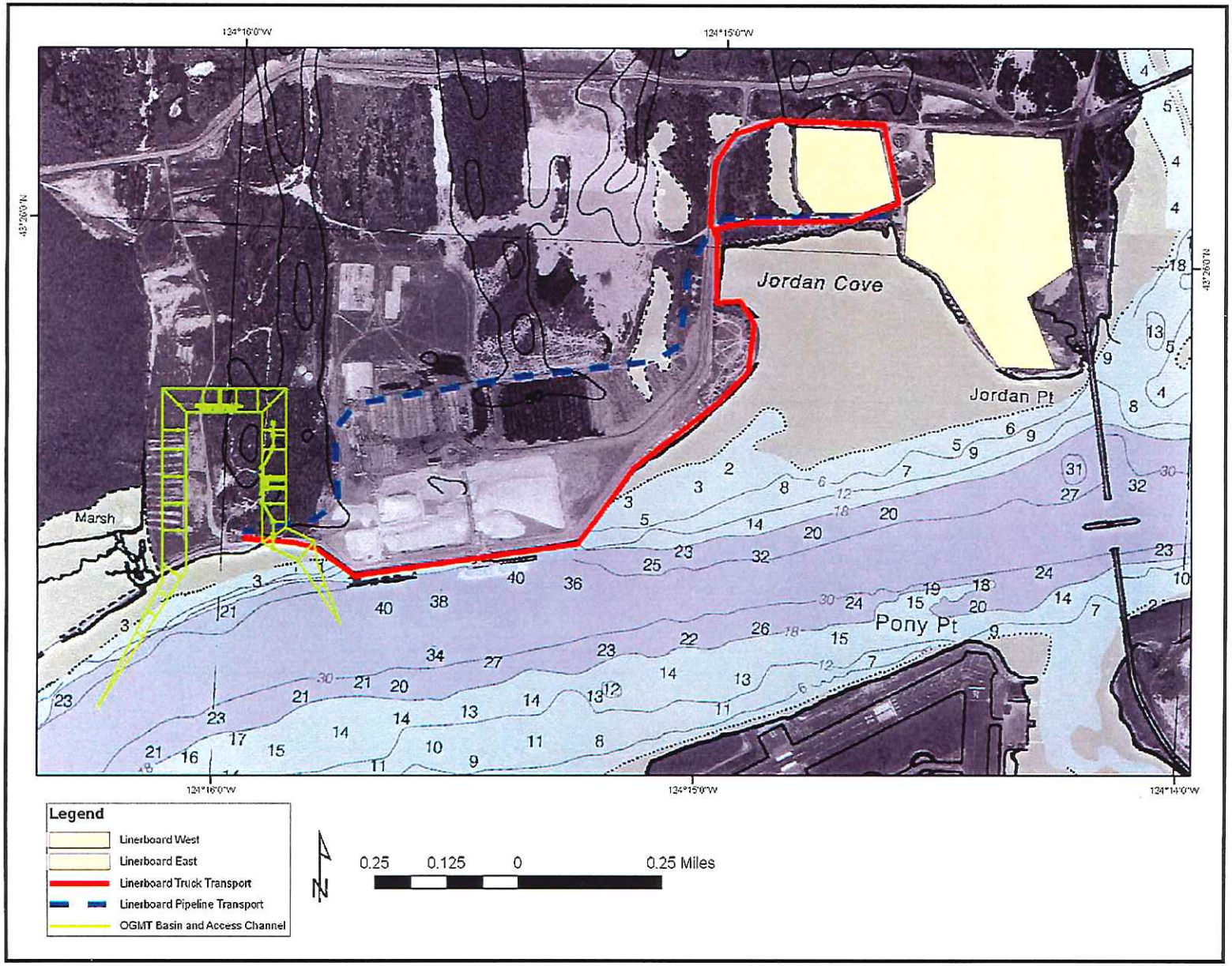


Figure 5-5: Location of Weyerhauser Linerboard Site

5.4.1.3 Existing Conditions

The majority of the facilities of the linerboard production mill that has since been demolished. Existing conditions at the Weyerhauser Linerboard Site are shown in Figure 5-6 and include the concrete foundations of the major mill buildings and some minor structures and surfaces features remain. The site is approximately 1.25 mi east of the OGMT.

Figure 5-6 Existing Conditions at Weyerhauser Linerboard Site

5.4.1.4 Feasibility Evaluation

Technical

The Weyerhauser Linerboard Site is relatively flat and minimally vegetated over a large portion of the site, which simplifies the clearing and grading process. In addition, the Weyerhauser buildings have been demolished with only portions of the slabs remaining. It is assumed that the existing soil has sufficient bearing capacity to support the load associated with the CDF. For dredged material, dewatering of the dredged material and management of storm water will be required.

Geotechnical analyses will be needed prior to final design to confirm bearing capacity and dewatering rates of the dredged material and existing soil. Based on the preliminary evaluation, this alternative is technically feasible.

Logistical

Material above 0.0 ft NAVD88 would be excavated using scrapers and transported from the OGMT basin to the Weyerhauser Linerboard Site with dump trucks. Trucks will leave the facility and travel along an existing road behind the Roseburg facility and around Jordan Cove. The average round trip distance is approximately 4.0 mi. Conventional earthmoving equipment will to construct a containment berm using 0.49 mcy of the excavated material. The remainder of the excavated material (1.31 mcy) will be placed within the berm and graded. With a production rate of 2,500 cy/day, 7 days/wk, the anticipated schedule for the completion of placement of material for this alternative is 24 months. A summary of the estimated construction schedule is provided in Appendix B.

Alternatively, material from below 0.0 ft NAVD88 in the OGMT basin and the access channel could be transported into the containment berm hydraulically. A cutter suction dredge would initially be placed behind a levee separating the OGMT basin from the access channel and Coos Bay. Trucks would transport 0.49 mcy of excavated material from the OGMT basin to the site and conventional earthmoving equipment would be used to construct the containment berm. Dredged material (0.89 mcy) would be transported as slurry from the OGMT basin to the linerboard site through a pipeline that would run along an existing pipeline corridor to the north of the Roseburg facility and discharge within the containment berm. Following decanting, return water would be transferred back to the OGMT basin through a separate pipeline to provide water necessary for dredge flotation behind the levee. Upon completion of dredging of the OGMT basin, the levee will be breached. The dredge will then complete dredging of the access channel during the defined dredging window of October 1 through February 15. At a production rate of 14,400 cy/day for dredging and 7,000 cy/day for excavation and berm construction, this alternative would require 9 months for completion (2.5 months for berm construction, 6.5 dredging).

Environmental

Placement areas at the Weyerhauser Linerboard Site will avoid impacts to existing wetlands located at the north western and southern portions of the property. Dredging and return water from the decanted dredged material will require a Section 10/404 permit from the USACE and Section 401 state water quality certification from the ODEQ.

5.5 Feasible Beneficial Use Alternatives

5.5.1 Beach Nourishment – North Spit Beach Nourishment

5.5.1.1 Description

The shoreline along the North Spit of Coos Bay was identified as a potential beneficial use site for construction dredged material from the OGMT basin and access channel. The beach has experienced severe scarping of the dune system due to storm waves. This alternative recommends nourishment of 4.5 mi of the dune line starting at the north jetty, as shown in Figure 5-7.

A cutter suction dredge would be used for construction dredging of the OGMT basin and access channel. A containment levee would be constructed at the seaward edge of the nourished dune profile using existing beach material. Dredged material would be transported hydraulically via pipeline behind the levee, with return water discharged into the Pacific Ocean. Earthmoving equipment will grade the containment levee to the desired and dredged material to the desired slope.

5.5.1.2 Capacity

Beach nourishment of the North Spit has the capacity to accommodate the 3.3 mcy of dredged material associated with the construction of the OGMT basin and access channel. Capacity was estimated using Light Detection And Ranging (LIDAR) data collected along the Oregon coast in 1998 and 2002. Nine transects spaced at 1,000 ft intervals beginning at the north jetty were analyzed to estimate the dune retreat and volume loss between the surveys. Due to scarping, the mean location of the dune faced retreated approximately 160 ft from 1998 to 2002, and the mean volume of material lost from the dune system was 80 cy/LF.

This alternative calls for a continuous dune fill with material placed above MHHW. The post-construction design template in general has a dune height of +30 ft NAVD88, nourished top of dune width ranging from 200 to 300 ft, 1V:3H slope from the top of the dune to +10 ft NAVD88. The average nourished density is 145 cy/LF.

5.5.1.3 Existing Conditions

The beach and berm system north of the north jetty in Coos Bay consists of a mild sloping beach that increases in slope as it approaches the dune system. According to the LIDAR data, the dunes average +25 to 27 ft NAVD88. The average median diameter of native beach sand ranges from 0.31 to 0.44 mm, based on sediment samples taken in 1987. The proposed nourished areas are bound to the south by the north jetty and to the east by 4WD Road. The portion of the beach seaward of the natural vegetation line is owned by the State of Oregon. The beach is experiencing an erosional trend and the dune system has suffered moderate to severe scarping. Continued erosion is threatening

a Federal Aviation Administration (FAA) beacon approximately 3 mi north of the north jetty (Figure 5-8).

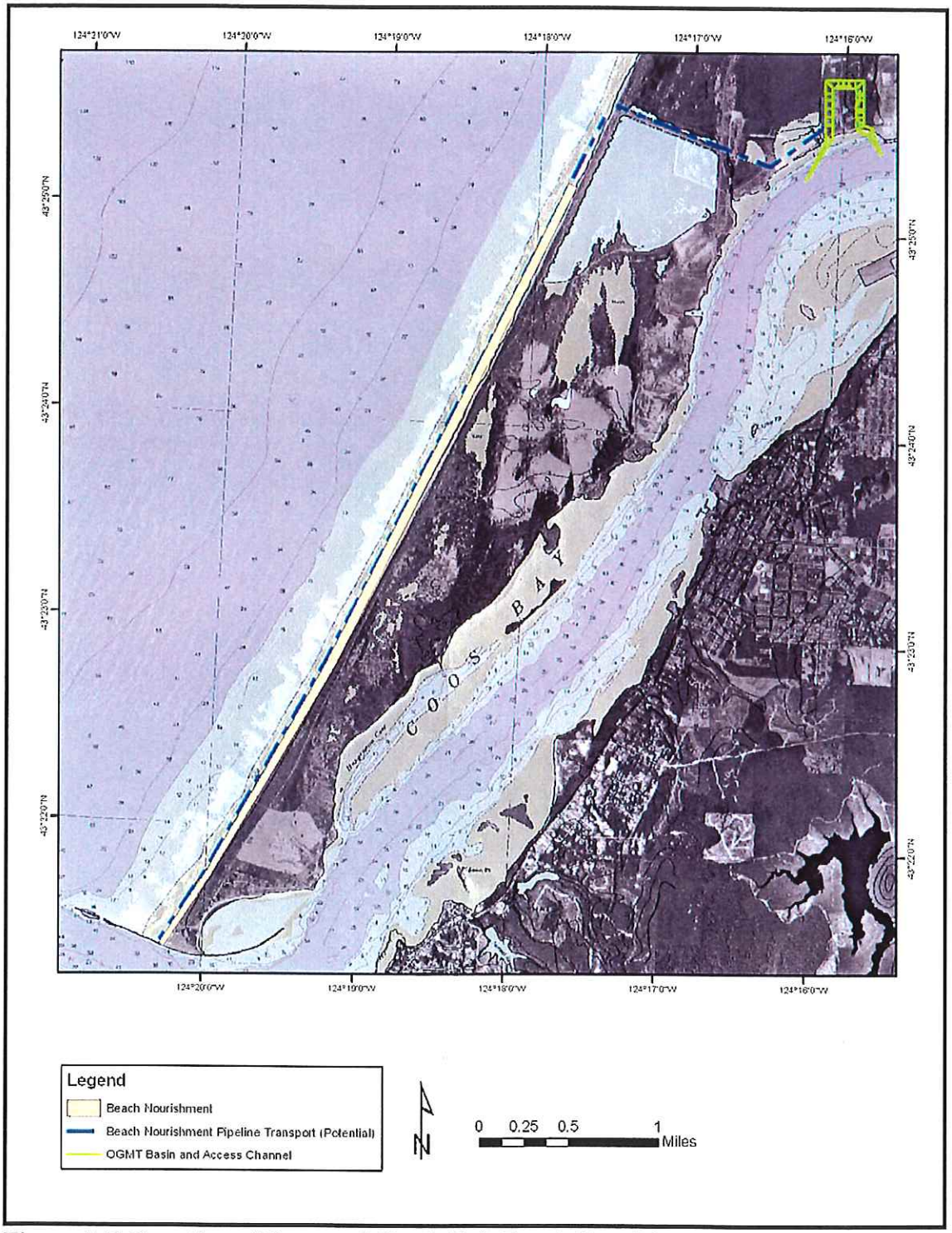


Figure 5-7: Location of Proposed North Spit Beach Nourishment

7.0 SUMMARY AND RECOMMENDATIONS

7.1 Summary

An evaluation of existing reports, discussions with interested parties and federal and state agencies, survey of available dredging and material transport technologies, and review of existing soil data led the identification of 23 potential dredged material placement and beneficial use alternatives for the management of excavated and dredged material associated with the OGMT (Figure 5-2). The construction of the terminal will require the excavation of 2.3 mcy and dredging of 1.95 mcy from the OGMT basin and 1.35 mcy from the access channel. Maintenance dredging of approximately 350,000 cy will be required every two years, with a total 20 year dredged volume of 3.5 mcy.

Each potential dredged material management site was evaluated against a three tier screening process developed specifically for the OGMT EDMMP. The screening process included criteria such as site availability; capacity; and technical, logistical, and environmental feasibility. Based on the screening criteria, five alternatives were considered feasible for the management of excavated and construction dredged material (Figure 5-3) and include: Coos Bay Site F (Open Water Placement), Weyerhauser Linerboard Site (Confined Placement), North Spit Beach Nourishment (Beneficial Use), Jordan Cove Energy (JCE) Placement Site (Beneficial Use) and North Spit Tsunami Protection Levee (Beneficial Use). Coos Bay Site F is feasible for the management for maintenance dredged material. A summary of feasible alternatives, including volume (capacity) and construction schedule is presented in Table 7-1 and Table 7-2 for construction dredged and maintenance material, respectively.

Table 7-1: Construction Excavation/Dredging Alternatives

Alternative	Type	Material	Volume (cy)	Schedule (months)
Coos Bay Site F	Open Water Placement	Mechanical Dredged	1,350,000	7.5
Weyerhauser Linerboard Site	Confined Placement	Excavated	1,800,000	24.0
Weyerhauser Linerboard Site	Confined Placement	Excavated and Hydraulic Dredge	1,380,000	9.0
North Spit Beach Nourishment	Beneficial Use	Hydraulic Dredge	3,300,000	8.0
JCE Placement Site	Beneficial Use	Excavated	500,000	2.5
North Spit Tsunami Protection Levee	Beneficial Use	Excavated	2,300,000	31.0

Table 7-2: Maintenance Dredging Alternatives

Alternative	Type	Material	Volume (cy)	Schedule (months)
Cycle 1				
Coos Bay Site F	Open Water Placement	Mechanical Dredged	350,000	4
20 Years (10 Cycles)				
Coos Bay Site F	Open Water Placement	Mechanical Dredged	3,500,000	

7.2 Preferred Management Alternative

The preferred material management alternatives for the OGMT EDMMP is the placement of excavated material at the Weyerhauser Linerboard and JCE Placement sites and the beneficial use of dredged material beach nourishment along the North Spit (Table 7-3). These sites were chosen based on:

- Proximity to the excavation/dredging site;
- Need for dune restoration along the North Spit;
- Ability to meet scheduling constraints; and
- Ability to meet excavated and dredged material capacity requirements.

Table 7-3: Preferred Material Management Alternative for Construction Activities

Alternative	Type	Material	Volume (cy)	Schedule (months)
JCE Placement Area	Beneficial Use	Excavated	500,000	2.5
Weyerhauser Linerboard Site	Confined Placement	Excavated	1,800,000	24.0
North Spit Beach Nourishment	Beneficial Use	Hydraulic Dredge	3,300,000	8.0
		TOTAL	5,600,00	34.5

Maintenance dredged material would be placed offshore in Coos Bay Site F. Coos Bay Site F is in close proximity to the dredging site has sufficient capacity to accommodate all maintenance material dredged over 20 years. Additionally, placement in Site F allows maintenance dredging to be conducted using a clamshell dredge. This type of dredge is typically utilized for maintenance dredging projects at various berths along the channel.

Completion of excavation and construction dredging using the recommended placement site will require approximately 34.5 months. Excavation of the OGMT basin must commence a minimum of 27 months prior to the start of a dredging window (October 1 through February 15) in order to complete the breaching of the levee and dredging of the access channel within the given window. The construction process will begin with the excavation of 2.3 mcy of material from the OGMT basin to approximately 0.0 ft NAVD88. Material will be hauled to the JCE Placement Area and Weyerhauser Linerboard Site.

The second phase of the construction process is the dredging of 1.45 mcy from the OGMT from approximately 0.0 ft NAVD88 to -45.0 ft NAVD88. Hydraulic dredging will occur within the OGMT basin behind a levee which separates the OGMT basin from the access channel and Coos Bay. A backhoe will be used to excavate a dredge pocket. The cutter-suction dredge will be mechanically lifted by crane into the dredge pocket to begin operations. Dredged material will be transported the dune restoration area on the North Spit in slurry form through pipelines that will discharge behind constructed containment levees. Return water will drain directly into the Pacific Ocean at the shoreline.

The final phase of the construction process will commence upon completion of the dredging of the OGMT basin. The levee will be breached by the cutter-suction dredge in order to begin dredging operations within the access channel. Material dredged from the levee (0.5 mcy) and the access channel (1.35 mcy) will be transported into the IWP CDF via pipeline. Return water will flow through a separate pipeline back into the OGMT basin.

7.3 Data Gaps and Recommendations for Final Design

Several data gaps were identified that must be completed prior to final design of the recommended alternative. First, the 2007 geotechnical investigation of the OGMT basin by GRI must be completed to verify that excavated and dredged material characteristics are compatible with the proposed management alternatives, and that the proposed dredging method is best suited for the given *in-situ* soils. In addition, detailed topographic surveys of the upland placement sites and topographic and bathymetric surveys of the beach restoration site are required for final design to calculate accurate volumes and fill elevations. Finally, construction estimates must be refined to account for weather delays and the possibility of an earlier start to the dredging window following further discussions and negotiations with ODFW.

Exhibit RR

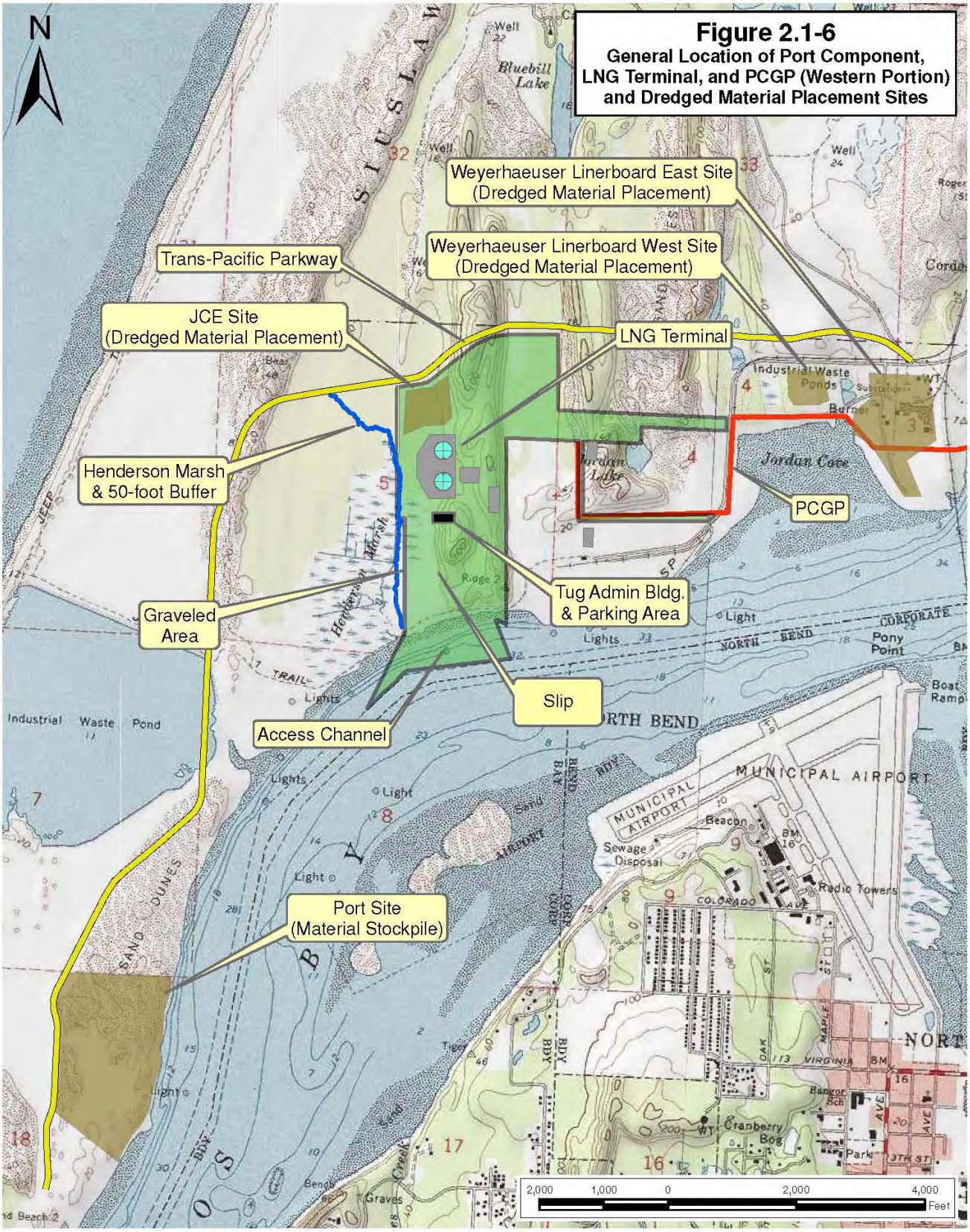


Figure 2.1-6
General Location of Port Component, LNG Terminal, and PCGP (Western Portion) and Dredged Material Placement Sites
N
Weyerhaeuser Linerboard East Site (Dredged Material Placement)
Weyerhaeuser Linerboard West Site (Dredged Material Placement)
Trans-Pacific Parkway
JCE Site (Dredged Material Placement)
LNG Terminal
Henderson Marsh & 50-foot Buffer
PCGP
Tug Admin Bldg. & Parking Area
Graveled Area
Slip
Access Channel
Port Site (Material Stockpile)
Bluebill Lake
Jordan Cove
Pony Point
NORTH BEND
MUNICIPAL AIRPORT
Industrial Waste Ponds
Sewage Disposal
Radio Towers
Cranberry Bog
Industrial Waste Pond
SAND DUNES
2,000 1,000 0 2,000 4,000 Feet

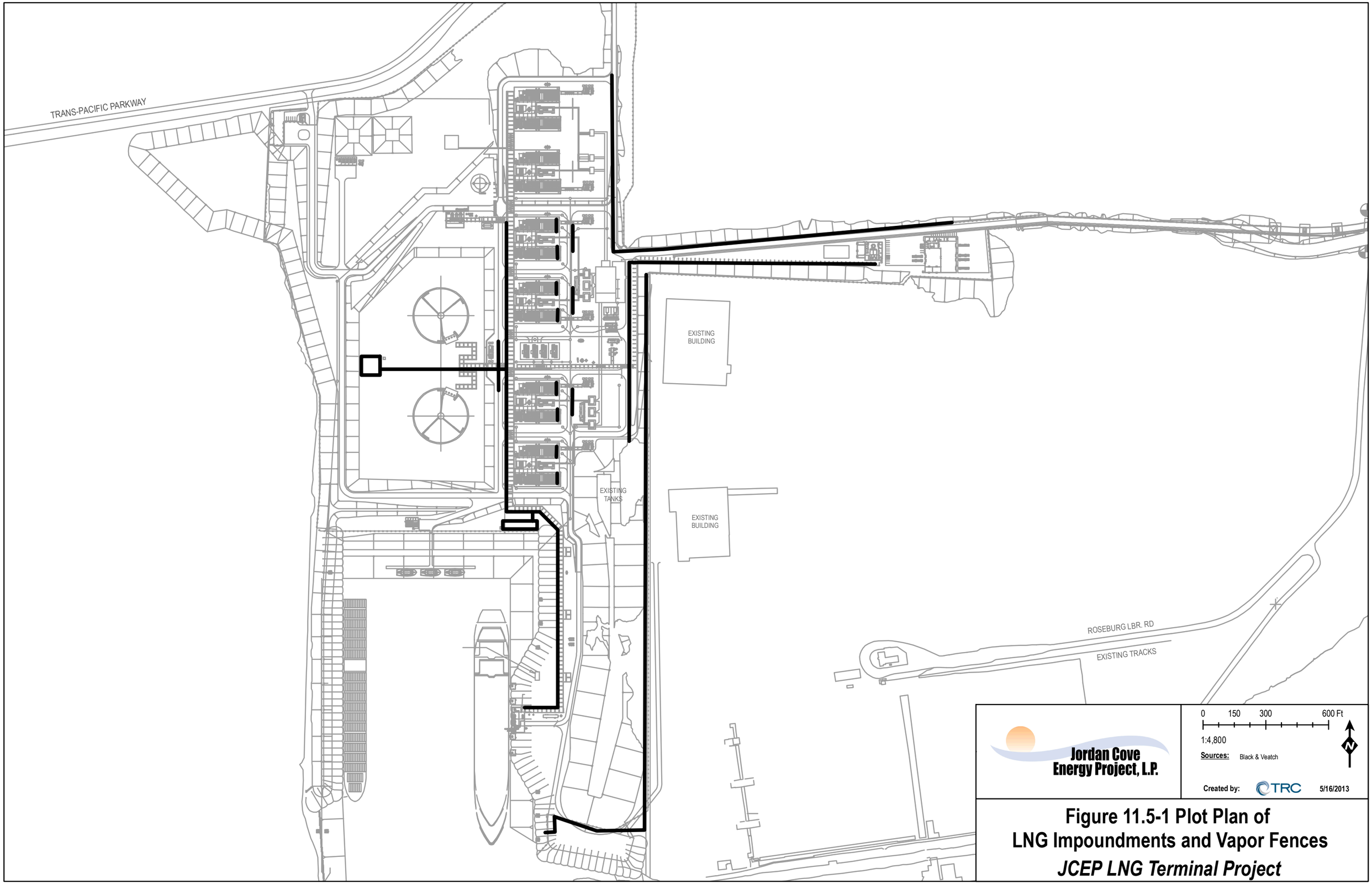
Exhibit SS

TABLE 1.1-2

Estimated Excavated and Dredged Material Volumes for the JCEP LNG Terminal Project

Facility	Construction Phase	Volume (mcy)	Placement Location
Slip	Land Based Excavation	2.3	LNG Terminal Site and South Dunes Power Plant Site
Fresh Water Phase			
Slip	Dredging in Pocket Behind Berm (Base Option)	Up to 1.5	LNG Terminal Site and South Dunes Power Plant Site
Salt Water Phase			
Slip	Dredging from Bay (Option 1)	Remaining of 1.5	LNG Terminal Site and South Dunes Power Plant Site
Slip	Dredging to Remove Berm	0.5	LNG Terminal Site
Access Channel	Dredging from Bay	1.3	South Dunes Power Plant Site

Exhibit TT



Jordan Cove Energy Project, L.P.

Figure 11.5-1 Plot Plan of LNG Impoundments and Vapor Fences

JCEP LNG Terminal Project

Exhibit UU

Potential Impact of

Jordan Cove LNG Terminal construction on

the Nursery Habitat of Dungeness crab.

December 2014

Sylvia Yamada Ph.D.

yamadas@science.oregonstate.edu

The **Dungeness crab** (***Cancer magister***) supports an important commercial and sport fishery from Alaska to California. Total annual landings in recent years exceeded 25,000 tons (55 million pounds) (FAO statistics, 2012). In Oregon, the 2014 Dungeness fishing season yielded 14.4 million pounds, $50 million to crabbers and an estimated $100 million to the Oregon economy (Oregon Dungeness Crab Commission in Fisherman's News On line). The Dungeness fishery is the most valuable commercial fishery in Oregon (Rasmusen 2013).

The life cycle of Dungeness crab is complex, depending on both estuarine and near-shore habitats. Typically, mating occurs in shallow water, and females migrate offshore to brood and hatch their eggs. The early larval stages feed and rear in the near-shore water column, after which the final larval stage rides tidal currents back to shore and settles out in shallow estuarine habitats. The final larval stage molts into a ~5 -7 mm wide first crab stage. The highest densities of juvenile Dungeness crabs are found in estuaries, which provide warm water, high biological productivity and protection from predators. Sand substrate and eelgrass beds are preferred habitat for these young crabs, which bury in the sand and hide in the eelgrass to escape predators. Size measurements of crabs trapped at Russell Point in Coos Bay (below the Highway 101 McCullough Bridge) show that Dungeness crabs in their first two years of life (100 mm carapace width and smaller) are extremely abundant in the mid-to low intertidal areas such as pools and eelgrass beds (Figure 1).

In my research documenting the status of the non-native European Green crab in Coos Bay, I encounter young Dungeness crabs in all my study sites. I selected a sub-set of my sites closest to the proposed Jordan Cove Energy Project: the north and south sides of Trans Pacific Lane and the beach adjacent to the Roseburg Forest Product watchman's booth. The results from over 600 trap-days, show that young Dungeness crabs are consistently abundant from 2002 to 2014 at all sites, with an average catch of 15 per trap (Table 1). These trapping results confirm the findings by Emmett and Durkin (1985) that estuaries are important nursery habitats for Dungeness crabs. This needs to be kept in mind when the Trans Pacific Parkway is to be expanded and an upland area is to be cut out to create a berth for ocean-going vessels. Not only will the turbidity during the construction phase be of concern to the ecological community, the on-going dredging to maintain the berth and shipping channels will continue be a disturbance to the ecosystem. It will result in habitat loss for native species, including the valuable Dungeness crab. In one study between 45 to 85 % of the Dungeness crabs died during a simulated dredging operation (Chang and Levings, 1978). Marine habitat modification by construction of the Jordan Cove Energy Project could impact the important Oregon Dungeness fishery.

Sylvia Yamada is a marine ecologist who has studied native crabs and the European green crab in Oregon and Washington for over 20 years.

References:

Chang, B., Levings, C. 1978. Effects of burial on the heart cockle *Clinocardium nuttalii* and the Dungenes crab *Cancer magister*. *Estuarine, Coastal and Shelf Scie*nce. 7, 4009-412.

Emmett, R.L. and Durkin, J.T. 1985. The Columbia River Estuary: An Important Nursery for Dungeness Crabs, *Cancer magister*. *Marine Fisheries Review*. 47(3), 21-25.

Fisherman's News On line Sept 24, 2014 http://fnonlinenews.blogspot.com/2014/09/oregons-crabbers-riding-market-value.html

Rasmuson, L.K. 2013. The Biology, Ecology and Fishery of the Dungeness crab, *Cancer magister*. In Michael Lesser, editor: *Advances in Marine Biology*, Vol 65, Burlington: Academic Press, pp. 95-148. ISBN: 978-0-12-410498-3 Elsevier Ltd. Academic Press.

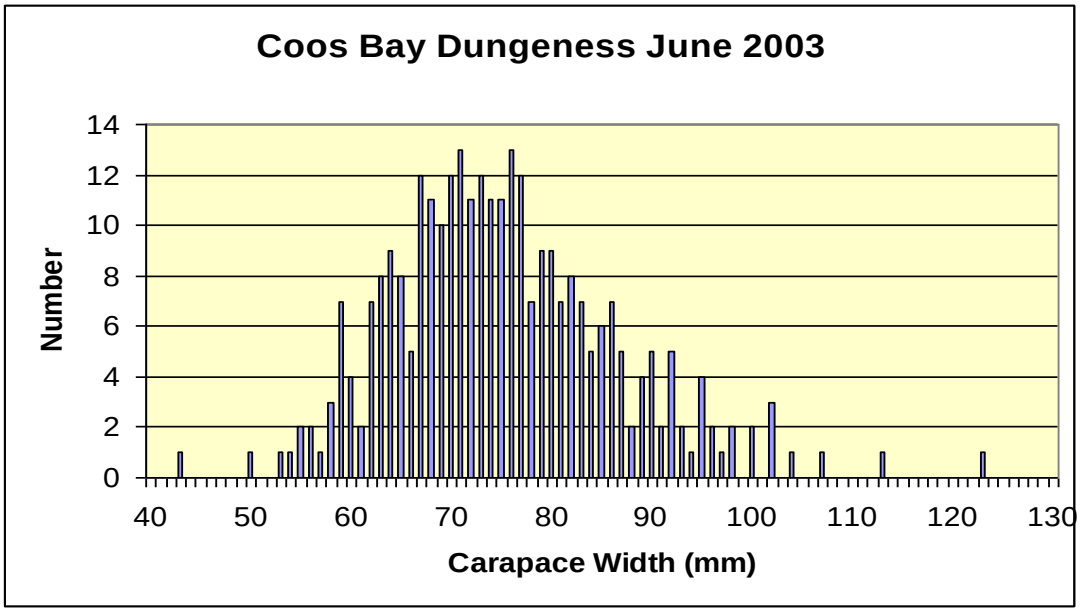


Figure 1. Size frequency distribution of Dungeness crabs trapped in pools and eelgrass at Russell Point, below the Highway 101 McCullough Bridge, in June 2003. Adult crabs are greater than 100 mm in carapace width. It is estimated that 2 year classes are represented.

Table 1. Trapping Data for study sites along Trans Pacific Lane and Roseburg Forest Product causeway from 2002-2014.

	Date	Trap Type	Zone	European green crab *Carcinus maenas*	Hairy shore crab *Hemigrapsus oregonensis*	Purple shore crab *Hemigrapsus nudus*	Dungeness crab *Cancer magister*	*Cancer magister* (Recruits <50mm)	Red rock crab *Cancer productus*	stag-horn sculpin	# Traps
Roseburg Lumber	6/25/2002	Fish	Site	0	0	0	45	0.5	0.1	0	10
Roseburg Lumber	6/16/2003	Fish	*low*	0	0	0	12.2	0	0.7	1.5	10
TransPacific S	7/10/2005	Fish	*low*	0	0	0	6.14	1.14	0	1.86	7
North	7/10/2005	Fish	*low*	0	0	0	0	5.7	0	1.1	10
South	3/25/2005	minnow	*Mid*	0	0	0	0	0	0	2.4	10
North	7/10/2005	minnow	*mid*	0	0.2	0	0	0.6	0	0.8	5
South	7/10/2005	minnow	*mid*	0	0	0	0	0.4	0	0.6	5
Trans-Pacific Bridge	9/1/2005	Fish	*Low*	0	0	0	6.6	0	3	1	5
	9/1/2005	Minnow	*high*	0	0	0	0.2	0	0	0.4	4
Trans-Pacific Ln.	6/8/2006	Fish	*Low*	0	0	0	4.9	0	0	2.6	10
	9/13/2006	Fish		0	0.4	0	0.2	0	0	0.2	5
	6/8/2006	Minnow	*high*	0	0	0	0.7	0	0	2.3	10
Trans Pacific Br.	9/13/2006	Minnow		0.2	0	0	0	0	0	0.2	5
TransPacific Ln. N	5/25/2007	Fish	Mid	0.5	0.2	0	1	0.1	0	0.8	10
	7/14/2007	Fish		0.4	1.47	0	23.53	0	0	0.2	15
	9/26/2007	Fish		0	0	0	4.75	0	0	0	8
TransPacific Ln. S	5/25/2007	Fish	Mid	0.09	0	0	0.82	0	0	0.36	11
	7/14/2007	Fish		0.27	0.07	0	9	0	0.07	1	15
	9/26/2007	Fish		0	0	0	2.71	0	0	0.14	7
TransPacific Bridge	5/25/2007	Fish	Mid	0	0	0	1.33	0	0	0	6
	9/25/2007	minnow	high	0	0	0	1.6	0	0	0.4	5
TransPacific Ln. N	6/18/2008	Fish	Mid	0.1	0.2	0	7.4	0	0	7.8	10
	6/19/2008	Fish		0	0	0	1.75	0	0	3.25	8
	9/18/2008	Fish		0	0.1	0	23.4	0	0	0.7	10
TransPacific Ln. S	6/18/2008	Fish	Mid	0.5	0	0	17.2	0	0	2.2	10
	6/19/2008	Fish		0.37	0	0	17.63	0	0	1.37	8
	9/18/2008	Fish		0.1	0	0	22.6	0	0	0.3	10
TransPacific Ln. N	7/8/2009	Fish	Mid	0.13	0	0	9.88	0	0	0.38	8

	7/9/2009	Fish		0.1	0.2	0	11.3	0	0	0.3	10
	07/0/09	Fish		0.1	0	0	11.7	0	0	0.5	10
TransPacific Ln. S	7/8/2009	Fish	Mid	0	0	0	24.38	0	0	0.25	8
	7/9/2009	Fish		0.1	0	0	30.2	0	0	0.9	10
	7/10/2009	Fish		0.4	0	0	16.6	0.1	0	0.5	10
	7/11/2009	Fish		0.4	0	0	13.1	0	0	2.7	10
TransPacific Ln. N	3/19/2010	Fish	Mid	0	0.4	0	0.7	0	0	0	10
	3/20/2010	Fish		0	0.1	0	0.1	0.2	0	0	10
	3/21/2010	Fish		0	0.3	0	0.3	0.4	0	0	10
	6/25/2010	Fish		0	0	0	35.7	0	0	1.1	9
	6/26/2010	Fish		0	0	0	75.9	0	0	0.4	10
TransPacific Ln. S	3/19/2010	Fish	Mid	0	0	0	1.9	0.9	0	0	10
	3/20/2010	Fish		0.1	0	0	1.7	0	0	0	10
	3/21/2010	Fish		0	0	0	2.5	0.1	0	0	10
	6/25/2010	Fish		0	0	0	90.6	0	0	0	10
	6/26/2010	Fish		0	0	0	69.9	0	0	1.6	20
TransPacific Ln. N	7/17/2011	Fish	Mid	0	0.6	0	4.73	0.27	0	0.73	15
	10/17/2011	Fish		0	0	0	5.3	0	0	0.2	10
TransPacific Ln. S	7/16/2011	Fish	Mid	0.03	0.09	0	1.5	0.06	0	1.53	34
	7/17/2011	Fish		0	0.13	0	2.07	0.47	0	1.2	15
TransPacific Ln. N	6/27/2012	Fish	Mid	0	0	0	89.2	0	0	0.4	5
TransPacific Ln. S	6/25/2012	Fish	Mid	0	0	0	9.75	0	0	0.75	12
	6/27/2012	Fish		0.11	0	0	5.2	0	0	0.67	9
TransPacific Ln. S	3/22/2013	Fish	Mid	0	0	0	1.75	0	0	0	20
	3/23/2013	Fish		0	0	0	6.79	0	0	0	19
	7/12/2013	Fish		0	0	0	7.37	0	0	1.6	30
	7/13/2013	Fish		0	0	0	5.24	0	0	1.48	25
TransPacific Ln N	7/12/2014	Fish		0	0	0	40.33	0	0	0.5	12
	7/13/2014	fish		0	0	0	24.9	0	0	0.4	12
TransPacific Ln. S	7/12/2014	Fish		0	0	0	47.27	0	0	0	15
	7/13/2014	fish		0	0	0	23.83	0	0	0	12
Average				0.068	0.075	0	14.955	0.067	0.065	0.874	
Total # Traps											649

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMSSION

IN THE MATTERS OF

Jordan Cove Energy Project, L.P.	**)**	**Docket No. CP13-483-000**
Pacific Connector Gas Pipeline, L.P.	**)**	**Docket No. CP13-492-000**

MOTION TO INTERVENE OUT OF TIME OF CLAUSEN OYSTERS AND LILLI CLAUSEN, AS AN INDIVIDUAL AND OWNER

Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C. F. R., 385.214, I, Lilli Clausen, an individual and owner of Clausen Oysters, respectfully move to intervene out of time in the May 21, 2013, application of the Jordan Cove Energy Project, L.P. and the June 6, 2013, application of the Pacific Connector Gas Pipeline, L. P. in the above-captioned dockets.

I. Identity and Contact Information

I ask that all communication in regards to this motion be addressed to the following:

Lilli Clausen
Clausen Oysters
[redacted]
North Bend, Oregon 97459
[redacted]

II. Declaration of Interest

On May 21, 2013, Jordan Cove Energy Project, L.P. filed in FERC Docket No. CP13-483-000 an application under section 3 of the Natural Gas Act (NGA) and Parts 153 and 380 of the Commission's regulations, seeking authorization to site, construct and operate a natural gas liquefaction and liquefied natural gas (LNG) export facility on the bay side of the North Spit of Coos Bay in Coos County, Oregon, directly across from the Cities of North Bend, Coos Bay and the Southwest Oregon Regional Airport. The LNG Terminal would be capable of receiving natural gas via the Pacific Connector Gas Pipeline, liquefying it, storing it in its liquefied state in two cryogenic storage tanks, and loading the LNG onto ocean going vessels.

On June 6, 2013, Pacific Connector Gas Pipeline, L. P. filed an application under CP13-492-000 with FERC to construct and operate the Pacific Connector Gas Pipeline (PCGP) Project, a new 231.82-mile, 36-inch diameter interstate natural gas transmission system

and related facilities. The proposed PCGP system will extend from the proposed Jordan Cove Liquefied Natural Gas (LNG) Terminal, being developed by Jordan Cove Energy Project, L.P. (JCEP), to interconnects with two interstate natural gas pipelines near Malin, Oregon. The PCGP is the proposed supply pipeline for the proposed Jordan Cove Terminal.

We continue to get conflicting information about the proposed route of the Pacific Connector Gas Pipeline and have been very concerned about the proposed route of the pipeline through Haynes Inlet and the West side of Coos Bay. As we understand it, the line is proposed to run between Silverpoint 1 and Silverpoint 3 oyster beds. The route going under the Highway 101 Bridge would be very detrimental to our oyster business for several reasons:

We need access to the three oyster beds: Silverpoint 1, 7 and 8, depending on the different tide levels, at various times of the day or night. The harvest crew goes out with the boats at low tide. The large barge is taken out at high tide to bring in the full nets. The channel between Silverpoint 1 and 3 is narrow. We couldn't fill orders if big equipment is being used to dig the trench for the pipeline, preventing us from going through.

Also, we need access to our three oyster beds, Silverpoint 1, 7 and 8, at all times. All the Silverpoint oyster beds: 1, 3, 5, 6, 7, 8 & 9, may be affected by mud or fines in the water which might prevent us from harvesting the oysters according to Dept. of Agriculture regulations. We are also storing our "re-beds" on S 1 for more grow out time. We bring them in as they are ready. Another problem would be the new seed placed around S 1 could potentially be affected by the fines suspended in the water.

When a pipeline is constructed in the water, mud and sand are suspended in the water, especially on windy days. It could drift over our one, two and three year old oysters in the bay. Oysters are filter feeders. They seine out the tiny plankton from the seawater to feed on. Mud, sand or fines could clog the gills of countless oysters. I would hate to have a repeat of the New Carissa oil spill effect. It took 4 years and 9 months before we were paid for the damage!

Another worry is the 250 foot construction right of way in the Bay! Any kind of hole or ditch dug in the mudflats takes years before the ground above it solidifies. One example is at the foot of the boat ramp next to us. A five foot diameter hole left by someone was like quicksand, and one couldn't walk across it for several years!

The line between Silverpoint 1 and 3 could cause problems when accessing the oyster beds, especially at night. Usually the boats are parked in shallow water close to the area to be harvested. I would hate for our guys to get stuck there. And the channel is very narrow! Since the original Silverpoint oyster beds were established in 1890 in Coos Bay and over the years have been worked by various oyster companies, we feel that this resource should be maintained and not jeopardized.

Due to the fact that the Pacific Connector Gas Pipeline's current proposed route could destroy our oyster business, I move to intervene out of time in this proceeding. No other party has been willing or is able to adequately represent our interest in this proceeding and it is for this reason I wish to be made a party to this proceeding, with all the rights attendant to such status. The decision by FERC to allow this Motion/Notice of Intervention Out of Time would be in the public interest.

Dated this 15th day of October 2014.

Lilli Clausen

Lilli Clausen, Clausen Oysters

CERTIFICATE OF FILING

I certify that on the 15th day of Oct 2014, I filed by electronic filing the original document, Motion to Intervene Out of Time electronically with:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Dated this 15th day of Oct 2014

Lilli Clausen

Lilli Clausen, Clausen Oysters

CERTIFICATE OF SERVICE

I certify that on the 15th day of Oct 2014 I served electronically or by first class mail this Motion to Intervene Out of Time to each person designated on the official service list compiled by the Commission in the above-captioned proceedings.

Dated this 15th day of Oct 2014

Lilli Clausen

Lilli Clausen, Clausen Oysters

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMSSION

IN THE MATTERS OF

Jordan Cove Energy Project, L.P.	**)**	**Docket No. CP13-483-000**
Pacific Connector Gas Pipeline, L.P.	**)**	**Docket No. CP13-492-000**

MOTION TO INTERVENE OUT OF TIME OF COOS BAY OYSTER COMPANY AND JACK HAMPEL, AS AN INDIVIDUAL AND OWNER

Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C. F. R., 385.214, I, Jack Hampel, an individual and owner of Coos Bay Oyster Company, respectfully move to intervene out of time in the May 21, 2013, application of the Jordan Cove Energy Project, L.P. and the June 6, 2013, application of the Pacific Connector Gas Pipeline, L. P. in the above-captioned dockets.

I. Identity and Contact Information

I ask that all communication in regards to this motion be addressed to the following:

Jack Hampel
Coos Bay Oyster Company
[redacted]
Coos Bay, Oregon 97459
[redacted]

II. Declaration of Interest

On May 21, 2013, Jordan Cove Energy Project, L.P. filed in FERC Docket No. CP13-483-000 an application under section 3 of the Natural Gas Act (NGA) and Parts 153 and 380 of the Commission's regulations, seeking authorization to site, construct and operate a natural gas liquefaction and liquefied natural gas (LNG) export facility on the bay side of the North Spit of Coos Bay in Coos County, Oregon, directly across from the Cities of North Bend, Coos Bay and the Southwest Oregon Regional Airport. The LNG Terminal would be capable of receiving natural gas via the Pacific Connector Gas Pipeline, liquefying it, storing it in its liquefied state in two cryogenic storage tanks, and loading the LNG onto ocean going vessels.

On June 6, 2013, Pacific Connector Gas Pipeline, L. P. filed an application under CP13-492-000 with FERC to construct and operate the Pacific Connector Gas Pipeline (PCGP) Project, a new 231.82-mile, 36-inch diameter interstate natural gas transmission system and related facilities. The proposed PCGP system will extend from the proposed Jordan Cove Liquefied Natural Gas (LNG) Terminal, being developed by Jordan Cove Energy Project, L.P. (JCEP), to interconnects with two interstate natural gas pipelines near Malin, Oregon. The PCGP is the proposed supply pipeline for the proposed Jordan Cove Terminal.

On December 18, 2014, I met with Representative Caddy McKeown and Michael Hinricks of the Jordan Cove Energy Project where I learned about the plans of the Pacific Connector Gas Pipeline and the close proximity of the proposed pipeline to our Silverpoint oyster beds. As we understand it, the line is proposed to run up the channel between ours (Silver point 3) and Clausen Oysters (Silver point 1) oyster beds.

Our concern is the effect that the construction of the Pacific Connector Gas Pipeline will have on our oysters along the proposed route through the Haynes Inlet on Coos Bay.

Our oysters are planted at the minus tide lines to utilize the mud flats as close to the channel as we can get. At certain minus tides, the channel may only be 100-200 feet wide. With the amount of mud and sand sediment that would be created within the close proximity of our beds, I believe we could suffer a devastating dead loss.

In the summer months, we set oyster larvae on shell and place them on pallets in bags that keep them up about a foot off the mud flats. This is done to keep them out of any silt or sediment while letting them grow through fall and winter for planting in the spring.

These larvae, when first set, are very small and very vulnerable. (Twelve million larvae equal about the size of a tennis ball).

When the oyster spat are planted in the spring (March-June), by removing them from the bags and pallets and cast directly onto the mud flats, they are approximately ¼ to ½ inch in diameter, and if you cover them with sediment, they will die!

I am also concerned about the bay water quality in this area during the construction time. The Oregon Department of Agriculture will surely be testing this water and if they have any concerns during this period, they will shut our harvesting down.

We need continual access to these beds both day and night. We work on the tides and they change daily.

Due to the fact that the Pacific Connector Gas Pipeline's current proposed route could destroy our oyster business, I move to intervene out of time in this proceeding. No other party has been willing or is able to adequately represent our interest in this proceeding and it is for this reason I wish to be made a party to this proceeding, with all the rights attendant to such status. The decision by FERC to allow this Motion/Notice of Intervention Out of Time would be in the public interest.

Dated this 28th day of February 2015.

__/s/ Jack Hampel_____
Jack Hampel, Coos Bay Oyster Company

CERTIFICATE OF FILING

I certify that on the 28th day of February 2015, I filed by electronic filing the original document, Motion to Intervene Out of Time electronically with:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Dated this 28th day of February 2015.

/s/ Jack Hampel
Jack Hampel, Coos Bay Oyster Company

CERTIFICATE OF SERVICE

I certify that on the 28th day of February 2015 I served electronically or by first class mail this Motion to Intervene Out of Time to each person designated on the official service list compiled by the Commission in the above-captioned proceedings.

Dated this 28th day of February 2015.

/s/ Jack Hampel
Jack Hampel, Coos Bay Oyster Company

Clam Diggers Association of Oregon

Chuck Erickson, Director
[redacted]
North Bend, OR 97459

William Lackner, President
[redacted]
Newport, OR 97365

February 21, 2014

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

RE: Motion to Intervene Out of Time submitted by the Clam Diggers Association of Oregon on February 20, 2014, for FERC Dockets CP13-483-000 and CP13-492-000

Dear Secretary Bose:

After submitting our *Motion to Intervene Out of Time* yesterday it was brought to our attention that we had the wrong date listed under our Certificate of Service portion of that Motion. Please accept this corrected version of our *Motion to Intervene Out of Time* that corrects this error. The original Motion was served to everyone in the FERC Service List for FERC Dockets CP13-483-000 and CP13-492-000 on February 20, 2014, and this corrected *Motion to Intervene Out of Time* will also be served to everyone in the Service List for the Jordan Cove / Pacific Connector Project.

Sincerely,

Chuck Erickson
William Lackner

UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY
FEDERAL ENERGY REGULATORY COMMISSION

IN THE MATTERS OF

Jordan Cove Energy Project, L.P. **) Docket CP13-483-000**

Pacific Connector Gas Pipeline, L.P. **) Docket CP13-492-000**

CLAM DIGGERS ASSOCIATION OF OREGON MOTION TO INTERVENE OUT OF TIME

Pursuant to 18 C.F.R. 385.214, the Clam Diggers Association of Oregon, hereby respectfully moves to intervene in the Jordan Cove Energy Project and the Pacific Connector Gas Pipeline applications submitted to the FERC on May 21, 2013 and June 6, 2013.

I. Identity/Contact Information

We ask that all communication in regards to this motion be addressed to the following:

Chuck Erickson, Director
Clam Diggers Association of Oregon
[redacted]
North Bend, OR 97459
[redacted]

William Lackner, President
Clam Diggers Association of Oregon
[redacted]
Newport, OR 97365
[redacted]

II. Declaration of Interest

On May 21, 2013, Jordan Cove Energy Project, L.P. filed an application under section 3 of the Natural Gas Act (NGA) and Parts 153 and 380 of the Commission's regulations, seeking authorization to site, construct and operate a natural gas liquefaction and liquefied natural gas (LNG) export facility (Liquefaction Project) on the bay side of the North Spit of Coos Bay in unincorporated Coos County, Oregon, to the north of the Cities of North Bend and Coos Bay.

On June 6, 2013, Pacific Connector Gas Pipeline, L.P. filed an application with FERC for approval to construct, own and operate a natural gas transmission pipeline in southern Oregon. The Pacific Connector pipeline would deliver approximately 1 billion cubic feet of natural gas per day to the Jordan Cove Energy Project export terminal at Coos Bay Oregon. There the natural gas would be cooled to form LNG for export from Jordan Cove's proposed export terminal.

The proposed LNG export project would require extensive dredging of the Coos Bay, including but not limited to; Channel Deepening and Widening, an LNG Marine Terminal Slip Dock and Access Channel ; and the construction of the Pacific Connector Gas Pipeline through the Coos Bay Estuary and Haynes Inlet. Due to contamination that has been found in Coos Bay sediments, this dredging will negatively impact clams in the Coos Bay both indirectly and directly as described below.

III. **Basis for Intervention**

My name is Chuck Erickson and I am the Director of the Clam Diggers Association of Oregon and have been a resident of Oregon for 58 years. We recently received records from my Oregon Public Records Request we made to Oregon International Port of Coos Bay and Oregon Department of Environmental Quality. Port released documents to us in 2014.

The following information has recently come to light.

In December 2, 1998 EPA and Oregon DEQ entered into a deferral agreement that non-compliance would be reported to the EPA concerning the clean-up of Charleston sediment contamination of hazardous substances (Tributyltin, metals, PAHs, PCBs) in Coos Bay near the proposed Jordan Cove Energy site.

In 2001 EPA Superfund Record of Decision 12.0 clearly states that bioaccumulation test were to be done two years after cleanup and annual monitoring of the sediments for five years. When this was completed the sediment quality was to be monitored at five year intervals.

In the public records emails we received from the Oregon International Port of Coos Bay and their agents, they clearly state that the annual and the five year tests were never done. The Port did not supply the bioaccumulation test results and we assume those were also never done. The Oregon Department of Environmental Quality failed to contact the EPA that the Port was non-compliant with their cleanup agreements. Emails I received late 2013 from Eugene DEQ stated they have never received any test results from Oregon International Port of Coos Bay. These facts also show that DEQ was also non-compliant with the Superfund Deferral agreement.

The records request we received included emails from the Port which show that Coos Bay sediment testing was finally done in 2012.The test results were provided to the Port in October 2013 by Geosyntec consultants. The Port did not release these documents to us until 2014.

These documents indicate heavy metals exceeding minimum requirements in the sediment composite test. The single samples tested were near maximum allowed for heavy metal. These test results also show the following contaminates: tributyltin, antimony, chromium, copper, mercury, nickel and zinc are still present in the sediments sampled. In these same requested emails there were references being made of using samples from other areas of the bay in order to close this matter.

Through our website and members we have learned that Geoduck clams have been taken by commercial and sport harvesters in Coos Bay. Pictures were posted on our website showing a Geoduck harvested. Through our research we found that these clams were present in historical times. Our organization contacted the Oregon Department of Fish and Wildlife Director Roy Elicker to list the Geoduck clams as threatened or endangered species. These clams are only found in limited numbers in Coos Bay and Netarts Bay. ODFW refused our request to list these last remaining stocks of clams. We believe that the planned facility at Jordan Cove LNG export is the reason for their refusal to take action to protect these resources. These remaining Coos Bay Geoduck clams may be the last surviving Geoducks in the State of Oregon.

The President of the Clam Diggers Association of Oregon, William Lackner, was shown pictures of clams by an Oregon Department of Fish and Wildlife employee at the Charleston Field Office. These pictures clearly showed deformed clams from Coos Bay. Mr. Lackner contacted the ODFW employee by email for copies of these photographs. The Charleston ODFW employee refused the request for copies of the photographs and stated they were his personal property.

Mr. Lackner has repeatedly made requests to Newport Oregon Department of Fish and Wildlife to implement an Invertebrate Species Plan for Oregon bays. The Clam Diggers association of Oregon has members along the entire coast of Oregon. Our members have observed clam die offs and crab die offs. When these were reported to the State of Oregon we were told the die offs were natural or they don't have people available to investigate.

Clam Diggers Association of Oregon has contacted the State of Oregon to report sewage spills in Oregon bays. The Oregon Department of Agriculture in Salem has refused to implement the sewage spill notification system to which they agreed. The State excuse is they do not have enough money.

Through our recent request for information from Eugene Oregon Department of Environmental Quality we have learned that DEQ sampling of Coos Bay 1995 dredging samples for contaminates were done incorrectly. Because DEQ did not know how to collect the samples correctly, contaminates like tributyltin could not be tested and all 14 loads of dredged materials failed to detect (TBT) tributyltin. Tributyltin is a known human health risk and can bio-accumulate in shell fish and finned fish.

We also learned from documents and recent communications that DEQ did not use scientific proven methods for detecting contaminates in Coos Bay sediments. DEQ failed to do tissue sampling on clams before and after dredging took place in Coos Bay. Because clams bio-accumulate toxic contaminates they are the litmus test if contaminates are present in sediments. This sample method is used worldwide by scientists who study the effects of environmental pollution in sediments. In other words, clams are the canaries of the coal mine.

DEQ did some limited testing of clams for contaminates in Coos Bay. From DEQ documents and communications we have learned that their sampling methods were less than scientific. DEQ never sampled the original 1970's area where baseline for contaminates were established. When DEQ did test, they never tested the same area again even though contaminates were present in high numbers for the clams sampled. DEQ did not follow scientific protocol by using baseline methodology for their tissue contaminates studies. It was also learned that the clams samples were not all sent to the testing lab as whole shell clams. The larger gaper clams were dissected and not sent whole. It was learned that some internal parts of the clam were not sent for testing. This may explain why the Gaper clams tested much lower than the softshell clams. This methodology of using two systems for sampling is less than scientific and could result in errors.

DEQ has informed the Clam Diggers Association that non source point benzo(a)pyrene levels have risen since the 1979 EPA study. This increase is noted in the Coos Bay Toxics Study. The sediment studies for Jordan Cove LNG have not included tissue sampling for clams. The methodology used by the Jordan Cove studies may contain errors for contaminates in Coos Bay sediments.

Due to the recent findings described above showing that sufficient studies have not been completed to date, and in an effort to protect Coos Bay clams, clam diggers and the interest of any and all citizens who may potentially ingest clams coming from the Coos Bay, the Clam Diggers Association of Oregon respectfully request to be made a party to this proceeding and be permitted to intervene in this proceeding with all the rights attendant to such status. No other party will or can adequately represent the Clam Diggers Association of Oregon and no prejudice to, or additional burdens would occur to existing parties as a result of the FERC permitting this intervention. Participation of the Clam Diggers Association of Oregon in this proceeding would be in the public interest.

CERTIFICATE OF SERVICE

We hereby certify that notice of this Motion to Intervene Out of Time will be served electronically or by first class mail to each person designated in the official service list compiled by the Commission in the above-captioned proceedings.

Sincerely,

Chuck Erickson
William Lackner
Dated this 20th day of February 2014

Site Guide: Weyerhaeuser Settling Pond Site on the North Spit of Coos Bay

Tim Rodenkirk - [redacted]

Introduction

This relatively new birding spot has proven to be on one the most diverse birding locations on the south coast. In addition, its location adjacent to the beach makes it a prime spot to find rarities which can occur in practically any month. Over the past nine years, I have recorded over 220 species of birds at this site, and that is not counting pelagic species observed from the dike on the northwest end of the site or species observed just east of the site in Coos Bay. Bird numbers and species diversity peak during the fall period when this spot is a must visit location for Oregon birders provided access is once again granted to bird this spot (see sidebar).

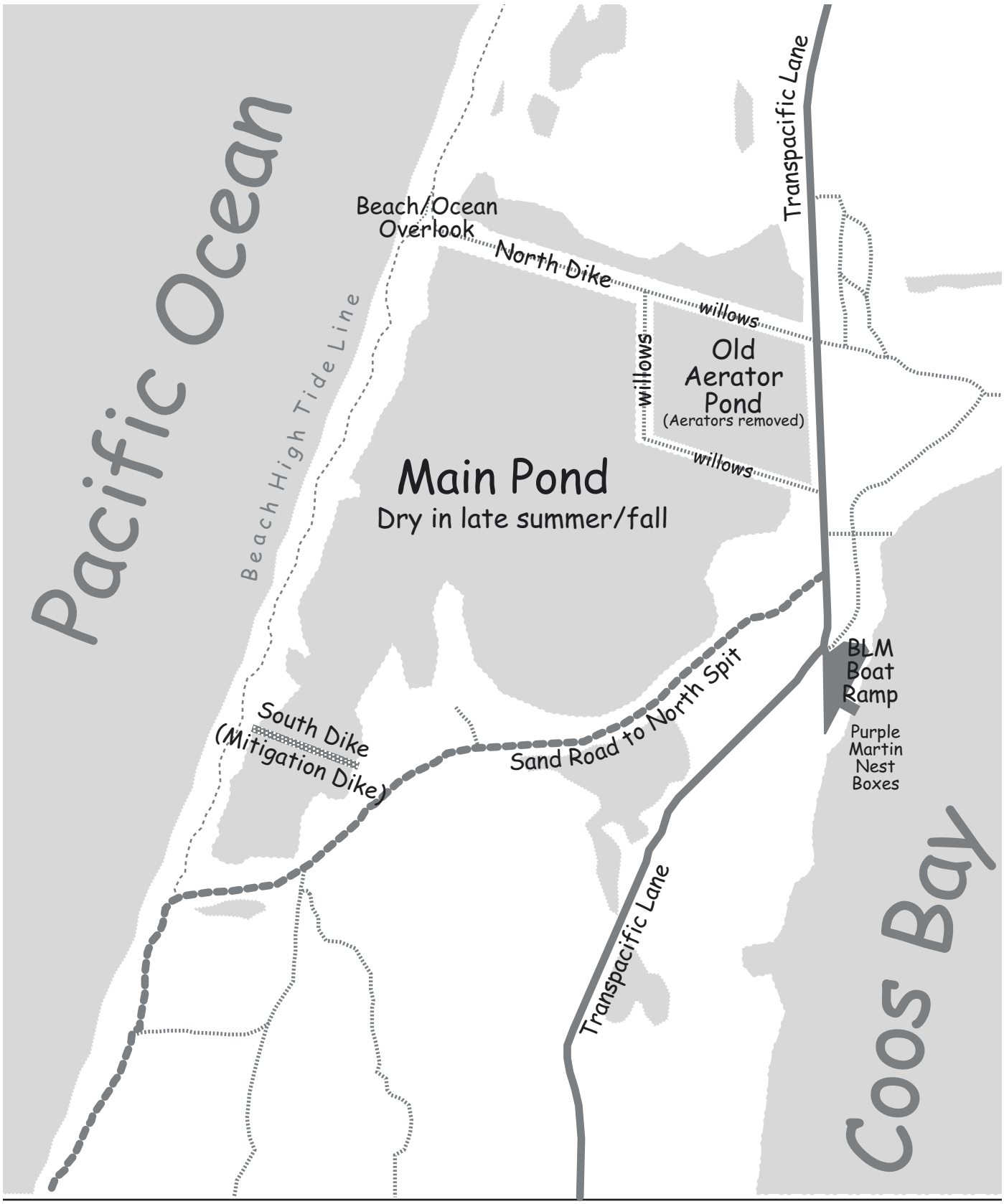
This site is located in the deflation plain on the North Spit of Coos Bay, Coos County, Oregon (see map). It is directly adjacent to the beach and sandwiched between the beach and Coos Bay by a very narrow strip of land. The area was diked off and leased from the Coos Bay Bureau of Land Management (BLM) to be used as an industrial effluent pond by Menasha in 1959. The Weyerhaeuser Company (Weyco) eventually bought the site from the BLM in the early 1990s and continued to use it as an industrial settling pond. In 1996, Weyco stopped using the area as a settling pond and instead pumped their mill effluent out to the aeration pond where it was then released via pipe a mile out into the ocean. Weyco shut down its mill on the North Spit in 2004 and the aerators were subsequently removed from the aeration pond. Weyco still pumps water through the aeration pond and out into the ocean so the aeration pond stays filled with water all year.

Since Weyco stopped using the large pond as a settling site in 1996, the area has naturally begun reclaiming itself. The settling pond fills with rainwater in the winter when it essentially becomes a lake. As the rains let up in spring, the water level begins to drop and by May there are sandy islands and a few mudflats exposed. By late June and July much of the water is normally gone and extensive sand and mudflats appear with scattered ponded water. In August and September, the area is almost entirely dry with sandy areas predominating and cracked mud on the northern end of the large pond where the last of the main pond water remains with a small pond also still present south of the mitigation dike. By October and November the winter rains have usually begun filling up the site with water and by December it is normally completely covered with water again. Once devoid of vegetation, hooker willows have begun growing in various locations at the site particularly around the aeration pond and in the southeast end of the main pond. Various sedges and forbs also appear as the water level drops in spring and summer. A forest primarily consisting of shore pine and Sitka spruce surrounds the site on three sides. The main pond area is not managed and could be described as in the early stages of natural pond succession. All other fresh water marsh sites in the deflation plain on the North Spit are more heavily vegetated so the open sand and mudflats make this a unique site on the spit.

The future of the site is uncertain. It is currently for sale by Weyco, and the International Port of Coos Bay (IPCB) looks like a likely buyer of the site as they have proposed acquiring all lands for sale on the North Spit to be used for industrial development. **On 24 April 2006, Weyco closed the site to public, along with all most of the rest of their land holdings on the North Spit.** Officials from Weyco said the land closure was a liability issue since they will not be monitoring the site anymore. A land deal with the IPCB is imminent and we can only hope that the new owner will once again open the site for public use. Cape Arago Audubon has been in contact with the IPCB on the future of the site which we hope could be used as a mitigation site and thus be left as is or managed for wildlife purposes. Hopefully, the IPCB would also permit public access to the site. If you would like to contact the IPCB to voice your opinion on the future of this site or to get more information about what is happening, you can contact them at: Phone: (541) 267-7678; Fax: (541) 269-1475; E-mail: www.portofcoosbay.com.

Spring Birds (April and May)

By mid- to late April all the swallows are back including Purple Martins which nest in boxes on pilings in Coos Bay right off the



Map of the Weyerhaeuser Settling Pond Site on the North Spit of Coos Bay
Map/S. Dowlan

BLM boat ramp site (see map). In mid-May this is the best spot to locate the rare but regular Bank Swallow in Coos County; I have seen all seven species of swallows that occur in Oregon in a single May morning here. Sora, Virginia Rails, and American Bittern breed here and can be heard calling early morning this time of year. Waterfowl, shorebird, and passerine migration really picks up in May. Hard to find species in the county like Greater White-fronted Goose, Redhead, and Blue-winged and Cinnamon Teal are fairly regular during May. If water levels are not too high and some sand and mudflats are exposed (varies from year to year), this is a good spot to see migrating shorebirds from late April throughout May. Since 2003, Wilson's Phalaropes have been nesting here (late May to early-July), the only known coastal breeding location for this species in Oregon. Mid- to late May is also an excellent time to find less common to rare county shorebirds like Pacific Golden-plover (annual), American Avocet (almost annual), and White-faced Ibis (one record). Passerine migration is always busy at the site in May, with many species of warblers, vireos, flycatchers, and sparrows funneling through. Uncommon to rare county passerines seen at the site in spring include: Sedge Wren (only Oregon record), Sage Thrasher (one spring record), Northern Mockingbird (almost regular), Western Kingbird (regular), Gray Catbird (one spring record), Nashville Warbler (almost regular), Vesper Sparrow (almost regular), Chipping Sparrow (rare on the coast), and Yellow-headed Blackbird (almost regular). Ring-necked Pheasant are particularly noticeable here during spring when the males can be heard calling from grassy areas.

Summer Birds (June and July)

This spot is the place to find waterfowl species that do not nest anywhere else in Coos County. Ring-necked Ducks have nested here every year but one since 1998 but nowhere else in the county. Other rare breeding records include: Blue-winged Teal (only county record in 2004); Cinnamon Teal (3 of 4 county records from here); Northern Shoveler (4 out of 5 county records from here); Green-winged Teal (only county record in 2004); Hooded Merganser (nest somewhere nearby; 2 of 3 county records from here); and Ruddy Duck (only county record in 2003). At least one pair of Black Phoebes now breed at the site and Yellow Warblers, absent as breeders in most areas of the Coos County along the coast, have recently been found breeding here. By June, Wilson's Phalaropes and Spotted Sandpipers are on nest and in early July, downy young birds of these species can usually be seen feeding with other shorebirds. June is a transition month for shorebirds with most birds on their breeding grounds in the Arctic. However, there always seems to be a few lingering shorebirds around through mid-June (probably nonbreeders that never make it to the breeding grounds) including both species of dowitchers, Semipalmated Plovers (which have bred further south on the North Spit before), and both Western and Least Sandpipers. By late June and early July the main pond area has been reduced to a series of puddles with sand and mudflat exposed, just in time for the beginning of fall migration. Short-billed Dowitchers, Western and Least Sandpipers, and Greater Yellowlegs are all in by the first week or so of July and things start to really pick up by mid-month when the first Semipalmated Sandpipers can normally be careful picked out of the huge flocks of peeps and striking breeding-plumaged Ruddy Turnstones show up in mixed flocks. July is the month to look for rare stints at the site; a Red-necked Stint was found amongst a large flock of peeps on 15 July 1999.

Fall Birds (August through mid-November)

This area is HOT during the fall migration. Shorebird numbers can exceed 10,000 at the site (generally Semipalmated Plovers and Western and Least Sandpipers making up the bulk of the numbers) during mid-August, September, and early October particularly when the bay is at high tide. It is important to walk the large sandy area between the north and south dikes as the shorebirds are often invisible from the north dike. The open sandy area is particularly attractive to both species of golden-plovers (with Pacifics decidedly more common), Baird's Sandpipers (mid-August is their peak), and Buff-breasted Sandpipers (last week of August through mid-September), the latter being fairly common here and often seen in multiple numbers including 13 on 28 August 2004! During this "dry" period in fall there is often little water except on the very northern edge of the main pond and south of the south mitigation dike. It can be rewarding to take the long walk to the pond south of the mitigation dike as this is a good way to jump Lapland Longspurs (September- October), Buff-breasted Sandpipers, golden-plovers, or to find rarities such as American Avocet (rare but regular) invisible from further north on the main dry pond area. Closely checking out the large flocks of peeps, often resting and well hidden in the dry cracked mud on the north-

Gyrfalcon at the North Spit of Coos Bay 20 February 2006. Photo/R. Namitz

west end of the main pond, is the best way to find Semipalmated Sandpipers (in August) which are regular in small numbers or other rarities such as Ruff (late August through mid-October), Sharp-tailed Sandpiper (mid-September through October), Stilt Sandpiper (mid-August through September), and Curlew Sandpiper (late September-October). Not only is the shorebirding outstanding this time of year, but passerine birding can be just as good. Check the willows around the aeration pond in early morning before the winds pick up, particularly in September. Yellow Warblers are thick in the willows during this time and rarities such as Magnolia and Virginia's Warbler have been seen in recent years. Palm Warblers are regular from mid-October into mid-November and are also fond of the willows. Check the powerlines around the site for Tropical Kingbirds which are almost annual here in the fall (late September-October) and maybe you will get lucky and see a couple with a Scissor-tailed Flycatcher as was witnessed by several birders in early November of 1997! Other rare finds include: Sage Thrasher (one fall record), Gray Catbird (one fall record), Grasshopper Sparrow (August), Chestnut-collared Longspur (multiple records from October to early November), and Bobolink (late September-early October). Large flocks of American Pipits are present in the main pond area in September and October, check these closely for Lapland Longspurs, Horned Larks, and Asian rarities such as Red-throated Pipit (a probable was heard and seen briefly in late September of 2003). Regular fall raptor migrants at the site include Rough-legged Hawks and Short-eared Owls (October-early November) with one record of Prairie Falcon in early August of 1999. Parasitic Jaegers and Common Terns (September) have also been seen over the main pond, and a Little Gull was found in September of 1999. Jaegers, terns, and other pelagic species are more often seen over the open ocean which can be scoped from the west end of the north dike which overlooks the ocean.

Winter Birds (mid-November through March)

Winter is the "slow" season at this site. Duck hunters use the large pond throughout the fall/winter hunting season so waterfowl numbers generally drop off as soon as the season starts. Hunting is not permitted on the aeration pond, so whatever ducks remain tend to congregate here. The aeration pond is one of the

most regular spots for wintering Eared Grebes in the county. Out on the main pond a Snow Goose or two are occasionally seen and there is one record of a Ross' Goose in December of 2005. If the main pond area has not filled up with water late fall rarities can sometime be found such as Snow Bunting (seen once in early December) and Lapland Longspur (more common in October). The willows around the aeration pond often host an overwintering Palm Warbler or two and should always be checked for rarities such as American Tree Sparrow (seen twice in recent years). "Myrtle" Yellow-rumped Warblers are abundant in the willows during winter and a few Black Phoebes are usually around. Bald Eagles, Red-shouldered Hawks, White-tailed Kites, Peregrine Falcons, Merlins, Osprey, and Northern Shrikes are seen off and on throughout the area during this period. Snowy Owls have been seen at the site during irruption years and Burrowing Owls have wintered in the area on more than one occasion. During recent winters, this has been a good location to spot the occasional Barn Swallow during December and January. After major December storms, it is not uncommon to find tens or hundreds of Red Phalaropes bobbing around on the main pond after being blown in off the ocean. Gyrfalcons have overwintered further south on the North Spit the past few years and have been seen on occasion at this site. By March the first swallows appear and some years a Say's Phoebe can be found flycatching from open perches along the north dike from mid-March through early April.

Directions to the Site and Birding Tips:

From Coos Bay, take Highway 101 north through North Bend and over the mile long bridge spanning Coos Bay. Just north of the bridge is the signed Horsfall Beach turnoff on the west side of Highway 101. Follow this diked road just over a mile until it crosses over some railroad tracks. Just past the railroad tracks stay left on Transpacific Lane. Follow Transpacific Lane 2.7 miles and park near the gate on the right (west side of the road, do not block the gate). This puts you at the north dike which passes along the north end of the aeration pond and then along the north end of the main pond. There is a diked trail around the aeration pond also. I've always had my best luck by getting down off the dikes and walking the main pond area. This gives you good birding access to the willows where passerines can be found and enables you to walk the sand and mudflats where many shorebirds cannot be seen from the dike. Birding the willows is best accomplished first thing in the morning, before the winds begin howling out of the north by late AM on a typical sunny late spring/summer day. The main pond is generally not walkable until late spring or early summer when water levels have dropped enough to permit access. Mud is not a problem except in the far north end of the main pond; otherwise it is mostly easy walking on sand. Mosquitoes are thick in spring and early summer especially in the morning before the winds have picked up, a repellant of some sort is almost always needed.

American Kestrel, 28 October, Ankeny N.W.R., Marion Co. Photo/S. Dowlan

Barbara Gimlin, P.O. Box 1527, North Bend, OR 97459

December 16, 2014

Jeff C. Wright, Director
Office of Energy Projects
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

RE: Public Comment on Jordan Cove Energy Project, L.P., Draft Environmental Impact Statement; FERC/EIS-0223F; Docket No. CP07-444-000; LNG Terminal Facility

Dear Mr. Wright,

I am sincerely concerned about soil contamination issues at the proposed site for a liquefied natural gas (LNG) terminal facility for the Jordan Cove Energy Project (JCEP) in North Bend, Oregon. I am a biologist and environmental specialist with a 30-year professional background that includes working as an educator and contract biologist, in addition to working 15 years for the Federal Emergency Management Agency (FEMA) as an environmental specialist from 1998 to 2013. At FEMA I specialized in writing Environmental Assessments and ensuring compliance with the National Environmental Policy Act (NEPA) for FEMA-funded projects. My knowledge and awareness related to JCEP site contaminants comes from firsthand experience working for the JCEP while employed by SHN Consulting Engineers & Geologists, Inc. (SHN) in Coos Bay as a biologist and environmental compliance specialist from March 2013 to April 2014.

I was initially hired by SHN to revise JCEP Resource Report 3 for Vegetation, Wildlife and Fish. I have also assisted in writing Exhibits P (Fish and Wildlife Habitat) and Exhibit Q (Endangered Species) for the Oregon Energy Facility Siting Council (EFSC) application for the JCEP South Dunes Power Plant (SDPP) portion of the project. In between writing these reports, I have spent a considerable amount of time at the various JCEP sites associated with the terminal facility. I have participated in and written reports for numerous habitat-related surveys and studies for the project. In March 2014, I was named as the acting Environmental Inspector (EI) for the JCEP Kiewit $15 million exploratory test program conducted at the LNG terminal site on the North Spit of Coos Bay.

During my time at SHN I struggled at times with the resistance by others working on the JCEP, both inside and out of the company, to respond to what is required for environmental compliance. It was understandable on some levels (it's all in education), but not understandable when substantial environmental issues were discovered.

What I experienced while working as the acting EI for the JCEP Kiewit test program led me to submit a resignation letter to SHN on April 21, 2014, as a matter of professional integrity. When considerable contaminated soils and sediments were exposed during the test program, I was repeatedly told the issues were "being taken care of" and that I didn't need to be involved, even although I was the acting EI. What occurred during the test program did not follow the Unanticipated Hazardous Waste Discovery

Plan written for the JCEP in Resource Report 7. This plan is referred to in the JCEP Draft Environmental Impact State (DEIS) as the process that would be implemented for any construction activities. Instead of management allowing me to further assess the situation and develop an action plan for the contamination issues discovered, I became the problem. I was bluntly told more than once that my job as the acting EI was to not to delay the test program construction being conducted.

I was, and still am, very concerned about site contamination and had hoped the issues I brought to the forefront would be acknowledged and addressed in the DEIS. They have not been. In addition, the contaminant issues I drafted for EFSC Exhibit Q were left out of that exhibit and ignored.

To back up a bit, questioning practices at the JCEP terminal site first began when I found out months after the fact that Southern Oregon University Laboratory of Anthropology (SOULA) archaeologists had discovered contaminated black soils along the JCEP shoreline during cultural resources surveys conducted in September 2013. The soils were discovered at the approximate site of the proposed barge berth. SOULA archaeologists stopped their surveys in the area because of black soils that they deemed to be contaminated (allegedly arsenic) and unsafe to work in. At the time, they notified Steve Donovan, my former boss at SHN, who is an environmental engineer.

When I found out about the soils in February during a meeting with SOULA, I asked if the Oregon Department of Environmental Quality (DEQ) had been informed. I was met with a type of subdued hostility from Steve Donovan and was told it was being taken care of, that it was going to be filled anyway, and that it was not my concern. At the time I thought to myself, not before workers go in there and move the stuff around. And why not report it to DEQ immediately and address it? Since there was a window where it could eventually be addressed, I sufficed in my mind that I would just watch and make sure it was taken care of properly. It was clear from the response I received from my initial queries that further discussion was not welcome. Of note, the site is included as a borrow site to be used as fill for the SDPP. To the best of my knowledge, no further action has been taken to have the soils tested and addressed.

Fast forward to the Kiewit exploratory test program conducted in the spring of 2014 at the proposed LNG terminal site, which includes Ingram Yard and parts the dune forest. As the acting EI, I attended the pre-construction meeting and was introduced by Kiewit as the person who would oversee environmental considerations at the site. As unidentified contaminated soils and sediment surfaced during excavations conducted in Ingram Yard, during my research I came across DEQ Environmental Site Cleanup Information (ESCI Site #4704) online for the 80-acre Ingram Yard property. Previously, I had been repeatedly told it was all “clean fill” from dredging conducted by the U.S. Army Corps of Engineers (USACE) in the 1970s. That was not the complete case at all. It had been used as a log sorting yard and had been authorized as a mill waste dump site by the DEQ following the placement of fill by the USACE. There have also been allegations by locals that the site was used as a dump site outside of mill waste. Limited and inadequate testing has been done post-closure at the site to determine the full extent of the contaminants, and the testing has been limited primarily to the northern half of the site.

In my efforts to ensure the contaminated soils uncovered were addressed appropriately, I provided a copy of the Unanticipated Hazardous Waste Discovery Plan for the JCEP to Steve Donovan at SHN along

with Kiewit personnel, West Coast Contractors personnel (a subcontractor hired by Kiewit), and to the archaeological monitor for the test program. As more contaminants were discovered during excavations, the protocol for site assessment, testing procedures, and compliance with regulations in place under the plan were not being followed. Although I pressed for compliance, I was precluded from any involvement in the matter as the EI. Instead, I was told it was being handled and that I didn't need to be involved. It became clear I was a figurehead EI. That worries me regarding how the future JCEP EI position will be managed.

Potential contaminates exposed by the Kiewit excavations conducted at the site included numerous black soils (north to south in Ingram Yard, including near the shoreline), bright yellow granulated/powder found in clumps of varying sizes, gray gummy material found in clumps (likely related to hydraulic drilling conducted by GRI), and the exposure of an underground concrete storage tank punched through by heavy equipment with unknown liquid inside. The underground tank was located within 15 feet of a temporary office trailer placed for workers at the site near the shoreline and was proclaimed to be an abandoned septic tank by Steve Donovan at SHN, without being tested or researched. There was no apparent smell and the liquid looked gray and foamy. The tank opening was covered by plywood and workers continued to park next to it and walk over it until I asked that it be cordoned off until tests were conducted.

To add to my growing alarm, the archaeologist hired to monitor Kiewit construction activities throughout the site reported his work boots were falling apart due to the seams disintegrating. Initially, he included reports of the potential contaminants he encountered during his monitoring for cultural resources. Under pressure he stopped including the information, as he's an employee who self proclaims he "rides for the brand." Additional information on the contaminants he encountered beyond his initial weekly reports can now only be found in his handwritten journals turned in for the project that are likely stuffed away in some box.

As the contaminant issues mounted, I stressed with my boss at SHN, Steve Donovan, that the Oregon DEQ needed to be contacted and that their policies and regulations needed to be followed. Instead, my hands were kept tied in terms of fulfilling my role as the acting EI and my attempts to initiate action were initially ignored (he was so busy) and then met with subdued hostility. Steve Donovan's standard line, similar to his response about the SOULA concerns with black soils, was to say that it was being taken care of and that I didn't need to be involved. When pressed, Steve Donovan would say he had contacted the DEQ but he wouldn't provide any details when asked for the sake of the administrative record. It was frustrating, to say the least.

While the potential contamination continued to be untested, I became the problem instead. When I repeatedly reported concerns about ongoing discoveries and the process that needed to be followed, my efforts were repeatedly ignored most of the time, or I was told I didn't need to be involved. I was restricted from taking any action that I felt would make the project not only compliant with environmental policies and regulations in place, but ultimately would assist the project as it continues to move forward. After submitting my resignation I contacted the primary DEQ contact for the environmental cleanup site at Ingram Yard, Bill Mason, and learned he had not been informed of any of the contaminant issues being exposed by the Kiewit test program.

The DEQ should have been contacted immediately when the black soils were discovered by SOULA archaeologists in September 2013, and again when the contaminated soils were uncovered during the Kiewit test program. Instead of taking action as the acting EI, I was restrained and told several times I needed to stop acting like a regulator. I have never been a regulator, but I do know the environmental laws and the ones I don't know I research when needed. There was a process that needed to be followed, but wasn't. And it was clear project managers did not want to hear about it from me.

I'm a supporter of the JCEP but am deeply concerned by the incidents that led me to sever my ties with SHN and the project. There is not a commitment to ensure regulatory compliance and, henceforth, accountability, transparency, and integrity for the project. I don't want to believe that the top project managers condone what has transpired. However, when I contacted Bob Braddock, JCEP Vice President and Project Manager, this past summer about my continued concerns, his short response was that he would take my concerns up with SHN. My response was, "therein lies the problem." I never heard back.

In the DEIS the Ingram Yard soils are repeated referred to as clean fill and as being free of contaminants. What little is mentioned as testing having been conducted does not address the limited areas tested and the concerns raised by the DEQ in 2006, including that there are bioaccumulating toxins that would be extremely harmful to marine life if released into the waters of Coos Bay (e.g., via stormwater during transportation, relocation, and use as filtration for stormwater management). The JCEP plans to excavate and transport approximately 2.3 million cubic yards of the upland soils from the terminal site for use as 20-30 feet of fill for the shoreline SDPP site.

The transparency of the JCEP has become a huge concern of mine since the implementation of the Kiewit test program. In addition to the large amounts of potential contaminants exposed during the test program that were not dealt with, I had repeatedly pointed out early in the design stage back in January that the access road along the shoreline was not paved during weekly conference calls with David Evans and Associates (DEA). It was not ever corrected in the NPDES permit submitted to the DEQ by DEA for the test program, or addressed by DEQ-required conditions for the permit, even though substantial improvements were conducted on this road. In addition, a staging area was constructed within 150 feet of the shoreline in Ingram Yard, ignoring standards established by the National Marine Fisheries Service. The approach of "let's wait and see if it comes out in the public comment period" proclaimed by Sean Sullivan, the DEA lead, for the NPDES permit didn't settle well with me. Vast improvements were made during the Kiewit test program to the shoreline dirt road, without any specifications or requirements by the DEQ for the work at that location because no one at the DEQ checked for site plan accuracy. Would other permits or authorizations have been required for work so close to the shoreline? That's what an environmental professional asks and I did. But only internally, as my comments were discounted by both SHN and DEA.

As the acting EI position for the Kiewit test program, I asked repeatedly that the correct process be followed, stressing transparency was paramount. I tried many times (oral, hand-delivered, phone messages, emails) to communicate this and either did not receive a response or was reprimanded. Despite my concerns raised, with not only SHN but with supervisors at the site, the process wasn't being followed. Prior to resigning from SHN, I learned of additional contaminants being exposed on Friday night of April 18, 2014. I went into work on Saturday morning and alerted all key personnel by email that the Unanticipated Hazardous Waste Discovery Plan for the JCEP needed to be implemented and the

protocol followed. The message was tagged as urgent and I emphasized the plan needed to be implemented before workers returned to the site on Monday. I included a personal commitment to assist in addressing the potential issues as expeditiously as possible.

I did not receive one response or phone call in return. When I went into work Monday morning, I was greeted by Steve Donovan who told me I had gotten myself in trouble with Bob Braddock and that I had gone too far. He sternly told me I had gotten off on the wrong foot, that I needed to focus on the "birds and the bunnies," that I had been very disruptive for the Kiewit test program, and that my job with SHN was not to delay the construction occurring at the time. I learned that nothing would be done, construction at the site was commencing without interruption, and there was no plan to deal with the potential contaminants. At that point, after 2-1/2 weeks of trying to resolve the matter, I felt I had no choice and turned in my letter of resignation.

I have a good rapport with the various resource agencies in Oregon from my work for FEMA, and also from when I have worked on my own as an independent environmental consultant. My professional name and integrity was put at stake when I was told my job was to stand back, thereby restricting me from ensuring the proper environmental response was carried out. Within my discipline there is a strict code of ethics (or should be) and I chose not to turn my back on doing the right thing. Transparency, due diligence, and integrity are very important to me. I have not felt they have been important for the JCEP decision makers at hand during the critical moments when a response could have been initiated.

I support the JCEP. I do not support what has recently transpired and sincerely hope it is a reflection of bad judgment on those firms (SHN, DEA) tasked with ensuring this project is transparent and committed to ensuring laws will be followed, including commencing with environmental cleanup as necessary that is coordinated with the Oregon DEQ. The JCEP has inherited property that has issues. These issues can and should be addressed immediately as they arise, and as spelled out by the DEQ. It would be a huge endorsement for the project that they are committed to doing the right thing. Handled correctly, it does not need to be covered up and people like me do not need to be treated as obstacles.

I felt as if I made a strong point by resigning. I had hoped that SHN and DEA would present and address the issues exposed and that the appropriate analysis would be included in the FERC DEIS. Instead, once the DEIS was released I saw that my concerns were excluded and that the Ingram Yard contaminated fill is instead repeatedly referred to as clean and plans are proceeding to use it as fill for the proposed SDPP shoreline site. And no mention is made of the proposed barge berth site, also a borrow site for the SDPP, being contaminated (SOULA, 2013)

The DEIS refers to the DEQ as issuing a "No Further Action" for the environmental clean-up at the terminal site (DEQ, 2006), but if you look at DEQ's website it is listed as a "Partial No Further Action" and is based on the premise that contaminants at the site excavated during future site activities or development must be properly managed and disposed of in accordance with DEQ regulations and policies. Much more testing is needed at the site, due to the much larger extent of contaminated soil exposed during the Kiewit test program. The contamination occurs well outside of the range of where the previous testing was conducted in only the northern portion of the site. Black soils were found all the way to the shoreline at Ingram Yard, along with the additional forested shoreline site to the east

encountered by the SOULA archaeologists. And I can't help but wonder if the underground storage tank was ever properly tested and analyzed. It certainly isn't mentioned in the DEIS. Very little regarding this whole issue is included in the DEIS, except for the misrepresentation of the fill being tested and as being free of contaminants.

In addition, the only stormwater management plan referred to in the DEIS is the one included in Resource Report 2, and it is far from adequate. A stormwater management plan needs to be individually developed for the site which clearly takes into account the contaminants at the site and ensures they are not transported to the shoreline SDPP site, where stormwater currently will be transported through a series of ditches and swales for release in the slip and access channel created for the project. Treatment is briefly mentioned as being included as needed, but there is no clear, site-specific plan included in the DEIS and there should be.

The narrative, plans and figures presented in the DEIS are substantially incomplete regarding the contaminant issues encountered by the project so far. It does not present or address these issues. Much more testing is needed and potentially hazardous materials need to be transferred off-site to a DEQ-approved facility for disposal, not transferred to the SDPP site for use as fill along the Coos Bay estuary. The matter is being swept under a rug and the project has set a very disconcerting precedence regarding how issues encountered at the terminal site will be managed. By not clearly and adequately analyzing the affected environment in the DEIS, the potential environmental consequences of the project are not being addressed. Therefore, cumulative effects and conclusions drawn from the misrepresentation of the site are inadequate.

The ongoing issues at the JCEP terminal site needs to be addressed, including corrective actions that will be taken to minimize potential adverse effects. This needs to be clearly spelled out in the Final EIS before a Record of Decision is issued; otherwise the NEPA process is not being followed.

I would be happy to answer any questions you may have and to steer you to the relevant reports that back up my allegations.

Sincerely,

Barbara Gimlin[1]

[1] electronic signature

cc: Ken Phippen, Branch Chief, Oregon Coast Habitat Branch, National Marine Fisheries Service (NMFS)
Brent Norberg, Office of Protected Resources, NMFS Northwest Region
Shawn Zinszer, Portland District Regulatory Branch Chief, USACE Portland District Regulatory Branch
Teena Monical, Eugene Section Chief, USACE Eugene Field Office
Tyler Krug, Project Manager, USACE North Bend Field Office
Patty Burke, District Manager, BLM Coos Bay District Office
Jennifer Sperling, Botanist, BLM Coos Bay District Office
Dennis McLerran, Administrator, U.S. Environmental Protection Agency (EPA), Region 10
Anne Dalrymple, Enforcement Coordinator, EPA Office of Compliance and Enforcement, Region 10
Laura Todd, Field Supervisor, Newport Field Office, U.S. Fish and Wildlife Service

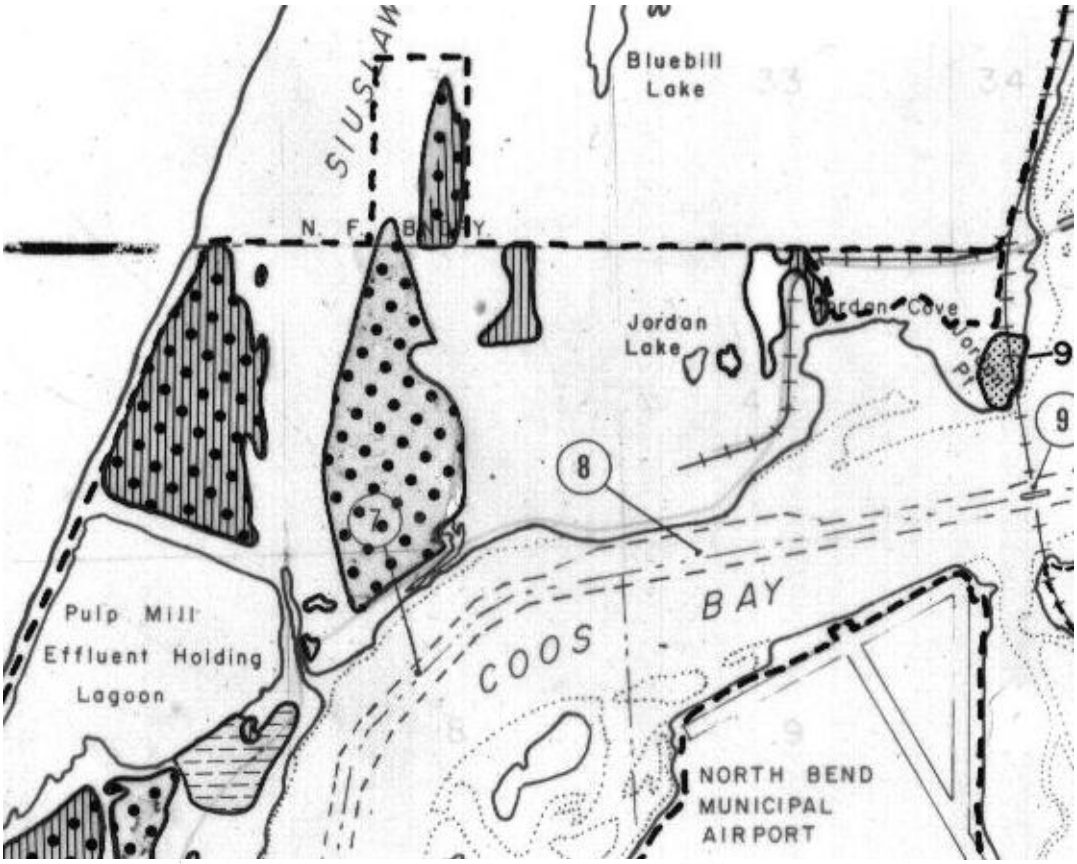
Dick Pedersen, Director, Oregon Department of Environmental Quality (DEQ)
Sara Christensen, 401 Water Quality Certification Coordinator, Oregon DEQ
Bill Mason, Senior Groundwater Hydrologist, DEQ Western Region Office, Eugene
Steve Nichols, Permitting/Compliance Specialist, DEQ Coos Bay Office
Mary Abrams, Director, Oregon Department of State Lands (DSL)
Bob Lobdell, Resource Coordinator, Oregon DSL
Mike Gray, ODFW District Fish Biologist, Charleston Field Office
Stuart Love, ODFW District Wildlife Biologist, Charleston Field Office
Christopher Claire, ODFW Habitat Protection Biologist
Patti Evernden, Coos County Planning Department
Juna Hickner, Coastal State-Federal Relations Coordinator, Oregon Department of Land Conservation and Development
Crystal Shoji, Mayor, City of Coos Bay
Thomas Leahy, Councilor, Coos Bay City Council
Rick Wetherell, Mayor, City of North Bend
David Koch, Chief Executive Officer, International Port of Coos Bay
John Souder, Executive Director, Coos Watershed Association

Warren Brainard, Chief, Confederated Tribes of Coos Lower Umpqua and Siuslaw Indians (CTCLUSI)
Howard Crombie, Director, Department of Natural Resources, CTCLUSI
Bob Garcia, Chairman, CTCLUSI
Don Ivy, Chief, Coquille Indian Tribe
Brenda Meade, Chairperson, Coquille Indian Tribe

Exhibit VV

Coos County Shoreland Values Requiring Mandatory Protection Map Sections

Jordan Cove – Jordan Point Area



9 – Archeological site

SHORELAND VALUES REQUIRING MANDATORY PROTECTION

LEGEND:

SIGNIFICANT WILDLIFE HABITAT

- FRESHWATER WETLANDS
- SNOWY PLOVER HABITAT
- HERON ROOKERY
- MAJOR MARSH
- ARCHAEOLOGICAL SITES
- HISTORICAL SITES
  1- CAPE ARAGO COMPANY MILL
  2- U.S. LIFE SAVING STATION
  3- U.S. LIFE SAVING STATION BOAT HOUSE
  4- CAMP CASTAWAY- APPROXIMATE LOCATION
- COASTAL HEADLANDS
- ----- COASTAL SHORELAND BOUNDARY

Exhibit WW

PUBLIC COMMENT

Provided by Barbara Gimlin, P.O. Box 1527, North Bend, OR 97459

Intertidal Flats Mitigation Proposed for Kentuck Slough

Jordan Cove Energy Project Joint Permit Applications

U.S. Army Corps of Engineers/Oregon Department of State Lands

January 11, 2015

INTRODUCTION

This public comment document presents concerns and credibility issues regarding the Compensatory Wetland Mitigation (CWM) plans submitted or referred to in current U.S. Army Corps of Engineers (Corps) and Oregon Department of State Lands (DSL) Joint Permit Applications (JPAs) for the Jordan Cove Energy Project (JCEP) in North Bend, Oregon. Of the CWM versions presented for the overall JCEP project, this document focuses on only one portion of each— the estuarine mitigation proposed for the Intertidal Flats Mitigation Site at Kentuck Slough.

The estuarine mitigation proposed for Kentuck by the JCEP has not undergone the serious environmental and hydrologic evaluation needed to ensure the mitigation will not result in contamination of the Coos Bay estuary, flooding of adjacent and upstream property owners, and a potential mosquito infestation that would affect area residents. Much more input is needed from hydrologists, engineers, natural resources scientists, and planners to fully understand and design a plan for the site that will address current and future site-specific conditions on the ground, including upstream of the site. The inconsistencies in the plans brought forward, together with the lack of appropriate studies and documentation, is alarming. As it stands, there is a significant potential for substantial adverse effects from the mitigation proposed at Kentuck.

Coos Bay is my playground and I enjoy boating, fishing, clamming, and crabbing in the bay. Kentuck is part of the neighborhood I live in. If toxins are released into the bay from the existing plans for the project, be it from the extensive soil contamination at the main facility site or former golf course toxins released by opening up Kentuck, it will likely have a devastating effect to marine life and the humans who consume shellfish if the issues presented are not fully addressed. In addition, my neighbors who live up Kentuck Way Lane already have increased annual flooding problems, and that will likely increase even more by the current plans for Kentuck.

There are various CWM plans floating around in the regulatory system for the mitigation proposed for the overall project, and all include various versions of the mitigation proposed for Kentuck. The lack of consistency is an indicator that the project warrants close and interactive scrutiny by the local, state and federal agencies that are authorized to review and approve the project.

BACKGROUND

The comments included in this document are based on my personal observations living one mile from Kentuck since 2008, along with firsthand knowledge of the JCEP while working on the project as

environmental consultant while employed by SHN Consulting Engineers & Geologists, Inc. (SHN) in Coos Bay from March 2013 to April 2014.

The existing bridge over the Kentuck Slough channel is located on East Bay Road and includes four large tidegates that regulate the flow between the channel and the Coos Bay estuary. The structure was rebuilt in 2007 and Coos County received $2,321,000 through Oregon Transportation Investment Act funds in 2003 to construct the project. Now the JCEP wants to remove the bridge and tidegates and open up the estuary along East Bay Road by building a bridge and allowing tide waters into both the former Kentuck golf course and the historical inlet that at one time extended approximately five miles inland prior to being filled over 60 years ago.

Figure 1. Existing tidegates (4) at the East Bay Road bridge over the Kentuck Slough channel. The tidegates and bridge were rebuilt in 2007 at the cost of over $2 million. (1-8-15).

The most recent JCEP JPA on record for the DSL was submitted in March 2014. The most recent version of the JPA submitted to the Corps was in October 2014. There are four CWM plans included and referred to in project documentation. They were all prepared by David Evans and Associates, Inc. (DEA) and look very similar. Of note, two different (but similar) CWM plans are included in the full JPA document submitted to the Corps for the current JCEP permit application, and both are dated October 2014. It is unclear which CWM plan is the final product, even from the narrative, but it appears the CWM plan attached first in the document is the one that is moving forward. In addition, two other

CWM plans were submitted to the DSL and are associated with their project documentation (December 2011, March 2014).

My concerns about the lack of proper study and analysis for the Kentuck mitigation portion of the project repeatedly fell on deaf ears while I worked on the project under SHN. I sat in on weekly conference calls with DEA, the consulting company hired by the project to (among many things) write the CWP plan. It was like they didn't want to hear anything that would interfere with what they had in place. This was despite the fact that the plan(s) in place did not take into account the issues brought forth in this public comment. I went as far as to send site photos during flooding stages and documentation of ongoing fill being conducted upstream that could affect the site hydrology. To my knowledge, it was ignored. The issues certainly were not included or addressed in the resultant CWM plans proposed by DEA, or in any other part of the JPAs prepared by DEA that were submitted to the Corps and DSL.

The CWM plans used in the current JPA for the Corps frequently refer to the DSL Removal-Fill (RF) Permit No. 37712-RF (issued by the DSL in December 2011 and expiring December 21, 2016) as providing approval for the mitigation proposed for estuarine resources at Kentuck for the current JCEP project. DSL Permit 37712-RF is based on a JPA submitted to the DSL in 2011 by the International Port of Coos Bay (Port) for the Port's previously proposed Oregon Gateway Marine Terminal project.

The current JCEP DSL permit recorded online at the DSL's website (as of January 8, 2015), Permit 54908-RF, is dated March 20, 2014, and includes a CWM plan dated March 2014. The March 2014 CWM plan has significant changes from the CWM plan approved by the DSL in December 2011, and is different from the two October 2014 CWM plans included in the Corps JPA. There is no documentation provided in any of the JCEP documents to demonstrate the previous CWM plan approved for the Port DSL permit issued in 2011 has been subsequently approved (as revised) for the current DSL permit for the JCEP. The 2011 approval was based on a different applicant and a different overall project. If the Corps and/or DSL have approved the subsequent changes, that process of approval should be documented as part of the administrative record included in the most current JPAs.

There is a lack of consistency in the information presented for review in the JPAs and associated CWM plans. It can be difficult at times to tell what is actually planned for the site. Even the most current CWM plan presented has not been updated and lists the construction of the project and associated mitigation as anticipated to begin in the 3rd and 4th quarters of 2014.

Despite the above inconsistencies, the comments and questions presented in this document are valid for all CWM plans associated with the JCEP.

EXISTING EAST BAY ROAD BRIDGE AND ASSOCIATED TIDEGATES

The narratives for the various CWM plans for Kentuck do not clearly present information on the existing tidegate structure installed under the current East Bay Road bridge that connects Kentuck Slough to Coos Bay. It is a substantial structure with four large tidegates and was rebuilt in 2007.

Prior to the recent replacement, the previous bridge did not meet current design standards and needed to be replaced. Attached to the downstream side of the existing bridge was a set of three 7.5-ft wide by 10-ft high top-hinged tide gates. One of the tide gates was wedged in the gate slot and completely

inoperable. The other two gates functioned, but leaked significantly during flood tides. Additionally, the gates were frequently overtopped during high tides.

The leaky gates allowed for saltwater intrusion into the slough and also resulted in an increase in the amount of saltwater that intruded into adjacent land via groundwater flow. This negatively affected the quality of the soil during the summer months when there is little freshwater inflow to the slough to help dilute the salt concentrations from the bay water. The local landowners indicated at the time that the volume of saltwater influx to the slough was tolerable, but any increase would not be acceptable.

WEST Consultants, Inc., was hired to conduct an HEC-RAS unsteady flow hydraulic model of the tidegate designs for the new bridge to accommodate and improve upon conditions that encourage the estuarine habitat, while at the same time would not increase the volume of saltwater influx to the slough over the existing conditions. Kentuck Slough is considered an important salmonid habitat. Therefore, the hydraulic parameters for the replacement tidegates installed in 2007 were developed in close consultation with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and the Oregon Department of Fish and Wildlife.

After over $2 million being spent to create an efficient bridge with tidegates at Kentuck in 2007, the JCEP now wants to undo it. For the complicated mitigation proposed at Kentuck for the JCEP, more complex hydraulic analysis to identify the impacts is needed to support the determination of appropriate mitigation. Removal of the existing bridge and tidegates needs full evaluation of existing hydrology, hydraulics, sediment transport, fluvial geomorphology and water quality, and the supporting documentation needs to be presented for evaluation.

INTERTIDAL FLATS MITIGATION PROPOSED — KENTUCK SITE

The Kentuck Slough site is referred to as "primarily unvegtated mudflat and tide channels, and some salt marsh." The following appears to be the scope of work for the JCEP CWM plan related to the site, from the JPA submitted to the Corps:

> *Jordan Cove Energy Project Compensatory Wetland Mitigation Plan – Part B*
>
> **1.2.2 Intertidal Flats Mitigation Site (Kentuck Slough Site)**
>
> **Mitigation Goal 2:** Reestablish tidal flow to approximately 45.01 acres of historical intertidal habitats adjacent to Kentuck Slough. (Actual area as currently designed will be 46.59 acres, which results in additional contingency credits. Mitigation Goal 2 and associated Objectives are based on the minimum acreage needed to meet standard DSL mitigation ratios). To achieve this goal, the following objectives will be carried out:
> • **Objective 2.1:** Construct a new bridge in East Bay Drive to allow tidal exchange between Kentuck Inlet and the "back nine" of Kentuck Golf Course.
> • **Objective 2.2:** Construct a new cross dike between the front and back nine of Kentuck Golf Course, with a standard tidegate to drain the front nine to the back nine, and construct a fish friendly tidegate array through the Kentuck Slough dike, allowing the majority of flow from Kentuck Slough to enter the back nine.
> • **Objective 2.3:** Remove the culvert and tidegate located adjacent to the east side of East Bay Road near the southeast corner of the golf course site.

• **Objective 2.4:** Restore tidal connection to the irrigation pond creek system through installation of a fish passable culvert that meets ODFW fish passage criteria.
• **Objective 2.5:** Construct and/or enhance approximately 6,000 linear feet of tide channels.
• **Objective 2.6**: Establish an approximately 1.73 acre wetland bench along Kentuck Slough by relocating the existing levee southward.
• **Objective 2.7:** Establish an emergent to scrub-shrub, brackish to freshwater transitional plant community along the Kentuck Slough bench described in Objective 2.6.
• **Objective 2.8:** Establish a minimum of 0.18 acres of salt marsh habitat within the internal portion of the Kentuck Slough site, with the remainder of the internal portion (43.10 acres) being mudflat and/or tide channel. A greater amount of salt marsh, with subsequent reduction in mudflat is acceptable.

Below is the general study area used by DEA for Kentuck.

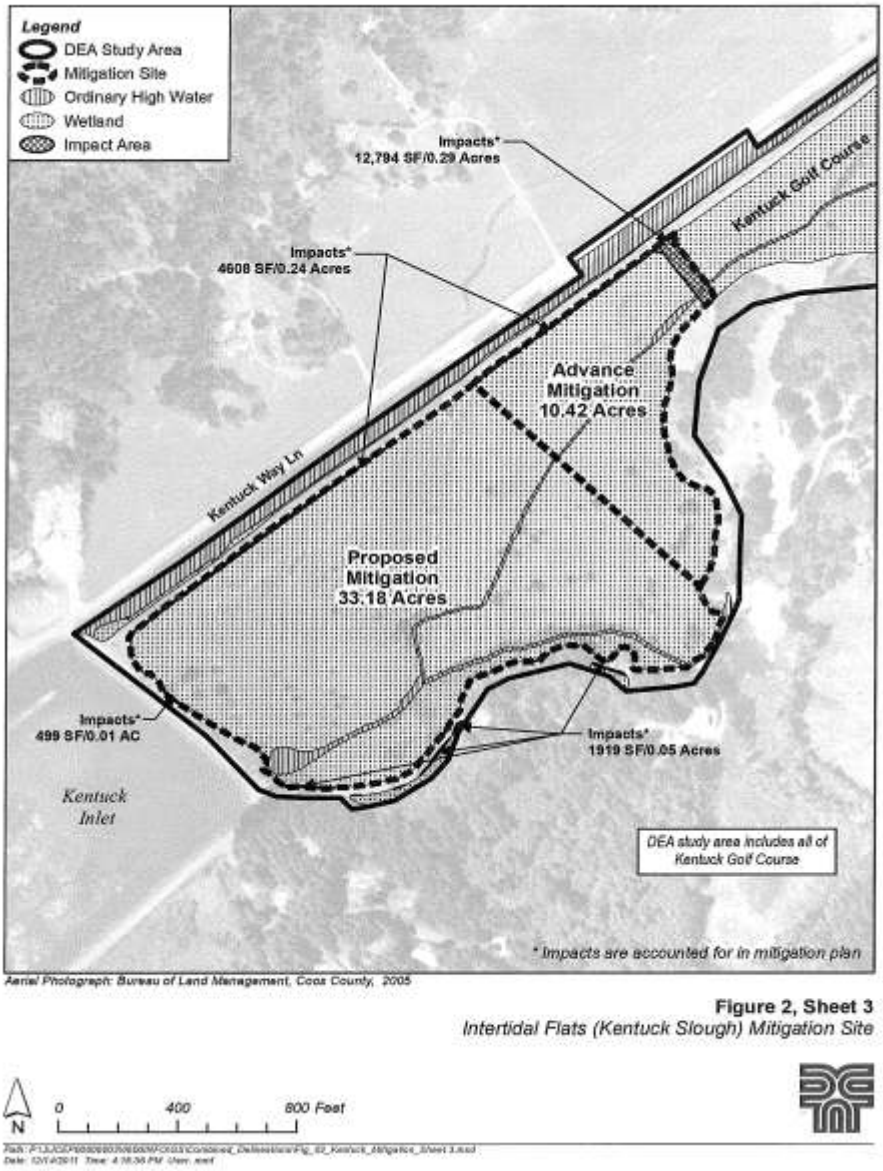


Figure 2. Study area used by DEA to development mitigation at the Kentuck Slough site.

Changes to the JCEP CWM Plan in the October 2014 Corps Permit Application

One of the CWM plans for Kentuck submitted in the October 2014 JPA to the Corps states mitigation for the site has been refined based on agency comments since the issuance of DSL Permit 37712-RF in 2011. What agency comments were considered and why aren't they referenced and documented? For the current CWM plan, the following are fairly significant changes to the mitigation proposed from what was previously approved in DSL Permit 37712-RF in 2011:

- The October 2014 CWM plan includes the establishment of 12.49 additional acres of tidally influenced habitats at the site and adjacent areas that were not included in 2011.
- Mitigation improvements such as levee relocation, cross-dike placement, roadway upgrades, etc., wil now result in 3.11 acres of permanent incidental wetland impacts, of which 0.59 acres was previously included.
- An additional 0.59 acres of incidental emergent wetlands impacts wil result from improvements needed at the site, in addition to the 10.47 acres of mudflat impacts presented in 2011.
- Current designs include raising elevations within the site to better support establishment of salt marsh, provided there is suitable material to import to raise grades. (*This seems a bit vague.*)
- The current design proposes rebuilding the existing Kentuck Slough levee roughly adjacent to the south side of the existing levee and restoring the area under the old levee back to wetland, creating a wetland bench along the slough channel.

Inconsistencies in Elevation Data

The October 2014 CWM plan states the following:

- *The primary salt marsh surface at the reference site (immediately downstream of East Bay Road) occurs between approximately elevations 5.5 and 8.5 feet NAVD88 (North American Vertical Datum of 1988). However, typical elevations within the former golf course range between 2.0 and 4.0 feet NAVD88. These lower elevations in the former golf course preclude vegetation establishment, and therefore mudflat would be the predominant habitat type without intervention. … Current design includes raising elevations within the site to better support establishment of salt marsh; however this is reliant on having suitable material to import to raise grades.*

However, in a November 4, 2010, letter to Chuck Wheeler at the National Marine Fisheries Service, DEA states the following:

- *The proposed mitigation would reestablish tidal flow to approximately 33 acres of historic intertidal mudflat/low marsh habitat adjacent to Kentuck Slough. Survey information confirms that elevations within the golf course are appropriate for establishing mudflat habitat. The primary salt marsh surface at the reference site (immediately downstream of East Bay Drive) occurs between elevations 7.0 and 9.0 feet mean low low water (MLLW). However, typical elevations within the golf course range between 4.0 and 6.0 feet MLLW. These lower elevations in the golf course preclude vegetation establishment and therefore mudflat will be the predominant habitat type (DEA 2010).*

Why would the elevation at MLLW immediately downstream of East Bay Road (7.0-9.0 feet) be higher than the NAVD88 elevation data at the same site presented by DEA in 2014 (5.5-8.5 feet)? In turn, the MLLW listed for the golf course in 2010 (4.0-6.0 feet) is higher than the NAVD88 elevation data in 2014 (2.0-4.0 feet). No supporting documents from site visits, field studies, and surveys conducted are provided for any of the assertions. And it sure seems like much more elevation data is needed overall.

PRIMARY CONCERNS ABOUT THE PROPOSED MITIGATION AT KENTUCK

Potential Site Contaminants

The former golf course at Kentuck operated over four decades before closing in 2009. The CWM plans do not demonstrate that any studies on contaminants have been conducted at the site, particularly for contaminants that may be harmful to marine life. While fertilizers, pesticides and herbicides have improved in recent years, who knows what was previously used at the site and the residual contamination risk the previous use as a golf course may pose.

Attachment A for the October 2014 Corps JPA lists the following regarding potential hazardous materials that may be encountered by the overall project:

13. **Hazardous, Toxic, and Waste Material Handling:** Petroleum products, chemicals, fresh cement, sandblasted material and chipped paint, wood treated with leachable preservatives or other deleterious waste materials shall not be allowed to enter waters of this state. Machinery refueling is to occur at least 150 feet from waters of this state and confined in a designated area to prevent spillage into waters of this state. Barges shall have containment system to effectively prevent petroleum products or other deleterious material from entering waters of this state. Project-related spills into waters of this state or onto land with a potential to enter waters of this state shall be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311.

This short section does not begin to address the issue of potential contaminants at the Kentuck mitigation site, which is part of the overall JCEP. In addition to concerns over the prior use as a golf course, other concerns were brought up during a Coos County Commissioners meeting on September 22, 2009. The commissioners approved a zone change for the Kentuck Golf Course to exclusive farm use to allow the Port to use the land. Commissioner Bob Main voted no, in light of concerns he said he had about pollutants washing into Coos Bay. Commissioners Nikki Whitty and Kevin Stufflebean voted yes.

A story carried in *The* World newspaper on September 23, 2009, said developers had devised a plan that would flood the back nine holes of the course to satisfy government wetland replacement requirements for the JCEP, and that they would remove part of the dike west of the course and build a bridge for East Bay Road. It also included the following:

> *Main said he was concerned that a former methamphetamine lab in a house in the area had contaminated the course and would leach into the bay if the mitigation plans proceeded. Oregon's Department of Health Services has a house on Golf Course Lane listed as unfit for use.*

Main's fellow commissioners and the Port's lawyer tried to reassure Main, noting that state and federal agencies would check into those issues through a biological assessment and U.S. Army Corps of Engineers review. Main remained opposed.

"I'm not comfortable that they will check that potential problem," he said.

Mark Whitlow, a Portland attorney representing the Port, said it was premature to discuss the runoff issue, because the primary purpose of the meeting was the zone change.

"Until the Port's project goes forward, there is no project proposal for the site," he said.

There is no mention in any of the CMP plans that the potential contamination from the former meth house has been investigated. This is not for lack of knowledge. I brought up the article during the summer of 2013 twice during weekly conference calls with DEA and also provided DEA staff with a copy of the article. And it's clear the JCEP's attorney, Mark Whitlow, was aware of the potential issue. At a minimum, it should be brought up and addressed in all project documents related to the proposed mitigation.

Site Hydrology

There is a serious lack of documentation of existing hydrological studies that have been conducted for the proposed Kentuck mitigation, including upstream of the site. The area floods frequently and even when the golf course was open, the locals referred to it as the "yacht club" during the rainy season. Farms and homes to the north of the Kentuck Slough channel, along with to the west (upstream) for approximately three miles, are frequently flooded during heavy rains.

Figure 3. Former Kentuck Golf Course taken from East Bay Road (looking west) following heavy rain. The channel is on the other side of the levy shown on the left. (12-24-14)

The October 2014 CMP plan states that groundwater at the site was typically observed in soil pits from 10 inches depth to within an inch or two of the surface. It further states that saturation typically occurred 2 inches above this depth and that these conditions are "typical of wintertime conditions." The plan, however, does not present any data, dates, or locations to substantiate this claim. From driving past the site on an almost daily basis for the past 6-1/2 years, I can tell you the ground saturation is frequent and much deeper during rainy periods. Heavy rains can occur in the fall, winter, and spring, and further monitoring and analysis is needed to accurately depict the current hydrology.

Figure 4. Kentuck Slough channel west of East Bay Road bridge and tidegates (north of the former Kentuck golf course) following heavy rain. (12-24-14)

Section 4.3.2.1 of the October 2014 CWM plan for existing hydrology states the following:

> *Shallow ponding was observed in many locations throughout the former golf course, but was most pronounced in the western half. Ground topography throughout the former golf course varies slightly, with roughly 2 to 3 feet of difference in relief from location to location. Drift lines were observed along the edges of the higher areas, which suggest that ponding was substantially greater before the site visit occurred. This ponding is likely the result of direct precipitation, which had not occurred for more than a week before the site visit.*

My first question would be, "What site visit?" And just one site visit was conducted to determine the existing hydrology? It's far from adequate. Where's the documentation? When was it conducted? One site visit vaguely referred to in the plan is listed as having occurred in January 2009. Is that the one they're referring to? The short Existing Hydrology section refers to shallow inundation occurring during "high tide," but what high tide? Tides vary many feet with the lunar cycle. Where is the data, are there photos, and how can they possibly claim the four paragraphs in Existing Hydrology represent the existing hydrology? The science is missing.

There is limited space for water to go at Kentuck and opening up the estuary will likely increase the flooding potential far upstream and to the north if this factor is not carefully studied and analyzed in the development of a project design. In addition, the annual rise of the world's oceans, thought to be approximately 1 cm a year, also needs to be calculated in.

Figure 5. Farm north of Kentuck Way Lane at Mile Post 1 following heavy rain. (12-24-14)

The above photo of a farm north of Kentuck Way Lane shows typical flooding during heavy rains. The site is west (upstream) of the new tidegate and dike proposed in the mitigation, despite the substantial reinforcement at the existing bridge and tidegates one mile downstream. The flooding extends to the south and west of Kentuck Way Lane, as shown in the next photo.

Figure 6. Farm south of Kentuck Way Lane at Milepost 1.5. Photo taken from Kentuck Lane at Milepost 1 and is looking west beyond the proposed tidegate and berm for the JCEP Kentuck mitigation. (12-24-14)

The October 2014 CWM plan refers to potential site constraints identified in the CWM plan authorized under DSL Permit 37712-RF, including the following:

> *Opening the site to tidal influence creates the risk of increased flooding potential and saltwater intrusion to adjacent and upstream landowners. New cross dike construction and repair and/or enhancement of the existing dike are therefore required to ameliorate this risk.*

That all sounds well and good, but where are the studies and data to address how the new tidegate and dike will address the increased tidal flow and the substantial flooding that occurs well upstream of the site they propose to block off?

Flood impacts (stage, velocity, duration) need to be addressed regarding current alterations that have been taking place upstream. In particular, Main Rock Products, Inc. (Main Rock) between Mile Post (MP) 3 and 4 has been progressively filling a 47.41 acre parcel located at 95688 Kentuck Way Lane (Parcel No. 1100, Coos County Tax ID: 25400, Map No. 25S12W04). The area is listed by the USFWS Wetlands Mapper as being Palustrine, emergent and temporarily flooded (PEMA) wetlands. As the fill amount has increased, portions of the wetlands have been excavated out to define the next boundary for the fill extension.

Figure 7. Coos County tax map showing the location of the Main Rock Products, Inc. parcel being filled.

Currently the western 1/3 of the parcel is being filled. However, further east along Kentuck Way Lane, the remaining 2/3 of the tax lot has also been progressively filled since 2003.

On January 8, 2014, I submitted an alleged violation report regarding the fill to Anita Andazola, Corps Compliance & Enforcement specialist, at the Corps North Bend Field Office. The alleged violation was provided to DEA at the time and followed up with discussion during a conference call with DEA on January 13, 2014, while I still worked for SHN. During the conference call, after expressing my extensive concerns about the Kentuck mitigation proposed, Sean Sullivan, DEA JCEP project lead, said unless there was a malfunction of the tidegate proposed for mitigation, problems were not anticipated. I reiterated that I felt it was quite likely the extensive amount of fill that has been occurring upstream of the mitigation site will affect the overall hydrology of the area and we left it at that.

On July 9, 2014, I followed up with Anita Andazola at the Corps on the alleged violation report submitted in January. Her response was that the information had previously been provided by the Corps to the EPA and she recommended I contact Yvonne Vallette of the EPA's Portland office. I spoke with Yvonne the same day and found out that another alleged violation report had been turned in by one of the adjacent property owners in October of 2013. Yvonne had visited the Corps' office in North Bend and met with Anita about various projects. She said she had expected to do a site visit and conduct further review of the Kentuck situation at that time, but they were not able to get to it. The Oregon Department of Environmental Quality National Pollution Discharge Elimination Systems (NPDES) permit was reissued for Main Rock on November 18, 2013 (Facility No. 52575), without modifications. Main Rock continues to operate under a permit under the Oregon Department of Geology and Mineral Industries (DOGAMI), which allegedly has approved the fill. A copy of the correspondence with the Corps and EPA is attached.

Figure 8. Ongoing fill activities along Kentuck Way Lane. View is at MP 3.2 looking east. (1-11-15)

A site visit on January 11, 2015, confirmed that extensive fill of the western portion of the Main Rock parcel has been continuing and now extends much further towards Kentuck Creek to the south since January 2014, filling a very wet area. The fill that is being placed appears to be spoils extracted from marketable rock/gravel and appears to be have a high silt/clay component. There are no sediment and erosion control measures in place for the extensive fill piles placed at the site. Instead, there are visible bulldozer tracks where the fill is systematically being pushed into the wetlands. Over the years, there has likely been a significant rise in elevation at the site(s) for the fill that has placed. It has created a platform-like over-sized berm for the surrounding wetlands and creek.

Figure 9. Ongoing fill activities along Kentuck Way Lane. View is at MP 3.2 looking west. (1-11-15)

Historical photos help to show the amount of fill that has been progressively been placed by Main Rock in recent years south of MP 3 and 4 of Kentuck Way Lane. For the parcel being filled, Kentuck Creek weaves back and forth along the long lot, occurring south of the site for the western 1/3 and eastern 1/3 but crossing over to the northern side adjacent to the road (Kentuck Way Lane) for the middle portion.

In Google Earth imagery from August 27, 2007, you can see where fill has been placed to the east at approximately MP 3.4. The images from November 16, 2011, show that Main Rock also began to fill the wetlands to the west from approximately MP 3.1-3.3, with the fill measuring approximately 445' long by 60' wide. By July 22, 2012, it was approximately 665' long and 120' wide. Although the length didn't change much by the next Google Earth photo taken on May 3, 2013 (approximately 690' long), the width of the fill from Kentuck Way Lane toward Kentuck Creek increased to approximately 190 feet. Since the last imagery, the length and particularly the width has increased much more. Not easily seen from Kentuck Way Lane is the extensive excavating and bulldozing of fill that is occurring at the current site along the southern boundary of the fill.

Figure 10. Fill placed south of Kentuck Way Lane between MP 3 and 4 (top right) as of August 27, 2007.

Figure 11. Fill placed south of Kentuck Way Lane between MP 3.1 and 3.3 as of July 22, 2012.

Figure 12. Fill placed between MP 3 and 4 as of May 3, 2013.

When the Kentuck mitigation site is newly re-opened to Coos Bay to increase the size of the estuary, complex and dynamic flow patterns are likely to occur. It is essential that the plan design takes into account the increased flows, tidal channels, and how flooding of adjacent properties to the north and west will be prevented. A hydrodynamic model that clearly researches and addresses the capacity and flow dynamics likely to occur needs to be developed and submitted for approval prior to issuance of Corps and DSL permits associated with the project. This should include monitoring that extends upstream of the proposed mitigation site and be based, at a minimum, on tides, storm surge, stream velocity, flow capacity, projected long-term sea level rise and, most importantly, current conditions. In addition, the current monitoring proposed in the CWM plans is far from adequate (once a year) and needs to be revised to ensure all seasons and scenarios are monitored and addressed.

Nautical charts displayed at the Coos Bay Boat Building Center show that from 1865 to 1937 Kentuck Slough extended approximately 5 miles inland from its current site and was an inlet. By 1947 approximately ½ of the inlet was filled in to the east, and by 1953 the inlet was primarily filled in west of East Bay Road. Today, the Kentuck Slough channel that remains is regulated by four large tidegates under East Bay Road, with a levy separating the channel east of the bridge/tidegates from the former Kentuck Golf Course site (closed in September 2009). The proposed JCEP Kentuck mitigation site extends from river mile 0.0 to 0.9 of the Kentuck Slough channel. In addition, there is a 5' diameter culvert and tidegate near the southeast corner of the former golf course along East Bay Road (approximately 1/10 mile from the four existing tidegates and associated bridge) that will be revised.

Figure 13. Nautical chart from 1937 shows Kentuck Inlet extending approximately 5 miles inland.

Figure 14. Nautical chart from 1947 shows Kentuck Inlet as filled to the west, reducing its size approximately in half.

Figure 15. By 1953, the nautical chart shows Kentuck Inlet filled to its approximate location today, with a channel now in its place.

The CWM plan (page 10) states the Kentuck mitigation site is a "100-acre historic flood terrace" that historically "would have been classified as an estuarine wetland." **Historically it was an inlet.**

AND WHAT ABOUT THE MOSQUITOES?

In the summer of 2012, an expansion project undertaken by the USFWS was completed for the Bandon Marsh south of Coos Bay. The purpose of the project was to allow tidal flats to resume their natural state after being diked and used for grazing land by farmers for decades. The expansion resulted in a huge mosquito infestation the following summer that was referred to as a biological disaster. It wreaked havoc on all surrounding property owners and made ventures outside a chore to escape the mosquitoes. The increase of mosquitoes was determined to be caused by removing tidegates, digging ditches, and increasing hydrology for the expansion. The original price tag for the 1000-acre restoration project was $4 million dollars. It inflated to $10 million plus and could have grown upwards of $100 million dollars if it were not for the temporary suspension of the marsh expansion in September 2013, until the situation could be contained.

While the Kentuck Slough mitigation proposed is smaller in size, it is very similar in terms of expansion of tidal flats. The potential for a similar mosquito infestation at Kentuck needs to be thoroughly evaluated and brought forward in discussions.

CONCLUSION

The estuarine mitigation proposed for Kentuck by the JCEP has a significant potential to result in contamination of the Coos Bay estuary, flooding of adjacent and upstream property owners, and a potential mosquito infestation that would affect area residents. During my time working on the JCEP under SHN, I encountered serious transparency and integrity issues with the management of both SHN and DEA. From inaccurate site plans submitted with permits to failing to address issues as they arose, the standard operating procedures of "let's wait and see if it comes out in public comment" is not the proper response to issues. Hence my public comment.

Before the project starts moving dirt around (or mud and sand), it needs to conduct a full analysis on every aspect of the mitigation proposed at Kentuck and demonstrate it understands the implications to the environment it will be affecting. The issues ranges far beyond the CWM comments presented in this document for the Kentuck. There is a pattern being set for the JCEP, and another major issue is the ongoing neglect by the project to properly address soil contamination issues at the facility site on the North Spit of Coos Bay. As with the soil contamination issues, additional studies are needed to ensure the designs and plans in place prior to ground disturbing activities fully address the potential adverse effects of the project.

It is my assertion that inadequate environmental and hydrologic studies have been conducted to warrant the Kentuck Slough mitigation to proceed as planned. It is imperative the Corps and DSL make sure the proper process is followed to ensure the natural and human environment will be protected to the maximum extent possible. That is not being done by the current CWM proposed and the residents who call Coos Bay and North Bend home deserve better. Both agencies need to ask tough questions, to coordinate with other respective agencies to ensure they are approving the same actions, and to expect complete investigation and analysis before approving any action.

cc: Shawn Zinszer, Portland District Regulatory Branch Chief, USACE Portland District Regulatory Branch
Teena Monical, Eugene Section Chief, USACE Eugene Field Office
Tyler Krug, Project Manager, USACE North Bend Field Office
Mary Abrams, Director, Oregon Department of State Lands (DSL)
Bob Lobdell, Resource Coordinator, Oregon DSL
Ken Phippen, Branch Chief, Oregon Coast Habitat Branch, National Marine Fisheries Service (NMFS)
Chuck Wheeler, Fisheries Biologist, NMFS Oregon Coast Habitat Branch
Dennis McLerran, Administrator, U.S. Environmental Protection Agency (EPA), Region 10
Anne Dalrymple, Enforcement Coordinator, EPA Office of Compliance and Enforcement, Region 10
Laura Todd, Field Supervisor, Newport Field Office, U.S. Fish and Wildlife Service
Patty Burke, District Manager, BLM Coos Bay District Office
Dick Pedersen, Director, Oregon Department of Environmental Quality (DEQ)
Sara Christensen, 401 Water Quality Certification Coordinator, Oregon DEQ
Steve Nichols, Permitting/Compliance Specialist, DEQ Coos Bay Office
Mike Gray, ODFW District Fish Biologist, Charleston Field Office
Stuart Love, ODFW District Wildlife Biologist, Charleston Field Office
Christopher Claire, ODFW Habitat Protection Biologist
Patti Evernden, Coos County Planning Department
Juna Hickner, Coastal State-Federal Relations Coordinator, Oregon Department of Land Conservation and Development
Crystal Shoji, Mayor, City of Coos Bay
Thomas Leahy, Councilor, Coos Bay City Council
Rick Wetherell, Mayor, City of North Bend
David Koch, Chief Executive Officer, International Port of Coos Bay
John Souder, Executive Director, Coos Watershed Association
Warren Brainard, Chief, Confederated Tribes of Coos Lower Umpqua and Siuslaw Indians (CTCLUSI)
Howard Crombie, Director, Department of Natural Resources, CTCLUSI
Bob Garcia, Chairman, CTCLUSI
Don Ivy, Chief, Coquille Indian Tribe
Brenda Meade, Chairperson, Coquille Indian Tribe

ATTACHMENT
July 2014 Correspondence with the Corps and EPA

From: "Vallette, Yvonne" <Vallette.Yvonne@epa.gov>
To: "Andazola, Anita M NWP" <Anita.M.Andazola@usace.army.mil>, bgimlin@charter.net
Date: 07/09/2014 08:05:51 EDT
Subject: RE: [EXTERNAL] Checking in and update on alleged violation submitted for Kentuck on 1-8-14 (UNCLASSIFIED)

Anita: I chatted w/ Barb this afternoon to assure her that we have taken a look at this situation. I think next steps is to talk w/ DOGAMI and get a better sense of what their permit allows (or not). Looking at the aerial photos, there definitely seems to be some fill creep happening. That overburden pile is just getting wider and wider (and probably taller), so a line needs to be drawn somewhere to stop it from spreading. Let's talk tomorrow if you have time.

Yvonne Vallette, PWS
Aquatic Ecologist
U.S. Environmental Protection Agency
Region 10, Oregon Ops Office
805 SW Broadway, Ste. 500
Portland, OR 97205
Phone: (503) 326-2716
Cell: (503) 545-4962

-----Original Message-----

Sent: Wednesday, July 09, 2014 4:18 PM
From: Andazola, Anita M NWP To: bgimlin@charter.net
Cc: Vallette, Yvonne
Subject: RE: [EXTERNAL] Checking in and update on alleged violation submitted for Kentuck on 1-8-14 (UNCLASSIFIED)
Classification: UNCLASSIFIED
Caveats: NONE

Barb - This information has been previously provided by the Corps to EPA. You may be interested in contacting EPA directly. Yvonne Vallette is likely your best option at 503-326-2716.

Sincerely,
Anita Andazola, Biologist
Corps of Engineers Regulatory
Eugene Section
Compliance & Enforcement
2201 Broadway, Ste. C
North Bend, Oregon 97459
541-756-5316 office
541-751-1624 Fax
http://www.nwp.usace.army.mil/Missions/Regulatory.aspx

-----Original Message-----

Sent: Wednesday, July 09, 2014 3:51 PM
From: bgimlin@charter.net
To: Andazola, Anita M NWP
Subject: [EXTERNAL] Checking in and update on alleged violation submitted for Kentuck on 1-8-14

Hi Anita,

I wanted to touch base with you about the report of an alleged violation I submitted to you on January 8 for the fill of wetlands at 95688 Kentuck Way Lane in North Bend (attached). The fill continues and last week they were going gangbusters with trucks back and forth to the site, repeatedly dumping fill. I went for a bicycle ride past the site and was very disheartened to see what was occurring. They have completely filled in the two large rectangular ponded areas along the road (shown in the previous photos) and they continue to fill the site to the south with all the ponded areas from those photos also filled in now.

The continued and large expanse of fill in USFWS-designated wetlands is bound to increase the flooding downstream of their neighbors. Should I contact the USFWS and/or the EPA about this? I would like to know something is being done and that corrective actions will be required.

I'd be happy to take some additional photos if that would help. I am cc'ing my friend Carri Baker who lives approximately 1 mile west of the site and who will undoubtedly continue to be affected more and more by the fill that is occurring. As previously mentioned, I would like to keep this report confidential.

Thank you for your assistance in this matter and I'll look forward to hearing from you. Something needs to be done, and sooner rather than later.

Barb

Barbara J. Gimlin
P.O. Box 1527
North Bend, OR 97459

Exhibit XX

Current Elevations on North Spit Property - per Google Earth

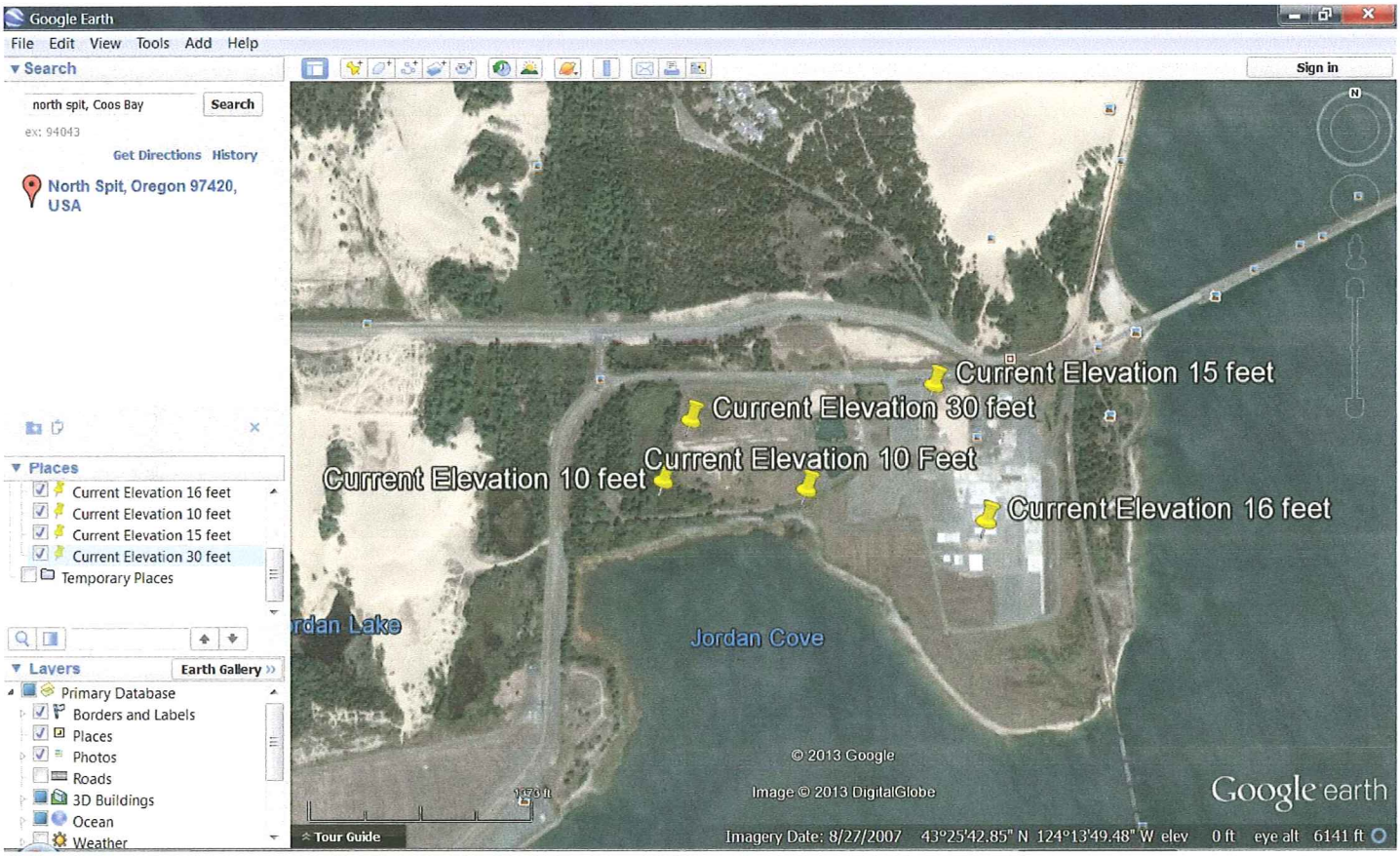
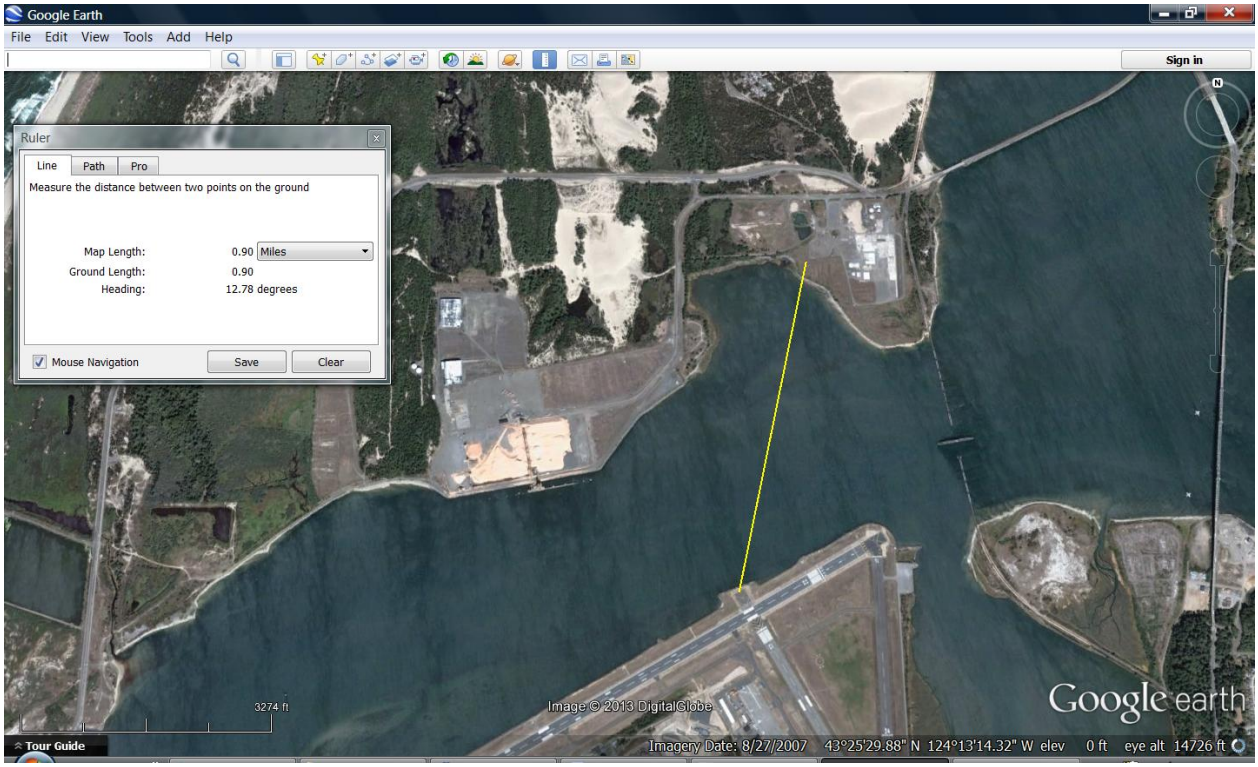
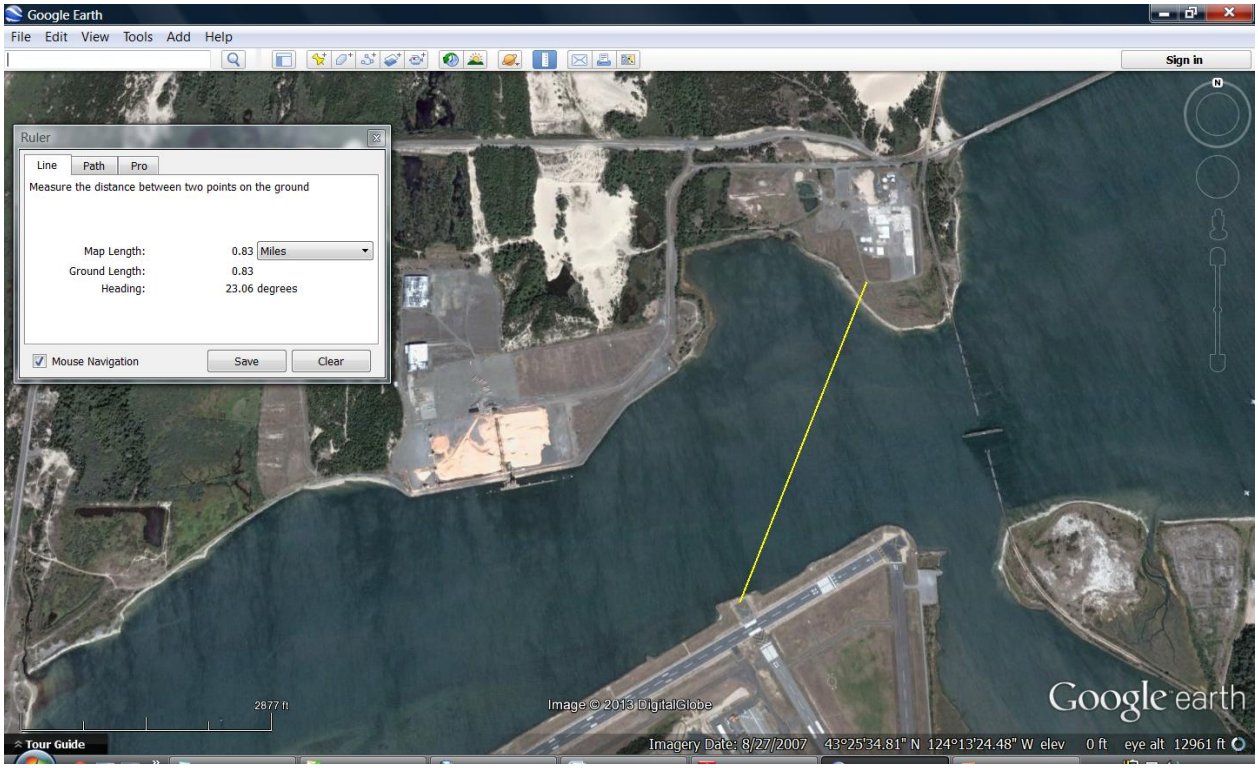


Exhibit YY

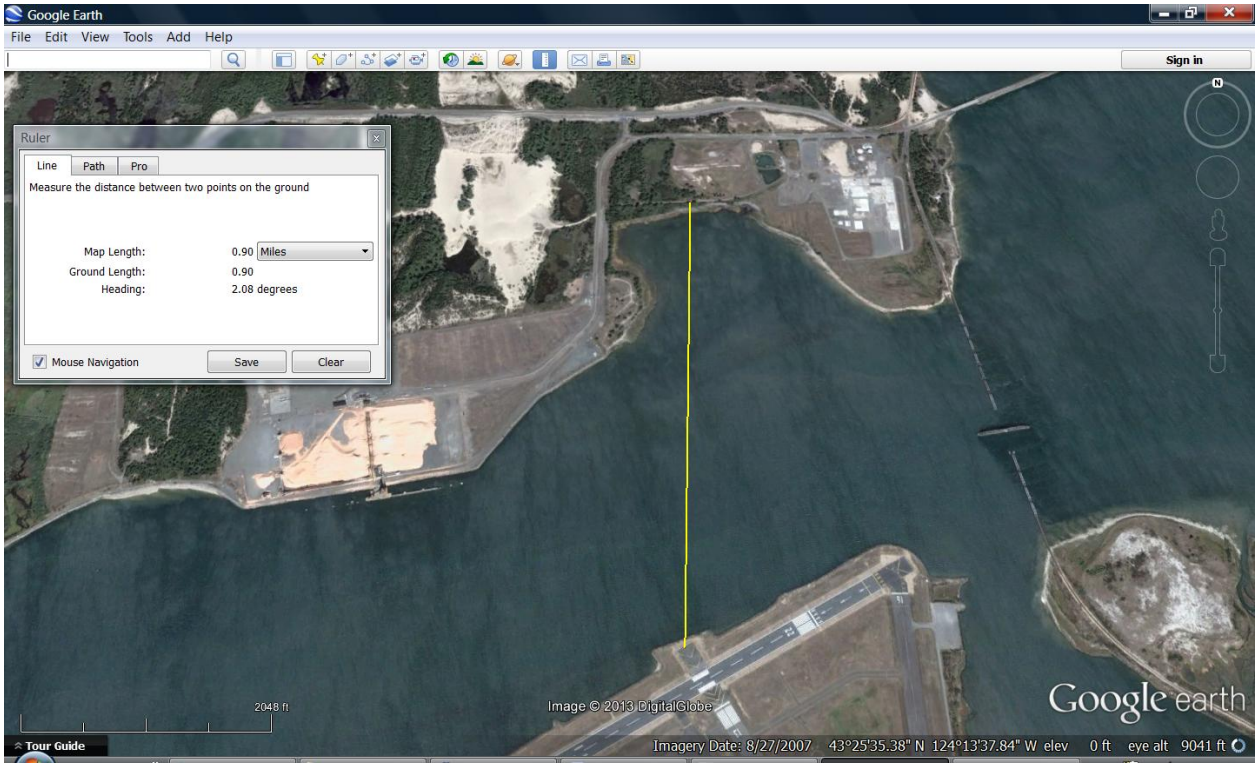
Distances from Southwest Oregon Regional Airport Runways



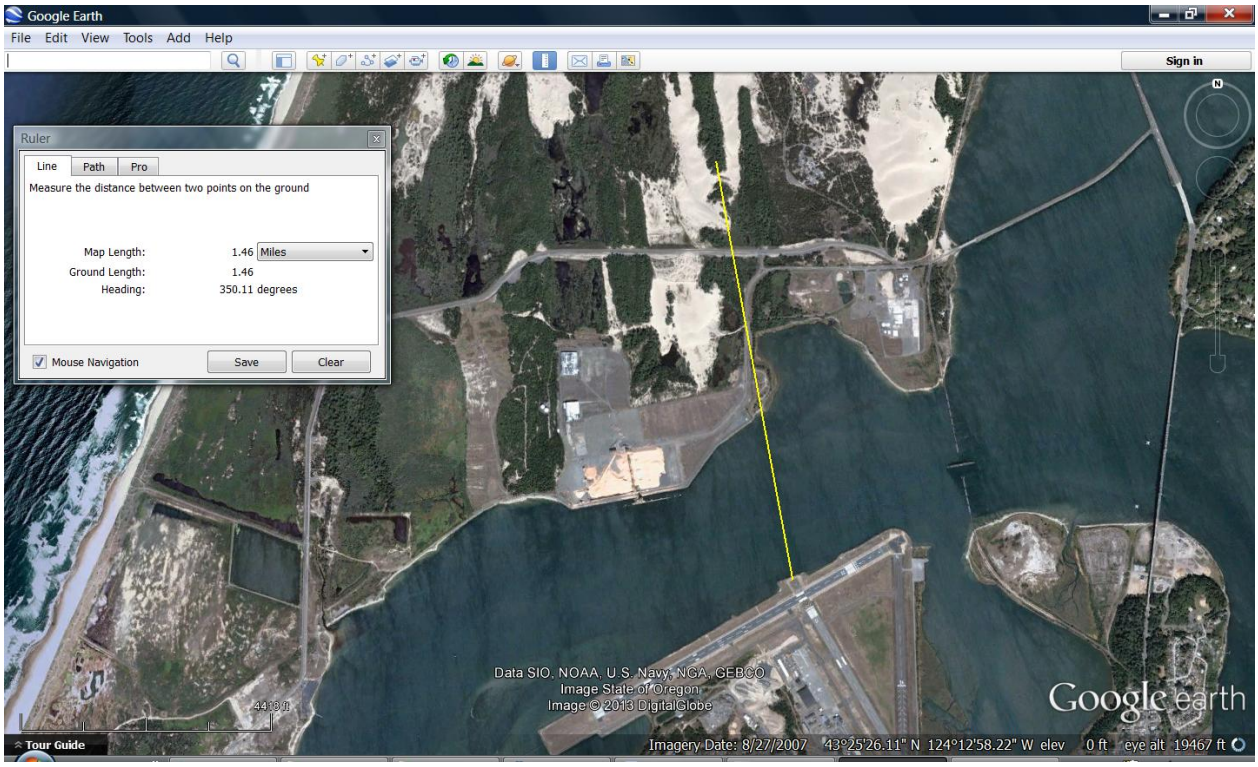
.9 miles from end of North / South runway



.83 miles from end of North / South runway

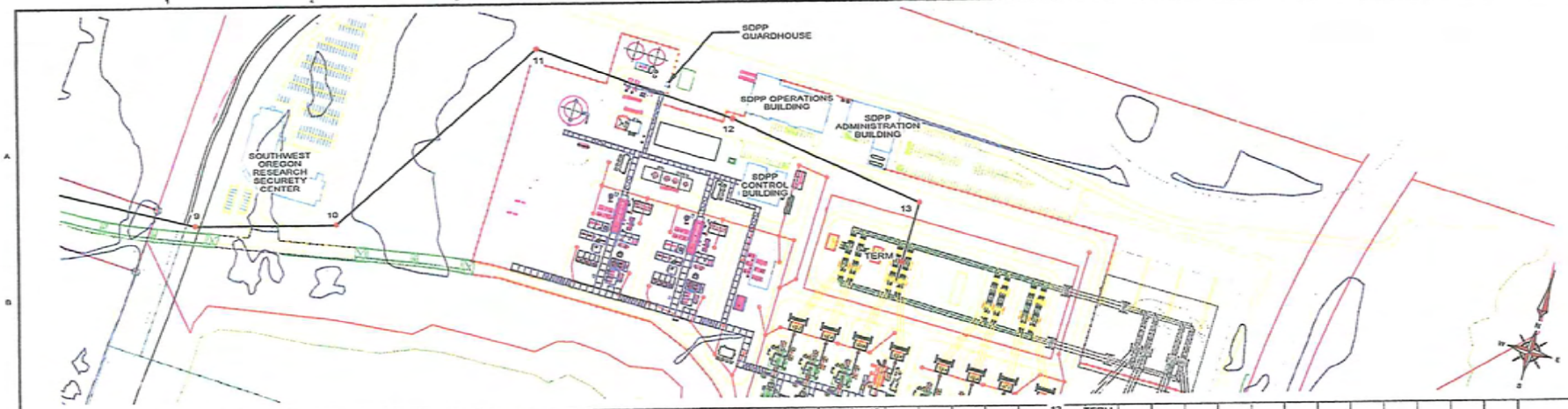


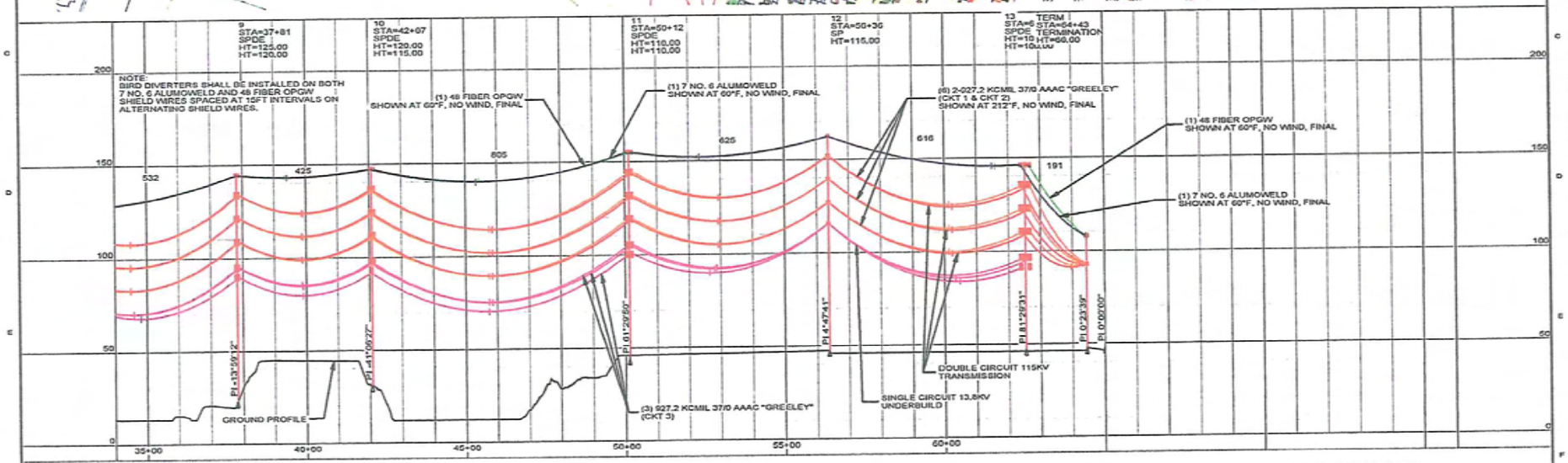
.9 miles from end of North / South runway



Airplane Hill approximately 1.46 miles from end of North / South runway. Hill approximately 100 – 120 feet in height. Named Airplane Hill because an airplane crashed into it.

PLS-CADD DRAWING





150.0 FT. HORIZ. SCALE

25.0 FT. VERT. SCALE

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NO	DATE	REVISIONS AND RECORD OF ISSUE	
A	07/19/13	ISSUED FOR FEED	

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ENGINEER | DRAWN BV

CHECKED | DATE 07/19/13

JORDAN COVE ENERGY PROJECT, L.P.
COOS BAY, OREGON

115KV - DOUBLE CIRCUIT W/ 13.8KV UNDERBUILD
PLAN AND PROFILE

PROJECT 142488 | DRAWING NUMBER -CPPB-SK9313 | REV A

CODE | AREA

ATASL015 01

FAR PART 77 OBSTRUCTION TABLE - AIRSPACE DRAWING

OBJECT NO.	OBJECT DESC.	OBJECT TOP ELEV. (MSL)	PART 77 SURFACE VIOLATION	PART 77 SURFACE ELEV. (MSL)	PART 77 SURFACE PENETRATION (+)	PART 77 MITIGATION/DISPOSITION
3	TREE	152	TRANSITIONAL	141,3	10,7	TRIM / REMOVE
4	TREE	141	TRANSITIONAL	115,4	25,6	TRIM / REMOVE
5	TREE	126	TRANSITIONAL	53,7	72,3	TRIM / REMOVE
6	LT	37	TRANSITIONAL	23,1	13,9	NONE
7	ROD ON OL GS	39	PRIMARY	15,2	23,8	OBSTRUCTION LIGHT
8	TREE	46	PRIMARY	14,9	31,1	TRIM / REMOVE
9	BLDG	98	TRANSITIONAL	66,3	31,7	OBSTRUCTION LIGHT
10	TREE	50	PRIMARY	14,6	35,4	TRIM / REMOVE
11	TREE	114	TRANSITIONAL	92,7	21,3	TRIM / REMOVE
12	LT	61	TRANSITIONAL	57,9	3,1	NONE
13	ROD ON OL MLSEL	27	PRIMARY	13,5	13,5	OBSTRUCTION LIGHT
14	OL POLE	32	PRIMARY	13,5	18,5	OBSTRUCTION LIGHT
18	TREE	428	CONICAL	359,4	68,6	TRIM / REMOVE
23	TREE	34	TRANSITIONAL	22,1	11,9	TRIM / REMOVE
24	TREE	37	TRANSITIONAL	21,9	15,1	TRIM / REMOVE
25	BUSH	33	TRANSITIONAL	22,3	10,7	TRIM / REMOVE
26	BUSH	28	PRIMARY	17,4	10,6	TRIM / REMOVE
27	RD(N)	30	PRIMARY	17,4	12,6	RELOCATE
28	BUSH	37	PRIMARY	17,4	19,6	TRIM / REMOVE
30	TREE	76	TRANSITIONAL	65,9	10,1	TRIM / REMOVE
31	TREE	59	TRANSITIONAL	45,5	13,5	TRIM / REMOVE
34	TREE	180	PART 77	171,5	8,5	TRIM / REMOVE
35	TREE	187	PART 77	194,9	-7,9	TRIM / REMOVE
36	TREE	228	PART 77	212,4	15,6	TRIM / REMOVE
38	TREE	215	HORIZONTAL	167	48	TRIM / REMOVE
39	TREE	177	HORIZONTAL	167	10	TRIM / REMOVE
40	TREE	243	HORIZONTAL	167	76	TRIM / REMOVE
41	TREE	291	HORIZONTAL	167	124	TRIM / REMOVE
43	TREE	219	CONICAL	212,1	6,9	TRIM / REMOVE
44	TREE	170	HORIZONTAL	167	3	TRIM / REMOVE
45	TREE	249	HORIZONTAL	167	82	TRIM / REMOVE
46	TREE	217	HORIZONTAL	167	50	TRIM / REMOVE
47	TREE	216	HORIZONTAL	167	49	TRIM / REMOVE
48	TREE	213	HORIZONTAL	167	46	TRIM / REMOVE
49	TREE	243	HORIZONTAL	167	76	TRIM / REMOVE
50	TREE	211	HORIZONTAL	167	44	TRIM / REMOVE
51	TREE	180	HORIZONTAL	167	13	TRIM / REMOVE
52	TREE	181	HORIZONTAL	167	14	TRIM / REMOVE
53	TREE	334	CONICAL	200,8	133,2	TRIM / REMOVE
54	TREE	391	CONICAL	266,9	124,1	TRIM / REMOVE
55	TREE	382	CONICAL	324,5	57,5	TRIM / REMOVE
56	TREE	202	HORIZONTAL	167	35	TRIM / REMOVE
57	TREE	162	HORIZONTAL	167	-5	TRIM / REMOVE
58	TREE	188	HORIZONTAL	167	21	TRIM / REMOVE
59	TREE	222	HORIZONTAL	167	55	TRIM / REMOVE

FAR PART 77 OBSTRUCTION TABLE - AIRSPACE DRAWING

OBJECT NO.	OBJECT DESC.	OBJECT TOP ELEV. (MSL)	PART 77 SURFACE VIOLATION	PART 77 SURFACE ELEV. (MSL)	PART 77 SURFACE PENETRATION (+)	PART 77 MITIGATION/DISPOSITION
377	BRIDGE	256	CONICAL	206,6	49,4	OBSTRUCTION LIGHT
378	BRIDGE	266	CONICAL	186,3	79,7	OBSTRUCTION LIGHT
379	T-L TWR	216	CONICAL	193,8	22,4	OBSTRUCTION LIGHT
380	TOWER	210	HORIZONTAL	167	43	OBSTRUCTION LIGHT
963	TOWER	250	CONICAL	220,1	29,9	OBSTRUCTION LIGHT
980	SPIRE	243	HORIZONTAL	167	76	OBSTRUCTION LIGHT
1338	TOWER	261	CONICAL	218,3	42,7	OBSTRUCTION LIGHT
1494	TOWER	253	HORIZONTAL	167	86	OBSTRUCTION LIGHT
20354	TOWER	292	HORIZONTAL	167	125	OBSTRUCTION LIGHT
21125	T-L TWR	228	HORIZONTAL	167	61	OBSTRUCTION LIGHT

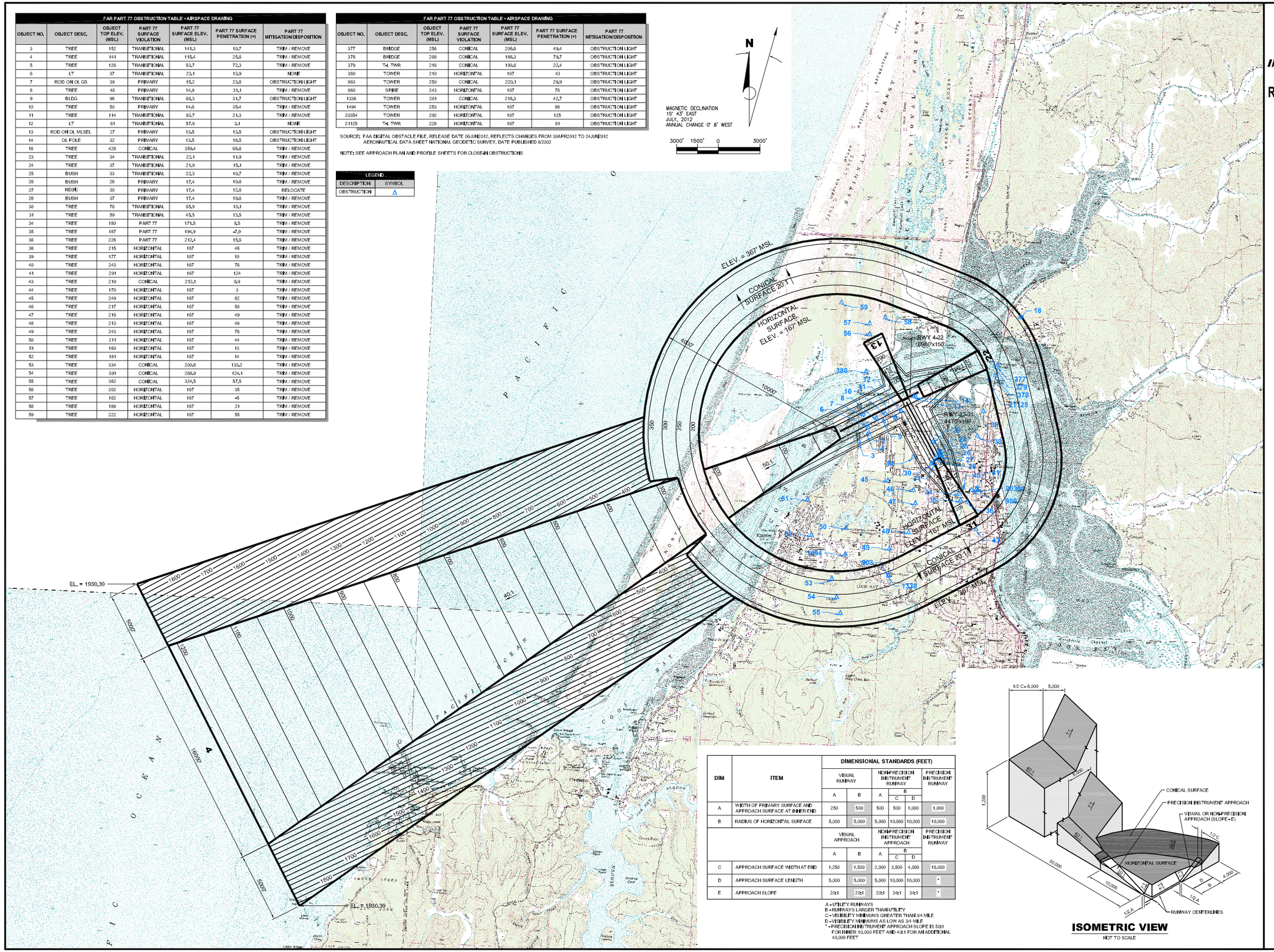
SOURCE: FAA DIGITAL OBSTACLE FILE, RELEASE DATE 05JUN2012, REFLECTS CHANGES FROM 30APR2012 TO 24JUN2012
AERONAUTICAL DATA SHEET NATIONAL GEODETIC SURVEY, DATE PUBLISHED 8/2002

NOTE: SEE APPROACH PLAN AND PROFILE SHEETS FOR CLOSE-IN OBSTRUCTIONS

LEGEND	
DESCRIPTION	SYMBOL
OBSTRUCTION	△

MAGNETIC DECLINATION
15° 43' EAST
JULY, 2012
ANNUAL CHANGE 0° 8' WEST

3000' 1500' 0 3000'



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B C	B D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT RUNWAY
		A	B	A	B C	B D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

ISOMETRIC VIEW
NOT TO SCALE

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OTH Southwest Oregon Regional Airport

SOUTHWEST OREGON REGIONAL AIRPORT

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2013
REVIEWED BY:
DRAWN BY: TJM
DESIGNED BY: MLB

AEP PROJECT NUMBER
224-2267-000

SHEET TITLE

AIRPORT AIRSPACE DRAWING (PART 77) PLAN VIEW

SHEET NUMBER

5 OF 10

Drawing: T:\P\2242267.000 Southwest Oregon MPU\Cad\C\OTH_05_Pt77.dwg Plotted on: 6/3/2013 3:18 PM Plotted by: Merrill, Tammy

Exhibit ZZ

Oregon
Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF ENERGY

625 Marion St. NE
Salem, OR 97301-3737
Phone: (503) 378-4040
Toll Free: 1-800-221-8035
FAX: (503) 373-7806
www.Oregon.gov/ENERGY

October 4, 2007

VIA Electronic Filing
The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Jordan Cove Energy Project L.P., Docket No. CP07-444-000, and Pacific Connector Gas Pipeline, LP, Docket Nos. CP07-441, CP07-442 and CP07-442

Dear Ms. Bose:

On September 4, 2007, Jordan Cove, Energy Project L.P. (Jordan Cove) filed an application for construction of a terminal for importation of liquefied natural gas (LNG) to be located on the North Spit near the cities of Coos Bay and North Bend, in Coos County Oregon. In a related project, Pacific Connector Gas Pipeline L.P. (PCGP) filed an application for an associated pipeline to run approximately 220 miles from the proposed Jordan Cove site, over the Oregon Coast Range to a connection with the interstate pipeline system near Malin, Oregon. The Energy Policy Act of 2005, enacted on August 8, 2005, specifies in Section 311(d) that the Governor of a state where a proposed LNG terminal would be located shall designate a state agency to consult with the Federal Energy Regulatory Commission regarding applications and that this state agency may prepare a safety advisory report that addresses state and local safety considerations. This provision in the Energy bill appears to be specific to the terminal and not to any associated pipeline. The report is due 30 days from the application filing date.

The Governor of Oregon has designated the Oregon Department of Energy as the agency responsible for preparation of a safety advisory report for the proposed Jordan Cove LNG terminal. Therefore, enclosed for filing in the above-mentioned proceeding, please find an electronic copy of the safety advisory report for the proposed LNG terminal. If you have any questions in this matter, please contact Tom Stoops at (503) 378-8328 or tom.stoops@state.or.us

Sincerely,

Ken Niles
Assistant Director
Nuclear Safety and Energy Facility Siting

SAFETY ADVISORY REPORT

ON THE PROPOSED JORDAN COVE
LIQUEFIED NATURAL GAS TERMINAL ON THE NORTH SPIT OF COOS BAY, OREGON

PREPARED BY THE STAFF
OF THE OREGON DEPARTMENT OF ENERGY

October 4, 2007

SAFETY ADVISORY REPORT ON THE PROPOSED

JORDAN COVE LIQUEFIED NATURAL GAS TERMINAL

ON THE NORTH SPIT OF COOS BAY, OREGON

The Oregon Department of Energy (ODOE) issues this Safety Advisory Report on behalf of the State of Oregon pursuant to section 311(d) of the Energy Policy Act of 2005 (the Act). The report concerns the application to the Federal Energy Regulatory Commission (FERC) by Jordan Cove Energy Project L.P. (JCEP) to construct a Liquefied Natural Gas (LNG) import terminal, with an associated natural gas pipeline application submitted by Pacific Gas Connector Pipeline L.P. (PCGP). The Jordan Cove Terminal would be located in Coos County, Oregon on the North Spit of Coos Bay, near the cities of Coos Bay and North Bend. Jordan Cove filed its application with FERC on September 4, 2007.

The Act allows the state to file an advisory report that identifies "state and local safety considerations" within 30 days of the date the application is filed. The "safety" information solicited in the advisory report is largely repetitive of information that Jordan Cove itself provides in its application to FERC in its terminal application and in its Waterway Suitability Assessment (WSA) to the Coast Guard. It is information that Jordan Cove also must provide in its emergency response plan to be developed in conjunction with the Coast Guard, the state, and appropriate local jurisdictions prior to any construction.

The State of Oregon has been intimately involved in reviewing and commenting on Jordan Cove's pre-filing and application resource reports, and is involved with the Coast Guard in reviewing the project's WSA. To the extent that the State disagrees with the information Jordan Cove has provided or will provide on safety issues in those venues, the state will pursue corrections or changes through the above review processes. For example, the WSA submitted by Jordan Cove does not reflect the most recent discussions between JCEP, ODOE, local response agencies and other state agencies regarding the area's emergency response capabilities and the proper allocation of augmented resources. The Department will work with the Coast Guard, other state agencies and local jurisdictions to correct the information under the WSA process.

The State considered providing FERC with specific scenarios for evaluating accidental or intentional releases of LNG from a vessel or the facility itself. Again, however, such scenarios play a role both in the WSA and in the forthcoming emergency response planning. Moreover, based on recent Commission approvals of LNG terminal projects, the State believes the FERC will find that the risk of any potential LNG release scenario can be reduced to an acceptable minimum.

On June 15, 2006, FERC approved three new LNG terminal projects: Sempra's Port Arthur LNG in Port Arthur, Texas; Cheniere's Creole Trail LNG in Cameron Parish, Louisiana; and BP America Production Company's Crown Landing LNG in Logan Township in New Jersey. The language in the Commission's Creole Trail decision about the risk of an accidental LNG release is mirrored in the other two decisions:

> Based on the extensive operational experience of LNG shipping, the structural design of an LNG vessel, and the operational controls imposed by the Coast Guard and the local pilots, a cargo containment failure and subsequent LNG spill from a vessel casualty – collision, grounding, or allision – is highly unlikely. For similar reasons, an accident involving the onshore LNG import terminal is unlikely to affect the public. As a result, the FEIS determined that the risk to the public from accidental causes is negligible.

Further, the language in the Commission's Creole Trail decision about the risk of an intentional LNG release is also mirrored in the other two decisions:

> Unlike accidental causes, historical experience provides little guidance in estimating the probability of a terrorist attack on an LNG vessel or onshore storage facility. For a new LNG import terminal proposal having a large volume of energy transported and stored near populated areas, the perceived threat of a terrorist attack is a serious concern of the local population and requires that resources be directed to mitigate possible attack paths. If the Coast Guard issues a Letter of Recommendation finding the waterway suitable for LNG marine traffic, the operational restrictions that would be imposed by the Lake Charles Pilots on LNG vessel movements through this area, as well as the requirements that the Coast Guard would impose, would minimize the possibility of a hazardous event occurring along the vessel transit area. While the risks associated with the transportation of any hazardous cargo can never be entirely eliminated, we are confident that they can be reduced to minimal levels and that the public will be well protected from harm.

The Department notes that FERC staff reached a similar conclusion regarding the proposed Bradwood Landing project. On August 17, 2007, FERC staff issued the Draft Environmental Impact Statement (DEIS) for Bradwood Landing. The above two paragraphs appear, in nearly identical language, in that DEIS as well. DEIS at p.ES-6.

For the above reasons, in this advisory report the State provides largely broad safety policy statements about the proposed Jordan Cove project along with a limited amount of specific, technical comments. In addition, the State of Oregon incorporates by reference the safety comments included in previous filings to the FERC docket, including PF06-25.

Although the application to FERC is limited in scope to the LNG terminal and associated pipeline, we consider the risks from a release of LNG on the inlet to be among the most significant safety concerns associated with the facility. The safety of the LNG terminal is strongly connected to the question of safety on the inlet and in the communities that the LNG carriers must pass. We expect FERC to address issues and concerns raised by stakeholders in those communities and to consider the safety of those communities in determining whether to approve, and if so, how to condition the LNG terminal and associated pipeline.

Each of the state and local agencies in Oregon, whether or not they contributed to this advisory report, reserve their right to file additional joint or separate comments and/or evidence on safety and other issues.

State of Oregon General Policy Comments

1. **FERC should require an applicant to commit to 100 percent of the safety and security costs directly associated with the LNG vessel transits, the facility and the pipeline.**
   Under Section 311(e)(2), an emergency response plan (ERP) to be developed prior to construction must include a cost-sharing plan that includes a "description of any direct cost reimbursements that the applicant agrees to provide to any State and local agencies with responsibility for security and safety at the LNG terminal and in proximity to vessels that serve the facility." The State understands and appreciates that JCEP has agreed thus far to pick up the costs of most safety and security needs that the company has identified as necessary. However, the local jurisdictions are not in a position to dedicate their own limited funds to any LNG safety and security measures that may be required. In addition, local jurisdictions may not agree with an applicant about the level of resources required. An applicant should first be required to pay for an adequate assessment of safety and security needs and then pay for all infrastructure, planning, drilling and other associated costs identified in an ERP agreed to by the state and local jurisdictions. Conditions proposed in the DEIS for Bradwood Landing would require a Cost-Sharing Plan to be filed with FERC prior to initial site preparation. However, the DEIS is silent on what percentage of costs, if any, could be borne by state or local jurisdictions. Should FERC not require the applicant to commit to 100 percent of the costs, FERC should explain its authority for imposing such costs on local jurisdictions and the state.

2. **The safety/security zones proposed for the vessel in transit and the vessel at dock must**

be sufficiently calculated and justified. The applicant or Coast Guard must thoroughly explain any changes to those zones that might accompany heightened national security as well as any resulting impacts.

Some area residents have expressed concern that the safety/security zones will be so large that they will "shut down" traffic on the Coos Bay inlet or access to recreational and commercial fishing, crabbing and harvesting of other seafood products near the proposed terminal site. Others have expressed concern that the safety/security zones will be too small, sized to avoid the above concern rather than for adequate safety protection. Moreover, residents of the small communities on the Eastern shore of the inlet have expressed concern that the potential for an emergency affecting their communities is considered acceptable primarily because of the small size of these communities. Any zones proposed should provide a rationale for their size.

3. **FERC should require an applicant to complete an acceptable ERP prior to any Commission decision on an application and in conjunction with the Coast Guard's validation of the Waterway Suitability Assessment.**

   Under Section 311(e)(1), FERC will not require Bradwood to create an ERP until after a positive decision by FERC and just before any final approval to begin construction. However, to the extent that JCEP's WSA relies on the creation of a satisfactory emergency response plan to ensure that the Coos Bay inlet is suitable for LNG, that emergency response plan must be available for review prior to any decisions on both the WSA and the FERC application. Again learning from the Bradwood Landing experience, the recommended conditions in the DEIS would require the applicant for that facility to develop the ERP prior to construction, but after FERC's decision to approve the project. (Draft Conditions, 62 and 63 at p.5-30.) It would be illogical for either the Commission or the Coast Guard to decide that LNG is safe for the region without knowing first if a suitable emergency response plan can be enacted along the vessel route and at the facility.

   In Resource Report 11 of the application, section 11.3.1, JCEP states that it will develop manuals, procedures and plans that address safety and security in accordance with established regulations. Other than NVIC 05-05, we have not found regulations that provide detailed guidance

4. **The applicant's ERP must be developed in full cooperation with state and local authorities.**

   Emergency response planning must be an integrated, carefully developed effort that involves every entity that is potentially affected by the LNG import terminal.

5. **The applicant's ERP must sufficiently and accurately characterize the emergency response capabilities along the vessel transit route and near the facility, including response times. The Plan must mitigate for any safety gaps.**

   Thus far, the state and local jurisdictions have not reached agreement as to which jurisdiction will have primary responsibility and authority in the event of an accident or intentional breach. Agreement also has not been reached on the resource gaps, and proper allocation of supplemental resources. The USCG and FERC should not find that the waterway is suitable until it is known that these issues have been resolved.

6. **The applicant's ERP must include all potentially affected communities along the LNG vessel route and near the terminal in a comprehensive, thoroughly publicized warning system.**

   Any community located within one of the three Sandia zones of impact must be considered in emergency response plans, including access to a reverse 911 system and sirens.

7. **The applicant's ERP must account for potential population increase due to tourism.**

   The Coos Bay area population increases significantly during high tourism season. Depending on the location of those visitors, the influx may bring challenges for LNG emergency response education as well as LNG ship transit education. The Department is particularly concerned about access and safe egress, because U.S. highway 101 is the only major route in or out of the area, and it becomes congested during peak hours in high tourist season.

8. **Any FERC authorization for an LNG terminal and associated pipeline in Oregon must fully comply with Oregon state and local laws and regulations, including energy facility siting laws.**
   In particular, the State of Oregon requires large energy facilities to provide a bond or letter of credit to ensure that the proposed site can be restored to a useable, non-hazardous condition. We consider the bond or letter of credit to be a safety precaution against a potentially abandoned or otherwise vacated site. Thus far, the applicant does not appear to have addressed this issue in its application materials.

State of Oregon Specific Comments

Seismic Design

The Department is particularly concerned about the potential for tsunami. Recent statements by DOGAMI following the 2005 tsunami in Sumatra indicate that maximum tsunami height could be up to 20 feet higher than previously thought. In discussion with DOGAMI staff stationed at Newport, Oregon, we have been told that deepening the channel would tend to increase maximum tsunami height. FERC should require that the design basis tsunami takes into account the height increase caused by dredging the channel.

Hazard Identification

Hazards potentially affecting the public are discussed in Resource Report 11 and its attachments. As required by NFPA 59A, Bradwood Landing used the LNGFIRE and DEGADIS codes to calculate thermal radiation and vapor dispersion from the design basis spill. Resource report 11 includes isopleth drawings and input decks for these calculations at Attachment 11A. We assume but could not verify that intentional spills were assumed, since they likely bound any accident scenario.

We note that thermal radiation maps in attachment 11A appear to be centered at the tanks and the dock. Because the accident or intentional spill could just as easily happen at the carrier during the eight mile voyage from the mouth of Coos Bay to the terminal, the thermal radiation maps and vapor dispersion maps should be shown at all points along this voyage. For the JCEP, the nearest affected population is most likely not near the terminal but rather the small communities on the eastern shore of the inlet, and the residences in North Bend in the Pony Slough area as the ship approaches the terminal.

The safety discussion in Resource Report 11 appears to rely heavily on the 2004 Sandia Report, and particularly on the Zones of Concern identified in that report and cited in NVIC 05-05. However, resource reports 1 and 10 of JCEP's application state that the terminal will be designed to accommodate ships with capacity over 200,000 m^3. The zones of concern in the Sandia report were based on ships smaller than 150,000 m^3. FERC's recommendation for this project should be conditioned on ships no larger than those assumed in any heat flux and vapor dispersion calculation.

The assumption of pure methane is probably not representative of actual cargo and may not be conservative. In public meetings, JCEP has disclosed that product could come from a variety of producing nations, including some where the LNG has a higher concentration of natural gas liquids such as propane. Some of these higher-weight hydrocarbons have higher potential for vapor dispersion than pure methane. We expect FERC to verify that conservative assumptions were used in NFPA 59A required calculations. The EIS for this project should explain how these assumptions were made and why they are the most conservative.

Quality Assurance

In our Safety Advisory Report for Bradwood Landing, dated June 2006, ODOE included extensive comments on the need for a rigorous Quality Assurance program that would be subject to regulatory review prior to start of construction. We note that the Bradwood DEIS does not include a discussion of such a program, and we renew the recommendation and incorporate our comments from that June 2006 report into this one. The State expects the Commission to describe and impose a condition requiring JCEP to adopt a rigorous and comprehensive quality assurance program applicable during both construction and operation of the import terminal.

Safety Issues

The State of Oregon has reviewed the Safety Advisory Report on the proposed LNG terminal at the Port of Long Beach issued by the California Energy Commission (CEC). That report relies largely on material taken from two readily available reports: (1) the Sandia Labs' November 2004 report "Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water" (Sandia Report) and (2) Richard Clark's "LNG Facilities in Urban Areas."

The safety significant events listed in Sandia and Clark and quoted in the CEC advisory report could apply to any terminal at any location and need not be repeated in this report. However, we agree with CEC that the 5 kw/m^2 is described in the Sandia Report as "the permissible level for emergency operations lasting several minutes with appropriate clothing" (Table 6, p.38). This is the lowest heat flux shown in the thermal radiation maps provided in Attachment 11A. Because the people occupying the nearest residences (those on the eastern shore of Coos Bay and the Pony Slough section of North Bend) do not have the appropriate clothing or emergency training, thermal radiation calculations should show the point at which worst case heat flux will permit safe evacuation, possibly requiring more than "several minutes" and without appropriate clothing or emergency training. The CEC advisory report at p. 15 suggests 1.5 kw/m^2. JCEP should calculate the distance to this heat flux for a design basis event at JCEP and issue a figure showing the results. As noted previously, JCEP should calculate this distance not just at the terminal but along the eight mile trip from the mouth of the bay.

Emergency Response Capabilities near the Facility Location

The State appreciates that FERC has provided draft guidance for preparing the required ERP for an LNG import terminal. However, the State remains concerned that the guidance will be viewed by applicants as an upper limit on their responsibility for ensuring the safety of surrounding communities. The State views the guidance as just that: guidance, and urges FERC to affirmatively state that the ERP must address all identified emergency situations, and that all costs attributable to insuring public safety must be borne by the applicant. Furthermore, the State remains concerned about the effect of impasse during negotiations for the ERP and urges the Commission to adopt a clear, expeditious process for addressing disagreements between the applicant and state and local governments.

Finally, whatever criteria are used to generate the ERP, FERC should make the process as transparent to the public as possible, including the essential elements of an emergency plan. Although the details of the WSA and ERP are withheld from public disclosure, information regarding measures to protect the public during a design basis event should be a part of public outreach and should be available before the issuance of a FERC construction permit.