Appendix E
Alternative Design Layouts

This appendix describes the alternative design layouts considered by Millennium Bulk Terminals—Longview, LLC (Applicant) at the location of the On-Site Alternative for the proposed Millennium Bulk Terminals—Longview project (proposed project). The process to develop and screen alternative design layouts resulted in the selection of the project design for the On-Site Alternative evaluated in the Draft Environmental Impact Statement (Draft EIS).

As described below, the Applicant considered different concepts for design layout, rail loop design, and dock designs with the ultimate goal of achieving a throughput of 40 to 50 million metric tons per year (MMTPY) of coal. To be competitive in the export terminal business, the Applicant identified the need to be able to load Panamax-sized vessels. The desired throughput would require two shiploaders to achieve the throughput loading rate, requiring docks of sufficient size to berth two Panamax-sized vessels.

To achieve a throughput of 40 to 50 MMTPY, the terminal requirements were to include a high capacity, automated system for unloading unit trains, equipment for moving coal to stockpiles for storage, adequate coal stockpile area, an ability to reclaim coal from the stockpiles, and the loading of vessels. Discussions with the railroad indicated that the design would need to include the capability to store on site trains that would be received during 1 day (8 trains for this throughput).

In evaluating the different design options described below, the Applicant determined that the most efficient movement of rail cars on site would be a rail loop instead of the need to move trains back off the site along the same tracks on which they entered. A rail loop would have an incoming line with the switching capacity to route trains onto any one of eight staging tracks, or directly through the inside loop. The inside loop would route trains through the rotary dumper to unload the trains, then route the 8 trains onto any of the eight staging tracks, or would directly exit the terminal.

In order to accommodate a unit train of 125 cars plus locomotives, the loop length was determined to be a minimum of 8,500 feet long, and loop radii were designed to railroad standards. These requirements were overlaid on the leased portion of the project area, which itself presented some constraints. These constraints included the presence of two parcels owned by the Bonneville Power Administration (BPA), one actively used for a major substation, a state highway (Highway 432) that bisects the property, a dike owned by a local diking district, and a closed landfill. In addition, the Applicant separately operates a bulk product terminal and required that existing and potential future bulk product terminal operations not be precluded.

The following sections present the Applicant's screening framework, alternative design layouts considered for review, alternative design layouts advanced after screening, and the alternative design layouts that were considered but not advanced after screening. The Applicant-prepared document *Millennium Coal Export Terminal, Project Purpose and Need, and Site Alternatives* (Millennium Bulk Terminals—Longview 2014) was used as a resource for this appendix.

Screening Framework

The Applicant established a framework to screen alternative design layouts and design features at the location of the On-Site Alternative. The screening framework consisted of one criterion based on the project's Purpose and Need and seven design criteria. These criteria are listed below.

Purpose and Need Criteria:

- Criterion A - Ability to support a throughput of 40 to 50 MMTPY

Design Criteria:

- Criterion B – Minimize effects on the footprint of the existing and future bulk terminal facilities
- Criterion C – Minimize effects on the operation of the existing and future bulk terminal facilities
- Criterion D – Ability to store a "days' worth" of unit trains on site
- Criterion E – Avoid impact on Bonneville Power Administration (BPA) substation operation
- Criterion F – Avoid impact on Consolidated Diking Improvement District (CDID) #1 levee
- Criterion G – Ability to provide access for emergency vehicles onto site
- Criterion H – Avoid affecting on-site closed landfill

Alternative Design Layouts Considered for Review

The Applicant considered 11 alternative design layouts for the On-Site Alternative. A brief description of each alternative layout is listed below; a more detailed description of each alternative is presented in the following sections.

- **Alternative 1a.** The proposed export terminal would encompass approximately 190 acres, including two BPA-owned parcels.
- **Alternative 1b.** The proposed export terminal would encompass approximately 175 acres, including two BPA-owned parcels, but using a slightly different configuration compared to Alternative 1a (i.e., an access road would cross the larger of the two BPA parcels, rather than the rail loop).
- **Alternative 2.** The proposed export terminal would encompass approximately 175 acres, including one BPA-owned parcel.
- **Alternative 3.** The proposed export terminal would encompass approximately 175 acres and would not include any BPA-owned parcels.
- **Alternative 4.** The proposed export terminal would use Applicant property on both the north and south sides of Industrial Way.
- **Alternative 5.** The proposed export terminal would use dual-quadrant shiploaders on the dock and locate the rail car unloading station on the west side of the property.
- **Alternative 6.** The proposed export terminal would use the existing Dock 1.
- **Alternative 7.** The proposed export terminal would include two dual-quadrant shiploaders with a rail loop that completely encompasses the site.

- **Alternative 8.** The proposed export terminal would use two new quadrant shiploaders with the rail loop for the unloading of coal located west of the proposed storage area.
- **Alternative 9.** The proposed export terminal would include two traveling shiploaders on two docks with a stockyard extending into the existing operational facilities.
- **Alternative 10.** The proposed export terminal would use two new traveling shiploaders on two docks with the rail loop for unloading located west of the proposed storage area.

The screening framework was applied to the 11 alternative design layouts for the On-Site Alternative. As a result of this screening process, Alternatives 1a, 1b, 2, and 3 were advanced for additional review and Alternatives 4 through 9 were dismissed from further consideration. Table E-1 summarizes the findings of the alternative design layouts screening process. A "✓" in the column denotes the alternative met the criterion.

Table E-1. Results of Alternative Design Layouts Screening

	Purpose and Need Criterion	Design Criteria						
Alternative	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Alternative 1a	✓	✓	✓	✓	✓	✓	✓	✓
Alternative 1b	✓	✓	✓	✓	✓	✓	✓	✓
Alternative 2	✓	✓	✓	✓	✓	✓	✓	✓
Alternative 3	✓			✓	✓	✓	✓	✓
Alternative 4	✓	✓			✓	✓	✓	
Alternative 5	✓				✓	✓	✓	✓
Alternative 6					✓	✓	✓	✓
Alternative 7	✓				✓	✓	✓	
Alternative 8			✓		✓	✓	✓	
Alternative 9	✓				✓	✓	✓	✓
Alternative 10	✓	✓		✓	✓			

Notes:
✓ = Alternative meets design criterion.
Criterion A – Ability to support a throughput of 40 to 50 MMTPY.
Criterion B – Minimize impacts on the footprint of the existing and future bulk terminal facilities.
Criterion C – Minimize impacts on the operation of the existing and future bulk terminal facilities.
Criterion D – Ability to store a "days' worth" of unit trains on site.
Criterion E – Avoid impact on Bonneville Power Administration (BPA) substation operation.
Criterion F – Avoid impact on Consolidated Diking Improvement District (CDID) #1 levee.
Criterion G – Ability to provide access for emergency vehicles onto site.
Criterion H – Avoid affecting on-site closed landfill.

The following sections describe alternative design layouts that were advanced after screening (Alternatives 1a, 1b, 2, and 3), as well as the alternative design layouts considered but dismissed after screening (Alternatives 4 through 10).

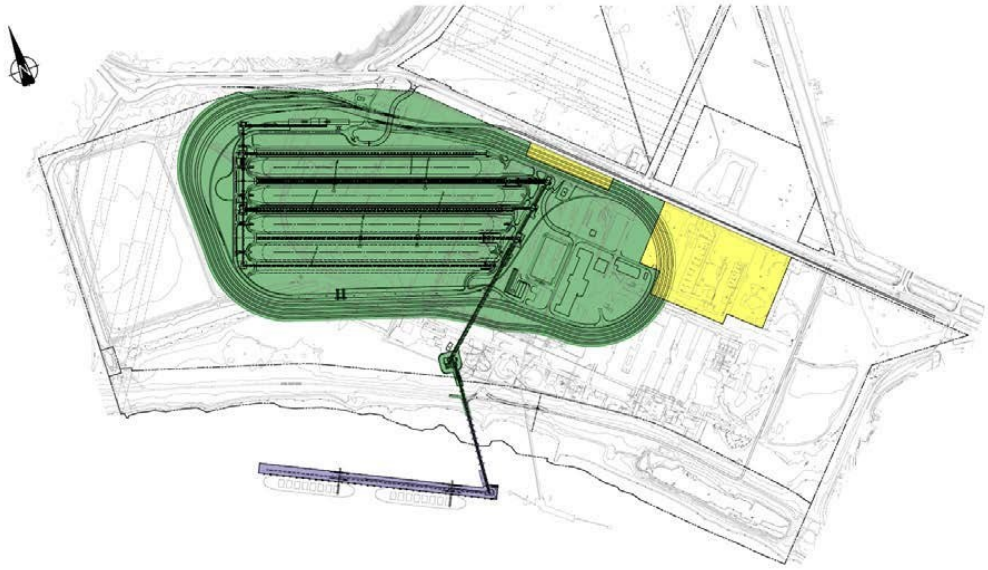
Alternative Design Layouts Advanced after Screening

Four alternatives (1a, 1b, 2, and 3) performed well against the screening framework and were advanced for further consideration. The Applicant developed the alternative design for these alternatives in more detail to determine potential on-site impacts. The alternatives differed in impacts on BPA-owned property, which is shown in yellow in Figures E-1 through E-4. The green in Figures E-1 through E-4 shows land currently leased by the Applicant.

Alternative 1a

Under Alternative 1a, the proposed export terminal would encompass approximately 190 acres, including two BPA-owned parcels (Figure E-1).

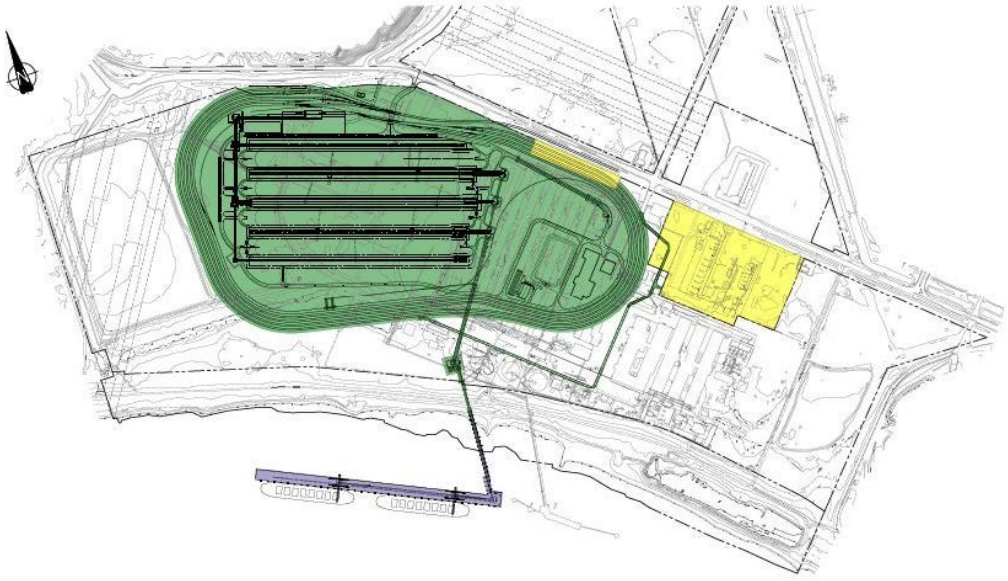
Figure E-1. Alternative 1a



Alternative 1b

Under Alternative 1b, the proposed export terminal would encompass approximately 175 acres, including two BPA-owned parcels. An access road would cross the larger of the two BPA parcels (Figure E-2).

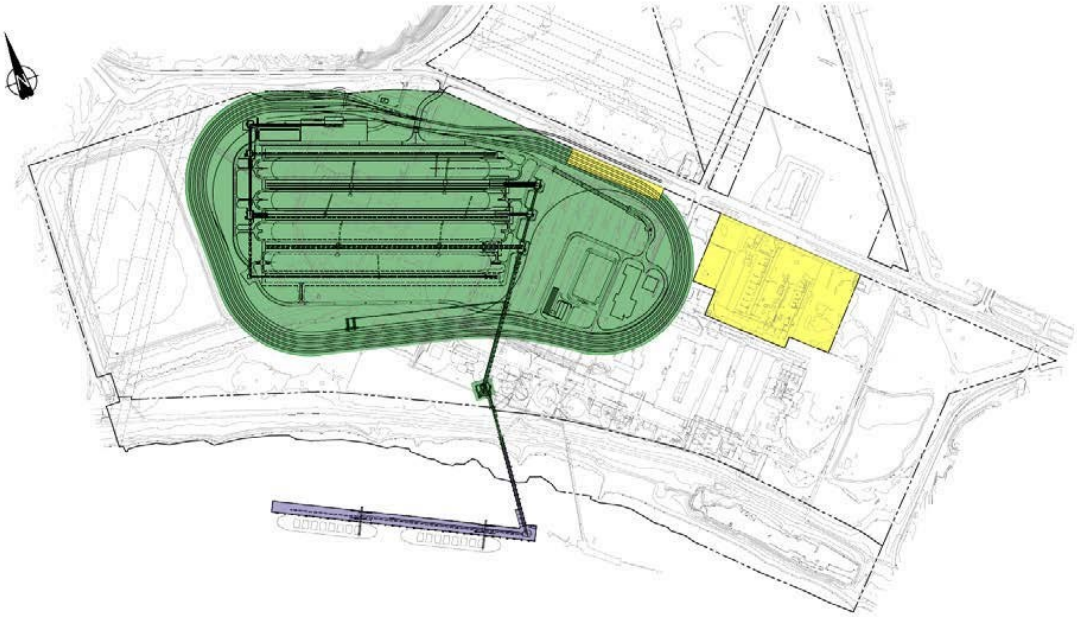
Figure E-2. Alternative 1b



Alternative 2

Under Alternative 2, the proposed export terminal would encompass approximately 175 acres, including one BPA-owned parcel (Figure E-3).

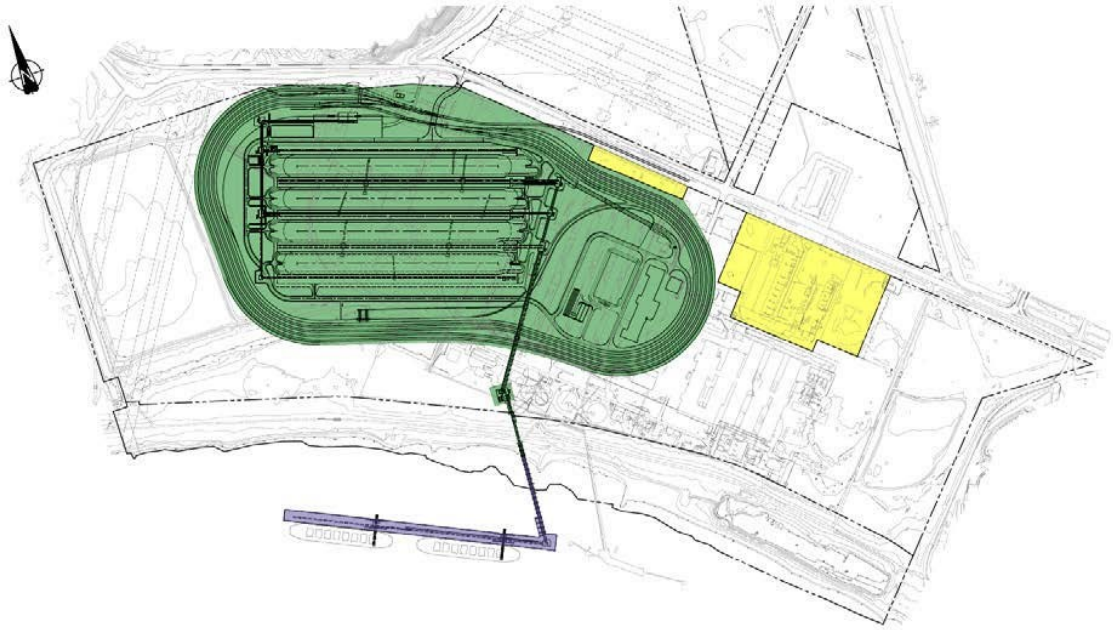
Figure E-3. Alternative 2



Alternative 3

Alternative 3 would encompass a smaller footprint than Alternatives 1 and 2 and would not include BPA-owned parcels (Figure E-4). The proposed export terminal would encompass approximately 170 acres. Because BPA properties would not be used, the rail layout would shift toward the Columbia River. Existing operating storage silos located in the southern portion of the existing bulk product terminal would need to be relocated. Alternative 3 would result in impacts on operations at the Applicant's site of existing bulk product terminal.

Figure E-4. Alternative 3



Summary and Preferred Design Layout

Table E-2 summarizes the key features for the alternative design layouts that were advanced from the screening process.

Table E-2. Key Features of Alternative Design Layouts

Element	Alternative 1 (Two BPA Parcels)		Alternative 2 (One BPA Parcel)	Alternative 3 (No BPA Parcels)
	Alternative 1a	Alternative 1b		
Total area of development	Approximately 190 acres	Approximately 175 acres	Approximately 175 acres	Approximately 175 acres
Dock and trestle Area	Approximately 5 acres	Approximately 5 acres	Approximately 5 acres	Approximately 5 acres
Stage 1 throughput	25 MMTPY	25 MMTYP	25 MMTPY	25 MMTPY
Stage 2 throughput	44 MMTPY	44 MMTPY	44 MMTPY	44 MMTPY

MMTPY = million metric tons per year

The process to evaluate alternative design layouts resulted in the selection of the design for the On-Site Alternative evaluated in this Draft EIS: Alternative 1a. Each of the four alternative design layouts would result in the same environmental impacts to wetlands (Grette Associates 2014), and would result in the same aquatic impacts because the dock and trestle areas would be the same. Alternative 1a was determined to result in the least impact on vegetated upland habitats compared to Alternatives 1b, 2, and 3 (Grette Associates 2014). In selecting Alternative 1a, the Applicant considered the potential environmental impacts of each layout, as well as throughput efficiencies of each layout and the potential future impact on areas used for the existing bulk product terminal. But for the uncertainty of being able to acquire or lease land from BPA, Alternative 1a is preferred by the Applicant because it allows for a more efficient layout of the stockpile area and rail loop compared to the other alternative designs while not adversely affecting existing bulk product terminal facilities.

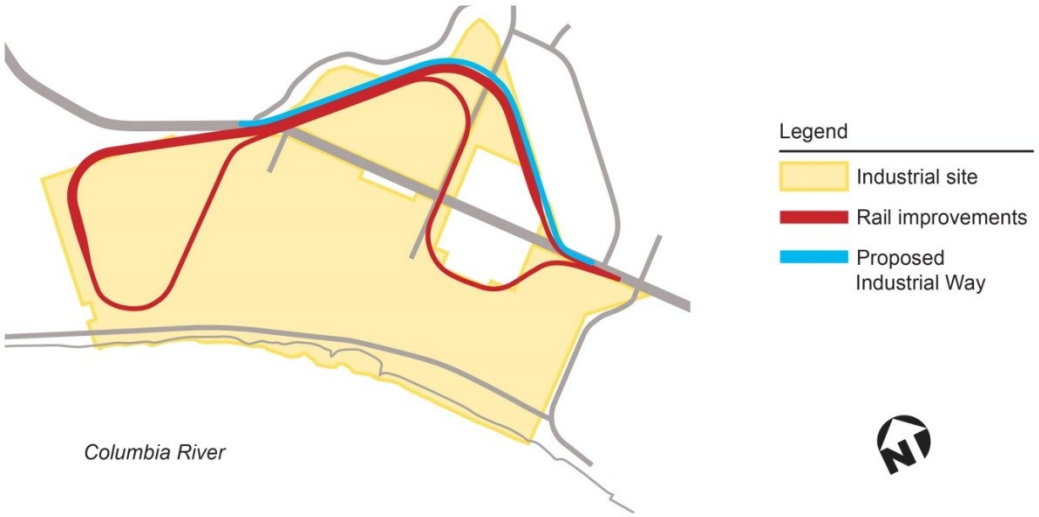
Alternative Design Layouts Considered but Not Advanced after Screening

This section describes the design layouts considered but dismissed by the Applicant after applying the screening framework. Information on these alternatives and the Applicant's rationale for eliminating them from further consideration are described in the following sections.

Alternative 4

Alternative 4 would use Applicant property on both the north and south sides of Industrial Way (Figure E-5).

Figure E-5. Alternative 4



Alternative 4 was eliminated from consideration because of the following reasons.

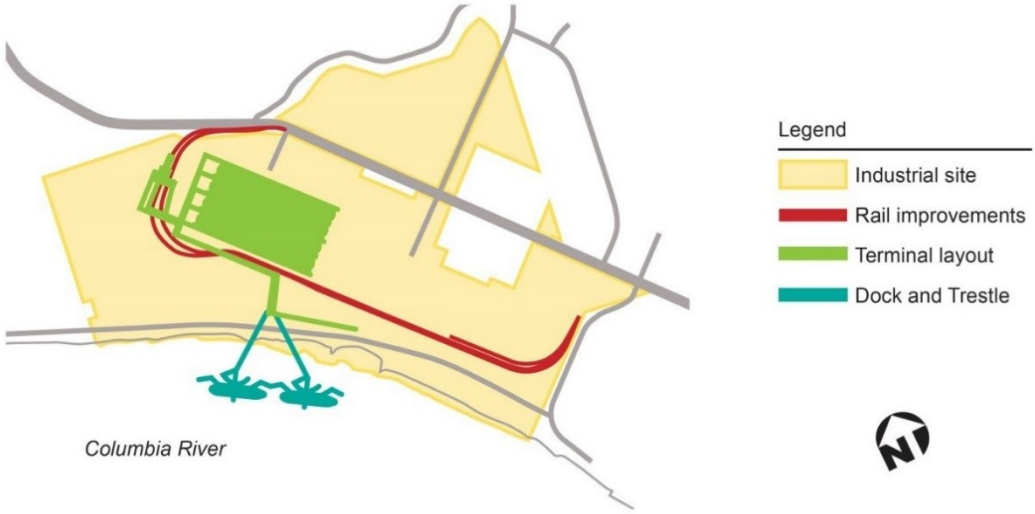
- The rail layout would limit access to other parts of the larger site and impact access to areas within the rail loop that used for the existing bulk product terminal (Criterion C).
- The rail layout would not accommodate a "days' worth" of unit trains on site (Criterion D).
- The alternative would be located over the on-site closed Reynolds Landfill (Criterion H).

In addition, the rail layout for Alternative 4 would affect Industrial Way with multiple additional at-grade rail crossings, and create the need to reroute Industrial Way.

Alternative 5

Alternative 5 would use dual-quadrant shiploaders on the dock and locate the rail car unloading station on the west side of the property (Figure E-6).

Figure E-6. Alternative 5



Alternative 5 was eliminated from consideration because of the following reasons.

- The rail layout would limit access to other parts of the larger site and impact access to areas within the rail loop that are used for the existing bulk product terminal facility (Criterion B).
- The rail layout would impede operations of the current and future bulk product terminal facilities (Criterion C).
- The rail layout would not accommodate a "days' worth" of unit trains on site (Criterion D).

Alternative 6

Alternative 6 would use the existing Dock 1 (Figure E-7).

Figure E- 7. Alternative 6

Alternative 6 was eliminated from consideration because of the following reasons.

- Dock 1 would not provide the loading capacity to support a throughput of 40 to 50 MMTPY (Criterion A).
- The use of Dock 1 for loading ships would conflict with the operations of the existing bulk product terminal (Criterion B).
- The rail layout would limit access to other parts of the larger site and impact access to areas within the rail loop that are to be used for the existing bulk product terminal (Criterion C).
- The rail layout would not accommodate a "days' worth" of unit trains on site (Criterion D).

Alternative 7

Alternative 7 would include two dual-quadrant shiploaders with a rail loop that completely encompasses the site (Figure E-8). The only differences between Alternative 7 and Alternative 5 are the material handling reclaiming aspects of the design.

Figure E-8. Alternative 7

Alternative 7 was eliminated from consideration because of the following reasons.

- The use of Dock 1 for loading ships would conflict with the operations of the existing bulk product terminal (Criteria B/C).
- The rail layout would limit access to other parts of the larger site and impact access to areas within the rail loop that are to be used for the existing bulk product terminal (Criteria B/C).
- The rail layout would conflict with operations of the existing bulk product terminal (Criteria B/C).
- The rail layout would not accommodate a "days' worth" of unit trains on site (Criterion D).
- The rail layout would be located over the on-site closed Reynolds Landfill (Criterion H).

Alternative 8

Alternative 8 would use two new quadrant shiploaders with the rail loop for the unloading of coal located west of the proposed storage area (Figure E-9). Alternative 8 would limit the amount of demolition to the existing facility required for the development of the terminal.

Figure E-9. Alternative 8

Alternative 8 was eliminated from consideration because of the following reasons.

- The site layout would not provide the stockyard storage capacity required for throughout of 40 to 50 MMTPY (Criterion A).
- The use of Dock 1 for loading ships would conflict with operations of the existing bulk product terminal (Criterion B).
- The rail layout would not accommodate a "days' worth" of unit trains on site (Criterion D).
- The rail layout would be located over the on-site closed Reynolds Landfill (Criterion H).

Alternative 9

Alternative 9 would include two traveling shiploaders on two docks with a stockyard extending into the existing operational facilities (Figure E-10).

Figure E-10.Alternative 9

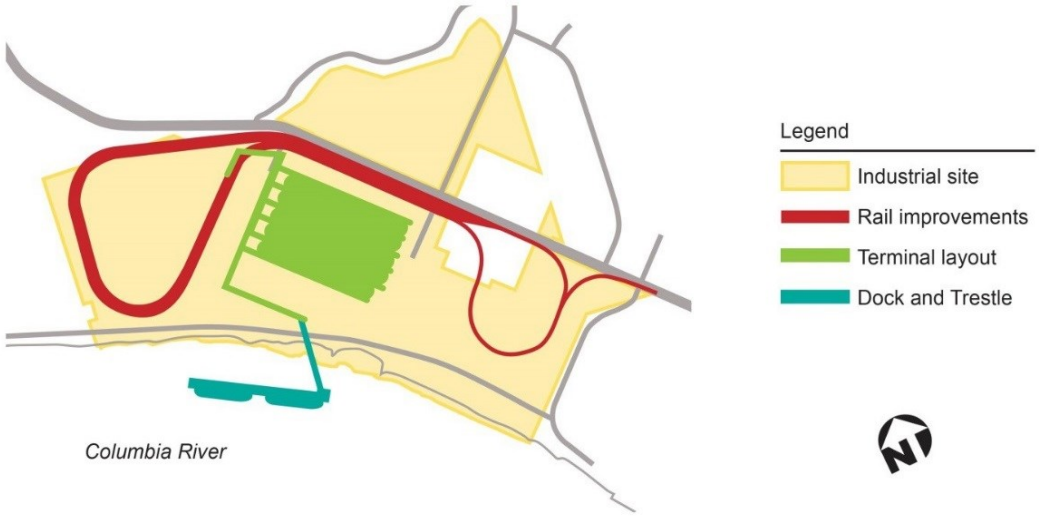
Alternative 9 was eliminated from consideration because of the following reasons.

- The stockpile area would encroach into the existing bulk product terminal operating facilities (Criterion B).
- The rail layout would conflict with operations of the existing bulk product terminal (Criterion C).
- The rail layout would not accommodate a "days' worth" of unit trains on site (Criterion D).

Alternative 10

Alternative 10 would use two new traveling shiploaders on two docks with the rail loop for unloading located west of the proposed storage area (Figure E-11).

Figure E-11.Alternative 10



Alternative 10 was eliminated from consideration because of the following reasons.

- The rail layout would conflict with operations of the existing bulk product terminal (Criterion C).
- The rail layout would cross through shoreline areas and the CDID levee (Criterion F).
- The rail layout would create difficult vehicular and emergency ingress/egress to the site based on the location and number of rail tracks that would be located on the north side of the property (Criterion G).
- The rail layout would be located over the on-site closed Reynolds Landfill (Criterion H).

References

Grette Associates. 2014. *Coal Export Terminal Wetland Impact Report—Parcel 619530400.* September 15. Prepared for Millennium Bulk Terminals—Longview, LLC. Grette Associated, LLC, Wenatchee, WA. 25pp.

Millennium Bulk Terminals—Longview. 2014. *Millennium Coal Export Terminal, Project Purpose and Need, and Site Alternatives*. July.