Port of EVERETT

MILLS to MARITIME
RESTORING JOBS. STRENGTHENING ECONOMY.

Title of Project:
Norton Terminal Development and Model Toxics Control Act (MTCA) Interim Action Cleanup

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Port of Everett

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1. PROJECT DESCRIPTION

Late last year, in December 2022, the Port of Everett celebrated the official grand opening of its new 40-acre Norton Terminal — the culmination of an expedited and successful effort to dovetail environmental cleanup needs with economic opportunity for our region. Completion of the $40 million Norton Terminal Development and Model Toxics Control Act (MTCA) Interim Action Cleanup project capped off the Port's 5-year, more than $150 million Mills to Maritime initiative that set out to transform the former Everett-based Kimberly-Clark (K-C) mill site that sat unused and contaminated into a sustainable maritime hub to restore jobs, keep commerce moving efficiently and cleanup the environment.

The Norton Terminal, situated between two federally secured facilities— the Port of Everett's international seaport and U.S. Naval Station Everett — represents the first all new cargo terminal to open on the U.S. West Coast in more than a decade. It introduced 40 acres of new upland cargo capacity to the national freight network to further enhance movement of commerce throughout the global supply chain at a time it of heightened demand. The new terminal nearly doubled the Port's upland cargo handling footprint, fully realizing the Port's previous $57 million South Terminal Modernization investment that added another full-service berth in Everett in 2021 to support larger ships and heavier cargo.

How did we get here? In 2019 the Port acquired the 66-acre vacant property from K-C, directly adjacent to its existing shipping facilities. The site is bordered by the Port's international shipping terminals, Naval Station Everett, BNSF Railway, and the East Waterway of Port Gardner Bay as shown in Figure 1. The property was home to pulp and paper operations for more than 80 years, beginning with the Puget Sound Pulp & Timber Co. in 1930 and ending with Kimberly-Clark Corp., which shuttered its doors in 2012; about 700 jobs were lost with the closure. As a result, the former mill site had been challenged by an extensive footprint of legacy pollution, both on land and in the water.

The Port took this project on — leveraging its unique ability to partner with state and federal agencies to support environmental remediation and infrastructure development on the property — to effectively restore jobs to the site, enhance the movement of commerce, allow for a diversified cargo mix, strengthen the economy and achieve sustainability.

This two-phase project involved a win-win strategy of cleaning up historic contamination and adding critical cargo capacity to support the Port's niche of moving breakbulk, project and containerized cargoes and to allow the Port to expand its offerings and diversify. **Phase 1** involved the cleanup of the site by the former property owner under an Agreed Order with the Washington State Department of Ecology (Ecology). When the Port acquired the site in 2019, its expedited remediation by K-C was a requirement of the Purchase and Sale Agreement. In 2021, K-C removed more than 250,000 tons of contaminated materials — or about 14,000 truckloads — and brought in just as much Port-provided clean Snohomish River Dredge sands to fill and regrade the site. In **Phase 2**, after K-C's cleanup, filling and grading activities, the Port and Ecology under an amended Agreed Order constructed an environmental pavement cap across a majority of the site as a MTCA interim action, which doubles as a cargo terminal. The infrastructure provides permanent environmental controls and state-of-the-art stormwater treatment for the first time in the property's history. In late 2022, just three years after the site was acquired, the Port was able to deliver on its vision for Norton Terminal.

The Norton Terminal project encompassed a wide array of intricate challenges, such as ensuring the property was cleaned of its legacy pollution from the more than 80 years of mill operations on a fixed timeframe and implementing the redevelopment of a 66-acre

site alongside a MTCA cleanup action. Despite these complexities, the unified approach adopted for this project proved to be highly efficient and effective, leading to the successful and rapid delivery of a new cargo terminal in a manner that upheld environmental responsibility.

2. INTRODUCTION – PROJECT HIGHLIGHTS

The Port of Everett is the third largest container port in Washington state and has traditionally been regarded as the premier breakbulk cargo facility for the region, handling high-value, conventional and overdimensional cargoes in support of the aerospace, construction, manufacturing, agriculture, energy and forest products industries. Most notably, the Port of Everett serves as an extension of the aerospace manufacturing process, accommodating all of the oversized aerospace parts for The Boeing Company's Everett factory including parts for the 747 (retired), 767, 777, 777X and K-C Tanker programs with parts coming direct from Asia to Everett weekly.

The Port of Everett continues to prioritize maritime infrastructure investments that support operational needs and growth, and that adapt its facilities to the ever-rapid changes in the industry. Over the past decade, the Port has invested more than $150 million to modernize its seaport facilities and expand capabilities from upgrading docks, adding on terminal rail capacity, procuring additional cargo handling equipment, and implementing sustainability features to help "green" the supply chain. Just prior to the Norton Terminal project, in early 2021, the Port opened its modernized South Terminal. The $57 million upgrade added another full-service berth in Everett with two Post-Panamax container cranes to support larger ships and heavier cargo — specifically the upsizing of Boeing's new 777X oversized containers that are now heavier and wider than any preexisting units handled here. While the infrastructure upgrade was critical to our aerospace business, it has also added many new capabilities to the Port's offerings. The wharf was strengthened to be able to handle 1,000 PSF, a significant upgrade from the former pier strength.

This work was immediately followed by the delivery of the Norton Terminal project in 2022, which is critical in ensuring full potential of the South Terminal upgrade. The new Norton Terminal compliments the needs of the $57 million infrastructure investment at South Terminal by nearly doubling the Port's cargo handling capacity with the 40-acre environmental cap to satisfy cleanup requirements and that also serves as the marine cargo terminal. Now both terminals are available, offering the cargo handling infrastructure and upland capacity to meet demand.

NORTON TERMINAL PROJECT ACCOMPLISHMENTS

The integrated environmental cleanup and redevelopment project expedited revitalization of a waterfront brownfield site into productive maritime industrial use within three years of site acquisition. Below are the project accomplishments:

- Realizes strategic acquisition of a former vacant mill site for maritime use at the working waterfront; situated at the heart of Everett's deep-water maritime complex, between two federally secured facilities — the Port of Everett Seaport and Naval Station Everett
- Achieves environmental stewardship by completing final upland cleanup of legacy contamination at the site, work included:
  - Removal of more than 250,000 tons of contaminated material and rubble (about 14K dump truck loads)
  - Backfilling the site with approximately 14K dump truck loads of clean river sands from the Snohomish River

- Preloading the site with 50,000 cubic yards of clean crushed material to compact the site, followed by grading the material to prepare for paving
- Installation of a low permeability 9-inch-thick environmental pavement cap over a majority of the site to provide permanent environmental controls, which doubles as the cargo terminal
- Installation of a state-of-the-art stormwater treatment system to protect Puget Sound into the future — the first treatment system in the site's history

- Enhances the movement of commerce by providing additional cargo laydown capacity
- Better positions Everett's seaport facilities to aid in our regional economic recovery efforts, as well as cargo diversification
- Provided necessary infrastructure for the Port of Everett Seaport to receive Strategic Seaport Designation from the U.S. Maritime Administration to support our armed forces — one of only 18 seaports nationwide
- Restores family-wage jobs to the site and supports the 40,000 jobs already supported by seaport options
- And, an added bonus, via the Port's voluntary 2% for public access policy, this project helped pay to dredge the public boat launch to ensure essential water access at the largest public boat launch in Washington state

ECONOMIC BENEFITS

The new Norton Terminal put the former mill site back into job-producing use, transforming the once-contaminated waterfront parcel into a sustainable and productive maritime hub that **now supports more than 950 jobs**. The Norton Terminal and previous South Terminal modernization combined, work together to create major economic benefit, generating:

- More than 1,050 direct jobs; 2,300 in total, including indirect and induced
- $180 million in personal income
- $46 million in local purchases
- $14.5 million in state and local taxes
- $46.5 million in federal taxes

This work also created benefit during construction, generating:

- 1,950 temporary construction jobs
- $64 million in personal income
- $6 million in state and local taxes
- $20 million in federal taxes

3. GOALS AND OBJECTIVES/BUSINESS PROBLEM

Preparing for trade of the future is the Port of Everett's standard. Over the past few decades, industry trends and demand have created a "big ship" shift where we are now seeing larger ships transporting more cargo. Much of this shift started before seaports were "big ship" ready. Seaports, just like the Port of Everett, have been in a rush to modernize their facilities to accommodate the level of large ships that can be berthed at their facilities and fit their niche markets with the goal of keeping freight moving

efficiently. Larger ships by nature also mean more cargo — and more cargo requires additional upland capacity to process these cargo moves. This is especially critical for the Port of Everett as our facility represents the third largest container port in Washington State and is the second largest export customs district in the state (fifth on the U.S. West Coast) — representing $29 billion in annual export value ($30 billion combined annual import/export value). The Norton Terminal project was vital providing the upland capacity to compliment and realize all the other maritime infrastructure upgrades to catch up to this shift.

In addition to the focus on meeting the aforementioned industry needs at the Port's trade facilities, the Norton Terminal had both environmental impediments to address and economic opportunities to consider. The site's environmental cleanup needs were massive, and cleanup projects are extremely costly and complex. As an economic driver in the region, the goal of the Port's acquisition was to ensure the site was not only cleaned up but put back into job-producing use.

4. DISCUSSION

The following sections provide details of this project's background, the methods and strategies used to implement it, and the overall benefits delivered.

4.1 BACKGROUND

The North Terminal project and other components of the overall Seaport Modernization efforts were designed to implement portions of the Port's 2008 Marine Terminals Master Plan (MTMP) and subsequent addenda. The MTMP desired to build upon the success the Port has had in attracting niche container and breakbulk cargoes. The plan focused attention on the traditionally underutilized South Terminal, while maintaining current operations at adjacent shipping terminals without notable change. Relevant aspects of the MTMP included structural upgrades and expansion of the South Terminal Wharf, the addition of two new 100-foot-gauge container cranes and a second mobile harbor crane, deepening the South Terminal Wharf to accommodate Panamax and Post-Panamax vessels, and the addition of yard tracks for on-terminal rail discharge and loading. The previous South Terminal Modernization project accomplished several of these goals and the 40-acre Norton Terminal project realizes that $57 million investment by nearly doubling the cargo footprint that is needed to support the cargo handling associated with the improved South Terminal. The City of Everett determined that the highest and best use of the K-C property would be supporting maritime commerce in the 2013 Central Waterfront Redevelopment Plan.

With shipping capacity at the Port more than doubling over previous years and container volumes increasing at Everett — the Port handled nearly 23,000 containers in 2022, up from just under 3,000 in 2021 — with Norton Terminal's 40-acre upland cargo yard we now have the capacity to store the oversized containers and breakbulk cargo that demand brings.

4.2 OBJECTIVES AND METHODOLOGY

SITE DEMOLITION AND CLEANUP

A key component of the Norton Terminal project was the demolition and cleanup of K-C's Everett-based mill (Figure 2). The Port continued environmental cleanup following the demolition and comprehensive cleanup actions by K-C.

When the mill closed in 2012, under an Agreed Order with Ecology, K-C prepared a remedial investigation and feasibility study, followed by a draft cleanup action plan in accordance with the Model Toxics Control Act, Washington state's cleanup law. K-C

demolished the mill in 2012-2013 and conducted the first Interim Action cleanup in 2013-2014 to remove contaminated soil (38,450 tons) and groundwater (5.6 million gallons) from the site.

After the demolition, K-C made the unfortunate decision of spreading the facility's crushed demolition materials, about 250,000 tons, to serve as fill on the site. This was done in violation of state and local regulations and required a costly correction. Ecology determined that the demolition materials were contaminated, some portion of which was causing groundwater recontamination (high pH and metals). The Snohomish Health District ordered that the material be recycled appropriately or disposed of in a landfill. As a result, this issue became a significant regulatory complication while working to clean up and redevelop the site.

Cleanup work continued after the Port acquired the former mill site (including 45 upland acres and a 21 underwater acres) in 2019. As part of the Port's Purchase and Sale Agreement, K-C was required to conduct the second Interim Action Cleanup within a year's time so that the Port could then oversee the third and final Interim Action Cleanup and redevelop the site into a marine cargo terminal.

Under Ecology's oversight, K-C removed an additional contaminated 17,600 tons of soil and 2.3 million gallons of groundwater. The former property owner decommissioned 21 underground pipes to prevent them from conducting groundwater flow into the East Waterway. The removal of 250,000 tons of demolition material was conducted under the supervision of the Snohomish Health District (Figure 3), after which K-C imported 150,000 tons of clean fill from Snohomish River dredging (provided by the Port) annually conducted by the U.S. Army Corps of Engineers fill to regrade the site (Figure 5).

The Port, in partnership with Ecology, conducted the third Interim Action Cleanup starting in 2021. This amended Agreed Order required the installation of a low-permeability cap that doubles as a cargo yard, which involved laying more than 12 inches of crushed surfacing base course and 9-inch-thick hot-mix asphalt pavement over 40 acres of the site.

ACCELERATED PERMITTING

This integrated approach accelerated the permitting process, as most of the project was considered to be part of the MTCA cleanup actions and did not require state and local permits. In Washington state, it is the desire of the Legislature to accelerate environmental cleanups. As a result, public entities performing cleanups are supported by robust state resources, including administrative support offered by Ecology, remedial action grant funding from the state, and exceptions from the procedural steps of state and local permitting. The following describes the regulatory framework through which the project was permitted and the resulting acceleration and streamlining of the approvals process.

MTCA PERMIT EXEMPTIONS & SUBSTANTIVE REQUIREMENTS

Since the third Interim Action was required by the Agreed Order amendment with Ecology, most of the Norton Terminal project was implemented under MTCA and exempt from state and local permit requirements. This exemption ensures that environmental cleanups occur without delay caused by administrative and public processes. The MTCA cleanup process includes its own public involvement process and, though exempt, work must comply with the substantive requirements of local permits and approvals. In addition to site grading, the pavement cap, site security fencing and stormwater facilities, Ecology agreed that the construction of the proposed buried utilities could be considered part of the third Interim Action to minimize future disturbance of the cap.

Therefore, most of the Norton Terminal design elements were exempt from City of Everett permit procedures apart from the above-grade components (Figure 4), which included lighting/communication poles, a guard shack and landscaping.

The work on Federal Avenue to the south (shown in Figure 4) was also outside of the MTCA scope, so the Port had to acquire a specific Public Works permit for utility and paving work in the public right-of-way and the above-grade surface features. Otherwise, the City of Everett agreed that the work inside the former K-C property limits was not required to obtain a permit.

All work identified as part of the MTCA scope was eligible for issuance of a Letter of Substantive Requirements by the City of Everett in lieu of any applicable permits. The following list a list of work within the Norton Terminal that was considered part of the MTCA cleanup:

- Site demolition and site preparation;
- Site stormwater system (including conveyance, treatment system and outfall replacement);
- Grading and earthwork (fill and excavation);
- Buried utilities (including below-grade portions of water, sanitary sewer and electrical);
- Perimeter fencing; and
- Asphalt pavement (which doubles as environmental cap to minimize infiltration)

Issuance of the letter allowed for the start of all work in the scope. The Port provided memorandums and graphics (like Figure 4) to help communicate to various City departments which items were within the MTCA scope of work and which were not.

SHORELINE LAND USE PERMITTING & PUBLIC ACCESS

Due to these Substantive Requirements agreements under MTCA, the Port was only required to obtain a Land Use Shoreline Substantial Development permit for the surface features not part of the third Interim Action. Those non-MCTA surface features are within the 200-foot shoreline setback, which is under the jurisdiction of the City's Shoreline Master Plan and required a hearing examiner's decision based on a project footprint greater than 1 acre within the jurisdiction. The shoreline hearing decision also included a variance from some City zoning standards for a height modification for light poles to allow for the proposed 75-foot height (300-foot spacing) and a perimeter landscaping modification for limiting perimeter buffer/screening landscaping near the north gate area of the project. (This is due to the industrial nature of the site, its recessed location 10 to 30 feet below properties to the east, and proximity to the BNSF rail line.) The Port held many meetings with City Land Use staff to confirm the height and landscaping requirements before the shoreline hearing.

Though the work in the MTCA action did not require public access provisions, the Port elected to contribute 2% of project construction costs to public access. The Port identified four off-site improvement projects consistent with the City's Shoreline Master Plan for the City's selection. The $624,000 in public access funds was earmarked for a new public restroom, dredging of the boat launch channel, a boat rinse station, or a new playground at Jetty Landing Park.

IN-WATER WORK PERMITS

The in-water work associated with terminal redevelopment was limited to the repair and rehabilitation of two existing stormwater outfalls. The scope of this work required a Hydraulic Project Approval (HPA) from the Washington Department of Fish & Wildlife, as

well as a Section 404 Nationwide Permit from the U.S. Army Corps of Engineers. However, because this is an element of the MTCA scope of work, the project was exempt from having to obtain the state issued HPA; therefore, a letter of Substantive Requirements was developed in lieu of the HPA. The number of operational outfalls at the site was reduced from six to two during the second Interim Action. Both outfalls were able to be constructed "in the dry" to prevent the release of contaminants to surface water during construction.

SEPA/NEPA

Compliance with the State Environmental Policy Act (SEPA) was required for the project. The Port and Ecology coordinated closely on the SEPA document's preparation, with the Port acting as the lead agency. Because the Port received federal funds through a U.S. Maritime Administration (MARAD) grant, the project also required compliance with the National Environmental Policy Act (NEPA). Since the Port was able to demonstrate to MARAD the independent utility of the initial construction phase of the Norton Terminal to function as a terminal, the Port received a categorical exclusion under NEPA. This exclusion meant that the Port did not have to do a full Environmental Assessment. The NEPA process included Section 106 compliance for potential cultural resource activities (consultation with the Washington State Department of Archeology and Historic Preservation and affected tribes) and Section 7 Endangered Species Act compliance.

OUTCOMES OF EXPEDITED PERMITTING & PROJECT DELIVERY

The project's innovative regulatory approach allowed the Port to quickly redevelop a 40-acre contaminated industrial waterfront property within a fast three-year window from property acquisition to terminal construction completion. The Substantive Requirements process for the MTCA elements required extensive education of City permit review staff, including Public Works and Land Use Planning staff. This integration of the cleanup review and approval process from Ecology and local permitting expedited the overall project schedule by allowing final design, negotiations with Ecology and permitting to occur at the same time. By combining these items, the Port significantly accelerated the project delivery schedule by expediting the Ecology process approvals in parallel with the one-year design duration. This resulted in saving considerable time and construction costs as opposed to waiting for the environmental cleanup to be completed before initiating site development.

GRANT FUNDING & COMPLIMENTARY PORT DESIGNATIONS

The Norton Terminal was awarded a $17.75 million federal Better Utilizing Investments to Leverage Development (BUILD) grant through MARAD to support returning the site to economically beneficial maritime use. The grant recognized that the additional upland capacity offered by the Norton Terminal would improve the Port's international trade and regional transportation performance and capacity, in addition to the environmental improvements it would generate. The project was also awarded a $9.15 million Ecology MTCA cleanup grant to advance the cleanup objectives. The BUILD grant required that all project elements meet Buy American requirements, while the MTCA grant was applicable to the project elements described as cleanup actions in the second Agreed Order (e.g., grading, paving, stormwater system and treatment facilities).

The BUILD grant and the MTCA grants, representing federal and state funding respectively, worked symbiotically as they provided matching funds for one another. This collaboration illustrates an exceptional model of how ports can join forces with both state and federal agencies. Together, they can overcome environmental obstacles plaguing a property, restoring it to its optimal functionality. Simultaneously, these collaborations contribute to the environmental restoration of the site, illustrating how financial resources and

teamwork can catalyze both economic growth and ecological rehabilitation.

Norton Terminal and its 40 acres of upland space to support seaport operations was recognized as beneficial for two recent Port designations:

Strategic Seaport: In 2021, the Port received its designation from the U.S. Maritime Administration as a Commercial Strategic Seaport— one of 18 nationwide and one of only five on the West Coast. The Port joins the Port of Tacoma as the only other port in Washington state with this designation to function as a recovery port to provide resiliency for the Puget Sound region during emergencies.

Marine Highway: In 2019, the Port received designation by the U.S. Secretary of Transportation as a Federal Maritime Administration Marine Highway Project for potential container-on-barge service under the America's Marine Highway Program to expand barge service along the Puget Sound corridor. This designation represents a vital step in reducing congestion on the I-5 corridor while moving more freight in the region.

NORTON TERMINAL SITE REDEVELOPMENT DESIGN

The Norton Terminal design included several unique features, with many based on the unique site constraints previously described above.

Site Access & Security

The Norton Terminal is a federally secure restricted area and access is controlled with a perimeter security fence and gates, among other elements, that meet U.S. Department of Homeland Security standards, including 4,500 linear feet of 8-foot-high chain link fence topped with three strands of barbed wire and razor wire. The perimeter fencing was considered part of the MTCA scope since it also served to keep the public out of the site and limited exposure to any remaining contaminants.

The primary site access is at the south end of the terminal via Federal Avenue, as cargo is moved between the Port's adjacent secure marine terminals and the new cargo terminal using Federal Avenue. The Port coordinated with U.S. Customs and Border Patrol and the City of Everett for approval of security gates and operational procedures to maintain access control for secure cargo transfer between the two secure terminals, with both considered Maritime Transportation Security Act regulated facilities. All stakeholders agreed that the Port could temporarily close the public street (Federal Avenue) to provide secure transport between terminals, as it is a short street that only served Port facilities and tenants.

A secondary north gate for infrequent use was developed for the egress of specialized or oversized cargo (like oversized windmill blades) via Norton Avenue at the northeast corner of the site. Two other gates were installed for egress onto Norton Avenue at the northeast corner of the site. These additional gates provide the Port the ability to provide separate access for potential future tenants and direct access onto Norton Avenue through the north end of the site.

Wood Waste Deposits & Preload

From its more than 80 years of use as a mill and pulp/paper facility, both new and historical geotechnical explorations revealed that the northeastern portion of the site included thick deposits of wood waste. To address concerns of potential future settlement, it was

decided to install a preload over a 6-acre portion at the northeast end (Figure 5). As a value engineering approach, the design team elected to utilize 95,000 tons of crushed surfacing base course material for the preload. This resulted in significant cost savings as the preload material would be reused as a base course for the 40 acres of Norton Terminal pavement section, rather than having to pay to remove the preload material from the site. The separate initial preload construction contract was also permitted through a Substantive Requirements letter from the City and allowed for the settlement period to start before starting terminal construction. The preload construction contract also included the creation of a temporary gravel access road across the sand surface of the site to Federal Avenue utilizing leftover ballast/gravel material from a wharf upgrade project at the Port's marine terminals.

Terminal Pavement & Remaining Remnant Foundations

The terminal was designed for a typical heavy-duty terminal pavement section of 9-inch-thick asphalt pavement over 12 inches of crushed surfacing base course. From observations and a survey of the remaining K-C building foundation elements exposed during the second Interim Action (Figure 3), the design team elected to use single and double layers of geogrid in areas where remaining foundation elements (e.g., concrete pile caps and steel H-piles) were known to be close to future finished grades. This geogrid design was intended to minimize reflective cracking and differential settlement of the asphalt pavement at the outlines of those foundation elements, to maximize both service life and impermeability of the pavement section.

The Port surveyed much of the remaining foundations that were exposed during the second Interim Action work by K-C. Utilities and underground installations were engineered to be placed in areas where large underground concrete foundations and H-piles had not been surveyed. Where this was unavoidable, provisions were made in the Norton Terminal construction contract to include unit prices for pile removal and demolition of concrete foundations if required to install utility trenches, vaults or drilled shafts for light pole bases. In addition, numerous large diameter pipes (15 to 54 inches) from the former K-C facility were abandoned in place, so it was determined that all existing pipes over 15 inches in diameter would be filled with controlled density fill to minimize the potential for future voids or sinkholes.

Storm Drainage Collection & Treatment

Most of the terminal area included a network of trench drains to collect rainwater and piping to route the collected stormwater to the 36-inch diameter outfall at the middle of the site near the north end of the existing wharf structure. Trench drains were used to keep the drainage system as shallow as possible to minimize demolition of the existing remnant foundation and provide a uniform sloped surface for container and cargo storage.

The water quality treatment flow is separated via a combined flow splitter/lift station structure and pumped to an above-grade Chitosan Enhanced Sand Filtration (CESF) system. The flow splitter structure included back-water check valves to prevent salt water from flowing into the conveyance and treatment systems. The CESF system is an active treatment system that provides the Port with long-term flexibility to treat varying levels of heavy metals in stormwater to meet the requirements of the Port's Industrial Stormwater General Permit. Through other local Port marine terminal industrial treatment installations, it has been determined that for larger combined drainage basins (30 to 40 acres) these active CESF treatment systems are more cost-effective than larger passive media filtration systems while also providing higher contaminant concentration reductions.

Utility Systems (Water & Electrical)

All utility network layouts were overlaid with remnant foundation surveys and past K-C mill aerial photos to optimize utility corridors

to avoid the most significant known remaining foundations and minimize required subterranean demolition. The site design included water and electrical system easements since the water main loop and a utility electrical duct bank through the terminal were public utilities. It was determined to run a Snohomish Public Utility (SnoPUD) primary duct bank through the site to connect services between Norton and Federal avenues, as well as provide a future pathway to connect the Port's marine terminals to the future SnoPUD substation to be in the northeast corner of the site. Having SnoPUD provide and maintain the main medium voltage (12.47kV) system through the terminal proved to be less expensive than the Port owning the medium voltage equipment, while also making it easier for expandability and eliminating the need for Port submetering as new tenants come online. The water system was also looped to connect to City water system at the northeast and southwest corners of the site, with fire hydrants located adjacent to the proposed high mast light poles for protection.

4.3 HARDWARE/SOFTWARE USED

The modeling software used to analyze the stormwater system for the Norton Terminal was a combination of Western Washington Hydrology Modeling (WWHM) software and EPA Stormwater Management Model (SWMM). WWHM was used to analyze the hydrology of the existing and developed site, with the analysis providing stormwater runoff and water quality flow rates for the drainage areas on the new terminal. The hydraulic system was analyzed with SWMM to adequately size the stormwater conveyance system, flow control structures, pump stations and treatment systems.

Autodesk Civil 3D was another modeling software used to help identify cut/fill volumes for earthwork quantities when re-grading the site. Existing topographic surfaces were developed from survey and proposed surfaces were generated based on proposed grading features. Civil 3D software allows the user to compare existing and proposed surfaces to accurately calculate areas on the site requiring additional fill material, as well as identifying existing high points that would need to be cut to the grade of the proposed surface. By using this software, designers were able to identify how much material would need to be exported from and imported to the site, allowing the design team to iterate the grading design to optimize cut/fill balance. Further, the Civil 3D model was provided to the construction contractor, and they used this along with their own systems to create surfaces for grading and survey utilities as installed. This was helpful for as-builts and made the contractor's work easier. They were able to upload surface information to their machines and double-check locations in real-time.

It was known that the site included significant quantities of buried woody material. These deposits of organic material are highly compressible and were anticipated to result in unsatisfactory performance of the proposed pavements if not properly mitigated. To better define the horizontal and vertical extents of the woody deposits, the project geotechnical engineer completed a series of exploratory borings, paired with an innovative electrical resistivity tomography (ERT) survey. The ERT technique involves transmitting an electrical current into the ground and measuring the received voltage to identify differences in the electrical properties of subsurface deposits. By calculating the resistivity of the subsurface deposit that the electrical current passes through, it is possible to infer the geologic makeup of the wood waste deposits (while limiting the number of expensive exploratory borings). ERT data gathered at the site was compared with data gathered from the subsurface explorations (both current and numerous historical explorations) to develop site-specific correlations between soil resistivity and soil type. Woody deposits at the site were found to have a much lower resistivity than the surrounding soil, revealing a significant deposit of woody material within the northern half of the site which helped define the limits of a recommended soil preload in that area.

Lighting design for this project was completed utilizing AGi32 software to model lighting alternatives (including optimization of

light pole spacing and heights) for the 40-acre paved terminal area. AGi32 is used to create a photometrically accurate model that simulated the proposed lighting to provide the information needed to select accurate lighting placements and fixture types. The software also includes features for calculating illuminance levels, energy consumption and lighting costs, making it a powerful tool for designing energy-efficient lighting systems. Electrical design included comprehensive lighting analysis, resulting in mostly 74-foot-tall poles with LED high mast downlight fixtures while minimizing light trespass onto the adjacent properties. Both normal (full night-time operations) and lower security light levels were analyzed, while making sure the lighting complied with the Dark Skies requirements mandated by the City of Everett.

4.4 PROJECT COST

The two-phase project came in just under $40 million. It was supported by dozens of businesses, educational institutions, and public agencies in our region, and was made possible and a substantial portion of project cost offset thanks to $27 million in state and federal grants, including a $17.75 million federal BUILD grant and a $9.15 million Ecology MTCA cleanup grant.

There were some additions/changes to the project that added to the overall budget. The original plan was to construct a 30-acre low-permeability cap to serve as the cargo storage space. The team planned to only put 2 inches of asphalt down on a 6-acre portion of the former K-C site rather than the 9 inches required. There were also two 2-acre parcels that had been set aside for future development: One was reserved for use by SnoPUD; the other was saved for a maritime-related business. With a few change orders, the engineering team decided to add the extra 4 acres into the Norton Terminal and provide 9-inches of pavement across the 6 acres mentioned above, increasing the size of Norton terminal by 10 acres, so that it covered 40 acres of the site (Figure 7).

4.5 PERFORMANCE MEASURES

Terminal development was designed to nearly double the upland cargo capacity of the Port while also providing permanent environmental controls and state-of-the-art stormwater treatment for the first time in the property's history. The 40-acre site also provides the infrastructure to promote short-sea shipping on the M-5 Marine Highway. As a result, this will restore roadway and cargo yard space to facilitate the efficient and safe movement of cargo between terminals and onto the state's freight network. In addition, power conduits were also added to support future electric tugs when the technology is implemented in the maritime industry. The project also preserves an existing 360,000-square-foot warehouse to be re-purposed for maritime-related or compatible business.

Additional features that made the project complex— it was much more than the 12-inch base course and 9-inch-thick pavement— included fire protection, high mast site lighting, a stormwater drainage collection system, water and electrical utilities, security surveillance systems, automated access control gates and conduits for future shore power.

4.6 HOW THE PROJECT FULFILLS AWARD CRITERIA

ENGINEERING INNOVATION

The project involved many twists and turns, including two notable engineering innovations that should be mentioned.

First, the Port implemented a cutting-edge Chitosan Enhanced Sand Filtration (CESF) system to manage stormwater. This active treatment system offers cost-effective, flexible solutions for treating various levels of heavy metals, complying with state Industrial Stormwater General permit requirements. Unlike passive filtration systems, CESF provides superior contaminant reduction and can

adapt to different chemical levels or new regulations. Given the crucial role stormwater compliance plays in Washington's shipping terminals, the site was designed to handle a broad range of stormwater scenarios.

However, the most remarkable engineering breakthrough of this project took place at the conceptual design stage, where envisioning the project's end goal as a cargo terminal provided an ideal resolution for addressing the site's remaining environmental pollution issues. This integration of outcomes facilitated significant efficiencies in regulatory and permitting processes and unlocked considerable grant funding possibilities. In the end, the local community emerged as the real victor, benefiting from a cleaner environment, bolstered economy, and enhanced public access.

MEANS OF CONTRACTING

Contracting for the terminal development was via the traditional design-bid-build process. The contracts were structured to facilitate Buy American requirements triggered by federal MARAD grant funding for the project. The contracts were timed to coordinate with grant disbursements and to satisfy grant requirements. Ultimately, the project had three separate contracts for the Norton Terminal project.

SPEED OF CONSTRUCTION

From the time the team started designing the environmental cap/cargo terminal, to the time the contractor finished construction was just three years — and most of this was due to the streamlined permitting process thanks to the terminal's development being considered part of the MTCA Interim Action. The project also required substantial coordination between the Port, design team and contractors. The Port's inspectors and design team were on site daily to perform inspections and address questions, especially while demolition, preload and construction were ongoing (Figure 6 and 9).

A major challenge involving timing so that speed of construction was not impacted was the City's need to construct a 36-inch diameter combined sewer pressure line right through the middle of the Norton Terminal property. This pipeline traveled from Federal Avenue at the south, past the remnant warehouse at a 45-degree angle to the northeast and turned again and traveled north to the City's future treatment center, which is the location of K-C's former water treatment center. The City's contractor was working to install this combined sewer line while the Port's contractor was developing the environmental cap/cargo terminal.

BUDGET SUCCESS

Rather than demolish the existing 360,000-square-foot concrete warehouse located on the southeast corner of the property, the Port plans to negotiate with private parties to adaptively reuse the three-story building at Norton Terminal. This area was set aside to be separate from the cargo terminal, but it may be integrated with site operations as plans are finalized. The ground floor is considered desirable for light industrial storage close to the Port's deep-water access. The yard area north of the warehouse was set aside separately from the new terminal.

As mentioned earlier, 6 acres of the K-C property needed to be preloaded because there were thick deposits of wood waste. The design team elected to construct the preload with 95,000 tons of crushed base course. After the settlement occurred, the team reused the preload material as a 12-inch base course for the pavement, which resulted in significant cost savings because the Port did not have to pay to remove the preload from the site.

In addition, the project involved a huge amount of asphalt (80,000 tons), so the Port applied an escalation clause developed by the Washington State Department of Transportation (WSDOT), which allowed contractors to provide the Port with their best price upfront with the bid. This was the first time the Port utilized an escalation clause with contractors.

NEW AND UNIQUE SOLUTIONS

A unique solution was the Port's innovative approach to this project, where site remediation and redevelopment were melded into a single cohesive strategy. This accelerated the permitting process, as parts of the development of the terminal were considered MTCA cleanup actions and, therefore, did not require state and local permits. The Port received letters of Substantive Requirements to do most of the work.

EXCEPTIONAL MEASURES

The project is in the former K-C mill MTCA cleanup site. The property is owned by the Port but listed on the Washington State Department of Ecology's list of contaminated sites and is currently under an Agreed Order through the MTCA cleanup process. Due to the ongoing cleanup process, the Port also had extensive soil and groundwater data related to the upland terminal area. For the upland terminal grading and utility installation, the contract documents included requirements and best management practices (BMPs) related to soil and groundwater management. Excavated soil management required testing/characterization prior to off-site disposal for any material that could not be reused on-site. The groundwater was sent to the City's sanitary sewer under a discharge authorization from them. Provisions were provided for replacement of geotechnically unsuitable wood waste if encountered during excavation, as well as dewatering for deeper vault installation.

5. CONCLUSION

The Norton Terminal project was the cornerstone of the Port's Mills to Maritime initiative to transform this polluted former waterfront mill site into a sustainable job-producing hub by melding environmental cleanup with economic development. This engineering feat was made possible by using the site-wide terminal redevelopment pavement as an environmental cap, following previous comprehensive Interim Action cleanups. Implementation of the state MTCA cleanup review/approval process in lieu of state and local permitting expedited the overall project schedule by allowing final design, negotiations with Ecology, consultation with state and local permitting agencies, and federal permitting to occur in parallel. The integrated approach also bolstered funding for the project, assisting with the Port's success in obtaining a $17.75 million federal BUILD grant, and making possible the $9.15 million state MTCA grant. As a result, the Port opened 40 acres of new marine cargo terminal space on a previously contaminated site, but now fully cleaned up site within three years of property acquisition (Figure 8). The new Norton Terminal is critical to support the Port's short and long-term goals to continue modernizing and expanding, providing additional cargo staging/processing space to support its existing multiple deep-water berths and supporting a greener supply chain. When Norton Terminal opened in December 2022, it marked the first all-new cargo terminal built on the West Coast in more than a decade, adding critical cargo capacity to the national freight network. The project restores jobs, strengthens the economy, enhances the movement of commerce, achieves sustainability and revitalizes Everett's working waterfront.

Addition project photos and milestones can be seen in Figure 9 and a link to a full project video showing this engineering feat from start to finish can be found on Figure 10.