From: Gunderson, Dan
Sent: Thursday, August 06, 2015 5:20:02 PM
To: Manlow, Steven W NWS
CC: Kelly Flint; Matthew Love; Makarow, Irina; sbumpus@utc.wa.gov
Subject: RE: Tesoro (UNCLASSIFIED)

Hi Steve,

The Applicant has prepared a response to your questions.

To answer the first part of your question " *Can you provide more information on how the "average" was calculated*":

The Facility is being proposed at the Port of Vancouver USA, (Port) Terminal 5, where the Port has established a "loop track" for train arrivals and departures. This loop track is being implemented by the Port as an element of the West Vancouver Freight Access (WVFA) project, which began construction in 2007 and is slated to be complete in 2017. The design of the Port WVFA project, including the loop track length, limits the total number of unit trains that can be received on site in a 24-hour period without blocking the main line or other Port tenant access. The average of four unit trains per day comes from that limitation.

The reason why four unit trains and 360,000 barrels per day is labeled an average, is that typically four trains will be received and unloaded each day. On occasion, a fifth train may arrive within the daily 24-hour period and begin unloading within that current 24-hour period, but would complete unloading in the following 24-hour period. However, this occurrence of five arrivals might then be offset (to some degree) by another day when, because of mainline traffic, only three trains might arrive and be unloaded. Additionally, occasionally there might be further limitations in mainline traffic (for example, weather closure), which could theoretically result in zero trains arriving on that particular day because of mainline closures. For impact assessment and planning purposes, the average of four trains per day (and 360,000 barrels [bbl]) is believed to be the most appropriate figure, given these potential variations.

The unloading infrastructure is similarly being designed with that loop track limitation in mind, and the resulting limit of an average of four unit trains per day being received. Each unit train would include approximately 100 to 118 tank cars, two buffer cars, and three locomotives. Tank cars typically hold between 650 and 750 bbl of crude oil (see Biological Evaluation [BE] Section 3.8). A typical unit train would therefore deliver between 65,000 and 90,000 bbl of crude oil. An average of four train arrivals per day can therefore result in an average of 360,000 bbl delivered per day.

To answer the second part of your question "*The minimum and maximum number of barrels that could be brought to the site, and loaded onto ships per day*?":

As discussed above, on average 360,000 bbl per day is anticipated to be brought to the site by rail.

The amount of crude oil that could be loaded on to vessels per day depends on the anticipated number of vessel arrivals per day, the transfer capacity of the vessel loading system, and the spill contingency planning standard applicable to the lower Columbia River. If no vessels arrive for loading (resulting from weather-related Columbia River bar closures for example), then the minimum amount to be loaded per day is zero barrels. Likewise, if rail arrivals are disrupted by mainline closures, or if there are no clients providing a vessel to be loaded, the amount to be loaded on that day is zero bbl.

The Facility anticipates receiving an average of one vessel per day. As identified in the revised draft BE submitted to you on 24 July 2015 (see Section 3.7), the primary size vessel anticipated to call on the Facility is expected to be a 46,000 DWT tanker capable of carrying 330,000 bbl of crude oil. Much less frequently, larger vessels may also call (105,000 DWT and 165,000 DWT).

The vessel loading system would be designed to transfer crude oil from the storage tanks at the terminal to marine vessels at the dock at a rate of up to 32,000 bbls per hour. However, loading rates may vary by vessel depending on vessel size, procedures to properly initiate the loading process (vessels typically start loading at 10 to 25 percent of their maximum rate), and the capacity to which the vessel is being filled (if a vessel is being filled to near full capacity, loading rates are lowered at the end to avoid overfilling).

The 46,000 DWT tankers would be loaded at an average rate of approximately 22,463 bbl per hour to complete the loading cycle within approximately 15 hours. It should be noted, however, the total time that vessels would be expected to be at the Facility would be approximately 24 hours, based on the time needed to secure and release the vessels as well as the lower fill rates used during initial and final loading. Thus, for a Veteran-class tanker the maximum amount that could be loaded per day is determined by the capacity of the tanker, i.e. 330,000 bbl.

The Applicant recognizes that currently the Lower Columbia River planning standard limits the volume of crude oil loaded onto a vessel to 300,000 bbl, with this number including the vessel fuel stored on board. If the planning standard were to be raised in the future, larger vessels could be loaded to the new planning standard. The limiting factor for loading larger vessels is the depth of the Lower Columbia River navigation channel; this results in the larger vessels identified in the BE (i.e. 165,000 DWT) to be loaded only to approximately 731,500 bbls (see note below). Based on the average and maximum hourly load rates, this volume of crude oil could be loaded in 20 to 30 hours. As noted above, the vessel would still be moored at the Facility for a longer period based on the time needed to secure and release the vessels.

If the planning standard is not raised, the planning standard therefore becomes the limiting daily loading factor, with only approximately 290,000 bbls per day, which added to the vessel fuel already stored on the vessel results in a maximum on board of 300,000 bbls.

Note regarding fill capacity of vessels potentially mooring at the Facility: this information is included in section 4 of the Operation Facility Oil Handling Manual, which was sent to you 26 June 2015.

Please let me know if you need any additional information.
-Dan

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-----Original Message-----
From: Manlow, Steven W NWS [mailto:Steven.W.Manlow@usace.army.mil]
Sent: Thursday, July 30, 2015 12:11 PM
To: Gunderson, Dan <Dan.Gunderson@abam.com>
Subject: Tesoro (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Dan:

We received an inquiry regarding the following statement in the application materials: "...the facility will receive an average of four unit trains per day and unload an average of 360,000 barrels (bbl) of crude oil per day." Can you provide more information on how the "average" was calculated, and the minimum and maximum number of barrels that could be brought to the site, and loaded onto ships per day? Thanks.

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Caveats: NONE