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Reuse and the Benefit to Community
Pacific Sound Resources Superfund Site

Executive Summary

In the early 1990s, the Port of Seattle (the Port) faced the possibility that a critical container cargo shipping business partner, American President Lines (APL), might relocate one of its principal West Coast container cargo operations from Seattle, due to the need for an immediate, substantially expanded cargo facility. The shipping company needed a modern container cargo facility twice the size of its existing space, including the addition of on-site rail cargo capability. The Port had recently prepared conceptual plans for adding a new container cargo area next to APL's existing Terminal 5 facility. Combining the Port's long-term plan with APL's specific and accelerated expansion schedule, however, required the acquisition of significant additional industrial property, including part of the Pacific Sound Resources (PSR) Superfund site, contaminated as a result of 80 years of industrial-scale treatment of wood timbers and pilings with hazardous materials.

In August 1994, following approval from the U.S. Environmental Protection Agency (EPA), the Port took ownership of the contaminated industrial property, with the intention of reusing it following cleanup. The Port opened the expanded Terminal 5 facility in 1998. Terminal 5 is now one of the Port's largest and most efficient container cargo shipment facilities and has become the base for APL's Global Gateway North cargo transfer center. Following cleanup and stabilization of the contaminated soils and ground water, the Port was also instrumental in creating Seattle's magnificent Jack Block Park, located partly along the northern edge of the property next to the shoreline. This case study explores the site's cleanup and reuse in greater detail, illustrating the opportunities, benefits and impacts of Superfund redevelopment in action.

Positive Impacts

- **The movement of goods through the combined Terminal 5/PSR site involves many businesses and organizations, helps produce substantial business revenue, and generates millions of dollars in taxes.**
- **Businesses operating at the combined Terminal 5/PSR site employ an estimated 440 people, providing nearly $30 million in annual employment income to the community.**
- **The cleanup and expansion of Terminal 5 resulted in an innovative cargo shipping terminal that significantly reduces the Port's carbon footprint.**
- **The project also resulted in new public recreation opportunities.**

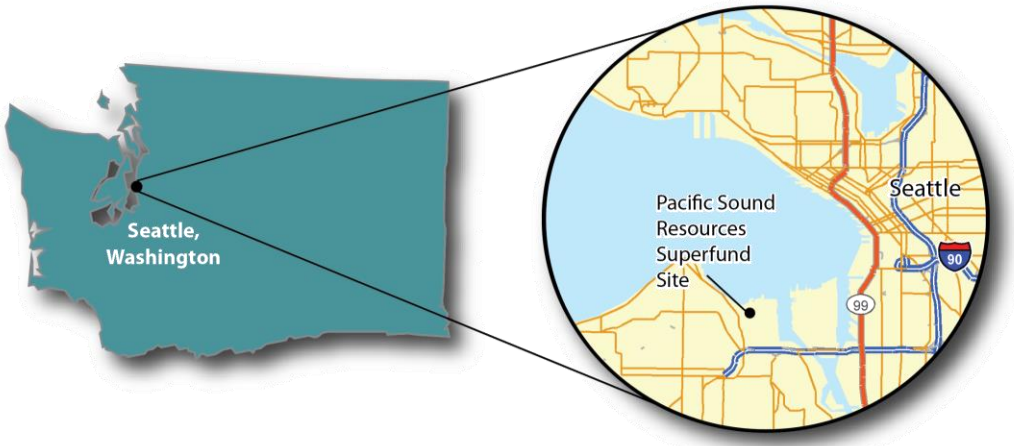

Figure 1. The site's location in Seattle, King County, Washington.

Introduction

Superfund site remediation can result in restored value to site properties and surrounding communities. Once a Superfund cleanup is complete and a site property is ready for reuse, it can revitalize a local economy with jobs, new businesses, tax revenues and local spending. This case study captures the on-site and community impacts of new development at the PSR Superfund site.

The PSR site includes an estimated 83 acres, in southwest Elliott Bay, in Seattle, Washington. Parts of Terminal 5 and Jack Block Park are located on a 25-acre portion of the site known as the Upland Operable Unit. One of the largest protective sediment caps in the world covers the remaining 58 acres, the Marine Sediments Operable Unit, just north of the Upland Operable Unit in the inter-tidal and near shore area of southwest Elliott Bay. The Upland Operable Unit is in an industrial area of West Seattle. Most of the property and area to the east and south consist of intermodal cargo transfer facilities, cargo holding and processing areas and maintenance structures within the Port of Seattle's 183-acre Terminal 5 intermodal container cargo transfer facility. Intermodal cargo transfer refers to the movement of cargo containers between two or more modes of transportation (e.g., ship, rail and truck).

A rail-barge cargo loading dock, the west portion of Jack Block Park and additional intermodal service and general freight rail lines border the Upland Operable Unit to the west. Important urban transportation routes, Harbor Avenue Southwest and Southwest Spokane Street, extend west and south of Terminal 5, respectively. Commercial and residential areas are present west and southwest of Terminal 5 and the Upland Operable Unit.

Figure 2. The PSR site, Terminal 5 and Jack Block Park

Site History

A wood-treating facility operated at the PSR site between 1909 and 1994. The plant changed over time from a small facility into a large-scale production facility supplying regional treated wood product needs. During the years of operation, the facility released creosote and related hazardous substances in large quantities into the environment, severely contaminating the underlying soils, ground water and marine near-shore environment. On May 31, 1994, EPA placed the PSR site on the Superfund program's National Priorities List. The PSR site is one of four Superfund sites in south Elliott Bay and adjacent waterways, including the Lockheed West Seattle, Harbor Island and the Lower Duwamish Waterway sites.

Figure 3. Terminal 5 prior to large-scale redevelopment and expansion. The PSR wood treating facility is near the bottom center. (image courtesy of the Port of Seattle)

Development and Expansion of Terminal 5

In the 1950s, the Port began purchasing former industrial properties to assemble the area that would eventually be redeveloped as Terminal 5. Construction of the marine terminal began in 1961, becoming one of the first container cargo shipping facilities in North America. In 1986, cargo-shipping company APL agreed to lease Terminal 5, consisting of only 95 acres, for its northwest operational link to Asia. In 1992, the Port began a six-year process, referred to as the Southwest Harbor Cleanup and Redevelopment Project, to improve Terminal 5 and meet APL's required cargo needs. The Port issued $274 million in general purpose bonds to pay for the acquisition of adjacent industrial properties, followed by cleanup and reuse as a significantly improved marine cargo facility. APL's long-term lease funds the payback of these bonds.

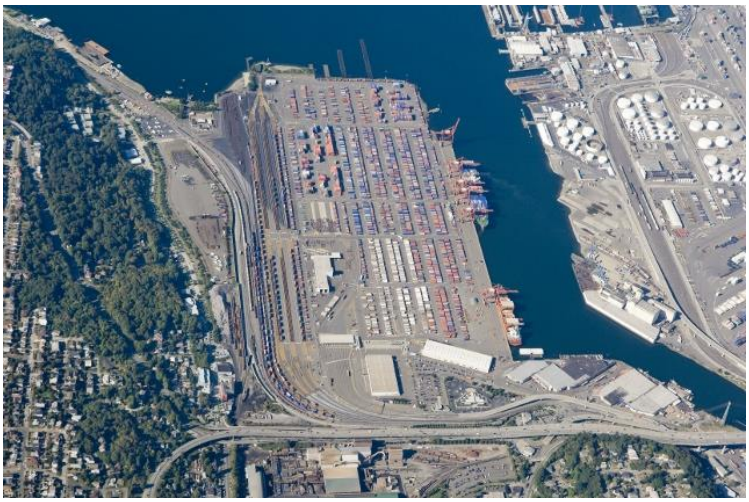

Figure 4. Terminal 5 after expansion, cleanup and redevelopment. (image courtesy of the Port of Seattle)

The Port's cargo facility improvement project called for the purchase, cleanup and redevelopment of several adjacent industrial properties, as well as the active PSR wood treating facility.[1] The goal of the project was to provide an expanded container cargo holding and processing area, construct a new ship-to-rail container cargo transfer area, and add more docking space for cargo ships. The Port led cleanup of non-Superfund site properties under state oversight and cleanup of the PSR

[1] Joint Lead Agencies, U.S. Army Corps of Engineers, Washington Department of Ecology, Port of Seattle. (November 1994). Southwest Harbor, Cleanup and Redevelopment Project, Final Environmental Impact Statement, Volume One.

site under EPA oversight. The Port sought extensive public input to redevelop the terminal in a way that made sure it would not negatively affect nearby neighborhoods. The Port also worked with federal, state and City of Seattle agencies to create Jack Block Park on the northwest corner of the terminal property, located partly atop the north portion of the PSR site's Upland Operable Unit.

In 1998, following cleanup, the Port opened the redesigned, expanded container cargo terminal and the public shoreline access site. In 2001, the Port dedicated Jack Block Park to the Port's longest living and serving commissioner.

Cleanup and Redevelopment of the Pacific Sound Resources Superfund Site

The Southwest Harbor Project would not have been possible without negotiations between EPA, the Port stakeholders and the wood treating facility. The Port needed the wood treating facility property to develop a critical piece of the expanded terminal – its cargo transfer rail yard. However, the Port first had to acquire the site property and ensure that contamination would be addressed in a manner satisfactory to EPA, while meeting critical schedule and budget performance requirements.

Protecting Purchasers from Future Liability

A Prospective Purchaser Agreement (PPA) played an important role in enabling the site's redevelopment. Nationally, EPA has since taken additional steps to make the acquisition and redevelopment of Superfund sites easier for prospective purchasers.

Under the Brownfields Revitalization Act, a prospective purchaser need no longer negotiate a PPA with EPA and the federal government. In lieu of a signed agreement, the purchaser can meet statutory requirements to become a bona fide prospective purchaser (BFPP).

For more information about BFPP requirements, please see: http://www.epa.gov/oecaerth/cleanup/revitalization/bfpp.html.

In August 1994, the principal owner/operators of the wood treating facility entered into a Consent Decree with EPA. The decree resolved the liability of the Pacific Sound Resources Company's principals in exchange for all the outstanding shares of the company's stock. The court then transferred these shares to a trust and hired a trustee to liquidate all company assets for the benefit of the EPA lead cleanups. At the same time, EPA entered into a Prospective Purchaser Agreement with the Port. EPA resolved the liability of the Port in exchange for Port cleanup of the PSR site's Upland Operable Unit, at an approximate cost of $15 million. Port costs were substantially attributed to site cleanup. However, part of the costs were attributable to paving a large portion of the Upland Operable Unit, a feature that serves cleanup goals while providing an excellent cargo equipment handling surface. As the trust liquidated the company's assets, the trust delivered most of the proceeds to EPA (approximately $40 million). EPA then used these funds to pay for the design and cleanup of the Marine Sediments Operable Unit, and subsequent monitoring. It took 15 years to liquidate the trust's assets and provide the money to EPA.

Figure 5. A large portion of the PSR site's Upland Operable Unit (shown here) was redeveloped as part of Terminal 5's cargo transfer rail yard.

Championing Cleanup and Redevelopment

In the late 1990s, President Clinton, Vice-President Al Gore and then-EPA Administrator Carol Browner recognized the site's cleanup and redevelopment as a model for environmental cleanup and economic redevelopment during speeches at the site.

(image courtesy of the Port of Seattle)

Between 1996 and 1998, the Port undertook a series of non-time-critical removal actions under EPA oversight to stabilize site conditions, remove contaminant sources, address principal threats posed by contaminated soil and ground water, and enable redevelopment of the site's Upland Operable Unit. These actions included digging up and disposing of about 3,840 tons of contaminated material beneath demolished structures and placing a low permeability cap over the Upland Operable Unit. Additional cleanup efforts included installing a 1,600-foot-long slurry wall to isolate shallow contaminated ground water and light non-aqueous phase liquid and minimize migration to Elliott Bay.[2] A recovery trench on the inland side of the slurry wall was also installed to collect this liquid, ensuring protection of shoreline and near shore environments in Elliott Bay. The Port was then able to extend rail lines and cargo transfer operations area over the capped portion of the site as part of Terminal 5's new ship-to-rail cargo transfer facility.

In 1999, EPA issued a cleanup plan in a Record of Decision (ROD) describing the Agency's plan for addressing remaining contamination in marine sediments at the site and stating that the previous removal actions would remain protective.

EPA's plan included dredging 10,000 cubic yards of contaminated sediment to ensure continued navigational access in the area, and removing 800 derelict creosote-treated pilings remaining as former PSR in-water structures, followed by placing and monitoring sediment caps over 58 acres of remaining contaminated sediment. EPA completed these cleanup efforts in 2005. The Port currently performs operation and maintenance activities across the asphalt cap of the site to maintain the remedy. It continues to use the southern part of the Upland Operable Unit as part of the Terminal 5's ship-to-rail cargo transfer area and maintains the northern part of the area as part of Jack Block Park. According to Port Environmental and Planning staff member George Blomberg, "Without rail access [on PSR's property], Terminal 5 would not have been a success to the degree it is now."

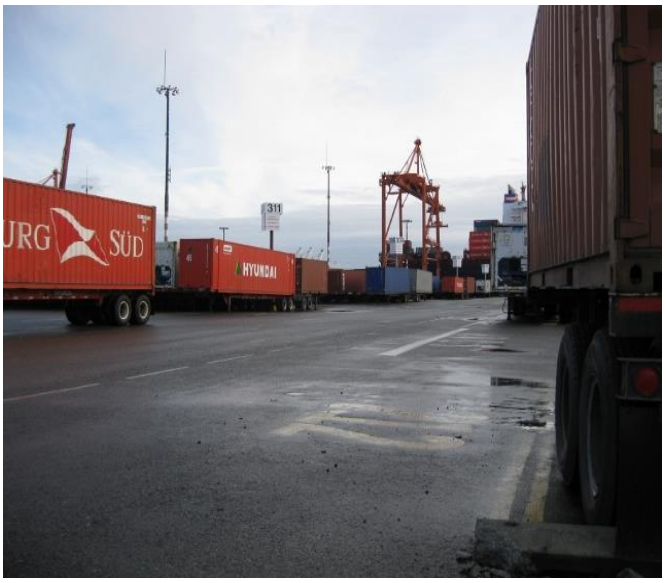

Figure 6. Cargo transfer operations at Terminal 5.

[2] Non-aqueous phase liquids are substances to that do not readily dissolve in ground water and can remain a source of ground water contamination for many years. NAPLs can include petroleum, solvents and creosote. EPA often classifies NAPLs as either light (LNAPs) or dense (DNAPLs). LNAPLs typically float on water while DNAPLs typically sink in water.

Local Impacts

Cargo terminal activity requires the involvement of many companies and organizations. In addition to cargo handling, the movement of goods involves railroad and trucking companies, transportation coordination firms, shipping operations and maintenance companies, and the coordinated efforts of local, state and federal government agencies. The Port provides and manages the physical marine terminal asset. However, the daily effort and oversight of agencies such as U.S. Customs and Border Protection, U.S. Coast Guard, and U.S. Department of Agriculture, together with state and city managers is essential for timely, predictable movement of large volumes of utterly diverse import and export cargo commodities.

Figure 7. Terminal 5 maintenance building, located at the center portion of the PSR site's Upland Operable Unit.

When the Port was developing plans for the Southwest Harbor Cleanup and Development Project, it estimated that the expansion would result in 1,000 new direct jobs, 500 jobs in the service sector and $60 million annually in new personal income. It also estimated that the expansion would result in $220 million annually in new business revenues and $4.7 million annually in new state and local taxes. [3]

American President Lines (APL)

Cargo shipping company APL operates at Terminal 5 under a long-term lease with the Port of Seattle. Currently, an estimated 44 APL employees work at the terminal, providing approximately $3 million in annual employment income. Other cargo carrying companies load and unload at Terminal 5 as well, including Hamburg Süd, Hyundai Merchant Marine, and Westwood Shipping Lines. APL operates vessels and shipping networks worldwide. APL's business plan allowed for a 30-year site lease, with penalties, if the redeveloped site was not operational for integration with APL's business as stipulated. The 30-year term allowed the Port to amortize the lease revenue, providing for retirement of the bonds used to finance the redevelopment. The retained and expanded APL business activity provided substantial economic, community, and environmental benefits in Seattle, at neutral cost, without increasing the Port's public tax-base support.

Eagle Marine Services and the Longshore and Warehouse Union (ILWU)

Eagle Marine Services, an APL subsidiary, is the firm responsible for coordinating the movement of cargo across Terminal 5. The company maintains the terminal's equipment and most of its facilities. Eagle Marine Services also contracts with the local union to order up crews of union dockworkers to load and unload the container ships at Terminal 5. ILWU dockworkers handle import/export cargoes by placing containers on trailers for temporary staging, moving the containers in and out of the ship-to-rail loading/operations area, or placing cargo

[3] Port of Seattle. (n.d.). "Southwest Harbor Cleanup and Redevelopment Project: A Regional Asset with Local Benefits." Brochure.

containers on to highway trucks. Currently, an estimated 150 Eagle Marine Services employees work at Terminal 5, providing $13.2 million in annual employment income. Depending upon cargo transfer needs, up to 250 ILWU dockworkers may work at the terminal over the course of a day. On days when no ships are scheduled to dock, there may be no dockworkers present. In recent years, the union dockworkers serving container cargo operations at Terminal 5 typically earned an estimated $13.3 million in annual employment income.

Property Value and Tax Revenue Impacts

The overall value of property parcels at Terminal 5 has increased from $178 million (1999 appraised value) to approximately $260 million (2012 appraised value). Although the Port of Seattle is a local government entity and is exempt from paying property taxes, this increase has likely raised the property values of nearby properties, resulting in increased property tax revenues for local governments. For example, the Port's 2009 economic impacts study estimated that marine cargo activity across its facilities contributed $254 million in state and local taxes in 2007.[4]

Recreational Impacts

The cleanup and redevelopment of the combined Terminal 5/PSR site Upland Operable Unit and cleanup of nearby sediments resulted in access to shoreline areas, in locations where public use and open space had never been possible. Jack Block Park provides 5.8 acres of native landscape vegetation, with about 3,700 linear feet of pedestrian/bicycle pathways, elevated walkways, piers, and viewing platforms, and 0.6 miles of shoreline access to southwest of Elliott Bay. Capping of contaminated sediment also made it possible to provide a new hand-carried boat launch in the shoreline park. Finally, the redevelopment of the combined Terminal 5/PSR site spurred the expansion of area bike trails beyond park boundaries. The Port constructed additional native landscape areas, pathways, and public use improvements on about 7.7 acres at the west and south margins of the redeveloped container cargo site.

Conclusion

In Seattle, Washington, careful planning and coordination between EPA and the Port of Seattle resulted in the cleanup of contaminated properties, including the PSR site. These cleanup actions protected human health and the environment and enabled the Port to double the size of its Terminal 5 cargo container port. It also enabled the Port to make comprehensive reuse of the PSR site as a marine industrial and public use area.

Environmental Benefits

Terminal 5 supports the Port's Green Gateway Initiative by expediting the container movement process.

- Water-based cargo transportation is six times more energy efficient than truck transport and 1.6 times more efficient than rail transport.
- Rail transport is three to five times more energy efficient than truck transport.
- Prior to Terminal 5's expansion, all shipping cargo was moved in and out of the terminal via truck.
- Redevelopment doubled the terminal's shipping capacity.
- Since redevelopment, 70 percent of shipping cargo is transported in and out of the terminal via rail.
- On-site rail operations significantly reduce freight truck miles in Seattle and associated air emissions.
- Despite doubling the size of Terminal 5, electrical consumption remains unchanged due to improved design efficiency and lighting management.

Source: the Port of Seattle

[4] Port of Seattle. (February 2009). The 2007 Economic Impact of the Port of Seattle. Prepared by Martin Associates. https://www.portseattle.org/Supporting-Our-Community/Economic-Development/Pages/default.aspx.

Today Terminal 5 is one of the Port's largest container handling and storage facilities and continues to serve as the base for APL's Global Gateway North. The terminal includes the latest generation of computerized terminal operations systems, advanced on-dock cargo transfer rail facilities, six container cranes and three container ship docking areas. Terminal crews load and unload container ships and move the cargo containers primarily on and off double-stack railcars. Trains and trucks then move the cargo to consumer markets throughout the United States. The integration of rail into terminal cargo shipping operations helped to reduce the terminal's dependency on truck transport of ship cargo, thus lowering the Port's overall carbon footprint and improving local air quality. The project also led to the creation of the 5.8-acre Jack Block Park – a public park that provides pedestrian and walking trails, access to the Elliott Bay shoreline for boaters and impressive views of the Seattle skyline, Puget Sound and shipping activity at Terminal 5. Looking forward, the park will continue to serve as a unique recreational gem for Seattle residents and tourists. The combined Terminal 5/PSR site will continue to be an important employment resource for local residents and a "Green Gateway" for the efficient movement of goods from across the world to markets throughout the United States.

Figure 8. The portion of Jack Block Park located on the PSR site is along the shoreline toward the upper right. As a result of the marine sediments cleanup, kayakers now use the beach (upper right) as a boat launch point. (image courtesy of the Port of Seattle)

Technical Appendix

Positive Impacts: Employment Information for On-site Jobs
An interview on December 4, 2012, with a Port of Seattle representative, George Blomberg, and a subsequent email communication sent on December 4, 2012, by Mr. Blomberg, provided on-site jobs information for APL, Eagle Marine Services, and the International Longshore and Warehouse Union.

Positive Impacts: Wage and Income Information for On-site Jobs
The U.S. Bureau of Labor Statistics (BLS) provided wage and income information. The BLS is a governmental statistical agency that collects, processes, analyzes and disseminates essential economic and statistical data to the American public, the U.S. Congress, and other federal agencies. The data provided by the BLS has high standards of accuracy and consistently high statistical quality and impartiality in both subject matter and presentation.

The BLS Quarterly Census of Employment and Wages database provided average weekly wage data for each of the businesses located at the Pacific Sound Resources (PSR) Superfund site and Terminal 5. Average weekly wage data was identified by matching the North American Industry Classification System (NAICS) codes corresponding with each type of business with weekly wage data for corresponding businesses in King County. If not available at the county level, wage data was sought by state or national level. In cases where wage data was not available for the six-digit NAICS code, higher level (less detailed) NAICS codes were used to obtain the wage data. The Dun & Bradstreet (D&B) database provided information on the NAICS codes for-APL, Eagle Marine Services, and the International Longshore and Warehouse Union (ILWU).

To determine the annual wages (mean annual) earned from jobs generated by each of the businesses located at the PSR site and Terminal 5, the average weekly wage figure was multiplied by the number of weeks in a year (52) and by the number of jobs (employees) for each of the businesses.

Table 1: Pacific Sound Resources Site and Terminal 5 Businesses: NAICS Code and Title, Average Weekly Wage, Employees, Annual Wages and Total Annual Wage per Employee

On-site Business/Workers	NAICS Code	NAICS Title	Employees[a]	Average Weekly Wage (2011)[b]	Annual Wage (Mean Annual) per Employee	Total Annual Wages[c]
American President Lines, LTD	48311	Sea, coastal, and Great Lakes transportation	44	$1,423	$73,996	$3,255,824
Eagle Marine Services	48832	Marine cargo handling	151	$ 1,679	$87,308	$13,183,508
International Longshore and Warehouse Union (ILWU)	813930	Labor Unions and Similar Labor Organizations	247	$1,034	$53,768	$13,280,696
Total	-	-	442	-	-	$29,720,028

[a] Employee data based upon employee data provided in an interview/email communication on December 4, 2012, with the Port of Seattle. The assumptions and calculations used to determine the final employee figures used here are detailed in the table below.
[b] Average weekly wage per employee based upon BLS Average Weekly Wage data.
[c] Total annual wage figures derived by multiplying "Employees" by "Annual Wage (Mean Annual) per Employee."

Table 2: Pacific Sound Resources Site and Terminal 5 Businesses: Employee Estimates

On-site Business/Workers	Daytime employees (active day)[d]	Nighttime employees - Shift 1 (active day)[e]	Nighttime employees - Shift 2 (active day)[f]	Total night and day employees (active day)[f]	Total night and day employees (low volume day)[g]	Total daytime and nighttime employees (average between active and low volume day)[h]
American President Lines, LTD (APL)[a,b,c]	25	19	19	63	25	44
Eagle Marine Services	85	65	65	215	86	151
International Longshore and Warehouse Union (ILWU)	140	106	106	352	141	247
Total	250	190	190	630	252	442

[a] The Port of Seattle indicated that for a day shift, with cargo vessels and intermodal rail yard operations underway, there are approximately 25-30 APL employees, 85-90 Eagle Marine Services employees and 140-150 ILWU workers working at Terminal 5.

[b] The Port of Seattle indicated there are three shifts per day depending on vessel and intermodal operations.

[c] An active day has 250-270 people working, with two night shifts of 190 to 200 people each. There would be about 60 percent less employees working on a low volume day.

[d] The employee figures here represent the conservative estimate for day shift employees for an active day provided by the Port of Seattle.

[e] Figures calculated by multiplying the total number of day shift employees working (active day) by 76 percent – the percentage of workers that work the night shift in comparison with the day shift workers, assuming an active day.

[f] Figures calculated by adding total day shift employees (active day) with total night shift employees (Shift 1 and Shift 2) (active day).

[g] Figures calculated by multiplying the total number of night and day shift employees that work at the terminal (active day) by 60 percent, which represents the approximate workforce needed on a low volume day, then subtracting this figure from the total number of night and day shift employees (active day).

[h] Figures calculated by adding the total number of day and night shift employees (active day) to the total number of day and night shift employees (low volume day) and dividing by two.

Positive Impacts: Local Tax Revenues Generated from Property Taxes

Property records accessible through King County Parcel Viewer: Interactive Property Research Tool (http://www.kingcounty.gov/operations/GIS/PropResearch/ParcelViewer.aspx) provided data on the most recently assessed values and taxes for property parcels at the Pacific Sound Resources site and Terminal 5 in January 2013.

Table 3. Appraised Value (2000 and 2012) for Pacific Sound Resources Site and Terminal 5 Parcels

Parcel ID No.	Property Name	Taxpayer Name	Appraised Value (2000) ($) (Valued in 1999)	Appraised Value (2013) ($) (Valued in 2012)[b]
7666704010	PORT OF SEATTLE	PORT OF SEATTLE	$23,407,800	$17,421,700
7666705000	PORT OF SEATTLE-APL	PORT OF SEATTLE	$230,500	$1,197,200
7666705020	PORT OF SEATTLE	PORT OF SEATTLE	$320,000	$629,600
7666705022	PORT OF SEATTLE	PORT OF SEATTLE	$298,500	$859,200
7666705045	AMERICAN PRESIDENT LINES	PORT OF SEATTLE	$2,305,600	$7,365,400
7666705200	VACANT PORT - TERMINAL 5	PORT OF SEATTLE	$6,550,900	$8,844,700
7666705209	PORT - TERMINAL 5	PORT OF SEATTLE	$1,229,900	$2,321,300
7666705340	PORT OF SEATTLE-TERMINAL #5 / JACK BLOCK PARK	PORT OF SEATTLE	$10,207,500	$9,789,400
7666705565	PORT TERM 5 - A.P.L. -WEST	PORT OF SEATTLE	$129,038,700	$157,953,100
7666706430	NORTHERN PART OF APL TERMINAL 5	PORT OF SEATTLE	$4,703,800	$53,412,900
7666705350	PORT - TERMINAL 5	PORT OF SEATTLE	NOT AVAILABLE	$6,684,200[a]
7666706435	PORT OF SEATTLE	PORT OF SEATTLE	NOT AVAILABLE	$1,093,600[a]
Total		-	$178,293,200	$259,794,500

Parcels identified by comparing area of Terminal 5 as shown on Port of Seattle Terminal map (http://www.portseattle.org/Cargo/SeaCargo/Facilities/Container-Terminals/Documents/HalfHarborPage.pdf) with area shown in King County Parcel Viewer.

Right-of-way parcels as well as properties near the terminal owned by the Washington State Department of Natural Resources are excluded.

[a] Figure not included in total because estimates were not available for 2000.

[b] Although the Port of Seattle, as a local government entity, is exempt from paying property taxes, this increase in value has likely increased the property values of nearby private properties, resulting in increased property tax revenues for local governments.