BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 2013-01 TESORO SAVAGE, LLC VANCOUVER ENERGY DISTRIBUTION TERMINAL	CASE NO. 15-001 PRE-FILED DIRECT TESTIMONY OF JERRY JOHNSON

I, Jerry Johnson, state as follows:

1. I swear under the penalty of perjury of the laws of Washington and the United States that the following testimony is true and correct.

2. I am over eighteen years of age and am otherwise competent to testify in this matter. My testimony is based upon my education, training, experience, professional qualifications, and understanding of the matters herein.

Introduction

3. My business address is 621 SW Alder, Suite 605, Portland, Oregon 97205.

4. I am an economist and principal with Johnson Economics, where I conduct research design, economic and financial modeling, and market analysis as a consulting economist on a wide variety of real estate development and economic topics.

5. I have a dual major undergraduate degree in Architectural Design and Economics and a Masters in Urban Planning from Portland State University. I have worked as a consulting economist since 1989 and as a principal for Johnson Economics and its predecessor firms for more than twenty years. As an economics professional, I have conducted market and public policy analysis for various public sector jurisdictions and agencies, including the Portland

Development Commission, Port of Portland, Metro, City of Seattle, Ada County, Abu Dhabi Urban Planning Council, and numerous jurisdictions and agencies. I have also conducted economic development analysis and related work for the City of Portland, City of Seattle, City of Beaverton, City of Hillsboro, City of Lynnwood, City of Newport, City of Redmond, Clackamas County, and Business Oregon. I have also conducted market and financial analysis for major developers throughout the Pacific Northwest. I currently serve on the Governor's Council of Economic Advisors in the State of Oregon.

6. I am also an adjunct professor at Portland State University's School of Business Administration, teaching graduate-level courses in real estate finance and real estate market analysis.

7. I was asked by Columbia Waterfront LLC to provide a professional independent analysis of the Project's Draft Environmental Impact Statement (DEIS) and supporting documentation as it relates to the socioeconomic impacts of the Project on the City of Vancouver and surrounding region, as well as to prepare this testimony assessing the economic benefits and costs associated with the Project. My testimony focuses on the likely economic and socioeconomic impacts that would result from Tesoro-Savage's proposal to construct and operate a crude-by-rail oil handling and distribution terminal to be located at the Port of Vancouver.

8. I have reviewed the Application for Site Certification (ASC) (Ex0001-PCE) (including Exhibit K, the Socio-Economic Analysis prepared by BST Associates), the DEIS (including Appendix O, the Analysis Group's economic report prepared for the Applicant) (Ex0051-PCE), and relevant literature related to socioeconomic and property value impacts of

rail traffic (Ex4002-0000001-CWF to Ex4018-000082-CWF). Since Appendix O incorporates the Applicant's most recent economic analysis, as prepared by the Analysis Group, much of my review and testimony focus on Appendix O.

Summary of Opinion

9. The Tesoro Savage Vancouver Energy Distribution Terminal as proposed will be a transloading facility, largely facilitating the shipment of crude oil extracted by fracking from the Bakken shale formation to refineries in Southern California. There is very little value added in the State of Washington by the Project, outside of the relatively few jobs attributable to the construction and operation of the facility. The primary beneficiaries of this trade are at the source of supply and the refineries (as well as their investors). Given the limited local benefits of the Project and the substantial negative impacts of the project, including property value impacts and increased congestion along the rail corridor, as well as foreclosure of potential alternative uses of the Port of Vancouver site, it is uncertain whether the Project will have a net positive economic benefit to the State of Washington. Instead, it is very possible that the net effect of the Project will be an overall negative economic impact to the State of Washington.

10. While Tesoro claims the facility will support 176 on-site jobs when fully operational, the development will preclude alternative uses for the site, which could have a greater employment density and make more substantial contributions to the local economy. At the same time, any likely alternative use will not have the same negative impacts on neighboring land uses and development. Neither the Applicant nor the Port of Vancouver has done any analysis of the net economic impact of the proposed use (estimated impacts of proposed use less

the estimated impacts of an alternative use). If such an analysis were performed, there are several factors that would likely result in a net negative economic impact.

11. First, development of the Tesoro facility will commit 47.4 acres of prime deep water industrial property, a scarce commodity in the region. In addition to a wide range of marine industrial uses, the site has adequate scale and infrastructure to accommodate a breakbulk, grain, dry bulk, or liquid bulk marine terminal. The Port of Portland's Terminal 2 is of similar size, and accommodated a breakbulk and bulk terminal, as well as warehouse and office space. The development of the Project will preclude the Port of Vancouver from using the site for these alternative uses.

12. Second, there will likely be extensive negative economic impacts associated with the operation of the Project. These include but are not limited to reduction in property values from negative externalities of the facility and related rail traffic, the risk of environmental and other catastrophic consequences of accidents, and the loss of rail capacity to serve other industries.

13. Third, the long term viability of the project is uncertain. Construction is not expected to be initiated until 2021 and operations may run through 2040. Transportation by rail is likely only a temporary solution for the transportation of crude oil that could eventually be replaced by pipeline infrastructure. There is considerable risk that future pipeline improvements will substantially reduce the need for rail transportation of crude oil, reducing the use of the facility. In addition, the economics of crude production have been shifting rapidly. At the time that this process was conceived and the operational projections were produced, crude prices traded in the range of $100 to $120 per barrel. Since that time, the market has largely collapsed,

with crude prices now trading close to $40 per barrel. Crude by rail is not likely to be an economically viable long-term transportation option if prices remain at such low levels. Carbon pricing could also undermine the long-term viability of the Project.

Assessment of Applicant's Economic Study Presented in the DEIS

14. Appendix O provides an incomplete, flawed, and fundamentally misleading assessment of the impacts of the proposed Tesoro oil terminal. In general, this Analysis Group report systemically overstates benefits while ignoring offsetting negative impacts. The socioeconomic benefit analysis is methodologically flawed, as it does not provide for a "net" impact analysis. The lack of an alternatives analysis for the site represents a basic and critical flaw and is the primary technical weakness of the assessment of socioeconomic impacts. While the DEIS did identify a number of these impacts, the socioeconomic portion of the analysis in the DEIS fails to incorporate the findings of other portions of the document that have socioeconomic impacts.

15. The proposed facility and its ongoing operational characteristics will generate a number of definable and significant negative impacts, which should be accounted for in any assessment of the economic and fiscal impacts of the facility. But Appendix O as it currently stands represents only a benefits analysis, as opposed to a ***net*** impact analysis. The Analysis Group report further overstates positive impacts. This includes categorizing indirect impacts as primary impacts, as well as overstating the likely capture of employment in Washington State. While it is common practice for a proponent of a development to present an overly optimistic assessment, we would expect an impartial assessment to present a comprehensive analysis that addresses net socioeconomic impacts.

16. The positive benefits of the Project have also been overstated by the Applicant. It is unlikely that the facility will yield significant consumer benefits or cause a measurable a reduction in the retail price of gasoline and/or diesel. In general, wholesale prices for gasoline and diesel (and other refined products) are not a function of crude prices for the specific refineries supplying a specific market. Rather, pricing for refined products tends to follow crude prices in broad international markets. It is refiners and not consumers that typically benefit from projects like the proposed facility that might provide access to lower cost crude.

17. Appendix O presents a significant overstatement of the socioeconomic benefits of the project by not accounting for the full range of impacts. When the full range of impacts is evaluated, it is far from certain that the proposed operation would even provide a net positive socioeconomic impact. Instead, from a purely economic perspective, the Project may have a net negative impact on the overall economy of the State of Washington. As purported economic benefits appear to be applicant's primary argument for approval of the proposed facility, the Council should also fully consider the negative economic impacts associated with the Project.

18. If a net impact analysis of the Project had been performed, the positive primary impacts asserted by the Applicant would be offset by negative impacts not considered or presented in Appendix O. For example, the impact of likely reduced property values along the corridor associated with increased traffic carrying hazardous cargo is not considered or presented. The potential negative economic impact on tourism is not addressed. Neither are the economic and fiscal losses associated with potential environmental damages considered in the assessment of economic impacts. There is no recognition of the risk inherent in assuming ongoing operation of a facility of this sort in light of significant shifts in the international oil

market. No consideration is given to the impact on other shippers due to rail system congestion. The Applicant has made claims that rail traffic in the state would not be reduced even if the Project is not built, a claim which is poorly supported. While shipment of agricultural commodities or other Washington-produced goods may not be as profitable for the rail carriers as crude by rail, such shipments of locally-produced goods almost certainly support more jobs and overall economic activity within the State of Washington.

Net Impact Analysis

19. A net impact analysis is an assessment of the impacts of a project, taking into consideration both positive impacts and negative impacts. Impacts that at a ***minimum*** should be considered as part of producing a net impact analysis include:

(1) Impact of the loss of capacity and/or increased delays on key segments of the rail system, which will impact other potential shippers;

(2) The economic and fiscal impact of alternative uses for the site;

(3) The economic and fiscal impact of a reduction of property values and achievable pricing along the rail corridor, as well as in Spokane and downtown Vancouver;

(4) Impacts to tourism, associated with increased traffic and potential environmental degradation, which would be both economic as well as fiscal;

(5) The potential for economic and fiscal losses associated with environmental damages, including impact to fisheries, tourism and recreation;

(6) Potential life safety risks.

20. When the full range of socioeconomic impacts from the Project is considered in even an incomplete net impact analysis, it appears that the positive primary impacts asserted by the Applicant are offset by negative impacts. The following table presents a simplified net accounting of impacts that would appropriately be included in a net socioeconomic impact assessment. The variables in red are assumed to be negative, and as noted previously, only impacts expected to be negative have been excluded from the Appendix O analysis.

TABLE 1. SUMMARY OF NET SOCIO-ECONOMIC IMPACT ANALYSIS

	Employment FTEs	Income ($ millions)	Value Added ($ millions)
CONSTRUCTION IMPACTS			
DEIS (Appendix O)	1,429.0	$86.8	$124.8
Less:			
Adjustment for Overstatement 1/	(714.5)	($43.4)	
Impact on Corridor-Clark County 2/			($248.1)
Impact on Corridor-Spokane County 2/			($216.1)
Impact of Alternative Uses of Property 3/	(589.9)	($42.7)	($49.9)
Impact on Remainder of Corridor	Not Evaluated	Not Evaluated	Not Evaluated
Impact on Tourism	Not Evaluated	Not Evaluated	Not Evaluated
Environmental Risk Hazard	Not Evaluated	Not Evaluated	Not Evaluated
Loss of Rail Capacity for Alternative Uses	Not Evaluated	Not Evaluated	Not Evaluated
Net Impacts/Limited to Available Analysis	124.6	$0.7	($389.2)
OPERATIONS/ANNUALLY			
DEIS (Appendix O)	1,081.0	$104.0	$133.5
Less:			
Adjustment for Overstatement 4/	(761.1)	($83.3)	($98.2)
Impact on Corridor-Clark County 2/		($7.9)	
Impact on Corridor-Spokane County 2/		($6.9)	
Impact of Alternative Uses of Property 3/	(174.5)	($11.0)	($20.6)
Impact on Remainder of Corridor	Not Evaluated	Not Evaluated	Not Evaluated
Impact on Tourism	Not Evaluated	Not Evaluated	Not Evaluated
Environmental Risk Hazard	Not Evaluated	Not Evaluated	Not Evaluated
Loss of Rail Capacity for Alternative Uses	Not Evaluated	Not Evaluated	Not Evaluated
Net Impacts/Limited to Available Analysis	145.4	($5.1)	$14.7

1/ Reduces construction impact by 50% to reflect likelihood that impact is captured by firms and labor residing outside of Clark County.

2/ Construction impacts reflect an assumed reduction of value of 5%, with an impact area ranging from 1/3 to 1/2 mile. Operational impacts reflect a 3% annual return on asset value over a 16 year lifespan

3/ Assumes development of property consistent with average employment density and character for marine terminal and marine industrial property in the Portland Harbor.

4/ Adjustst the IMPlan data to reflect only truly direct employment.

21. The results of the IMPlan modeling provided in Appendix O do not change this conclusion. The IMPlan model is a well-recognized method for assessing economic impacts. However, its utility is limited to the quality of information considered. The IMPlan model is an input-output model which calculates indirect and induced impacts associated with a defined event, which is referred to as "direct" effects. In this case, the defined event was the construction and operation of the proposed terminal.

22. It is clear that the model as used in Appendix O takes Tesoro's application at face value for its assumptions, any of which can be questioned. For example, the analysis assumes a 16-year lifespan for the Project. This appears to be inconsistent with the terms of the Applicant's lease with the Port of Vancouver, which sets a ten-year initial lease period with two five year optional renewals. The analysis also appears to adopt off-site related employment as direct employment. This overstates the impacts of the Project, as it incorrectly categorizes indirect impacts as direct impacts. When using an input-output approach, overstating direct impacts will lead to a commensurate overstatement of indirect and induced impacts.

Alternative Uses of Project Site

23. More importantly, as discussed throughout this testimony, the model was not used to generate a "net" analysis of impacts from the proposed facility. It does not account for any negative impacts on impacted properties, potential alternative use of the leased property, the impact associated with dedication of rail capacity to this use at the potential expense of alternative uses, and the likelihood that an alternative location for an oil export terminal may likely result if the Project does not go forward. Appendix O acknowledges some but not all of these issues but does not substantively address these significant omissions.

24. Moreover, Appendix O contains a significant caveat, which outlines and acknowledges a significant shortcoming in the analysis:

> *We do not explicitly model scenarios in which another industrial activity is undertaken in place of the Project. In principle, an alternative Port use could result in impacts that are larger or smaller than those from the Project depending on a range of factors. While we do not consider alternative uses, one factor suggesting that the Project could have greater impacts than an alternative use is the Port's conclusion that a crude-by-rail facility would provide the Port with greater revenue streams than other uses. Revenues to the Port affect overall economic impacts to the regional economy because these revenues would be used to either increase operations at the Port or increase investment in additional construction by the Port, both of which would increase primary positive economic impacts.*

DEIS, Appx. O, p. 5 (Ex0051-PCE). This is an important gap in the analysis. While the report cites a "net effect", determination of a net effect would at a minimum require an assessment of the impact of alternative use of the property, as this Project will preclude alternative uses of the property. As an example, if the purported impact of the facility was 1,000 direct and indirect jobs, but that development precluded an alternative use that would have supported 600 direct and indirect jobs, the "net" impact would be 400 jobs. While the caveat contemplates that higher expected revenue streams to the Port from crude-by-rail facility indicates a greater economic impact from this use, this is neither necessarily true nor does it address the fundamental requirement of assessing alternatives uses in order to generate a "net" impact. Revenue to the Port is not a measure of overall net economic benefit. It is entirely possible that a breakbulk or other use at the Port site could generate more jobs and overall economic benefit to the State of Washington and its residents, even if such use did not generate as much revenue for the Port as the proposed Project.

25. The Project will commit 47.4 acres of prime deep water industrial property, a scarce commodity in the region, to exclusive use for oil handling, storage and distribution. The Port of Portland's Terminal 2 is of similar size, and accommodated a breakbulk and bulk terminal, as well as warehouse and office space. The City of Portland commissioned a study by ECONorthwest and Maul Foster & Alongi in 2012, which concludes that the Port of Portland's existing marine terminals have insufficient capacity to meet mid- to long-term needs.[1] The report notes that these needs could be met through a new marine terminal at the Port of Vancouver. While the forecasts included a wide range of potential terminal needs, under the high growth scenario the current regional inventory appropriate for these facilities is seen as insufficient to accommodate demand.

26. For ongoing impacts, the Analysis Group's assessment in Appendix O includes the impact of revenue streams from property taxes and Port of Vancouver lease payments, which reportedly combine to total over $47 million annually. While we may question if the revenue streams to a public agency will have the same proportional impact as private sector income, the more relevant issue is again the "net" impact, as no alternative use of the property and the associated revenue streams is evaluated. Moreover, Appendix O improperly double counts the payments as part of the operations of the facility, despite such payments already being reflected in the IMPlan calculations under operating costs.

Construction Employment

27. The IMPlan results also apparently assume that all construction labor is completed by local Clark County-based firms, a highly questionable assumption in a county that

[1] Exhibit 4010-000111-CWF, ECONorthwest, *Portland Harbor: Industrial Land Supply Analysis* (June 2012).

serves as part of a much larger metropolitan area. Based on second quarter 2015 data from the Bureau of Labor Statistics, Clark County accounts for only 22.3% of construction employment in the Portland-Vancouver-Hillsboro MSA, and only 16.3% of industrial building construction, as shown in Table 1 below. While I expect that Clark County firms will have a competitive advantage due to proximity to the Project site, the likelihood of all construction work being captured locally is quite low.

TABLE 2: CONSTRUCTION EMPLOYMENT STATISTICS FROM BUREAU OF LABOR STATISTICS

QCEW, 2Q-2015		Portland-Vancouver Hillsboro MSA	Clark County, WA	% of MSA Total
Construction Employment		43,763	9,754	22.3%
23621	Industrial Building Construction	689	112	16.3%
237	Heavy and Civil Engineering Construction	3,331	1,406	42.2%
238	Specialty Trade Contractors	29,044	6,524	22.5%

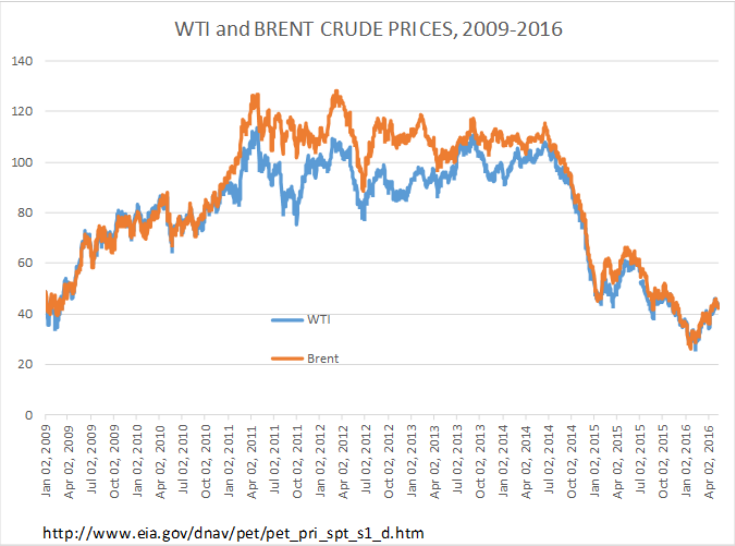
Long-Term Impacts and Uncertainty

28. In addition, the future prospects for transportation of crude oil by rail are uncertain. Transportation by rail of crude oil is both more hazardous as well as less cost effective than other means of conveyance, and this mode of transport is likely only a temporary solution that could eventually be replaced by pipeline infrastructure.[2] There is considerable risk that future pipeline improvements will substantially reduce the need for rail transportation of crude oil, reducing the use of the Project. Rail has benefited vis-a-vis pipelines in the short term due to greater political expedience, but this is likely only a short-term advantage.

[2] Ex4004-000010-CWF, Furchtgott-Roth, *Pipelines are Safest for Transportation of Oil and Gas*, MANHATTAN INSTITUTE (June 2013).

29. The economics of crude production have been shifting rapidly. At the time that this process was conceived and the operational projections were produced, crude prices traded in the range of $100 to $120 per barrel. Since that time, the market has largely collapsed, with crude prices now trading below $40 per barrel and many analysts expecting pricing to decline further in 2016. There are a number of factors contributing to this price decline, and analysts see little reason to expect a rapid rebound in oil prices anytime soon. The commercial crude stock in the US is at all-time highs, and OPEC appears to have lost its ability to control production. In addition, Iranian crude is expected to start entering the market in the next year, as sanctions are removed. As a result, there is little structural indication that crude pricing will rise again to the levels seen in the previous decade. Russia has recently stated an expectation of pricing in the $40 to $60 per barrel range through 2022. Figure 1 illustrates the volatility and sharp decline in recent oil prices.

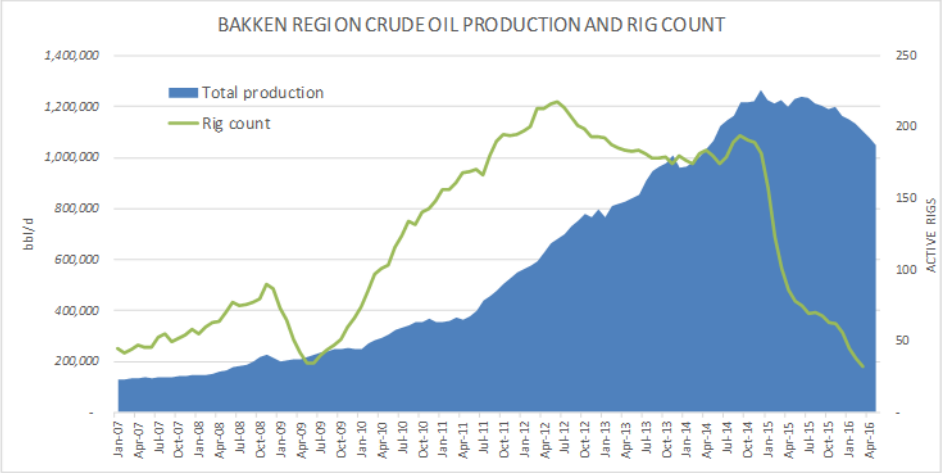
FIGURE 1. WTI VS. BRENT CRUDE PRICES: 2009 – 2016[3]



[3] Figures 1, 2, and 3 may be generated and downloaded from the U.S. Energy Information Administration website, located at: http://www.eia.gov/dnav/pet/pet_pnp_unc_dcu_r50_a.htm.

The recent sharp declines in crude pricing have also led to a predictable associated decline in oil production and active rigs in the Bakken region, as illustrated in Figure 2 below.

FIGURE 2. BAKKEN REGION CRUDE OIL PRODUCTION AND RIG COUNT



SOURCE: US Energy Information Administration

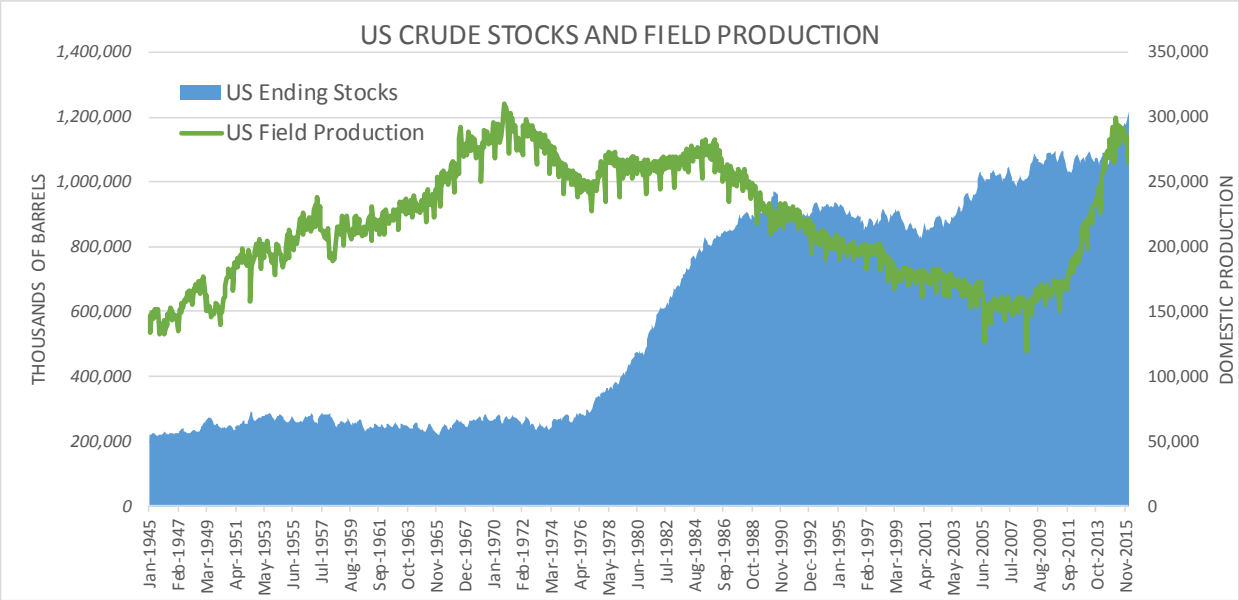
30. The global market for oil is highly dynamic, and assumptions based on anticipated production levels should also recognize the highly volatile nature of this market, as well as the significant risk that forecasts of local economic activity predicted on activity in this market will not be met. In addition, shifts in energy markets due to potential actions such as a "carbon tax" are difficult to accurately predict. While there is some debate regarding the exact impact of oil pricing on production, this risk should be addressed in any analysis. In light of the volatility of global crude oil prices, it is difficult to accurately predict future demand for crude by rail (CBR) capacity and the long-term viability of CBR projects, including the Project.

Impacts on Refineries in Washington

31. There is no shortage of crude oil for existing refineries in Washington. Existing refineries in Washington have ample supplies of crude oil from a variety of sources, including

from the Alaska North Slope and the Bakken formation. Nationally, crude oil stocks are at or near an all-time high, as shown in Figure 3 below.

FIGURE 3. U.S. CRUDE STOCKS AND FIELD PRODUCTION



SOURCE: US Energy Information Administration

32. There are five refineries in Washington State with a total operating capacity of about 647 Mb/d. These refineries all process Alaska North Slope ("ANS") crude shipped down from Valdez by tanker. The only traditional source of supply aside from ANS has been imports (mostly from Asia) or limited supplies of Canadian crude reaching the Northwest via the 300 Mb/d Kinder Morgan Trans Mountain Express pipeline from Edmonton. ANS is the default crude processed by most West Coast refineries. Before the boom in shale oil production, ANS largely competed with imported crudes and was priced against the Brent international benchmark.

33. Since the boom in shale oil production, each of the Washington refineries has built or attempted to build a Crude by Rail ("CBR") unloading terminal mostly designed to receive deliveries of Bakken crude from North Dakota, the shale basin nearest to the Northwest.

Bakken crude was heavily discounted in 2012 and 2013 such that it was cheaper to process than ANS. However, CBR economics between North Dakota and Washington State have turned upside down in the past year, making Bakken crude more expensive than ANS.

34. Most of the CBR shipments to refineries in Washington State originate in North Dakota where rail freight costs are more than $10/Bbl. Bakken crude from North Dakota competes at Washington refineries with ANS. Back in 2012, ANS prices were more than $20/Bbl. higher than Bakken crude, easily covering the rail cost. In 2016, so far the ANS premium to Bakken has averaged well below the $10/Bbl. freight cost, making CBR shipments uneconomic. But, Northwest refiners are still accepting significant volumes of crude from North Dakota delivered by rail.

35. To date, CBR volumes being shipped to Northwest refineries have remained quite resilient in the face of poor economics. This resilience is likely due to refiners having made term "take-or-pay" commitments to rail load and unload terminals and to leasing rail tank cars. These contracts mean that they have to pay variable transportation costs even if they don't ship crude. They therefore continue to do so, even though ANS crude would otherwise be a more economical source of crude. The available CBR movement data bears out this resilience. In the long-term, however, the high shipping costs for CBR projects can only be absorbed if global crude oil prices significantly increase from current pricing.

Impacts on Real Property Values along Rail Corridor

36. I disagree with the conclusion in the DEIS that impacts to real property values in the rail corridor would be "minor". The DEIS states at 3-16.14 through .15:

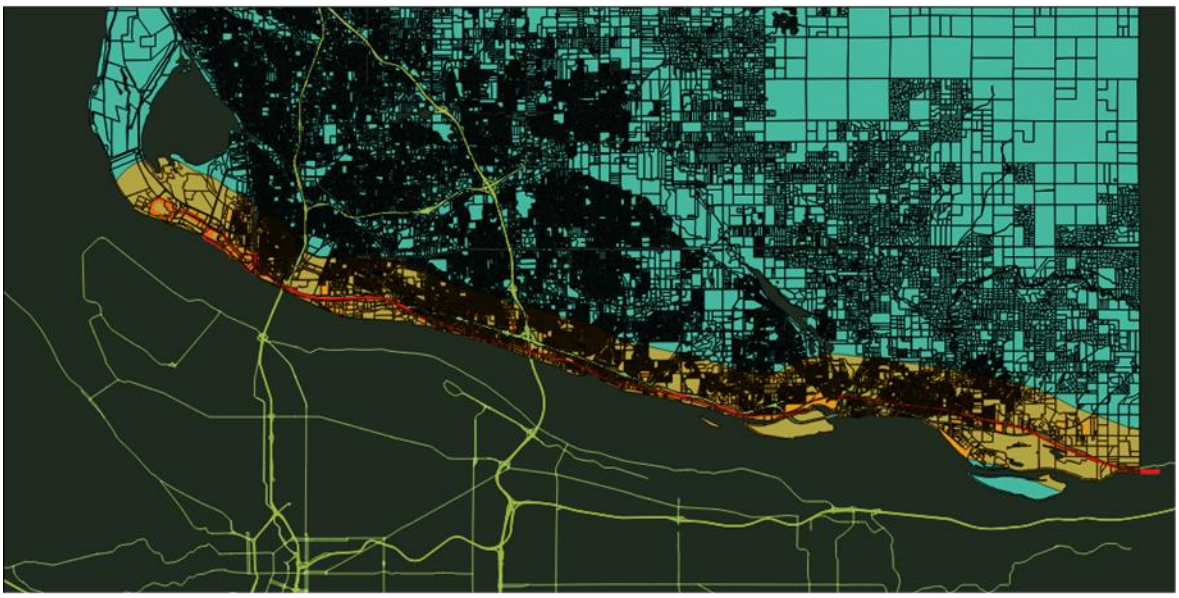
> *According to the Applicant, the incremental increase of four unit trains per day traveling along the rail route could reduce property value within a mile of the rail corridor by 0 to*

> *1.5 percent, which could reduce property tax collections for homes located within a mile of the rail corridor by a corresponding 0 to 1.5 percent. Property tax impacts for the rail corridor study area outside of Washington and Oregon are also anticipated to be in the 0 to 1.5 percent range (Appendix O). . . .*
> *The Applicant has estimated the incremental increase of 4 additional trains per day could reduce property value within a mile of the rail corridor by not greater than 1.5 percent (Appendix N, Tables L-19 and L- 20), which is considered to be a minor impact. Reduction in property value within the rail corridor study area outside of Washington and Oregon is similarly anticipated to be no greater than 1.5 percent (Appendix O).*

In light of the length of the rail corridor, even a "minor" impact of 1.5% has a very large economic and fiscal impact. For a homeowner with a property valued at $400,000, this would translate into a reduction in value of $6,000, which is likely to be considered by the owner to represent a "significant impact". Property in the rail corridor impact area has an estimated aggregate real market value of $5.7 billion in Clark County alone.

37. The DEIS refers to a potential impact of up to 1.5% within a one-mile radius, which was also evaluated as a potential area of impact. A visual representation of this impact area in Clark County is shown in the following map.

FIGURE 4. AREA OF IMPACT IN CLARK COUNTY, 1 MILE FROM TRACK



38. However, the 1.5% estimate in the DEIS does not accurately characterize the impacts of the Project on real property values because it incorrectly assumes that there are no impacts resulting from the nature of the cargo being transported. As I will explain further, research shows that the transport of cargo perceived to be hazardous has greater negative impacts on property values than cargo that is not so perceived. The studies cited to support the 1.5% finding in the DEIS are of limited utility, as they addressed changes in the volume of rail traffic but not the nature of the cargo. My research shows that the following statement in Appendix O on page 6, footnote 15 does not reflect current research which shows a demonstrable difference in property value impacts dependent on the type of cargo transported:

> *These estimated effects reflect the specific types of freight that were transported along the rail lines studied, which likely reflects a diversity of cargo. To the extent that impacts for particular types of cargo would impose greater or lesser impacts, these results would not reflect such differences. We identify no previous empirical research that attempted to evaluate the effects on property values of changes in the volume of crude oil traffic specifically.*

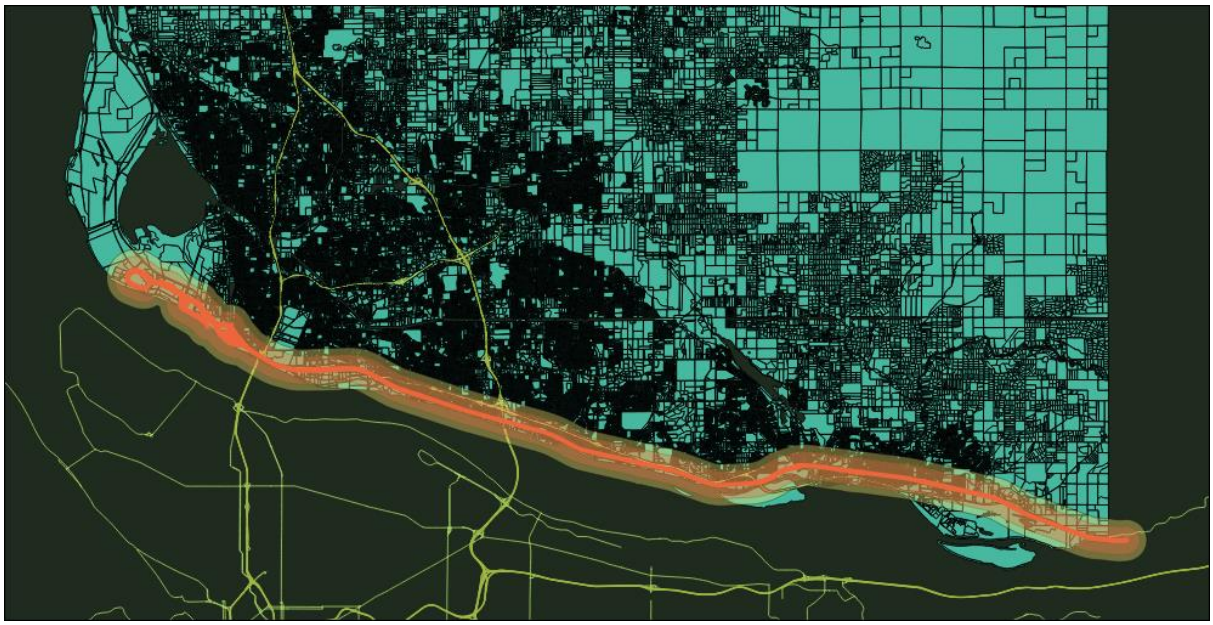
The proposed new terminal would result in a profound change in the nature of existing cargo along rail lines in the Vancouver area, with the incremental increase in traffic almost exclusively volatile crude oil shipments. In addition, the function of the rail traffic would also change, with the incremental increase in traffic no longer elevated at the site but routed to an at-grade spur line immediately adjacent to the planned Waterfront development in Vancouver.

39. As part of the Johnson Economics evaluation of the projected impacts of the proposed changes in rail configuration and traffic associated with Tesoro's proposed crude oil depot, I reviewed a number of available studies which attempted to quantify similar impacts. See Exhibits 4002 – 4018, attached to this testimony. The existing literature is largely consistent in finding negative impacts on pricing associated with rail lines and/or increased rail traffic. The

studies indicate a fairly consistent finding of negative impact on values, which as would be expected is greater at closer proximity to the tracks.

40. The implications of this expected reduction in values due to the nature of the cargo is highly significant. As shown in the following map, our office evaluated what the impact would look like in Clark County, which represents only a small portion of the overall corridor. The areas of defined impact in this analysis were 1/3 and 1/2 miles from the rail line (1,760' and 2,640').

FIGURE 5. AREA OF IMPACT IN CLARK COUNTY, 1/3 AND 1/2 MILE FROM TRACK



Clark Couty GIS

41. Properties within these areas of impact were identified, including their estimated Real Market Value (RMV) and taxable value based on the most current assessor records. We modeled the expected loss of value in the impact area based on a range of assumptions regarding the percentage reduction in value and the assumed impact area. The following table summarizes the results of this analysis:

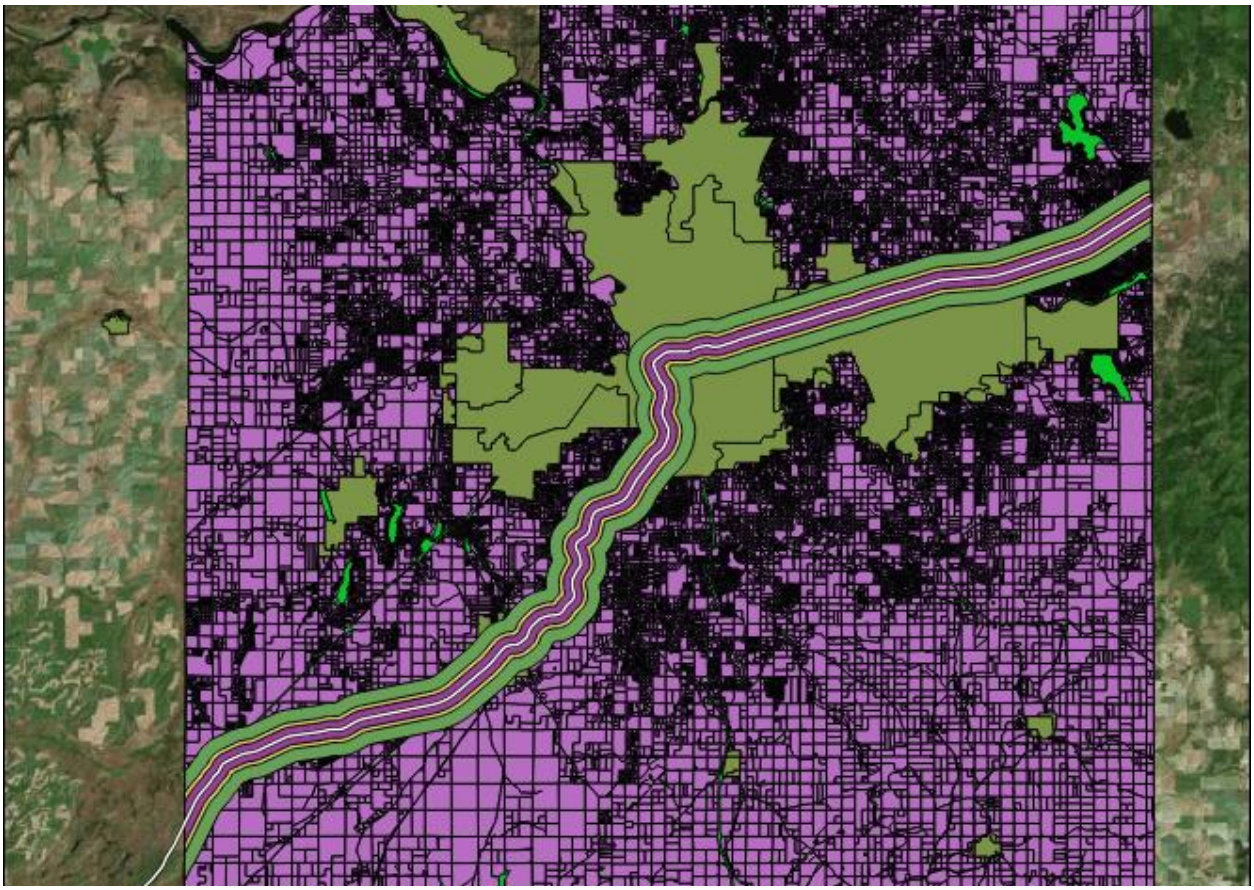
TABLE 3: SUMMARY OF IMPACTS OF REDUCED PROPERTY VALUE, CLARK COUNTY IMPACT AREA

Assumed % Impact	-1.50%			-5.00%		-7.00%	
Assumed Impact Area	**1 mile**	**1/3 mil**	**1/2 mile**	**1/3 mile**	**1/2 mile**	**1/3 mile**	**1/2 mile**
RVM Impact (Million $)	-$147.59	-$63.93	-$84.96	-$213.08	-$283.21	-$298.32	-$396.50
Taxable Value Impact (Million $)	-$121.36	-$47.78	-$66.36	-$159.27	-$221.19	-$222.97	-$309.67
Annual Property Tax Impact ($000s)	-$1,855.7	-$730.6	-$1,014.7	-$2,435.4	-$3,382.3	-$3,409.5	-$4,735.3
State of Washington	*-$270.0*	*-$106.3*	*-$147.6*	*-$354.3*	*-$492.0*	*-$496.0*	*-$688.8*
Clark County	*-$400.8*	*-$157.8*	*-$219.1*	*-$526.0*	*-$730.5*	*-$736.4*	*-$1,022.7*
Municipal	*-$339.8*	*-$133.8*	*-$185.8*	*-$445.9*	*-$619.3*	*-$624.2*	*-$867.0*
School District	*-$621.4*	*-$244.7*	*-$339.8*	*-$815.5*	*-$1,132.6*	*-$1,141.7*	*-$1,585.7*
Other	*-$223.8*	*-$88.1*	*-$122.4*	*-$293.7*	*-$407.9*	*-$411.2*	*-$571.1*

42. In summary, the impact of even a reduction of 1.5% is quite high, reducing real market values in a 1-mile study area by almost $148 million in Clark County. Based on existing literature, our analysis indicates a more likely value impact of 5.0% within a 1/3 to ½-mile radius, which would represent a loss in value along the corridor in Clark County of between $213 and $283 million. The fiscal implication of this loss would be a reduction of between $2.4 and $3.4 million per year for affected taxing jurisdictions. Over the 16 year operating period assumed in Appendix O, this would reflect a reduction of between $36 and $50 million in property tax revenues from this section of the impact area.

43. The same analysis was also completed for Spokane County, which would also be impacted by the increased train traffic associated with the Project. Following is a map of the impact areas evaluated:

FIGURE 6. AREA OF IMPACT IN SPOKANE COUNTY, 1/3, 1/2 AND 1 MILE FROM TRACK



44. As with Clark County, properties within these areas of impact were identified, including their estimated Real Market Value (RMV) and taxable value based on the most current assessor records. We modeled the expected loss of value in the impact area based on a range of assumptions regarding the percentage reduction in value and the assumed impact area. The following table summarizes the results of this analysis:

TABLE 4: SUMMARY OF IMPACTS OF REDUCED PROPERTY VALUE, SPOKANE COUNTY IMPACT AREA

Assumed % Impact	-1.50%			-5.00%		-7.00%	
Assumed Impact Area	1 mile	1/3 mil	1/2 mile	1/3 mile	1/2 mile	1/3 mile	1/2 mile
RVM Impact (Million $)	-$147.39	-$44.03	-$85.62	-$146.76	-$285.41	-$205.47	-$399.57
Taxable Value Impact (Million $)	-$113.98	-$36.10	-$64.48	-$120.33	-$214.92	-$168.46	-$300.89
Annual Property Tax Impact ($000s)	-$1,587.7	-$502.9	-$898.2	-$1,676.2	-$2,993.8	-$2,346.7	-$4,191.4
State School	*-$239.3*	*-$75.8*	*-$135.4*	*-$252.7*	*-$451.3*	*-$353.7*	*-$631.8*
Spokane County	*-$167.7*	*-$53.1*	*-$94.9*	*-$177.0*	*-$316.2*	*-$247.9*	*-$442.7*
City of Spokane	*-$443.9*	*-$140.6*	*-$251.1*	*-$468.6*	*-$837.0*	*-$656.0*	*-$1,171.8*
School District	*-$680.7*	*-$215.6*	*-$385.1*	*-$718.7*	*-$1,283.6*	*-$1,006.1*	*-$1,797.0*
Spokane EMS	*-$56.1*	*-$17.8*	*-$31.7*	*-$59.2*	*-$105.8*	*-$82.9*	*-$148.1*

45. A 1.5% impact in Spokane County would reduce real market values in a 1-mile study area by almost $148 million, roughly equivalent to Clark County. Our analysis indicates a more likely value impact of 5.0% within a 1/3 to ½-mile radius, which would represent a loss in value along this corridor of between $147 and $285 million. The fiscal implication of this loss would be a reduction of between $1.7 and $3.0 million per year for affected taxing jurisdictions. Over the 16 year operating period assumed, this would reflect a reduction of between $26 and $48 million in property tax revenues from this section of the impact area.

46. While the area of impact evaluated was limited to only two counties, the impact on values associated with negative externalities from the incremental increase in train traffic would be expected to be experienced along the entire corridor. Thus, a comprehensive analysis for the entirety of the impact area along the rail corridor would be expected to show significantly greater impact above and beyond the more than $500 million in negative property value impacts projected for Clark and Spokane counties. While discounted in the DEIS as "minor", the impacts are actually quite significant, even when the analysis is limited to only the two counties evaluated. Also, this analysis addresses property value impacts based on existing development on real property within Clark and Spokane counties, but does not consider potential impacts on

new high-value development such as the Columbia Waterfront project or the Port's redevelopment of the Red Lion property.

47. We also conducted additional literature review to evaluate impacts on property values associated with the increased risk from rail transport of hazardous cargo. The literature indicates that the nature of cargo affects property value impacts, with hazardous cargo having a greater negative impact on property values than would otherwise be expected based on general levels of rail traffic. This reflects the fact that hazardous cargo entails a significant risk hazard, which would be expected to impact values to a greater extent than simple rail traffic. While the findings of these studies have not been included into our calculations of impacts, nor the assumptions used in the DEIS, they clearly support the proposition that perception of hazard has a negative impact on property values, which would be above and beyond that associated with the negative externalities of rail traffic alone. In light of this, the Council should recognize that the projected property value impacts represent a conservative estimate and that actual negative property value impacts are likely to be significantly greater due to the perceived risk associated with crude by rail activities.

Impacts From Accidents

48. Potential economic impacts associated with possible oil spills, explosions or other accident scenarios associated with transportation of crude by rail should be assessed, but have not been by the Applicant or in the DEIS. The DEIS discusses a number of potentially significant or even catastrophic events, identifies these as being having a relatively low probability of happening, and then ignores the negative consequences of these occurrences in assessing socioeconomic impacts. The correct methodological approach would be to calculate

an expected value, similar to the approach that would be used by an actuary for an insurance company. While the likelihood of an event may be low, when the consequences of that event are high the expected value of the outcome is often significant. The following is a simple example of how this should be done for potential events.

Table 5: Sample Risk Analysis Calculations

Event	Significant Oil Spill	Catastrophic Explosion
Annual Likelihood of Event	5.0%	0.1%
Assumed Years of Operation	16	16
Likelihood During Operation	80.0%	1.6%
Impact of Event (Current $s)		
Estimated Cost of Event	($10,500,000,000)	($20,000,000,000)
Job Losses Associated	165,000	200,000
Expected Value (Current $s)		
Estimated Cost of Event	($8,400,000,000)	($320,000,000)
Job Losses Associated	132,000	3,200

This example is for explanatory purposes only, as we have made no effort to assess the likelihood of specific events nor have we evaluated the likely socioeconomic impacts. To fully account for the risks of catastrophic events, the Council should thoroughly consider the potential likelihood and magnitude of a catastrophic incident.

Transportation Impacts

49. The potential economic impacts from increased transportation of crude by rail are not inevitable, regardless of whether or not the Project is built. If the Project is not built, I would not expect the same oil train volume to simply pass by the site to other facilities in its absence. I am assuming that traffic would be travelling along the BNSF Fallbridge and Seattle Subdivision lines, heading to alternative facilities to the north. The Project is a very large transloading terminal, and it is unclear to what extent if any other CBR unloading terminals would be

developed and utilized instead of this facility. In particular, it is very questionable that there would or even could be a similar amount of CBR unloading capacity developed elsewhere in Washington, Oregon, or California, such that trains would possibly be routed by the site or even close to the site. Moreover, if CBR shipments occur absent the proposed facility, they would be via different CBR terminals that might be served via different rail routings, such that trains would not simply pass along the same route to other facilities.

50. To the extent that the Project would be used to supply refineries in California, it is unclear to what extent if any crude would otherwise be transported directly by rail into that state. To date, the State of California has been reluctant to permit crude by rail facilities, and there has been very little crude by rail unloading capacity developed in California. Hence, crude by rail into California has to date been a minor source of supply for refineries in California, and shipments have recently declined owing to shifts in crude pricing that have made crude by rail less economically viable.

51. Moreover, if crude by rail was going directly to California, little or any would follow the same route as trains headed to the Port of Vancouver. It is unlikely that crude trains destined for California would travel on the north side of the Columbia River all the way to Vancouver and then cross over to Portland. Instead, a more likely routing would be along the Columbia and then south from the Wishram area through Bend.

52. Hence, the only alternatives to the Project that could likely result in rail traffic along a similar route would involve unloading terminals elsewhere in Washington, downstream on the Columbia or conceivably in coastal locations further north. Trains going to proposed crude by rail projects in either Grays Harbor or at the Shell refinery in Anacortes could go

through Vancouver. The Grays Harbor projects (Imperium and Westway) are in some ways substitutes/competitors for the Project in that all of these projects are intended provide rail to ship transloading for crude. However, with CBR shifting from a period of rapid growth to a period of overall contraction, there is no guarantee that the Grays Harbors projects will proceed, regardless of whether the Project is approved or denied.

53. The proposed Shell unloading terminal currently in the permitting process would be located at its Anacortes refinery. The other four Washington refineries, including the Tesoro refinery adjacent to the Shell Anacortes refinery, already have operating CBR unloading terminals. In general, refineries prefer on-site unloading terminals, since they provide more control and simpler logistics relative to hybrid logistics (such as crude by rail, then by water). Shell's pursuit of a CBR facility appears to reflect a preference for developing an on-site unloading terminal as opposed to relying on multi-modal facilities such as the Project.

54. The proposals for development of CBR terminals in Oregon to provide transloading to ships are very small in comparison to the Project. Notably, the existing Global Partners terminal in Clatskanie/Port Westward that was seeking to expand its crude handling has now stopped handling crude and will only handle ethanol. This is another indicator that crude by rail is shifting from a period of rapid growth to a period of overall contraction.

55. There are no comparably-sized CBR facilities under development in the Pacific Northwest, so the Council should not assume that the rail traffic needed to serve the Project would be rerouted to other CBR facilities in the event that the Project application was denied. The high levels of crude by rail traffic that would be needed to serve the Project are unlikely to occur if the Project is denied.

Impacts on Retail Prices in Washington

56. The Project will not have a significant effect on the retail price or gasoline or other petroleum products in Washington. Refiners and not consumers typically benefit from facilities such as the Project that might provide access to lower cost crude. There is no indication that greater access to crude from the proposed facility will have a measurable impact on the ***retail*** price of gasoline in the State of Washington. Any claim regarding such a pricing impact is not consistent with mainstream economic opinion, and is even less supportable in light of the operation of markets in Washington and California.

57. In this discussion of pricing for refined products, I will focus on wholesale prices. The retail prices paid by consumers include wholesale prices, plus retail margins and taxes. The proposed facility could *conceivably* affect wholesale prices for refined products, but it is unlikely to have any significant impact on retail margins or taxes.

58. In general, wholesale prices for gasoline and diesel (and other refined products) are not a function of crude prices for the specific refineries supplying a specific market. Rather, pricing for refined products tends to follow crude prices in broad international markets. This linkage to pricing in international markets reflects that there is typically substantial physical ability to trade products over broad areas (via pipeline and sometimes water in continental markets and by water in overseas markets). Moreover, the cost of moving products between markets is typically not that high. Owing to these linkages between markets (both between crude and refined markets, and between markets in various states/regions/countries), wholesale prices for refined products of similar quality do not vary that much between most markets within the U.S. and throughout the world.

59. To illustrate potential pricing dynamics, consider the following example cases:

Case 1: Assume refineries A and B typically each supply half of demand in Market 1, and Refineries C and D typically each supply half of demand in Market 2. There is normally no trade between Market 1 and 2, but trade is possible with a transport cost of 10¢/gallon. Also assume that initially all refineries have identical costs for crude and other cost components. Hence, the price of refined products will be the same in Markets 1 and 2, and all refineries will be equally profitable (and this profit is just a normal economic profit required to compensate investors for providing financing and taking on risk). Now assume that Refinery A is able to obtain crude at 5¢/gallon less than the other refineries. In Case 2, refined product prices will not change from Case 1, since product prices have to remain high enough to enable Refinery B to provide supply for half of demand in market 1. Hence the benefit of Refinery A having access to cheaper crude goes to the refinery in the form of increased profits. Consumers do not benefit.

Case 2: Same as Case 1, but assume Refinery B can now only supply 40% of demand in Market 1, and Refinery A cannot increase production. But Refinery C and/or D can increase output to send product to Market 1, and their cost of production/gallon will be the same as for the baseline production needed to supply Market 2.

The result will be that demand in Market 1 is supplied as follows: 50% from Refinery A, 40% from Refinery B, and 10% imports from Market 2. The

price of refined products in Market 1 will be 10¢/gallon higher than in Market 2, to enable imports from Market 2. Refineries C and D will be indifferent to supplying Market 1 or Market 2, since the revenue per gallon net of transport costs will be the same. Refinery A will have higher profits than in Case 1, since it will have revenue 10¢/gallon higher, but the same costs of production. Refinery B will also have higher margins than in Case 1, but it will also have lower volume.

60. There are real world examples over the last few years for these and similar cases. Crude prices have bounced around, both for specific refineries and in broad national and international markets. Hence, there have been situations where some refineries were very profitable, because they had access to cheaper crude than other refineries and/or were selling into markets where product prices were high because these markets were also reliant on imports from markets with higher crude costs. But it is only since mid-2014, when crude prices began to fall basically everywhere (nationally and internationally), that refined product prices have also come way down. So lower crude prices since mid-2014 have definitely benefitted consumers. But the shifts toward lower crude and refined product pricing have also had some benefits for refineries, by increasing demand for refined products and also by lowering inventory costs.

61. Based on the above analysis, the Project is unlikely to affect pricing for refined products in the State of Washington. The Project is a relatively large project in terms of crude by rail, but it is not such a big project that it would have any measurable impact on global markets. Markets and pricing for refined products throughout much of the U.S. have strong linkages to global markets.

62. The California refined products market, however, is a relatively insular market with limited linkages to other regions. In part this is due to geography and the limited pipeline connectivity between California and the rest of the country. Even more importantly, California requires gasoline and other transportation fuels to meet more stringent requirements than other jurisdictions, generally to reduce air emissions. Higher standard fuels are typically more expensive to produce, affecting both production costs and wholesale prices. As a result, California refineries supply virtually all of California demand, and there are only limited refined product imports into and exports out of California. Put simply, if crude oil from the Project is delivered to California refineries, refined products are highly unlikely to be sent back to Washington to meet Washington's energy needs. Nor will crude oil deliveries to California refineries affect pricing of refined products in Washington.

63. In contrast to the largely self-contained California market, supply from Washington refineries substantially exceeds demand in Washington, such that Washington-based refineries send substantial amounts of refined product to Oregon, British Columbia, and more distant markets. Put another way, Washington refineries are in part an export industry. With Washington refineries heavily involved in supplying product to a variety of markets outside the state, the refined products market in Washington has substantial linkages with markets outside the state. This suggests that even if the Project supplies crude to Washington refineries (which is not guaranteed or even likely); this would not likely have any substantial effect on the pricing of refined products in the State of Washington.

64. Moreover, it is unlikely that the Project will be a big supplier to Washington refineries. As I previously explained, 4 of 5 Washington refineries already have on-site rail

unloading facilities, and the fifth refinery (Shell Anacortes) is in permitting to develop on-site facilities. So if Washington refineries are going to receive crude via rail, they are likely to do it directly via their on-site unloading facilities, rather than through the Project's multi-modal deliveries. Hence, it is unlikely that the Project will have much, if any, impact on refined product pricing in Washington.

Conclusion

65. In conclusion, while the Project will create a small number of jobs during construction and operations, the positive economic benefit to the State of Washington is likely outweighed by the Project's negative economic benefits, including significant property value impacts, development impacts in the City of Vancouver, constraints on competing shippers, and risks associated with catastrophic accidents. There is no indication that the Project will help serve any demonstrated energy needs in Washington or will otherwise benefit Washington consumers. In fact, there is no guarantee that the Project will provide any energy within Washington, much less "abundant energy at reasonable cost." Instead, the Project will largely benefit upstream oil producers and downstream oil refiners, without meeting any energy needs or providing substantial economic benefit to the state or its residents. When these limited benefits within the state are considered in light of the substantial negative economic benefits associated with the Project, as well as its likely and potential environmental consequences, I believe the broad interests of the public would be best served by denying approval of this Project.

66. Attached for convenience are the following documents:

A. Exhibit 4002-000001-CWF is a copy of my resume.

B. Exhibit 4003-000022-CWF: J. Johnson, Johnson Economics, Inc., *Tesoro Savage Vancouver Energy Distribution Terminal DEIS Independent Review* (Jan. 20, 2016).

C. Exhibit 4004-000010-CWF: D. Furchtgott-Roth, *Pipelines are Safest for Transportation of Oil and Gas*, MANHATTAN INSTITUTE FOR POLICY RESEARCH, ISSUE BRIEF NO. 23 (June 2013).

D. Exhibit 4005-000030-CWF: D. Clark, *Externality Effects on Residential Property Values: The Example of Noise Disamenities*, GROWTH AND CHANGE (Sept. 2006).

E. Exhibit 4006-000025-CWF: T. Carroll, et al., The Economic Impact of a Transient Hazard on property Values: The 1988 PEPCON Explosion in Henderson, Nevada, 13 JOURNAL OF REAL ESTATE FINANCE AND ECONOMICS 2 (1996).

F. Exhibit 4007-000014-CWF: S. Farber, *Undesirable Facilities and Property Values: A Summary of Empirical Studies*, 24 ECOLOGICAL ECONOMICS (1998).

G. Exhibit 4008-000008-CWF: R. Diaz, *Impacts of Rail Transit on Property Values,* American Public Transportation Association, Proceedings of 1999 Commuter Rail/Rapid Transit Conference, Toronto, Canada (1999).

H. Exhibit 4009-000017-CWF: D. Forkenbrock, *Comparison of External Costs of Rail and Truck Freight Transportation*, TRANSPORTATION RESEARCH PART A 35 (2001).

I. Exhibit 4010-000111-CWF: ECONorthwest, *Portland Harbor: Industrial Land Supply Analysis*, Prepared for the City of Portland: Bureau of Planning and Sustainability (May 2012).

J. Exhibit 4011-000018-CWF: K. Gawande, et al., *The Long-Run Impact of Nuclear Waste Shipments on the Property Market: Evidence from a Quasi-Experiment*, JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT 65 (2013).

K. Exhibit 4012-000030-CWF: M. Fucht, *Examining the Spatial Distribution of Externalities: Freight Rail Traffic and Home Values in Los Angeles* (Nov. 11, 2011).

L. Exhibit 4013-000032-CWF: M.A.J. Theebe, *Planes, Trains, and Automobiles; The Impact of Traffic Noise on House Prices*, SBV Research (2002).

M. Exhibit 4014-000027-CWF: G. Debrezion, et al., *The Impact of Rail Transport on Real Estate Prices: An Empirical Analysis of the Dutch Housing Market*, TINBERGEN INSTITUTE DISCUSSION PAPER, No. 06-031/3 (2006).

N. Exhibit 4015-000027-CWF: K. Gawande and H. Jenkins-Smith, *Nuclear Waste Transport and Residential Property Values: Estimating the Effects of Perceived Risks*, JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT 42 (2001).

O. Exhibit 4016-000013-CWF: R. Simons & A. El Jaouhari, *The Effect of Freight Railroad Tracks and Train Activity on Residential Property Values*, THE APPRAISAL JOURNAL (Summer 2004).

P. Exhibit 4017-000033-CWF: Washington Physicians for Social Responsibility, Position Statement on Crude Oil Transportation and Storage to Governors of Washington and Oregon from Concerned Washington & Oregon Health Care Professionals (Feb. 2015).

Q. Exhibit 4018-000082-CWF: Washington Department of Ecology, Final Cost-Benefit and Least Burdensome Alternative Analysis: Chapter 173-182 WAC, Oil Spill Contingency Plan, Pub. No. 12-08-014 (Dec. 2012).

DATED this 13th day of May, 2016.

By: _____
Jerry Johnson, Declarant

STATE OF Oregon)
)
County of Multnomah)

Jerry Johnson, being duly sworn upon oath, deposes and says: The foregoing testimony is true correct, and complete to the best of my knowledge, information, and belief and is given subject to the laws of perjury in the State of Washington.

GIVEN under my hand and official seal this 13th day of May, 2016.

OFFICIAL STAMP
RACHEL BUNDAY
NOTARY PUBLIC - OREGON
COMMISSION NO. 939608
MY COMMISSION EXPIRES JUNE 04, 2019

Rachel Bunday
NOTARY PUBLIC in and for the State of:
Oregon
Residing at: Portland
My Commission Expires: June 4, 2019
Printed Name of Notary:
Rachel Bunday

CERTIFICATE OF FILING

I hereby certify that on May 13, 2016, I filed this Pre-Filed Direct Testimony of Jerry Johnson and a true and correct copy by first class U.S. mail, postage prepaid, to the following mailing address:

Energy Facility Site Evaluation Council
1300 S. Evergreen Park Drive SW
Olympia, WA 98504-3172

And sent a true and correct copy by electronic mail to the following electronic filing address:

EFSEC@utc.wa.gov.

DATED: May 13, 2016

Daniel L. Timmons
Attorney for Columbia Waterfront LLC

CERTIFICATE OF SERVICE

I hereby certify that on May 13, 2016 I served by authorized method of service pursuant to WAC 463-30-120(3) a true and correct copy of this PRE-FILED DIRECT TESTIMONY OF JERRY JOHNSON upon all parties of record as in this proceeding via electronic mail to the addresses listed below:

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Dated at Seattle, Washington this 13th day of May, 2016.

Daniel Timmons
Attorney for Columbia Waterfront LLC