BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of: Application No. 2013-01 TESORO SAVAGE, LLC TESORO SAVAGE DISTRIBUTION TERMINAL	CASE NO. 15-001 SWORN PRE-FILED TESTIMONY OF DENNIS O'MARA

I, Dennis O'Mara, 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 case. My testimony is based upon my education, training, experience, professional qualifications, and understanding of the matters herein.

3. My testimony addresses potential risk of transportation by vessel of petroleum crude oil associated with the Tesoro-Savage Vancouver Energy Terminal (the "Project").

I. Education and professional background

4. Based on my professional experiences and training, I have developed an expertise in identifying and evaluating risks of maritime transportation of oil and gas, which includes overseeing the application of the DNV GL Marine Accident Risk Calculation System (MARCS) model, interpreting study results and applying them to a proposed operation.

5. I work in the Environment & Navigation Risk Section of the Risk Advisory Department in the Oil & Gas Division. DNV GL is a global company with a reputation as

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

an independent, third party voice in maritime, oil and gas, energy, and business assurance. The company has locations in over 100 countries and is headquartered in Oslo, Norway.

6. My work for DNV GL includes overseeing the application of the DNV GL Marine Accident Risk Calculation System (MARCS) model, interpreting study results and applying them to a proposed operation. I also interface directly with our oil and gas customers to clarify the scope of the studies they have asked us to perform, including quantitative and/or qualitative studies to evaluate the estimated frequency of vessel incidents and the frequency and volume of an oil spill.

7. I began working for DNV GL on July 8, 2013. Prior to coming to DNV GL, I completed a 21 year US Coast Guard career, started and ran a consulting company, and performed other jobs as described below.

8. I had various shipboard and shore assignments in the Coast Guard. I was a small boat crewmember and served as an Electronics Technician First Class (E-6) before attending Officer Candidate School, where I received my commission. I received training and gained experience in marine casualty investigations, pollution response management, vessel inspections, port operations, contingency planning, maritime security, exercise planning and facilitation, and oil spill response oversight.

9. After I retired from the Coast Guard, I created Great Lakes Consulting Services to assist marine terminal operators in complying with USCG security regulations. During that time, I assisted approximately 30 marine terminals in maintaining compliance with USCG regulations, I helped the Detroit Port Authority get their new public dock and terminal operational, conducted a port-wide risk assessment of the Port of Detroit, taught the Incident Command System at the Lebanese Naval Academy and worked as the HSE Manager for Hornbeck Offshore Services in Covington, Louisiana.

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

10. I have a Bachelor of Science Degree in Organizational Management from Daniel Webster College in Nashua, New Hampshire.

11. I have attached my Curricula Vitae as Attachment A to my testimony.

II. Vessel Risk Analysis for Vancouver Energy

12. Tesoro Savage Petroleum Terminal LLC, (TSPT) asked DNV GL to perform a vessel traffic risk assessment for the transport of Bakken crude oil on three sizes of tank vessels from the Vancouver Energy Terminal, down the Columbia River, and across the Columbia River bar. We were also asked to assess the risk of an oil spill from for three vessel sizes as well as from the facility during loading operations.

13. I was the Project Manager and assisted with development of the scope of work for the Vancouver Energy project and interacted with personnel from Tesoro, Savage and DNV GL throughout the project. This work culminated in a *Quantitative Vessel Traffic Risk Assessment* (VTRA), which was finished in January, 2016, and is attached hereto as Attachement B. The VTRA contains results of quantitative studies of vessel-in-transit risk, oil spill risk from vessels, and oil spill risk from terminal loading operations.

14. Prior to completing the VTRA, DNVGL was asked to perform a qualitative risk assessment based on information that had been provided and analysis that had been completed by that time. That qualitative analysis was titled *Vessel Traffic Risk Impact Analysis and Vessel Traffic Risk Assessment* was completed jointly with Worley Parsons, released in September 2014, and is attached hereto as Attachment C.

15. My opinions and conclusions on vessel traffic risk are contained in the VTRA, attached as Attachment B and the report attached as Attachment C, which are incorporated herein by reference.

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

16. In summary, the VTRA documents a Quantitative Risk Assessment of marine incidents and oil spills associated with vessel loading operations at the terminal and transits away from the Vancouver Energy Terminal. The VTRA explored three separate oil spill risk aspects; transit risk along the route, risk from collision at the dock, and risk from cargo loading. TSPT eventually decided to evaluate river traffic under four separate scenarios in order to gain a comprehensive understanding of the potential impacts of the project. My conclusions on each of the three oil risk aspects are set forth in the report, and summarized immediately below.

17. The VTRA used the DNV GL Marine Accident Risk Calculation System (MARCS) to model vessel transit risk. The MARCS model has been used to assess many other navigational risk studies and marine waterway suitability studies, including the Prince Rupert area (British Columbia), Mississippi River (Louisiana), Delaware River (New Jersey), Prince William Sound (Alaska), the Aleutian Islands (Alaska), Puget Sound (Washington), and the entire coast of Australia. The model applies global incident and accident data to the local information to provide an order of magnitude estimate of average annual likelihoods, presented in terms of events per year.

18. We were asked to model four separate scenarios to get a full picture of the potential impact of the Vancouver Energy project. The four scenarios were:

i. Current Marine Traffic. This study estimated incident frequencies of marine traffic without considering Vancouver Energy Terminal vessels (what we called Sample Vessels).

ii. Sample Vessels and Current Marine Traffic. This study estimates incident frequencies considering Sample Vessels in Current Marine Traffic.

iii. Future Marine Traffic. This section estimates incident frequencies of Current Marine Traffic and all known Proposed Marine Traffic. We performed a search of all publically available information to estimate future vessel counts to estimate Proposed Marine Traffic. It does not include Sample Vessel traffic. Including all of the proposed projects on the river assumes that every project that

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

is currently proposed comes to full fruition and results in the total vessel count put forth by those projects.

iv. Sample Vessels and Proposed Marine Traffic. This section estimates incident frequencies considering Sample Vessels and Proposed Marine Traffic.

19. By isolating the vessels associated with the Vancouver Energy Terminal and comparing to the current marine traffic and future marine traffic, the model predicts that the Vancouver Energy Terminal vessel traffic will increase the risk of marine incidents (with or without consequences of concern) on the Columbia River above those baselines by approximately 2%.

20. The number of incidents predicted by the model for Vancouver Energy vessels under current marine traffic conditions is 1.59 per year. The incident return period for an incident of any type (most of which will not result in a spill) is:

- 1 every 0.8 years for 47,000 DWT tankers.
- 1 every 3 years for 105,000 DWT tankers.
- 1 every 57 years for 165,000 DWT tankers.

21. Under future traffic conditions, the incident frequency was 1.67 per year. Again, these are not necessarily incidents that result in an oil spill.

22. The study did estimate the frequency that an oil spill may occur as a result of an incident. The future traffic scenario was used. Oil spill frequencies, as a result from a collision for future traffic (i.e., all existing traffic + Vancouver Energy traffic + the total of all proposed future projects on the Columbia River) were as follows:

- 1 every 43 years for 47,000 DWT tankers.
- 1 every 170 years for 105,000 DWT tankers.
- 1 every 3,100 years for 165,000 DWT tankers.

23. The frequency of an oil spill from a grounding in the future traffic scenario is estimated to be:

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

- 1 every 40 years for 47,000 DWT tankers.
- 1 every 150 years for 105,000 DWT tankers.
- 1 every 2,800 years for 165,000 DWT tankers.

24. The frequency of oil spill from a collision at the dock in the future traffic scenario was also evaluated. Results were:

- 1 every 25,000 years for 47,000 DWT tankers.
- 1 every 100,000 years for 105,000 DWT tankers.
- 1 every 1.6 million years for 165,000 DWT tankers.

25. The model results were compared with historical averages, and found to over-predict collisions and groundings by a factor between two and seven. This is likely due to the nature of such models, which intentionally err on the side of conservatism (i.e., overstating the risk) when uncertainties must be quantified. Also, a comparison was made between global incident rates and modeled local incident rates as a means of benchmarking the MARCS risk assessment results. The estimates of the number of future incidents are six times higher than that of local data compiled by the US Coast Guard.

26. The risk from cargo loading considered potential release scenarios based on the drawings, description of operating conditions, material characteristics (type of oil), and representative leak locations which were either provided or reviewed by Vancouver Energy. The scope of the study only included Bakken Crude oil.

27. The assessment evaluated oil spill risk using two different methodologies. Details of each methodology are included in the report, but the results are summarized in the table, which is found in the VTRA and illustrates the average time period of occurrence for a range of potential oil spill volumes for both methodologies.

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

Spill Volume Range (bbl)	Average Interval of Recurrence	
	Method 1 (yr)	Method 2 (yr)
0-50	1,300	7
50-100	42,000	42,000
100-500	8	160
500-1,000	590	1,500,000
1,000-10,000	420,000	420,000
10,000-30,000	75,000	78,000,000,000
>30,000	5,800,000	39,000

In the table above, the recurrence interval is used interchangeably with return period. The results are rounded down to the next integer year and presented with a maximum of two significant digits

28. The cargo loading oil spill risk assessment did not take into account any of the required containment systems that would be in place at a marine terminal. Nor does it account for catchments or surface elevation changes on the facility (with one exception in one scenario). Also, the majority of the equipment analyzed in this study is proposed to be located on land, so not all spills would reach the Columbia River. That said, it is reasonable to conclude that in the event of a spill from the facility, the actual spill volumes would likely be less than those estimated in the study, and the spill volumes estimated would not reach the Columbia River.

29. The following documents are attached to my testimony for reference:

Attachment A: CV of Dennis O'Mara

Attachment B: *Quantitative Vessel Traffic Risk Assessment,* January 2016

Attachment C: *Vessel Traffic Risk Impact Analysis and Vessel Traffic Risk Assessment*, September 2014

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372

DATED this 12th day of May, 2016.

Dennis O'Mara, Declarant

STATE OF Oregon)
)
COUNTY OF Multnomah)

Dennis O'Mara, 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 12th day of May, 2016

R. M.

NOTARY PUBLIC in and for the State of:
Oregon
Residing at: Portland
My Commission Expires: June 27, 2016
Printed Name of Notary:
Raine M. R. Miller

OFFICIAL SEAL
RAINE M R MILLER
NOTARY PUBLIC-OREGON
COMMISSION NO. 469155
MY COMMISSION EXPIRES JUNE 27, 2016

Van Ness Feldman LLP
719 Second Avenue Suite 1150
Seattle, WA 98104
(206) 623-9372