

Assessment of Vancouver Energy Socioeconomic Impacts: Primary Economic Impacts

Analysis Group, Inc.

July 28, 2014

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Executive Summary

Todd Schatzki and Bruce Strombom¹

July 2014

The proposed Vancouver Energy project (“the Project”) would provide Clark County and the neighboring region with new economic benefits, including increases in labor employment and income, opportunities for local business and tax revenues. Quantitative estimates of these impacts were developed using the IMPLAN model, a widely-used economic model grounded in data developed by the U.S. Commerce Department’s Bureau of Economic Analysis. The estimates reflect not only the direct economic impact of the Project’s construction and operations, but also the “indirect” spillover effects as the Project’s economic activity ripples through the economy and the “induced” effects as income earned by workers at the Project (and other workers indirectly supporting the Project) is spent in the economy.

Our analysis finds that the development of the Vancouver Energy project would lead to increases in employment, labor income and tax revenues. Our results are summarized in Table ES-1 and Figure ES-1, and further details on assumptions, methods and results are provided in our full report. We find that over the Project’s sixteen year assumed life-time, reflecting both construction and operations, over 1,000 jobs annually would be generated by the Project, on average. This aggregate impact reflects the combined effect of activity at the Project, regional activity to support its operations, and the indirect and induced impacts that occur as this spending ripples through the regional economy. These aggregate employment impacts are driven by direct employment impacts from the Project, including 239 jobs during the one-year Phase I construction period, 162 jobs for the six-month Phase II construction period, 302 jobs annually from on- and off-site Project operations during the one-year start-up period, and 616 on- and off-site jobs annually for each of the remaining 15 years of the assumed operational period studied. These impacts represent “full time” jobs or their equivalent.² To the extent that actual operations were shorter or longer than this assumed operational period, economic impacts would be proportionately smaller or larger.

This new employment would lead to significant new labor income, which is expected to total nearly \$1.6 billion in labor income (\$890 million on a present value basis) over the 16 year construction and operation period. Similarly, economic value added, reflecting labor income, property, sales and other

¹ Dr. Strombom is a Managing Principal and Dr. Schatzki is a Vice President at Analysis Group. The report was conducted on behalf of Tesoro Savage Petroleum Terminal LLC, but the opinions expressed are exclusively those of the authors. To request further information or provide comments, Dr. Schatzki can be reached at: tschatzki@analysisgroup.com.

² Job impacts are measured in “full-time” positions, which could reflect full-time jobs or an equivalent quantity of part-time jobs (e.g., two half-time jobs being equivalent to one full-time job).

production taxes, and returns to local business, is expected to total over an additional \$2.0 billion (\$1.2 billion on a present value basis) to Clark County and the surrounding area.

The Project would also provide additional tax revenues to local and state government resulting from income and other profits taxes. In total, the Project is expected to have a one-time tax impact of over \$22 million to state and local government during Project construction, and an annual impact of over \$7.8 million once the Project is operating at full capacity.

Table ES-1

Summary of Estimated Annual Economic Impacts from the Vancouver Energy Project

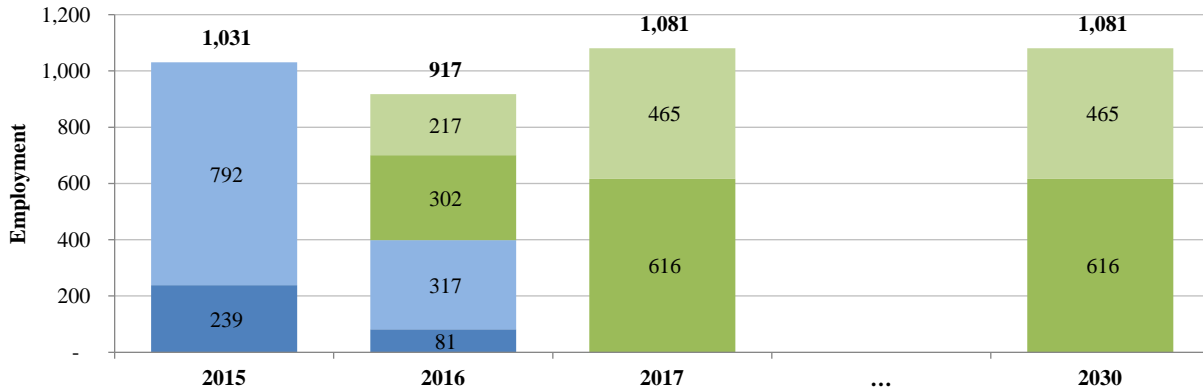
	Direct Impacts			Total Impacts (Direct, Indirect and Induced)		
	Total Employment (Full-time Jobs)	Labor Income (\$ millions)	Economic Value Added (\$ millions)	Total Employment (Full-time Jobs)	Labor Income (\$ millions)	Economic Value Added (\$ millions)
<u>Construction</u>						
Phase I	239	\$23.3	\$23.3	1,031	\$62.6	\$89.6
Phase II	81	\$8.1	\$8.1	398	\$24.2	\$35.2
Total for Phase I and II	320	\$31.4	\$31.4	1,429	\$86.8	\$124.8
<u>Operations (Annual)</u>						
Start-up (2016 only)	302	\$33.5	\$35.7	519	\$44.1	\$55.5
Full Build-out (2017-2030) ¹	616	\$67 - \$88	\$73 - \$95	1,081	\$90 - \$118	\$116 - \$151
Construction and Operations Total over 16 year lifespan	9,245	\$1,144	\$1,239	17,082	\$1,581	\$2,042
Net Present Value over 16 year lifespan	n/a	\$634	\$686	n/a	\$892	\$1,156

Note

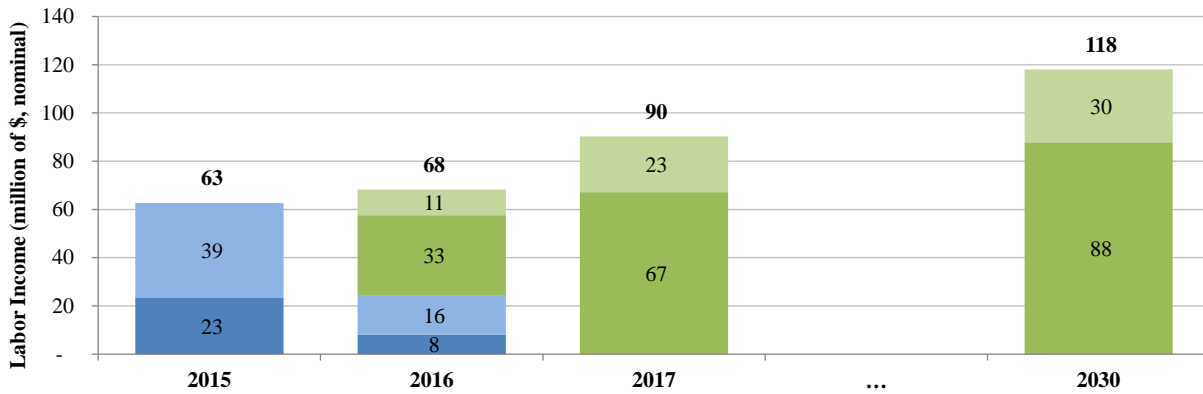
[1] Labor income and economic value added grow over the Project's 2017-2030 lifespan due to inflation.

Figure ES-1

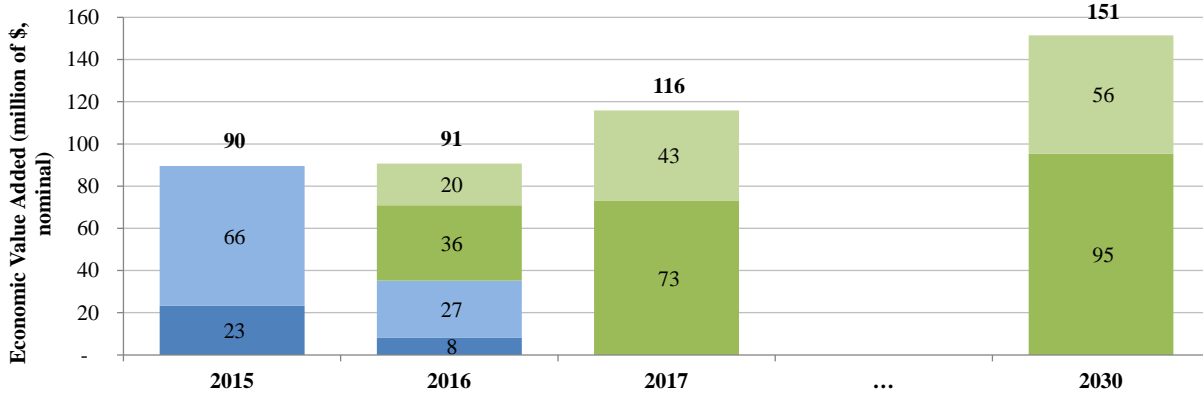
**Summary of Estimated Annual Economic Impacts from the Vancouver Energy Project
Employment**



Labor Income



Total Value Added



■ Construction - Direct ■ Annual Operations - Direct
■ Annual Operations - Indirect and Induced ■ Construction - Indirect and Induced

Note: Values shown represent nominal values, and labor income and total value added grow between 2017 and 2030 due to inflation.

Assessment of Vancouver Energy Socioeconomic Impacts: Primary Economic Impacts

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Tesoro Savage Petroleum Terminal LLC (“Tesoro Savage”, a joint venture between Tesoro Corporation (“Tesoro”) and Savage Companies (“Savage”), is proposing to develop the Vancouver Energy project (“the Project”) in Vancouver, Washington, which will facilitate the movement of crude oil produced in North America to West Coast refineries. The Project would be located in the Port of Vancouver.

This technical report provides an assessment of the expected primary socioeconomic impacts of the proposed Project, and is designed to provide input to the Draft Environmental Impact Statement.⁴ Primary economic impacts reflect the changes in economic activity from the Project’s construction and operations, and include increased income for local workers, increased profits for local business owners and increased revenue streams for local government. These impacts reflect the direct employment and local business activity from the Project’s construction and operation, as well as the spillover effects as this activity ripples through the region’s economy. We assess these impacts over a regional geographic area comprised of the 10 counties closest to the Project.

This study is divided into four sections. In Section I, we provide an overview of the methodological approach taken to estimating the Project’s primary economic impacts. In Section II, we provide an overview of the IMPLAN model and the types of economic impacts estimated. In Section III, we describe the data and assumptions used in performing the analysis. Finally, in Section IV, we summarize the estimated economic impacts of the Project.

I. OVERVIEW OF METHODOLOGICAL APPROACH

Economic impacts are evaluated through comparison between a “policy case” in which the Project is developed and a “base case” in which the Project is not developed. This base case implicitly assumes a “No Action Base Case” in which the parcel in the Port that the Project would occupy in the

³ Dr. Strombom is a Managing Principal and Dr. Schatzki is a Vice President at Analysis Group. The report was conducted on behalf of Tesoro Savage Petroleum Terminal LLC, but the opinions expressed are exclusively those of the authors. To request further information or provide comments, Dr. Schatzki can be reached at: tschatzki@analysisgroup.com.

⁴ Our estimates differ from the estimated Project impacts developed by BST Associates, which were submitted with the Project’s EFSEC Application. Impacts differ for a variety of reasons, including updated information about construction costs and employment, operations costs, and the timing of project development, and methodological differences. Appendix K, Tesoro Savage Vancouver Energy Distribution Terminal Socio-Economic Analysis, EFSEC Application No. 2013-01, prepared by BST Associates, Revised November 25, 2013.

policy case remains undeveloped. Comparison between this base case and the policy case provides a measure of the Project's "stand alone" impact. Because the Project would result in new economic activity, this results in positive economic impacts to the region.

We do not explicitly model scenarios in which another industrial activity is undertaken in place of the Project.⁵ 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.⁶ 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.⁷ 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.

II. OVERVIEW OF IMPLAN

Our analysis of primary impacts of the facility on the regional economy is performed using the IMPLAN model. The IMPLAN model estimates local economic impacts arising from changes in economic activity and is based on detailed region- and sector-specific data from the U.S. Commerce Department's Bureau of Economic Analysis.⁸ This model provides highly disaggregated estimates

⁵ In practice, it is highly likely that if the Project were not developed that another business operation would take its place and use the parcels and resources planned for use by the Project. The impacts of the Project relative to such an alternative Port use would depend critically on the particular type of business and the details of its operations that would be developed in place of the Project. Because, based on communications with the Port, there is no preferred or likely secondary use of Port resources if the Project is not developed, we do not attempt to independently identify and model alternative uses. Personal communication with the Port of Vancouver personnel.

⁶ These factors include labor requirements during construction and operations, use of goods and services from Vancouver and other regional businesses, tax revenues to local government and other factors.

⁷ We understand that the decision by the Port to pursue a crude-by-rail terminal through a competitive solicitation was made after analysis of various alternative uses that considered compatibility with the particular configuration of available parcels within the Port, potential revenue streams to the Port and other factors. Personal communication with the Port of Vancouver personnel.

⁸ IMPLAN data files are compiled from a wide variety of sources including the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor, and the U.S. Census. These include the following federal programs: Bureau of Economic Analysis Benchmark I/O Accounts of the US and Output Estimates; Bureau of Labor Statistics Covered Employment and Wages (ES202) Program and Consumer Expenditure Survey; Census Bureau County Business Patterns, Decennial Census and Population Surveys, Censuses and Surveys; Department of Agriculture Crop and Livestock Statistics; and US Geological Survey. Information is collected about regional employment, income, value added, household and government consumption. Examples include: employee compensation; proprietary income; federal, state and local taxes affecting income, sales, real estate, and so forth; personal consumption expenditures at nine income levels; federal government purchases (military and non-military) and investments; purchases by local and state governments (including educational institutions); inventory purchases; capital formation; foreign exports; and inter-institutional transfers.

specific to the geographic region and industries being analyzed. IMPLAN is widely used for economic impact assessments in the public and private sectors.⁹

In this study, we use IMPLAN to model the impacts to the city of Vancouver and surrounding counties from the new economic activity generated by the construction and operation of the Project. IMPLAN captures both the direct impacts of this new activity as well as the subsequent impacts as the effects of Project construction and operation flow through the regional economy. Thus, estimates of economic impacts reflect the many layers of economic activity that would be created with construction and operation of the Project.

The immediate economic impacts of the Project's construction and on-going operations are referred to as *direct impacts*:

- *Direct impacts.* Direct impacts reflect the immediate impacts of the new project on employment. In this case, direct impacts reflect workers hired during facility construction and employees needed to operate the Project on an on-going basis. All of this economic activity is new to the region and thus creates incremental employment and economic effects.
 - *Example:* Wages earned by construction workers.

In addition to this direct economic activity, the subsequent flow of economic activity within the region would lead to *indirect* and *induced* economic activity. These impacts are often referred to as “multiplier effects.”

- *Indirect impacts.* Indirect economic activity arises because various phases of the Project's development – plant construction and subsequent operations – create new demand for local goods and services, which in turn leads to new jobs in these sectors. These local purchases can include fuel, materials (e.g., water, feedstock) and other services (e.g., maintenance, information technology, and consulting services). Indirect impacts capture the cycle of spending, as initial spending works its way backward through the supply chain of business interactions.¹⁰

⁹ IMPLAN stands for “IMpact analysis for PLANning.” It is a social accounting/input-output (I/O) model designed to replicate the structure and functioning of the economy in a specific geographic area. Input/output (I/O) models draw on long-standing, well-established and broadly accepted methodologies to estimate how a change in economic activity impacts a regional economy based on data-driven estimates of how this change ripples through the economy. IMPLAN estimates are based on census data collected from businesses by the Bureau of Economic Analysis (BEA), U.S. Department of Commerce. This data tracks the flows of dollars into and out of enterprises and is used to develop input/output tables – or a Social Accounting Matrix (“SAM”) – that capture the movement of dollars between sectors of the economy. From these tables, multiplier effects emerge as dollars flow through the economy from one sector to another. Input/output tables within IMPLAN are geographically-specific, reflecting the particular flows within a region's economy based on region-specific data collected by BEA. The model tracks dollars spent in a region, including dollars that circulate within the region, and dollars that flow into and outside of the region from neighboring economies. For further information on IMPLAN or input/output models, see <https://implan.com>.

¹⁰ This backward cycle will continue until all money leaks from the local economy, either through imports or through the creation of new value (i.e., value added).

- *Example:* Services procured by the Project, such as crude oil testing or janitorial services, would utilize local businesses such as scientific testing laboratories and janitorial service companies.
- *Induced impacts.* As workers increase their spending on general goods and services with new income earned in direct and indirect economic activity, this creates *induced* economic activity. Induced impacts reflect the re-spending of income received through both direct and indirect activity
 - *Example:* Dollars spent by the Project’s personnel on local businesses, such as restaurants, retail stores, automotive purchases and home improvement.

A number of economic metrics can be evaluated using IMPLAN. Our analysis focuses on four metrics:

- *Employment* – the total number of jobs created or lost;
- *Labor Income* – the total change in income to employees that results from the economic activity;
- *Tax Revenue* – the total change in revenues received by state and local governments; and
- *Value Added* – the total change in the value added to the economy from the new economic activity.¹¹ In practice, value added reflects new “value” created by the economic activity which goes to labor (in the form of labor income), government (in the form of tax revenues) and shareholders (in the form of “profits” or residual value).¹² Consequently, both labor income and tax revenue, which are reported separately, are components of value added.¹³

Below, we describe in further detail the particular assumptions and data relied on in our IMPLAN analysis.

III. DATA AND ASSUMPTIONS

Estimates of the impacts of the Project were modeled using IMPLAN's 2012 data file for Clark County, where the facility is to be constructed and operated. A multi-region analysis was conducted which includes impacts to the following additional counties in Oregon and Washington: Multnomah County, Cowlitz County, Clackamas County, Washington County, Marion County, Skamania County, Yamhill County, Columbia County, Hood River County. Thus, our analysis does not account for broader economic impacts in Washington (and Oregon) beyond this ten-county region, and therefore understates the full economic impacts throughout the state. These counties were analyzed based on prior

¹¹ This value reflects new gross economic output net of the cost of non-labor inputs used in creating this output.

¹² Note that value added and gross output are not equal. Value added represents remaining portion of gross output after accounting for input costs. Thus, one dollar of direct spending does not translate into one dollar of value added. For example, the value added associated with the sale of a light bulb includes only the net revenue (and labor income) of the retail store where the light bulb was sold, but does not include the cost of manufacturing the light bulb itself.

¹³ Estimates for value added reported below understate the likely value added because they do not reflect certain tax revenue estimates that we make outside the IMPLAN analysis. Further discussion of the tax estimates is provided in Section IV.B.

determination as part of the Project's Energy Facility Siting Evaluation Council (EFSEC) Application filed in November 2013, and includes counties within a one-hour commute of the Project.¹⁴ These county-level data files include information for a set of highly disaggregated industries, sorted generally by their 4- and 5-digit NAICS codes.¹⁵ A multi-region analysis allows us to capture the Project's impacts on Clark County and neighboring counties within a one-hour commute of the Project.

Information on the Project's construction and operations were provided to us by Tesoro Savage. This information includes: employment during construction and operations phases; construction costs and annual operations costs, both disaggregated into various categories of expenditures; schedules for the timing of the Project's construction; and schedules for plant operations, including assumptions about throughput levels over time.¹⁶ We assigned expenditures into appropriate IMPLAN sector categories, based on assumptions about the character of the economic activity associated with each category of spending. Construction wages were based on information from the EFSEC Application, which was based on data from the Washington State Employment Security Department.¹⁷

The Project's construction and operations will occur over a multi-year time frame, with an initial construction period and subsequent operations period. A summary of the timeline assumed in our analysis for Project construction and operations is provided below in Figure 1. Construction of the Project will potentially occur in two phases. For purposes of this analysis, Phase I construction is assumed to start December 1, 2014 and last approximately 12 months. After Phase I construction is complete, the Project will have the capacity to serve two to three trains per day. Phase II construction is assumed to start January 1, 2016 and last approximately 6 months. Upon completion of Phase II construction, the facility will have the capacity to serve up to four trains per day, its maximum capacity. Phase I construction costs total approximately \$150 million, while Phase II construction costs total approximately \$60 million. The labor employed in Phase I of construction is summarized in Table 1. Labor employed in Phase II reflects the same mix of job types, although the number of on-site and off-site positions is scaled proportionately to the relative magnitudes of Phase I and Phase II construction costs.

The Project's operations will begin after completion of Phase I construction, for purposes of this evaluation assumed to be in 2016. It is anticipated that during 2016, the Project will receive up to two or three trains per day based on Phase I capacity, with volumes increasing to four trains by the end of the year when Phase II is complete. Consequently, we have modeled a one-year operations "start-up" period during 2016 in which deliveries to the Project average two trains per day.

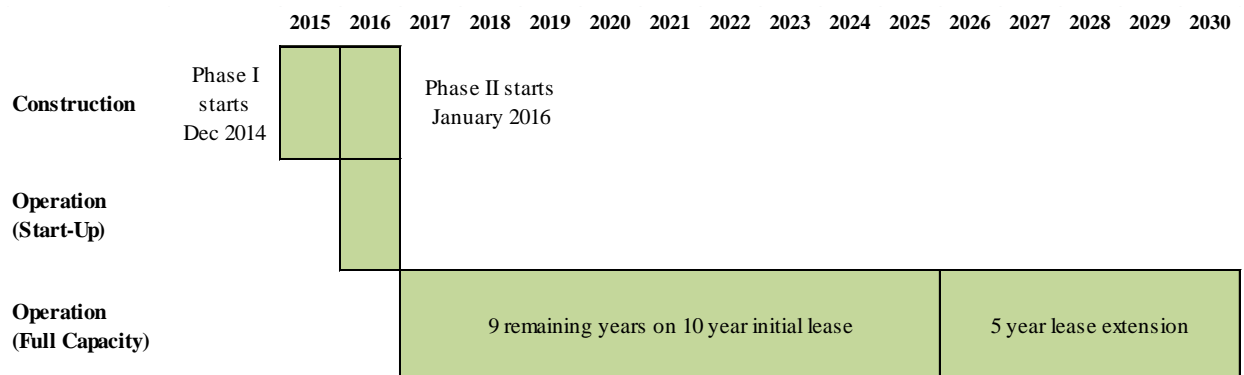
¹⁴ EFSEC Application, Appendix K, pp. 1-2.

¹⁵ NAICS codes are tied to the North American Industry Classification System, which is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

¹⁶ Cost information relied on are initial estimates, provided for the purposes of this economic analysis. Actual costs may differ from those shown in this report.

¹⁷ EFSEC Application, Appendix K, p. 2.

**Figure 1
Timeline of Construction and Annual Operations for the Project**



**Table 1
Summary of Annual Direct Operations Employment at the Project
Phase I Construction**

Description	Onsite	Offsite	Total
Steel erecting	32	-	32
Laborers	53	10	63
Mechanical & piping	50	15	65
Equipment operators	25	4	29
Tank erectors	40	10	50
Electrical	25	20	45
Concrete	25	20	45
Ground improvements/pilling	22	10	32
Dock seismic upgrades	20	10	30
Fire system installation	6	10	16
Total number of workers employed	298	109	407
Total full-time jobs (given 50% average on-site)	149	55	204
Additional permitting and engineering support	-	35	35
Total (full-time jobs)	149	90	239

Note: Employment figures reflect full-time jobs or their equivalent. Facility construction would result in 298 on-site positions, although it is assumed that only 50 percent would be employed at any given time. Consequently, on-site employment levels would be comparable to 149 full-time on-site positions. Facility construction would also result in 109 off-site positions, with 50 percent active at any given time, resulting in the equivalent of 55 full-time positions.

We assume that once Phase II construction is completed, the Project will operate at full capacity of four trains per day in 2017 and all subsequent years. We assume that the Project will operate for 14 years at full capacity, which includes the initial ten year lease period and an additional five year lease period. The actual length of the Project’s operations is uncertain at present. Plant operations could be as short as ten years, the length of the initial lease with the Port, or could continue indefinitely beyond the

ten year lease and subsequent two five year lease options. The assumption of a 15 year operating term reflects a balance between these potential outcomes. We have not evaluated impacts under different assumptions about plant lifetime. Our analysis also does not consider activities that could occur after the Project's operational life, such as site remediation, construction activities to modify the site for subsequent uses or the operations under subsequent uses. Each of these activities would lead to additional future primary economic benefits to the region that are not included in this analysis. Start-up and full build-out expenditures are summarized in Table 2 below. The direct labor employed at the Project is summarized in Table 3.

Lease and fees paid to the Port of Vancouver are modeled as a separate set of direct activities, with the quantity of expenditures based on pro-rata shares of activities in the Port of Vancouver's 2014 final budget.¹⁸ For example, the portion of the lease and fee payments assumed to be spent on capital project investment at the Port is based on the percentage of the current budget devoted to capital project investment.

Table 2

Summary of IMPLAN Inputs for Annual Operations at the Project

Description	IMPLAN Activity Type(s)	IMPLAN Sector(s)	Start-up (2014 dollars, annually)	Full Build-out (2014 dollars, annually)
General Operating Expenses	Labor Income, Commodity Change	3032, 3033, 3326, 3327, 3329, 3351, 3367, 3369, 3382, 3413, 5001	\$25.06 million	\$52.07 million
Property Tax	Commodity Change	3437 & 3438 (50/50 split)	\$2.31 million	\$2.31 million
Port of Vancouver Lease/Fees	Commodity Change	See report text	\$19.17 million	\$44.86 million
Total Operations			\$46.54 million	\$99.24 million

¹⁸ Available at <http://www.portvanusa.com/assets/2014-FINAL-Budget-111213.pdf>, accessed April 15, 2014.

Table 3
Summary of Annual Direct On-Site Operations Employment at Project

Description	Start-up Employment	Full Build-out Employment
Marine (dock, vessel securement, etc.)	16	19
Rail (engineers, switchmen, inspectors, etc.)	20	40
Transload (transloaders, tanks farm, trainers, etc.)	30	79
Safety Health Environment & Maintenance (mechanics, maintenance, EHS, etc.)	9	13
Office/Management (managers, coordinators, supervisors, etc.)	16	25
Total Operations	91	176

Note: Employment figures reflect full-time jobs or their equivalent. Table 3 includes direct on-site employment, while Table 4 includes both direct on-site employment and direct off-site employment, including activities resulting from the Project’s operations and leases/fees paid to the Port of Vancouver.

IV. RESULTS: ESTIMATED PRIMARY ECONOMIC IMPACTS OF THE PROJECT

The Project would create economic benefits for local workers, businesses and governments. Below, we provide estimates of these impacts developed using the IMPLAN model. First, we report estimates of the job, labor income and value added impacts. Next, we provide estimates of the increase in tax revenues to state and local governments.

A. Employment, Labor Income and Value Added Impacts

The economic impacts of the Project are summarized in Table 4 below and Appendix A provides further details. Annual results are presented in nominal terms, while cumulative impacts are presented in both nominal terms (i.e., the sum of annual values) and as the net present value as of 2014 in 2014 dollars.¹⁹ Figures 2 to 4 illustrate the annual values, broken out into direct, indirect, and induced impacts.

The direct employment impacts in Clark County in Phase I construction are expected to be 239 jobs for the one-year construction period, while these impacts are expected to be 81 jobs for the six-month Phase II construction period. Throughout the report, job impacts are measured as “full time” jobs or their equivalent.²⁰ Phase I construction will also lead to \$23 million in both labor income and economic value added, while Phase II will lead to \$8 million in labor income and economic value.²¹

¹⁹ The net present values reflect the use of a 7 percent discount rate. This rate is consistent with guidance provided by the Office of Management and Budget (OMB) to regulatory agencies when performing regulatory analysis. Because employment is not a monetary measure, these values are not discounted. OMB, Circular No. A-94 Revised, October 29, 1992.

²⁰ Job impacts are measured in “full-time” positions, which could reflect full-time jobs or an equivalent quantity of part-time jobs (e.g., two half-time jobs being equivalent to one full-time job).

²¹ Estimates of economic valued added reflect tax revenues as reported by IMPLAN. Below, we provide further detail on our estimates of tax revenues, including differences between our estimates and those from IMPLAN.

During the Project's operations, direct employment impacts will average 616 jobs annually over the assumed 15 year operational period (totaling 8,925 jobs over the period). These estimated direct employment impacts of the on-going operation of the Project include labor on-site at the Project, as well as jobs associated with activities directly created by the Project and lease payments and fees to the Port of Vancouver. The direct labor specific to on-site Project operations is expected to be 91 jobs annually for the start-up period, and 176 jobs annually for each year of the remaining years over the 15 year operational period studied. This employment specific to on-site operations at the Project represents 28 percent of total direct employment (2,555 of the 9,245 total direct job-years).²²

Other direct impacts over the 15 year operational period include \$1.1 billion in labor income (\$76 million annually on average), and \$1.2 billion in economic value added (\$83 million annually on average). Like the employment impacts, these impacts reflect both the direct labor at the facility as well as the direct activities created by the facility including lease payments and fees to the Port of Vancouver.

Table 4
Summary of IMPLAN Results
Construction and Annual Operations at the Project, 2015-2030

	Direct Impacts			Total Impacts (Direct, Indirect and Induced)		
	Total	Labor	Economic	Total	Labor	Economic
	Employment (Full-time Jobs)	Income (\$ millions)	Value Added (\$ millions)	Employment (Full-time Jobs)	Income (\$ millions)	Value Added (\$ millions)
<u>Construction</u>						
Phase I	239	\$23.3	\$23.3	1,031	\$62.6	\$89.6
Phase II	81	\$8.1	\$8.1	398	\$24.2	\$35.2
Total for Phase I and II	320	\$31.4	\$31.4	1,429	\$86.8	\$124.8
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Construction and Operations Total over 16 year lifespan	9,245	\$1,144	\$1,239	17,082	\$1,581	\$2,042
Net Present Value over 16 year lifespan	n/a	\$634	\$686	n/a	\$892	\$1,156

Note

[1] Labor income and economic value added grow over the Project's 2017-2030 lifespan due to inflation.

Because IMPLAN tends to understate likely tax revenues, reported estimates of economic value added are generally conservative with respect to the tax revenue component. Also, for direct impacts in the construction phase, economic value added reflects only labor income.

²² A job-year reflects one job held for one year, and provides a metric for measuring employment over multiple years. In this case, total on-site employment equals one year of start-up employment (91 jobs) plus 14 years of full build-out operations (176 jobs) – that is, 91 jobs + 14 years * 176 jobs = 2,555 jobs-years.

Figure 2
Summary of IMPLAN Results - Employment
Construction and Annual Operations at the Project, 2015-2030

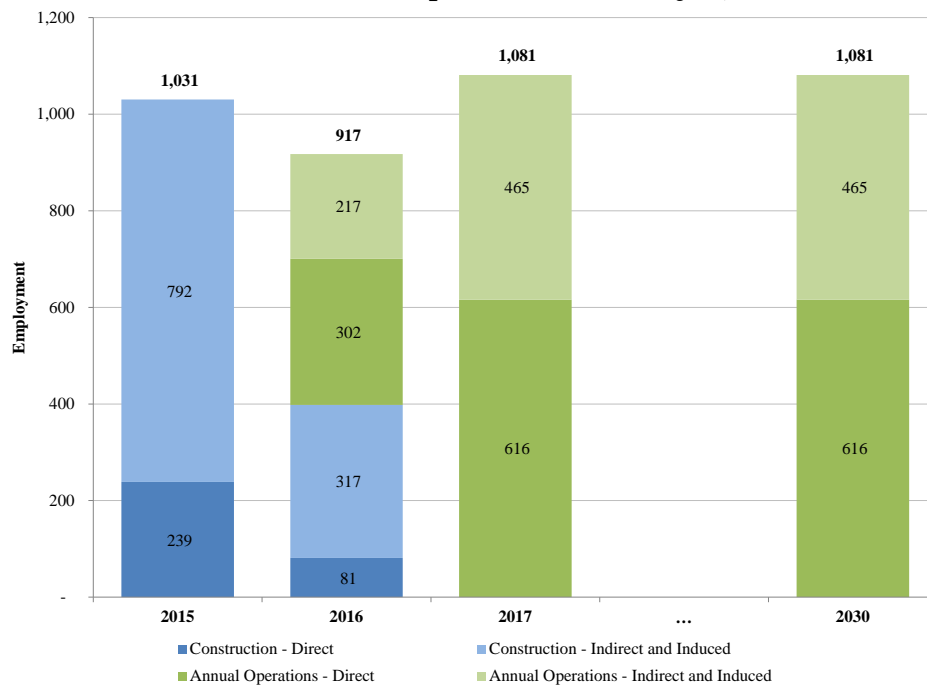
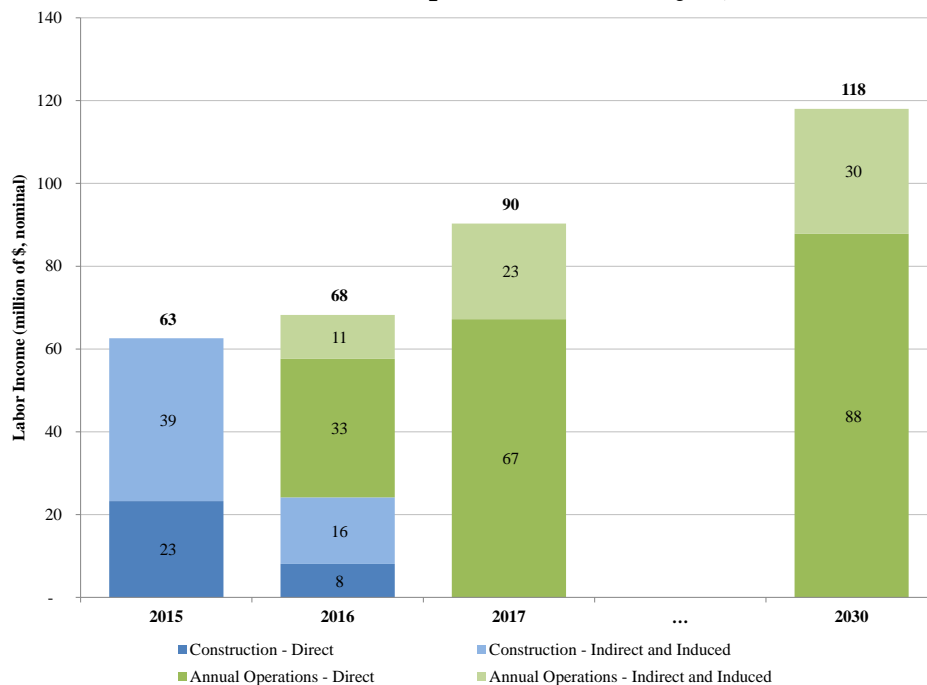


Figure 3
Summary of IMPLAN Results - Labor Income
Construction and Annual Operations at the Project, 2015-2030



Note: Values shown represent nominal values and grow between 2017 and 2030 due to inflation.

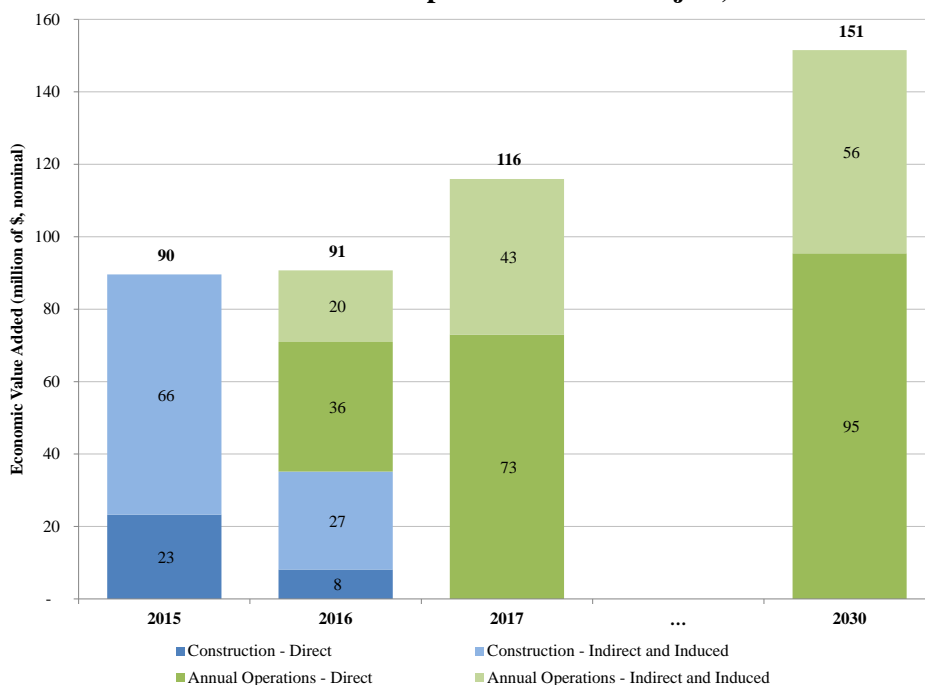
Indirect and induced impacts to the ten-county area of study of Phase I construction yield 792 jobs during the one-year construction period, \$39 million in labor income, and \$66 million in economic value added, while Phase II construction impacts yield 317 jobs over the six month period, \$16 million in labor income, and \$27 million in economic value added.

During the Project’s operations, the indirect and induced employment impacts are expected to result in 449 jobs on average, totaling 6,728 jobs over the 15 year Project operation period. Over the assumed 15-year period, indirect and induced labor income is expected to be \$382 million, while indirect and induced value added is expected to be \$709 million.

In total, the combined effects of the construction and operations of the Project yield an average of over 1,000 jobs annually over the assumed 16 year construction and operation period, totaling over 17,000 job-years over this period. Other cumulative impacts include nearly \$1.6 billion in labor income, and over \$2.0 billion in economic value added to Clark County and the surrounding area. On a present value basis, these nominal impact estimates correspond to about \$890 million in labor income and about \$1.2 billion in economic value added.

Figure 4

Summary of IMPLAN Results – Economic Value Added
Construction and Annual Operations at the Project, 2015-2030



Note: Values shown represent nominal values and grow between 2017 and 2030 due to inflation.

B. Tax Revenues Impacts

Taxes generated by the facility include several forms of payments to state and local governments. These include sales tax, business and occupation (B&O) tax, property taxes on both the facility and other supporting businesses, and other taxes, such as payments for temporary disability insurance and business license fees. Taxes were calculated using information from multiple sources, including the Washington Department of Revenue, Tesoro Savage, the Application Supplement,²³ and IMPLAN.²⁴ Table 5 summarizes estimated tax impacts from the Project.

Table 5
Summary of Tax Impacts
Construction and Annual Operations at the Project

	Construction (Phase I and II)	Annual Operations (Start-Up)	Annual Operations (Full Build-Out)
Sales Tax	\$17,640,000	\$1,497,657	\$3,225,410
B&O Tax	\$989,100	See note 2	See note 2
Property Tax (Terminal)	n/a	\$2,317,898	\$2,317,898
Property Tax (non-Terminal)	\$2,572,557	\$752,269	\$1,638,342
Other Taxes	\$947,474	\$313,830	\$682,393
Total	\$22,149,131	\$4,881,654	\$7,864,043

Notes:

[1] Retail sales tax includes a state and local portion, and is calculated on the full construction costs for Phase I and II of \$210 million. The state tax rate is 6.5% and the local tax rate is 1.9%, for a total tax rate of 8.4%. Sales tax for annual operations comes from the IMPLAN results. IMPLAN estimates of sales tax from indirect and induced activities are not included for the construction phase. For more information, see <http://dor.wa.gov/content/FindTaxesAndRates/SalesAndUseTaxRates/>.

[2] Business & Occupation tax is based on the classification of activity, and is calculated on gross business income. The rate for construction is based on the retailing classification, and is .00471. The B&O tax for annual operations is not reported independently in IMPLAN, but is accounted for in the sales tax and other taxes categories reported. For more information, see <http://dor.wa.gov/content/FindTaxesAndRates/BAndOTax/>.

[3] The Project's property tax for annual operations was estimated by Tesoro Savage.

[4] The non-Project property tax for annual operations is based on IMPLAN results, and represents property taxes on production and imports only (i.e., it does not include household property taxes).

[5] Other taxes include a variety of other taxes and fees, such as payments for temporary disability insurance and business license fees.

Sales taxes will be assessed during both the construction and operations phases of the projects. The construction of the Project will generate almost \$18 million in one-time state and local sales taxes, while the operation of the Project will generate about \$1.5 million in state and local sales taxes in the

²³ Tesoro Savage Vancouver Energy Distribution Terminal, Application No. 2013-01 Supplement, Section 4.4 – Socioeconomic Impact, February 2014.

²⁴ IMPLAN has limited capability to identify the portion of total taxes that will accrue to local governments. Because a large fraction of total taxes would accrue to non-local governments, we assume that state and local tax revenues are not allocated back into the area of study. The exception to this is the property tax paid by the Project, which is assumed to be reinvested in the local community.

initial start-up year, and then produce approximately \$3 million in annual sales tax revenues thereafter. This estimate reflects a state sales tax rate of 6.5 percent and a City of Vancouver local sales tax rate of 1.9 percent. During construction, sales tax is assessed on the Project's full construction cost (totaling \$210 million for both Phase I and Phase II). Sales taxes during operations are assessed annually and are calculated by IMPLAN.

B&O taxes, assessed during the Project's construction, are estimated to produce almost \$1 million in revenues for both state and local governments. These revenues are based on a B&O tax rate of 0.471 percent.²⁵

Property taxes include taxes on the Project itself, as well as increased property taxes due to expanded business activity in support of the Project's construction and operation. Property tax on the Project itself is expected to be \$2.3 million annually based on information received from Tesoro Savage. Additional property taxes from expanded (indirect and induced) business activity are expected to be about \$2.6 million during construction, \$0.75 million in the first year of operation start-up, and about \$1.6 million annually during the remainder of the Project's operation. These estimates are based on IMPLAN output.

Other taxes reported in Table 5, such as payments for temporary disability insurance, business license fees, payments for fines and donations, are also calculated by IMPLAN. Construction of the Project will generate approximately \$0.9 million in other one-time taxes and fees to state and local government, while operation of the Project will generate an additional \$0.31 million in other tax revenues the first year of operations start-up, and \$0.68 million annually thereafter.

In total, the construction of the Project is expected to have a one-time tax impact of over \$22 million to state and local governments, and the annual operation of the Project is expected to have a recurring annual impact of approximately \$7.8 million once the Project is operating at full capacity.

²⁵ This is based on the assignment of construction activity to the "retailing" classification.

Appendix A
Detailed Summary of IMPLAN Results
Construction and Annual Operations at the Project, 2015-2030

	<u>Total Employment</u> (job-years)	<u>Labor Income</u> (\$ millions)	<u>Total Value Added</u> (\$ millions)
<u>Direct Impacts</u>			
<i>Construction</i>			
Phase I	239	\$23	\$23
Phase II	81	\$8	\$8
Subtotal	320	\$31	\$31
NPV Subtotal	n/a	\$29	\$29
<i>Annual Operations ¹</i>			
Start-up	302	\$33	\$36
Full Build-out	8,623	\$1,079	\$1,172
Subtotal	8,925	\$1,113	\$1,208
NPV Subtotal	n/a	\$605	\$657
Total	9,245	\$1,144	\$1,239
NPV Total	n/a	\$634	\$686
<u>Indirect and Induced Impacts</u>			
<i>Construction</i>			
Phase I	792	\$39	\$66
Phase II	317	\$16	\$27
Subtotal	1,109	\$55	\$93
NPV Subtotal	n/a	\$51	\$86
<i>Annual Operations</i>			
Start-up	217	\$11	\$20
Full Build-out	6,511	\$371	\$689
Subtotal	6,728	\$382	\$709
NPV Subtotal	n/a	\$207	\$385
Total	7,837	\$437	\$802
NPV Total	n/a	\$258	\$471
<u>Total Impacts</u>			
<i>Construction</i>			
Phase I	1,031	\$63	\$90
Phase II	398	\$24	\$35
Subtotal	1,429	\$87	\$125
NPV Subtotal	n/a	\$80	\$114
<i>Annual Operations</i>			
Start-up	519	\$44	\$56
Full Build-out	15,134	\$1,450	\$1,862
Subtotal	15,653	\$1,494	\$1,917
NPV Subtotal	n/a	\$812	\$1,042
Grand Total	17,082	\$1,581	\$2,042
NPV Grand Total	n/a	\$892	\$1,156

Notes:

[1] Annual operations includes facility labor, purchases, and Port of Vancouver lease payments/fees. Direct labor to support annual operations at the Tesoro Savage facility is expected to account for 2,555 of the 8,925 job-years.

