Community Action for a Renewed Environment (CARE) Level I
Grantee Final Report

Grantee:	Clean Air Council
Project location:	Philadelphia, PA
Project title:	Identifying Strategies to Reduce Pollution from Philadelphia Ports: A Stakeholder Process
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Project Manager:	Joseph Otis Minott, Esq.
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I. Your Partnership

Introduction

Clean Air Council, with the help of a diverse group of stakeholders, has successfully completed the first two phases of the Community Action for a Renewed Environment (CARE) Process: 1. creating a broad-based stakeholders group and 2. identifying pollution problems at the Philadelphia ports and developing a hierarchy of solutions to address the pollution.

The greater Philadelphia Port system is not isolated to a specific area, but instead stretches for several miles along the Delaware River. One of the first goals of this project was to identify one or more "port communities" affected, both positively and negatively, by activity at the port. A "port community" not only includes the residents of neighborhoods nearest port activity, but also port employees (labor), port operators (management), land owners, maritime industry leaders, small businesses, government regulators and elected officials. Clean Air Council, with stakeholder input, chose Packer Marine Terminal and Tioga Marine Terminal and the surrounding neighborhoods as the focus for initial outreach on the CARE project.

Port facilities pose particular health problems for residents of Southeast Philadelphia. Port activities generate significant air emissions from ships, locomotives, and trucks coming in and out of facilities, as well as from onsite operations such as the use of cargo handling equipment. Indeed, their diesel machinery makes ports the largest unregulated source of particulate pollution in the greater Philadelphia area (*Estimated PM Emissions from Port Operations in the Philadelphia Area*, U.S. EPA, 2005). Meanwhile, older housing stock and comparative lack of ground cover (National Land Cover Data 1992) not only discourage newcomers to the neighborhood, but create a convergence of conditions that contribute to well-documented respiratory problems for current residents. [1] The neighborhood faces other challenges as well. 36% of the children residing in the area most impacted by the port live in poverty. According to data from Medically Underserved Area Populations of the U.S. Department of Health and Human Services, significant sections of the neighborhood are also underserved by healthcare providers. As area port facilities follow the projected growth trends, and expand to accommodate even greater cargo

[1] "Population Profile of Southeast Philadelphia," prepared by Philadelphia Health Management Corporation (PHMC), July 2006 p.2. *Assessment of Air Emissions and Impacts at Philadelphia-Area Ports*, Port Subcommittee Report 2006, p. 22. While the PHMC report found youth asthma rates of 14.4% in Southeast Philadelphia, i.e., lower than the citywide average, the report also notes that the survey size of 14 households "may not be a representative sample." Surveys conducted for the Port Subcommittee report on Air suggest a much higher incidence of asthma rates in children and adults in Southeast Philadelphia and a high level of concern.

volumes, they will increasingly impact the surrounding communities' health, welfare and quality of life.

Initially formed as the Port Subcommittee of the Philadelphia Diesel Difference Working Group -- a well-established stakeholder group focusing specifically on local diesel emission reduction projects -- the Council's CARE stakeholder group eventually evolved into the more appropriate Port Environmental Task Force (PETF). Clean Air Council worked to create a stakeholder-driven process that would include some members of current Philadelphia Diesel Difference Working Group and a new group of "target stakeholders" including the port authority, terminal operators, unions, small businesses, community advocates and environmental advocates.

With the focus on Port activities, the PETF joined together to identify environmental concerns in the communities around Packer and Tioga Marine Terminals. After a series of mailings to community groups and civic associations, follow up phone calls and meetings, United Communities of Southeast Philadelphia (UCSEP) emerged as the key community partner on the PETF. Located at 8th & Snyder in the Houston Community Center, UCSEP serves the southeast area of Philadelphia near Packer Terminal (Greenwich Terminals), Philadelphia's busiest port terminal.

A few demographic details regarding this neighborhood provide additional context. First, Southeast Philadelphia has a population of 49,815 adults and children (US Census 2002). It is a neighborhood rich in racial, ethnic, and cultural diversity, but also encumbered with significant educational, economic, and quality of life challenges. According to census data, the percentage of youth ages 12-18 in Southeast Philadelphia (9.5%) is similar to the percentage citywide (10%). The gender distribution of youth is split evenly among males (50.4%) and females (49.6%), representing 2,389 males and 2,344 females. The youth population in Southeast Philadelphia is among the City's most racially and ethnically diverse. Nearly 43% are white, 24.2% are black, and 25.5% are Asian. The percentage of youth speaking a language other than English at home is 22.3%.

A number of other community groups were approached in the hope that they would join the stakeholders process and eventually co-lead the PETF with the Council. For the most part the active neighborhood leaders in the communities near the ports are overwhelmed with higher priority issues such as drug abuse, crime, and rapidly deteriorating housing stock. While supportive of the program they simply lacked the resources to participate in a stakeholder process and/or did not see emissions from the ports as having the urgency of other issues facing the neighborhoods. A study conducted for US EPA Region III in 2005 concluded that Philadelphia area ports are among the largest contributors to particulate matter in the region. Even with limited resources some neighborhood groups were eager to help doing some outreach around particulate pollution and asthma. Another major obstacle the PETF encountered early in the project was the proposal to build two large casinos along the Delaware River. The threat of new waterfront casinos in Philadelphia emerged during the Council's CARE outreach, galvanized and divided a number of waterfront neighborhoods, thereby distracting community leaders and activists from the ongoing environmental health impact of a continually growing port activity.

Activity at Packer Terminal increased 40% from 2004 to 2005 and rapid growth is predicted to continue at all Philadelphia port facilities. The need to address the environmental impact of port activities has been addressed by a number of port communities throughout the world, but little was happening at the Philadelphia ports prior to the formation of the PETF. The need for a stakeholder-driven effort was obvious and the PETF quickly developed its "to-do" list. Some of the biggest environmental problems facing the port communities near Packer and Tioga included diesel emissions, neighborhood asthma rates in port communities, stormwater runoff, riverfront development and port expansion.

Stakeholder Input

Clean Air Council created a stakeholder-driven process that included some members of Philadelphia Diesel Difference and a new group of "target stakeholders" including the port authority, terminal operators, unions, small businesses, community advocates and environmental advocates.

a. *What environmental problems does your community face that brought people together?*

The ports are major economic drivers in the Philadelphia area. They are also a major contributor to local and regional air, water, and land pollution. The PETF quickly identified diesel emissions, storm water runoff, and high asthma rates in the local neighborhoods as highest priorities. Fortunately the broad representation of interests on the PETF made it easy to develop creative ways to address these three priorities. One of the main criteria in selecting which environmental issue to address first was the impact on the local neighborhoods and the willingness of port operators to voluntarily adopt the pollution lowering measures.

b. *How many individuals and their organizational affiliations were involved?*

The following individuals and organizations have been involved with the work of the Port Environmental Task Force over the past two years:

First	Last	Company
Kas	Sellassie	Air Management Services—City Health Dept.
Alison	Riley	Air Management Services—City Health Department
Kirt	Flowers	Amtrak
Cynthia	McKeown	Camden Iron & Metal
Ed	Carreras	Carreras, Inc.
John	Hadalski	City of Philadelphia—City Managing Director's Office
Darlene	Heep	City of Philadelphia
Eric	Cheung	Diesel Difference—Public-Private Stakeholder Group
Sean	Jacobs	Clean Air Council—Environmental Advocacy Group
Joe	Minott	Clean Air Council—Environmental Advocacy Group
Glen	Reid	Clean Diesel Technologies
Steven	Ours	DNREC—Delaware State Environmental Agency
Ed	Duffy	Duffy Associates—Consultant to local businesses
Michael	Block	Emisstar
Emily	Bockian-Landsburg	Energy Co-op—Low Income Energy Advocates
Trish	Koman	EPA, Clean Ports USA
David	Campbell	US EPA Region 3
Bill	Johnson	Gloucester Terminal

Kurt	Ferry	Greenwich Terminals (Packer)
Jerry	Maratea	Greenwich Terminals (Packer)
Paul	Breeman	Holt Logistics Corp.
Sharon	Conrad	New Jersey Department of Environmental Protection
Peg	Hanna	New Jersey Department of Environmental Protection
Angela	Skowronek	New Jersey Department of Environmental Protection
Alice	Wright-Bailey	Pennsylvania Department of Environmental Protection
David	Burke	Pennsylvania Department of Environmental Protection
Natalie	Ignacio	Partnership for the Delaware Estuary
John	Haak	Philadelphia City Planning Commission
Janani	Narayanan	Philadelphia City Planning Commission
Brinda	Shetty	Philadelphia Clean Cities
Lisa	Magee	Philadelphia Regional Port Authority
Laureen	Boles	Philadelphia Water Department
Peggy	Adams	Port of Bucks County
Thomas	Jennings	Saul Ewing Law Firm
Bill	Ross	Sprague Energy
Guiselle	Aldrete	Starcrest Consulting Group, LLC
Jamie	Spagna	State Senator Vincent Fumo
Glen	Wrighten	United Communities of Southeast Philadelphia
Laura	Smoot	United Communities of Southeast Philadelphia
Thomas	May	Urban Engineers, Inc.
Jerry	Conrad	US Coast Guard
Perry	Pandya	US EPA Region 3

There are several other organizations which have contributed to the success of the PETF, but for various reasons have not been able to join as active members. Included in this group are:

First	Last	Company
Gary	Keefe	Argillon
Pete	Chapin	Bio-Extraction Services, Inc.
Jeremy	Newberg	Capital Access
Ed	Woods	Caterpillar
Jon	Edelstein	City of Philadelphia Brownfield Redevelopment
Kathleen	Murray	Council President Anna Verna
Brian	Abernathy	Councilman Frank DiCicco—City Council Representative
William	Goetz	CSX Rail
Kevin	Benson	Cummins Power Systems
Thomas	Fikslin	Delaware River Basin Commission—Regional Regulatory Agency
John	Yagecic	Delaware River Basin Commission
Linda	Hayes	Delaware River Port Authority
Roger	Youngren	Delaware River Stevedores
Maya	Van Rossum	Delaware Riverkeeper Network
Fred	Stine	Delaware Riverkeeper Network
Fred	Schmidt	Donaldson Company, Inc.
Kendall	Miller	DVRPC—Regional Planning Agency
Peter	Ortenburg	Engine Control Systems Ltd.
Bill	Jones	EPA Region 3
Ray	Heinzelman	Gahagan & Bryant Associates
Fran	Welsh	Greenwich Terminals
David	Whene	Greenwich Terminals

Leo	Holt	Holt Logistics Corp.
Tim	Brown	Horizon Stevedoring
Shelly	Warren	Howland Group
Sabina	Strautman	IKEA
Jim	Lyons	JH Stevedoring
Brett	Alkins	Johnson Matthey
Susan	Stephenson	MARAMA
Susan	Wierman	MARAMA
Dennis	Rochford	Maritime Exchange
John	Gazzola	Moran Towing Corp.
Simeon	Hahn	NOAA
John	Pedrick	PA Fish and Boat Commission
William	Keller	PA State House Representative—State Representative
Kathy	Klein	Partnership for the Delaware Estuary
Robert	Gorgone	Philadelphia Industrial Development Corporation
John	Cuff	Pilots' Association for the Bay & River Delaware
Ward	Guilday	Pilots' Association for the Bay & River Delaware
Kate	McNamara	Port of Philadelphia & Camden
Sue	Coffey	Port of Tacoma, NJ office
Randall	Horne	Port of Wilmington
Phyllis	Shivone	Ports of the Delaware River Marine Trade Association
Dimitrievski	Larry	PUREM North America, LLC
Sarah	Whitney	Sea Grant
James	VonDreele	Seaman's Church Institute of Philadelphia & South Jersey
Hank	D'Andrea	South Jersey Port Corporation
Shawn	Jalosinski	Sports Complex Special Services District
Steven	Levy	Sprague Energy
Doug	Dillon	Tri-State Marine Safety Association
Corbett	Jim	University of Delaware, College of Marine and Earth Studies
Edward	Thomas	US Dept. Housing & Urban Development
Michael	O'Connor	Weeks Marine
John	Pauling	Weston Solutions
Edward	Hicks	Weston Solutions

c. Did this project bring any new partners into your work? How did the new partners aid the partnership and project?

During the months in which the Port Environmental Task Force met, new partners offered innovative ideas and a fresh perspective. Civic associations were the primary target of PETF's outreach and were approached through mail invitations, follow-up phone calls, one-on-one meetings with community leaders and a series of presentations to civic groups, senior centers, and after-school programs.

New partners contributed greatly to the work of the PETF. In each quarterly report, the Council listed and explained new partner participation. Here is a brief summary of activity of key new partners:

Mariners Advisory Committee (MAC)

John Cuff, President of the MAC and Board member of the Philadelphia Regional Port Authority, met PETF members Sean Jacobs and Ed Carreras over lunch to discuss the project and ask for advice on how to proceed. He extended an invitation for the Council to speak at the December 2005 MAC meeting. Mr. Cuff also spoke on behalf of the "port community" at an EPA press event on November 7, 2005 announcing the start of the Council's new project with port operators and nearby communities. The MAC is comprised of Master Mariners and River Pilots, and concerns itself with safety and navigation, with particular regard to large ocean-going vessels. Formed in 1964, the MAC works closely with the U.S. Coast Guard regarding appropriate drafts and the safe and environmentally sound operation of its river and bay. As a result of this committee's efforts, the Delaware River ports have a history of more than 40 years of operating in a navigationally safe manner.

Philadelphia Regional Port Authority (PRPA)

Lisa Magee has represented PRPA at PETF meetings since its inception in 2005. She was the first official "voice" of the port community on the PETF. At first hesitant, Ms. Magee has opened up and offered constructive criticism and advice at PETF meetings. She assisted in editing the Water, Land and Air Reports of the PETF. She also increased PRPA support of the project by offering letters of support for new grant proposals supporting the goals and priorities of the PETF. PRPA is an independent agency of the Commonwealth of Pennsylvania charged with the management, maintenance, marketing, and promotion of the public port facilities along the Delaware River in Philadelphia, as well as protecting maritime-industrial activity in the port district. PRPA was created by an act of the Pennsylvania legislature in 1989. PRPA works with its terminal operators to modernize and improve its facilities on a regular basis, and to market those facilities to current and prospective port users.

City of Philadelphia (by City Department):

Air Management Services (AMS)
Morris Fine, Division Chief, is an experienced air pollution engineer. AMS is a division of the City of Philadelphia Department of Public Health. Alison Riley, is part of AMS Technical staff. Both Mr. Fine and Ms. Riley were active participants in the PETF and were invaluable in helping to prioritize air issues at the port. .

Philadelphia Water Department (PWD)
Sean Jacobs and Joe Minott met with John Hadalski and Laureen Boles in January 2006. Together, PWD and the Council reviewed the initial list of primary water pollution concerns from port operations. The water issues identified at the meeting included: bilge water, metal scraping/barnacle removal, storm water runoff, accidental releases from floods/fires and fumigation/pesticides/fertilizers. PWD does not issue permits or actively regulate water quality in and around the ports in Philadelphia. They suggested some groups that would be good to approach regarding water issues, as well as South Philadelphia community contacts.

John Hadalski, a long-time environmental advocate and city employee, was instrumental in connecting Clean Air Council with potential PETF members. He also helped indentify several brownfields sites that would eventually utilize the allocated CARE Targeted

Brownfields Assessment funds of $50,000 to jump-start the development of a Greenway in the Tioga port community along the Frankford Creek.

Department of Commerce
John Edelstein, Manager of Brownfield Redevelopment, City of Philadelphia Commerce Department met with the Council in January 2006. The meeting focused on the Targeted Brownfields Assessment (TBA) funds available through CARE. His expertise was more around the Tioga Terminal area, not South Philadelphia nearest Packer Terminal. He did however offer the Council some leads and suggestions on using these funds. Later in the project, Mr. Edelstein offered feedback on the PETF Land Report.

Philadelphia City Planning Commission (PCPC)
John Haak and Janani Narayanan each participated in PETF stakeholder discussions on behalf of the PCPC. Their insight and expertise during the project was extremely helpful. They offered extensive constructive criticism on the PETF Land Report. Having their feedback over the past two years has given the PETF more credibility.

US Coast Guard (USCG)
Jerry Conrad, Security Specialist & Environmental Planner, attended the December 2005 meeting of the PETF. He represents USCG on several committees and introduced the PETF to some key players at the Coast Guard's Area Committee, an emergency response stakeholder group focused mainly on oil spill prevention and clean-up. Sean Jacobs has attended and networked at three of the Area Committee quarterly meetings since early 2006. This has led to new contacts and support for the PETF.

Greenwich Terminals (Packer Marine Terminal)
Greenwich is the largest port facility in Philadelphia. Robert Kermon, Director of Safety and Loss Control, attended the second PETF meeting in December 2005. (He retired shortly after this meeting and was later replaced by Captain William Sammons.) Mr. Kermon was the first representative from a port facility to join in the PETF process. He was instrumental in securing Packer's involvement by engaging upper management with the work of the PETF. By early 2006, the Council received a verbal commitment from Packer to address pollution concerns and participate in the PETF stakeholder process. In May 2006, Packer sent two officials to the PETF Workshop, Kurt Ferry and David Whene. In July 2006, Packer agreed to participate in a National Clean Diesel Campaign-funded diesel retrofit demonstration using their cargo-handling equipment. They continued to attend PETF meetings through this project.

Holt Logistics Corp.
Holt Logistics Corp. is the parent company and operator of Greenwich Terminals (Packer) in Philadelphia and Gloucester Terminal in Camden, New Jersey on the opposite side of Delaware River. Leo Holt, President of Holt Logistics Corp., offered the keynote address at the May 2006 Mid-Atlantic Clean Ports Workshop. He also joined as a top event sponsor. Mr. Holt's involvement in the process offered the PETF more credibility. He is well known throughout the world as a leader in the Philadelphia port community. His keynote speech at the workshop offered a glimpse of increased activity at Packer and plans for port expansion to the southeast corner of Philadelphia.

United Communities of Southeast Philadelphia (UCSEP)

UCSEP was particularly helpful in connecting residents of Southeast Philadelphia to the work of the stakeholders. The PETF's community outreach culminated in an Environmental Forum in the Packer port terminal neighborhood. Hosted by UCSEP at the Houston Center, an active community and social services center in the heart of the port community, and billed as the "South Philadelphia Environmental Forum," the meeting brought together over 40 local residents, young and old, of almost every walk of life, to discuss the most pressing environmental concerns in the neighborhood.

Delaware River Stevedores (DRS, Tioga Marine Terminal)
Shortly after receiving official commitment from Packer, the Council was invited to meet with Roger Youngren, Vice President at DRS. As operator of Tioga Marine Terminal, the second-largest port terminal in Philadelphia, Mr. Youngren was assigned as liaison to the PETF. He attended the May 2006 Workshop and allowed the Council access to Tioga. He quickly agreed to participate in the National Clean Diesel Campaign-funded diesel retrofit demonstration and signed a pledge form in August 2006. Due to a lack of resources and staff time, they have not attended stakeholder meetings, but have been very supportive of the PETF.

Urban Engineers
Thomas May, Project Manager at Urban Engineers, has extensive expertise in the areas of emission reduction, environmental planning and EMS development with port terminals across the country. His presence at stakeholder meetings and feedback on the Air, Land and Water Reports was invaluable.

Seafarer's Union (SU)
The Council met with Joe Mieluchowski, President of the Philadelphia chapter. The SU represents workers assigned to American-flagged ships. Mr. Mieluchowski had a good working knowledge of the fuel usage and environmental health conditions on large container ships. He explained how the SU is structured and the general union presence in the Philadelphia-area port industry. He offered contacts for the International Longshoremen Association which represents local port terminal employees, many of which live in Southeast Philadelphia.

d. What role did your organization play in this partnership? What skills were most important from your organization to implement the project?

The Council acted as the project's planner, coordinator and facilitator. The Council also managed the stakeholder process. The Council initially focused on expanding the role and quality of the work of the PETF. Working with the PETF, the Council reached out to other potential stakeholders, coordinated PETF meetings, and acted as staff for projects identified by the stakeholders. Overall the Council was the project's primary representative when meeting with port officials, elected officials and community members. The Council developed and staffed the community outreach component of the project. The Council acted as the main driver in helping the PETF stakeholders reach consensus on the goal of reducing the environmental impact of port activities on nearby communities and habitats in the Philadelphia area.

The key skill for this project was patience while the stakeholders coalesced into an effective working group. In addition, the Council is experienced in translating technical information into clear engaging English and that was important in communicating the work of the PETF to community members. The Council also spent much of its time networking with various port and

community entities to seek common ground. Another important skill was being well organized in order to facilitate effective meetings and being persistent in order to keep the process moving forward.

e. Which partners were most active? How?
f. What resources and strengths did each organization bring to the project?

United Communities of Southeast Philadelphia (UCSEP) – Houston Center
UCSEP was the key connection between residents and the work of the stakeholders. In the early spring of 2006, Alice Wright Bailey, Community Environmental Advocate with the Pennsylvania Department of Environmental Protection and active PETF stakeholder, was approached by UCSEP's Laura Smoot to connect with environmental campaigns in the city. Ms. Bailey immediately connected Ms. Smoot with the Council's Sean Jacobs and the work of the PETF. From his first interaction with Ms. Smoot in May 2006, the Council was convinced this would be the perfect connection to the south Philadelphia port community. Several project highlights came out of this initial meeting:

Youth Leadership Council
With an energized staff and a willingness to work together, UCSEP was very creative in finding overlap between the PETF and existing programs at the Houston Center. Mr. Jacobs gave an initial presentation to the Youth Leadership Council (YLC) on environmental issues facing Southeast Philadelphia, including the port. He solicited feedback from the students, which was reported back to the PETF. UCSEP hosted the August 2006 PETF stakeholder meeting, creating the first official meeting of port officials and community leaders. In late 2006, the Council partnered with the YLC on a program, *Our Port Neighbors & Our Environment in Southeast Philadelphia,* aimed at connecting students with environmental issues and port activity affecting Southeast Philadelphia, with a focus on stormwater management.

In April 2007, YLC Director Laura Smoot, eight members of the YLC and Sean Jacobs of the Council, received a two-hour guided tour of Packer Marine Terminal, Philadelphia's largest port facility. Two officials at Packer Marine Terminal led the group in two separate vehicles. The students took pictures and asked many questions. During this experience, the students received a rare glimpse of a full scale port terminal on a busy work day. The tour helped to reinforce the lessons learned during the community forum and after-school presentation. By the end of the tour, the students were excited with new information and knowledge.

As a result of the presentation and visit to the port, the YLC gathered ideas and expertise to develop an urban stormwater runoff project during the spring and summer of 2007. The youth identified urban gardening and increased green space as an effective method for managing excess stormwater runoff in an urban environment. To get the project started, the YLC teamed up with other local youths, the Council, community activists and the Philly Orchard Project, a grassroots organization dedicated to increasing fruit tree cover in Philadelphia. An abandoned lot just north of the Houston Center on 8th street was identified as the site for implementation of the YLC Urban Stormwater Runoff Project. During this final project phase, incredible progress was made to transform this space into a beautiful, green garden and open space. The YLC is in the process of

ensuring long-term funding for this space to remain undeveloped and open for stormwater retention. It is the students' hope that other neighborhoods will take their lead and begin similar projects.

South Philadelphia Environmental Forum

UCSEP teamed up with the Council to host the South Philadelphia Environmental Forum in February 2007. This was a unique moment for the project. Over 40 community residents, including roughly 10 members of the YLC, joined together to identify environmental concerns and offer suggestions for improvement. The event was the perfect opportunity for the Council to understand the scope and level of interest in environmental issues of residents in southeast Philadelphia. Stormwater runoff and its effects came up several times during at the meeting, both directly and indirectly. Among the issues associated with stormwater management were basement flooding, lack of green spaces and trees, abandoned lot neglect and stormwater drains clogged with trash and debris. The voice of the youth contingent in the room was energized and knowledgeable.

South Philadelphia Asthma Health Fair

Based on input from the South Philadelphia Environmental Forum, it became clear that asthma was an issue of great concern to neighborhood residents. The Council began working towards a more focused event that would connect the southeast port community with asthma information, tools and resources. The Asthma Health Fair at the United Communities Houston Center on Saturday, August 18, 2007 was a huge success. Over 50 people came out to learn more about the disease, hear from local experts, receive individualized information and make the connection between asthma triggers and asthma attacks, especially in Southeast Philadelphia. While planning the event, it was clear that there was a lack of hard data on asthma rates and triggers in Southeast Philadelphia. Based on the success of the Fair and the questions coming out of it, the Council applied for and was recently awarded new funding to increase outreach around asthma in this area. The small grant from Claneil Foundation aims to assess asthma rates in Southeast Philadelphia, identify triggers and provide real solutions for the community to reduce asthma attacks.

EPA Region III

Throughout the process EPA was involved in every aspect of the PETF's work. They attended every stakeholder meeting, community meeting, and workshop. They offered counsel to the Council throughout the process. Finally, EPA helped the PETF access members of EPA technical staff. This was important as it highlighted EPA's regulatory process in various departments in relation to port activity.

Packer Avenue Marine Terminal (Greenwich)

As Philadelphia's busiest port facility, Packer was an early target for the PETF. Since engaging early in the process by sending a representative to the PETF meeting in December 2005, Packer has remained active in stakeholder meetings. They have opened their gates to the Council and the PETF, leading various groups of people on a driving tour of the terminal, participating in both Mid Atlantic Clean Ports Workshops and acting as the primary partner on the EPA-funded diesel oxidation catalyst retrofit demonstration involving cargo-handling equipment. Their leadership and willingness to participate in the project has created a positive, forward-thinking attitude.

Tioga Marine Terminal (Delaware River Stevedores)
While Tioga has been less involved than Packer, their contribution over the past two years has also been extremely helpful. Tioga has participated in both Mid-Atlantic Clean Ports Workshops and given several tours of their terminal. They also acted as a second partner on the EPA-funded diesel oxidation catalyst retrofit demonstration involving cargo-handling equipment.

Urban Engineers
Thomas May, PETF representative from Urban Engineers, has been an extremely helpful partner, especially over the past year. His expertise and depth of knowledge on port environmental issues led stakeholders to reach consensus on priorities and shaped the work of the PETF. Mr. May volunteered many hours of his time for the good of the PETF. He brought new ideas to every stakeholder meeting he attended and always brought in new perspectives. He was able to draw on experience within Urban Engineers as many of the issues discussed within the PETF had already been addressed at other port communities around the country and the world. Mr. May offered extensive comments on the Water, Air and Land Reports of the PETF. He provided much-needed research for new grant proposals and wrote letters of support when needed. Urban Engineers is now conducting a baseline assessment of stormwater management at Philadelphia ports for the Council's 2007 outreach under a current National Fish & Wildlife Foundation grant.

Philadelphia Water Department
Laureen Boles, PETF liaison from PWD, was very helpful in researching and assessing the environmental impact of port activities as they relate to water quality. She was especially helpful in editing the PETF Water Report and pushing the Council to pursue new funding around stormwater management at the ports. She attended and actively participated in PETF stakeholder meetings since its creation. She helped identify brownfields along PWD's Frankford Creek Greenway project in the Tioga port community of Philadelphia. After a review of the PETF, these sites eventually utilized $50,000 in Targeted Brownfields Assessments, as allocated for all EPA CARE projects. She also attended both Mid-Atlantic Clean Ports Workshops and connected PWD officials with these events.

g. What efforts did you make to ensure that the most vulnerable community members were included in the partnership?

The Council and the PETF clearly understood that those most impacted by the pollution from the ports needed to be an integral part of the project. The Council sent out over 100 letters to community leaders in Philadelphia port communities along the Delaware River. These mailings were followed by several phone calls to each group leader. A handful of groups were interested in meeting and a few offered the PETF space on their respective community meeting agendas to present the project. The Council made it clear that community representatives were an important part of the process and that PETF wanted such representatives involved in any capacity they were willing to give. The Council was extremely aware that these neighborhood representatives were already overworked and overextended on issues that they identified as higher priorities such as drugs, crime, violence and casino development. Nevertheless a number of such neighborhood representatives chose to participate. Here is a summary of activity:

North of Washington Avenue Coalition (NWAC)

The Council met with Madeline Shikomba, President of NWAC. The group was originally formed to advocate for low income housing. Now that the neighborhood has started to gentrify, the group is looking to diversify their agenda. She mentioned a few projects where the group had been effective in taking a lead on a local problem. She's been personally aware and active around environmental issues for many years. Ms. Shikomba was supportive, but unable to attend PETF stakeholder meetings due to physical disabilities. She did, however, participate in the South Philadelphia Environmental Forum at the Houston Center in February 2007. As a long-time Philadelphia resident, she offered an historical perspective on community-based efforts to address environmental issues.

Jefferson Square CDC

The Council met with Jeremy Newberg, President of Capital Access and lead developer on the Jefferson Square CDC housing project in the Southeast Philadelphia port community. Gaining access to the key players behind new housing development in the port community will be especially helpful as the project matures. Mr. Newberg's insight into the future of the neighborhoods closest to the busiest port terminal in Philadelphia, Packer Marine Terminal, gave the Council a unique snapshot of where new CARE allies might be found. Mr. Newberg asked to be regularly updated on developments with the PETF . He was added to the PETF email list and remained supportive, but could not dedicate time to PETF stakeholder meetings.

South Philadelphia Right-to-Know Committee

The Council met with Mable Mallard, Founder and President of the South Philadelphia Right-to-Know Committee. Mable Mallard is a well known South Philadelphia community environmental advocate. Many people had recommended getting in touch with Ms. Mallard when they heard about the Council's outreach in the South Philadelphia community. She gave an overview of the history of her organization's campaign highlighting the health impacts of former employees and nearby residents of a once major industry in the community. While the neighborhood in concern is in an area of South Philadelphia somewhat removed from port activity, this is the best and most recent example of a community-driven response to a serious environmental health concern. She asked to be kept informed of the PETF's progress. Ms. Mallard was particularly interested in educating Philadelphia policy makers on the Precautionary Principle and seeing the City adopt such a policy in its policy making. She made a presentation to the City's Air Pollution Control Board.

JCC Senior Center of South Philadelphia

The Council met with and presented to the Jewish Community Senior Center at 6th & Porter Streets in Philadelphia. Located at 6th & Porter Streets, the Center serves over 200 seniors in the Packer community, many of which have lived there their entire lives. The oldest residents of the community are the ones who are most connected with and can easily identify some of the most pressing community-based environmental and health issues. The Center is less than a mile from Packer Marine Terminal in South Philadelphia. The meeting was a perfect opportunity for increasing community input into the Council's Port program. Senior citizens, many of whom have lived in the neighborhood their whole lives, spoke out about environmental concerns in the area. The biggest concerns were emissions from trucks and vehicles and excessive litter on the streets. The meeting also revealed a lack of knowledge about the health effects and environmental impact of nearby port activity. This was consistent with feedback from other community group discussions over the past year. As was the case with other community groups, the JCC Senior Center was supportive of the work of the PETF, but did not have the

resources to get more involved. The group's concerns were reflected in subsequent PETF stakeholder meetings and CARE quarterly reports.

Queen Village Neighbors Association
The Council met with and presented to the Queen Village Neighbors Association (QVNA), part of the community bordering the Delaware River. At the meeting of roughly 55 residents, Council staff received input on the community's environmental concerns and other priorities. QVNA is extremely concerned about and putting most of its resources towards fighting the development of casinos in their neighborhood. Impacts on air quality from increased automobile and truck traffic from the presence of a casino were raised by some residents. They wanted to be kept informed of the Council's project, but active participation on the PETF would have to wait until the casino debate is over. As of this report, casinos remain a contentious issue and top the group's priority list.

Regional Citizens Committee (RCC)
The mission of the Delaware Valley Regional Planning Commission's Regional Citizens Committee (RCC) is to provide citizen access to, and participation in, the regional planning and decision-making process. Sean Jacobs gave a 10-minute presentation to the RCC highlighting the CARE project and the vision for a diverse group of stakeholders. The audience was attentive and responsive, offering ideas and suggestions for community input. While follow-up efforts were made, a lack of interest remained among the RCC leadership to continue further involvement in the PETF.

South Philadelphia H.O.M.E.S.
A presentation and meeting took place with South Philadelphia H.O.M.E.S., a community group based in the Point Breeze section of South Philadelphia. This neighborhood is not directly adjacent to a port facility, but they did respond to the Council's mailing to South Philadelphia community groups. Sean Jacobs presented to a meeting of roughly 40 community members on the Council's CARE project. When asked what the community's environmental concerns were, responses were mixed. Among their concerns were a lack of trash cans, debris and illegal dumping in alleys and water drains, emissions from local industry and a lack of green spaces and trees. Since this group focuses mostly on affordable housing, environmental issues have largely been overlooked. There was some interest in establishing an environmental subcommittee where the residents would have an open dialogue to prioritize concerns. Due to their physical location, away from port activity, the leadership decided to not get overly involved in the PETF.

Whitman Civic Association
This Association is situated in the southeast corner of Philadelphia, just next to Packer Terminal. After a one-on-one meeting with the group's President, Bob Blackburn, the Council was invited to address the next meeting of the entire Whitman Civic Association. Mr. Blackburn is also part of management of the Philadelphia Regional Port Authority. His dual roles of community leader and port leader made him a top candidate for the PETF. Unfortunately, Mr. Blackburn rescinded his invitation to speak to the Civic Group when he was offended by the term pollution being used in connection to port activities. While the Council has maintained good ties with PRPA via Lisa Magee, the PETF has never officially gained access to the Whitman Civic Association to present its findings and ask for their more active participation.

Sports Complex Special Services District (SCSSD)

Sean Jacobs met with Shawn Jalosinski, Executive Director of SCSSD. The SCSSD represents the residential areas surrounding the Stadium complex in South Philadelphia. This district is divided into four geographic regions: Stadium, Packer Park, SPCCA (Tony Greco), Broad Street West. With an estimated 5.5 million vehicle trips per year traveling through this area, traffic and parking are the top concerns of these residents. With the possibility of casinos entering the picture, there is potential for an additional 10-11 million annual vehicle trips. Other hot button issues are the Sunoco Oil Refinery and the car-crushing facility, SPC. Mr. Jalosinski said his community leaders are preoccupied with these issues and would not consider any new campaigns or agendas at this time.

United Communities of Southeast Philadelphia – Houston Center (UCSEP)
Activities involving this group have been mentioned above.

h. What role did your EPA Project Officer play in the partnership?

Perry Pandya kept the Council up-to-date on internal EPA CARE happenings, connected the PETF with technical staff within Region III headquarters, coordinated brownfields meetings, researched community and port-related activity in other regions of the country and actively participated in PETF stakeholder meetings, workshops and community events. He was extremely helpful in bringing the project through two successful years and ensuring its long-term sustainability.

i. What barriers did your partnership experience and how did you overcome them (distrust, unequal power, control over money, differing priorities, process for reaching consensus, etc.)?

The project faced some formidable barriers: (1) the port community is a close-knit, insular community, does not welcome outside interference, and distrusts government agencies, (2) there is little history at the ports of having to consider the environmental impact of their activities, and (3) port neighborhoods are low income and struggle with a host of issues such as crime, unemployment, and proposed casinos, that they generally deem to be a greater concern than port environmental issues.

It became clear early in the process that relationship-building would be a critical component of outreach for the project. The Council participated in a number of networking events to maintain constant contact with partners in the insular port community. These events offered the Council opportunities for informal interaction with port leaders. Interactions at these events strengthened existing relationships and led to new stakeholder involvement. This helped the project move forward. A few highlights:

Attended State of the Port Address and Luncheon, October 2005
Sponsored by the World Trade Center of Greater Philadelphia, the event took place at the Philadelphia Hyatt Regency on the waterfront. Joe Minott and Sean Jacobs of the Council heard the most up-to-date happenings with both New Jersey and Pennsylvania ports. It was the first real opportunity to network with port contacts.

Ports of Philadelphia Maritime Society Crab Feast, August 2006 & 2007
The event provided the Council with unique access to all of the major players in the Philadelphia port industry community. Reinforcing the community's concerns for a cleaner, healthier port system at exclusive events like this helps elevate the urgency and momentum behind the PETF. Council staff interacted with officials at the Philadelphia Regional Port Authority, Greenwich Terminals (Packer) and others.

Spirit of the Port Award Luncheon, March 2006
This networking event with area port and marine industry leaders led to several new contacts. Information about the PETF was distributed to attendees.

Vessel Owners and Captains Association Bi-Annual Dinner, April 2006
This event took place at Philadelphia's Sheraton Society Hill. Connections were made with tug boat operators, port operators and others in the port industry from across the Mid Atlantic Region. The attendee list from the event was also acquired, allowing PETF access to a new list of maritime industry contacts.

Delaware Valley Goods Movement Task Force, April 2006
The Council worked to give this quarterly meeting a ports theme. Perry Pandya presented findings on EPA's spring 2005 study, *Estimated PM Emissions from Port Operations in the Philadelphia Area*. He also encouraged participation in the PETF. This presentation brought the project to a new level of visibility and credibility in front of a crowd of roughly 50 regional leaders, many involved in the port community. The meeting was also a great networking opportunity.

j. How has this partnership improved relationships among those involved? Please describe the working relationship that has improved the most and those that may still need work.

Members of the PETF would not normally meet together on their own to discuss environmental improvements in Philadelphia. This group is gathering around positive ideas and a cleaner, healthier port community. Relationships across the entire group improved over the course of the past two years. The working relationships that have improved the most are those with the insular port community. Developing and nurturing relationships with certain key leaders has brought the PETF to its current leadership status.

k. Has your organization engaged in a similar process to CARE in which you had a similar role? Please describe briefly.

Yes. The PETF was originally created as a subcommittee of the Philadelphia Diesel Difference (PDD) program. The greater Philadelphia area has an air pollution problem as evidenced by the measured levels of ground level ozone, fine particulate and air toxics. Because there is much evidence indicating diesel emissions as a major contributing factor to this problem, the PDD Working Group was formed to help build a coalition of diverse partners with a mutual interest in reducing air pollution from diesel engines in the greater Philadelphia area through voluntary programs and the use of innovative strategies including market-based approaches. It is anticipated that this partnership could deliver significant voluntary reductions in diesel emissions, which cause aggravation of asthma, chronic bronchitis, and lung cancer in humans.

Neighborhoods will be cleaner as public health, odors, and visibility improve, giving an improved image to the community.

l. Is there anything else about your partnership that you would like to share?

n/a

II. Your Project

Please describe your CARE project and provide copies of important materials that you developed. Please make sure that your description includes the following:

a. How did you go about identifying toxic risks and setting priorities (e.g., methods you used, data sources you used)? What were the top risks identified and why? Please provide us with your risk ranking and your priorities for action. Feel free to just attach an existing summary or final report if you have already created one.

The PETF stakeholder group met nine times between November 2005 and October 2007 (see attached minutes). Planning committees were established and met regularly leading up to the Mid-Atlantic Clean Ports Workshops in May 2006 and November 2007. In partnership with UCSEP, 2 Community meetings took place- South Philadelphia Environmental Forum in February 2007 and Asthma Health Fair in August 2007 (photos attached). Over the course of the project, the Council performed extensive research on other CARE communities, port environmental issues and organizing strategies to make the PETF an effective voice of the environmental movement in the local port community.

As information was received and organized, the Council began drafting the Air, Land and Water Reports for the review of the entire PETF stakeholder group. These reports went through a series of edits before a final version was made available to the public through The Council's website, www.cleanair.org. As of the filing of this report, the Land and Water Reports have been approved by the PETF and the Air Report is still under review by stakeholders. (Attached are the Final Water Report, Final Land Report and DRAFT Air Report.)

b. What process did your community partnership use to reach formal agreement on what toxic risks to tackle first?

The Council assembled all suggestions over the past two years, solicited final input at the October 2007 stakeholder meeting, and completed the Air, Land and Water reports which served as basis for toxic priorities list. One of the goals of the PETF was to create a prioritized list of environmental concerns relating to port activity in the Philadelphia region and potential solutions. These priorities are outlined in detail in the Air, Land and Water Reports of the PETF.

c. How did you inform the broader community of the results of the risk ranking and priority setting?

The Council's quarterly newsletters highlighted the work of the PETF multiple times. With a circulation of over 7,000, the newsletter was a great tool connecting the work of the PETF to the broader community. Press releases were distributed to announce the 1st and 2nd Mid-Atlantic

Clean Ports Workshops and the installation of EPA-funded diesel retrofits at Tioga and Packer Terminals. The "Green Ports" website was created to allow the broader community to see the work of the PETF. PETF Reports, environmental resources and a list of PETF stakeholders are just a few examples of what can be found at www.cleanair.org/greenports. Since the start of the project, a PETF email list was created. This includes active and passive stakeholders, as well as individuals or organizations encountered over the past two years that expressed any interest in the work of the PETF. This list has been used to schedule stakeholder meetings, make general announcements and distribute relevant information. Elected officials representing those areas within the boundaries of the Philadelphia Port System were approached through a series of meetings in the spring of 2006. These meetings were crucial to earn the "blessing" of the elected officials and their staff. As outlined above, community organizations and civic associations were approached to solicit feedback and inform them of the work of the PETF. The Council also has a community outreach staff which goes door-to-door promoting the work of the Council. The port project was part of their outreach in Philadelphia neighborhoods.

d. How far did you get in planning your pollution reduction strategies?

The Council produced reports on air, water and land pollution at the Philadelphia ports. The reports were created to set priorities for pollution reduction projects. The following pollution reduction projects have already been started:

- Implemented Targeted Brownfields Assessment on Frankford Creek near Tioga
- Implemented Diesel Retrofit Technologies at Packer and Tioga terminals
- Began outreach on stormwater management
- Began Environmental Management System research

e. To what degree did your project raise awareness and build support for action?

The Green Ports program of the Council and the work of the PETF has gained regional, national and even international recognition. It is a model for leveraging community and other stakeholder support to engage port operators in environmental planning. The number of people attending the Mid-Atlantic Clean Ports Workshops (May 2006, November 2007), the South Philadelphia Environmental Forum and the Asthma Health Fair are evidence of the need and success of the project. Sean Jacobs is speaking about the program at the GreenPort 2008 Conference in Amsterdam in February 2008.

f. How did you build momentum over the course of your project? Did you secure any "early wins" to help build momentum? Did you look for additional funding early on? What was acquired?

Initial outreach was supported by growing international and national urgency within the port industry to reduce its environmental footprint. The most notable "early win" was the willingness of Packer and Tioga terminals to install diesel oxidation catalysts to reduce diesel emissions from their operations. Another "early win" was the tremendously successful and first-ever Mid Atlantic Clean Ports Workshop in May 2006. Additional funding was secured for the project within the first year. In December 2006, the Council was awarded a grant from The National Fish & Wildlife Foundation to work with Philadelphia-area port operators on improved stormwater management. As a result, the Council was able to host a 2nd Mid Atlantic Clean Ports Workshop and accelerate the work of the PETF. This funding was matched by a grant

from the Coastal Zone Management program administered by the Delaware Valley Regional Planning Commission. Additionally, the Council was awarded a mini-grant from the Environmental Fund of Pennsylvania: *Our Port Neighbors & Our Environment in Southeast Philadelphia.* This expanded the work of the PETF into an active Youth Leadership Council at the Houston Center in the port community of Southeast Philadelphia.

g. What technical resources (e.g., data sources, modeling or mapping tools, programs, or approaches) were important to support local decisions? Where did you turn for help?

The initial EPA Region III report, *Estimated PM Emissions from Port Operations in the Philadelphia Area* (U.S. EPA, 2005), provided the data detailing the environmental impact of port activities. This information combined with the expertise of stakeholders like Urban Engineers and community activists at United Communities of Southeast Philadelphia, created a decision-making process aimed at common goals through the PETF.

h. What were the significant outputs of your project (meetings held, materials developed, people trained, etc.)?

The most significant project outputs were:

- 1st Annual Mid Atlantic Clean Ports Workshop: Air Quality & Diesel Emissions
- 2nd Annual Mid Atlantic Clean Ports Workshop: Water Quality & Stormwater Management
- PETF stakeholder meetings
- South Philadelphia Environmental Forum
- South Philadelphia Community Asthma Health Fair
- Port environmental resource center
- Air, Land and Water Reports

i. What were your project's most significant outcomes (changes in knowledge, behavior, and practice, e.g., reached consensus on priority toxics, number and type of partners you were aiming to bring to the table and were successful at bringing to the table, "early win" environmental results from cleanups, collections, etc.)

The most significant project outcomes were:

- Consensus on priorities of PETF (reports, recommendations)
- Positive change in attitude around environmental issues at local ports
- Positive change in attitude at PRPA
- Developed relationship with terminal operators and the port community
- Increased involvement of State Representative Bill Keller
- New ports attending 2nd Annual Mid-Atlantic Clean Ports Workshop

j. What specific reductions in environmental risks, if any, did your project achieve?

The diesel retrofit installation at Packer and Tioga Terminals resulted in a reduction of emissions on 83 pieces of cargo-handling equipment. The EPA on-road verification for these diesel oxidation catalysts is a 20% reduction in PM, a 40% reduction in CO and a 50% reduction in HC.

k. *Were there differences between your original plan and what actually occurred in your project? Did you achieve your objectives? Please explain. What objectives were not met and why?*

There were a few differences in the project. The first has to do with the definition of "community." The Council's project assumed a definition of community which included port operators and decision-makers within the port community. Once outreach for the project had begun, EPA CARE staff approached the Council about this. They had a much more narrow definition of "community." Secondly, the Council's project was notably different from other CARE projects awarded in 2005. This was apparent at the annual CARE retreat in November 2006 where each project presented on their progress. Lastly, the project shifted from a focus on the Tioga community with El Concilio to the Packer community with UCSEP. The Council originally planned on working exclusively in the Tioga port community, however shifted its focus to Southeast Philadelphia after a few stakeholder meetings and increased involvement of UCSEP.

l. *What other resources (not already covered in your discussion of your partnership above) did your project mobilize, both financial and in kind?*

Additional funding mobilized as a result of the Council's port project included the Environmental Fund of Pennsylvania mini-grant program (youth outreach), National Fish & Wildlife Foundation (stormwater management), Coastal Zone Management (stormwater management), Mid-Atlantic Clean Ports workshop sponsors and Claneil Foundation (asthma outreach). Additionally, the Council is waiting to hear back on two funding proposals as of the filing of this report. The first is an EPA emissions inventory of port activity in Philadelphia. The second is a new Coastal Zone Management proposal aimed at promoting Environmental Management Systems to local port operators.

The in-kind resources for the project included workshop speakers from environmental offices at other ports, input/attendance of stakeholders in the process, Cummins labor on retrofit installation, YLC at Houston Center and brownfields funding supplemented by additional EPA Region III funds.

III. Reflection

a. *How likely is it that the progress achieved could have been made without your CARE partnership?*

Of all the questions raised in this report – this is the easiest. The project would not have materialized without a CARE partnership. The Council and PETF were fortunate that a relatively small CARE Grant investment in 2005 has already achieved so much.

b. *What do you consider your project's greatest achievement?*

The greatest achievement of the Council's CARE project was the formation of the Port Environmental Task Force and its establishment as a highly respected voice for the need to protect workers, neighborhoods, habitats and the natural environment closest to port activities in

the Philadelphia area. The credibility and diversity of the stakeholder process allowed for ambitious but realistic goals for improving the port's environmental footprint.

c. *What was your greatest challenge and how did you deal with it?*

The greatest challenge was getting buy-in from the port facilities and owners for the goals of the project. Port operators are a close knit community that is not trustful of government. The result is that environmentally the ports have been largely ignored. It took a great of patience, ability to listen and attending many many meetings before port operators started to trust the process and to commit to working to address some of the PETF's priorities.

d. *What would you do differently next time in terms of organizing and structuring your partnership to achieve your project objectives?*

Lack of financial resources made it difficult to subsidize neighborhood leaders who wanted, but did not have the ability to participate in a slow stakeholder process. Rather than spending quite so much time and resources in developing reports on water, land and air pollution from the port, the Council would have spent more time in providing resources to a handful of neighborhood leaders to participate in the stakeholder process.

e. *How might you have been more strategic in designing or implementing your project?*

The Council did not realize how insular the port community was or how resistant the operators would be to outside influences. Fortunately, patience and persistence allowed the project to move forward.

f. *If you chose to create one, did you find using a logic model or other goal-driven model helpful? Please explain. Did the model change over time? If so, how?*

n/a

g. *To what extend did your CARE community communicate or engage with other CARE communities and how was that interaction helpful?*

There was not much interaction. Addressing pollution at the ports was a new and fairly unique program.

h. *Did media coverage play a role in your project? If so, please explain.*

Somewhat. In reaching out to port operators it was helpful to promise them some earned media recognition if they implemented certain pollution reduction programs. Press releases were also sent out for workshops and community events.

i. *In what ways did you rely on EPA for assistance (assessing risks in your community, conflict resolution, partnership support, voluntary programs, such as Tools for Schools or Pollution Prevention)?*

EPA was very helpful connecting the project with technical staff within the Region III office and researching what environmental initiatives were taking place at other ports in the US. They also had a supportive presence at each stakeholder and community meeting.

j. What role did your Project Officer and other EPA staff play in your work? What would you have liked more of or less of?

EPA staff was very helpful throughout the process. Not only did they actively participate in the stakeholder process, but they also helped review the reports on air, water and land pollution from the ports. It was also helpful to talk to EPA staff about different approaches to address port pollution issues.

k. To what extent do you think that this project increased the capacity of your organization? Your partnership? Your community? Please provide examples.

The Council had the opportunity to work with many new partners on this project. Partnerships formed during this process will enhance the Council's statewide ability to address pollution from diverse sources. Already a number of the stakeholders are looking to work together to address asthma levels in South Philadelphia. The Council is also working with some of its stakeholder partners to address pollution at other ports in the Mid-Atlantic.

l. Did your project produce any new "community leaders?" Please describe.

Yes. By defining community broadly to include the port operators, workers, residents of nearby communities, small businesses, and environmental advocates, a number of new community leaders emerged throughout the project. The most significant were UCSEP's Youth Leadership Council and Packer Terminal. The YLC stepped into a new role as environmental advocates for the community and Packer became the first port to actively participate in environmental discussions at the first meeting of the PETF in November 2005. Today, both groups are leaders in their respective roles on the PETF.

m. What advice would you offer to other communities undertaking similar work?

Be patient. Be open in the process used for setting priorities. Be realistic in what you ask operators to voluntarily take on in terms of initial emission reduction projects.

IV. What Next?

a. *Will members of your partnership continue to work on these issues?*

Yes, the Port Environmental Task Force is well established and is working hard to get continuing funding for this important project of reducing the environmental footprint of port activities on local habitats and nearby neighborhoods.

b. *How will this work be sustained?*

The PETF will apply for a CARE Level II grant. Other potential funders include the National Fish & Wildlife Foundation, Coastal Zone Management, Claneil Foundation and the William Penn Foundation.

c. *If neither your organization nor the members of the partnership plan to continue the work, please describe why.*

n/a

d. *Please describe a continuing or next source of funding you have for your work or other groups in your community that have continued the work and have found funding.*

See Above.

V. Feedback and Follow up

a. *Please share any thoughts you have about what EPA could do to improve the CARE program.*

n/a

b. *We want to keep in touch and learn about the work that you do after your grant with CARE. Would it be okay for someone from the headquarters CARE team to contact you in the future to talk about how your work is progressing? Are there others we should contact instead of or in addition to you? If so, please provide their contact information.*

Yes

c. *Would you be willing to be interviewed for a more in depth case study?*

Yes. Contact should be:
Sean Jacobs
Project Coordinator
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215-567-4004 x102
sjacobs@cleanair.org

Land Use at the Philadelphia Port:

Environmental Issues and Concerns

A report for the Clean Air Council

Written by Jennifer Britton

With comments from the Port Environmental Task Force

Final Draft – December 2007

Introduction

The port terminals scattered along the Delaware River represent part of a robust global commercial shipping industry that generates roughly 75,000 jobs in the greater Philadelphia region. As a key part of this global transportation network, Philadelphia's port is notable in several ways. By volume, it is the second largest port in the North Atlantic. Philadelphia is also the leading U.S. port for temperature-sensitive cargo, and is the fourth largest U.S. handler of imported products.[1]

Recent debate surrounding Delaware River dredging, prompted by large-scale changes in the nature of container shipping, has brought to the fore some of the environmental concerns posed by marine port activity. The Philadelphia port terminals are also the subject of renewed planning attention as the Philadelphia City Planning Commission has begun the conceptual work for an ambitious riverfront revitalization and redevelopment process. These facilities have already found themselves more frequently on the planning radar due to urban redevelopment projects that bring mixed land uses—light industrial, retail, residential, and recreational—to vacant riverfront space. Ports will increasingly be close neighbors with a mix of functions. This underscores the importance of understanding the environmental risks and concerns posed by land that is currently in port use, or is a disused port-related brownfield.

Philadelphia port operators have already begun taking environmental concerns seriously. For instance, the Philadelphia Regional Port Authority(PRPA) and port operators participate in the Clean Air Council's efforts to retrofit diesel powered port equipment with particulate-trapping technology. The PRPA also supports the Partnership for the Delaware Esutary's "No Dumping!" effort that seeks to make area residents better aware of the dangers to water quality posed by dumping toxic materials into street drains and sewers.[2]

In this paper we consider some of the land-use concerns of marine port operations and how these issues apply to the port of Philadelphia. Because this topic is underrepresented in the literature of ports management and environmental sciences, some extrapolation is required. Reviewing port-related landside activities will give us some idea of potential environmental concerns. Using this framework we will then look specifically at Philadelphia's port terminals and the materials they typically handle. Of special interest are two issues: (1) stormwater runoff from these paved industrial spaces, and (2) toxic spill management. The paper will also highlight some notable design, development, and management efforts aimed at reducing pollution and improving public waterfront access at other ports in the U.S. and around the world.

Marine Port Land Use and Land Management

In the environmental engineering and sciences, coastal research, and ports management literature, the vast majority of port- and harbor-related environmental research focuses on the significant and obvious environmental impact of shipping activity on water and marine habitat quality and air pollution due to factors such as diesel emissions, dredging, the release of ballast water, and contamination by chemicals used in ship maintenance. Discussions that connect land use to environmental issues are elusive, and clearly represent an opportunity for new research.

International organizations that direct port investment, design, and environmental regulation pay scant attention to the environmental impact of land use at ports. The International Maritime Organization (IMO), an international body that establishes and maintains regulatory frameworks for the global shipping industry, lists environmental concerns as part of its remit. Although the IMO has developed a wide range of regulations and best-practices documents regarding the mitigation of water and air pollution caused by container ships, it does not address any potential landside environmental hazards.[3] The World Bank, funding port modernization in developing nations, identifies four categories of environmental protection management at ports requiring the development of prevention or remediation measures: impact of marine structures, ship waste management, dredging activities, and accidental pollution.[4] These categories primarily deal with hazards produced by container ships themselves.

In its handbook on environmental management, the American Association of Port Authorities (AAPA), an industry association representing North and Central American port authorities, provides what may be one of the most complete assessments available of land use concerns,[5] which we will use as a framework to guide the rest of this paper. AAPA cross-references comprehensive lists of water- and land-based activities related to both port development (development of new facilities or expansion of existing ones) and operations. The study assesses their short and long term potential impacts on air quality, surface water quality, soils and sediment, ground water quality, fresh water biota, and marine biota.

We re-create these helpful tables here, keeping in mind AAPA's caveat that "the type and magnitude of impact is dependent on the extent to which an activity occurs, its proximity to sensitive receptors, and the controls employed by the port or its tenants."[6]

Potential Impacts from Development Related Activities[7]

	Air quality		**Surface water quality**		**Soils & sediment**		**Ground water quality**		**Fresh water biota**		**Marine biota**	
	ST	**LT**	**ST**	**LT**	**ST**	**LT**	**ST**	**LT**	**ST**	**LT**	**ST**	**LT**
Building demolition	H	L	H	L	L	L	L	L	M	L	M	L
Building renovation	M	L	M	L	L	L	L	L	M	L	M	L
Bulkhead installation	M	L	H	L	L	M	L	L	M	M	M	M
Contamination remediation	M	L	H	L	L	L	L	L	M	L	M	L
Dredge material placement	M	L	H	M	L	M	L	L	H	M	H	M
Dredging	M	L	M	L	L	M	L	L	H	M	H	M
Landfilling	M	L	M	L	L	L	L	L	M	L	M	L

New building construction	M	L	M	L	L	L	L	L	M	L	M	L
Pier construction and rehabilitation	M	L	L	L	L	L	L	L	M	L	M	L
Pavement installation	M	L	M	L	L	L	L	L	M	L	M	L
Pavement removal	M	L	M	L	L	M	L	L	M	L	M	L
Site cleaning	M	L	M	L	L	L	L	L	M	L	M	L
Utility construction	M	L	M	L	L	L	L	L	M	L	M	L
ST – Short Term LT – Long Term **L – Low Impact M – Moderate Impact H – High Impact**												

Potential Impacts from Operational Activities[8]

	Air quality		**Surface water quality**		**Soils & sediment**		**Ground water quality**		**Fresh water biota**		**Marine biota**	
	ST	**LT**	**ST**	**LT**	**ST**	**LT**	**ST**	**LT**	**ST**	**LT**	**ST**	**LT**
Automobile transport												
Off-loading	H	M	M	L	L	L	L	L	M	L	M	L
storage	M	L	M	L	L	L	L	L	M	L	M	L
Building & grounds maintenance	L	L	M	M	M	M	M	M	M	M	M	M
Cargo handling												
Dry bulk	H	M	H	L	M	L	L	L	M	M	M	M
Liquid bulk	M	M	M	L	M	M	M	M	M	M	M	M
General cargo	L	L	M	L	L	L	L	L	L	L	L	L
Containers	L	L	L	L	L	L	L	L	L	L	L	L
Break bulk	M	L	M	L	L	L	L	L	M	M	M	M
Chemical storage & handling	M	M	M	L	M	L	M	L	M	L	M	L
Fueling												
On-loading	H	M	M	L	M	L	M	L	M	M	M	M
Storage	M	M	M	L	M	M	M	M	L	L	L	L
Off-loading	M	M	M	L	M	L	M	L	M	M	M	M
Painting												
Building	H	L	L	L	L	L	L	L	L	L	L	L
Anti-fouling	H	L	M	L	L	L	L	L	M	M	M	M
Service vehicles	H	L	L	L	L	L	L	L	L	L	L	L
Paint stripping	H	L	M	L	L	L	L	L	M	L	M	L
Public access & recreation												

Cruise lines	M	M	L	L	L	L	L	L	M	L	M	L
Fishing piers	L	L	M	L	L	L	L	L	L	L	L	L
Moorings/slips	L	L	M	M	L	L	L	L	M	L	M	L
Public recreation access	M	M	M	M	L	L	L	L	M	L	M	L
Rail maintenance	L	L	M	L	M	L	L	L	M	L	M	L
Ship liquid discharges												
Ballast water	L	L	H	L	L	L	L	L	M	M	M	M
Tank cleaning	M	L	H	L	L	L	L	L	M	L	M	L
Bilge water	L	L	H	L	L	L	L	L	M	L	M	L
Sewage	L	L	M	L	L	L	L	L	M	L	M	L
Solid waste												
Ship-generated	L	L	M	L	L	L	L	L	M	L	M	L
Shore-generated	L	L	M	L	L	L	L	L	M	L	M	L
Vehicle and equipment maintenance	H	L	M	L	M	L	M	L	M	L	M	L
Vessel repair and maintenance	M	M	M	L	M	L	M	L	M	L	M	L
Ship breaking	M	L	M	L	M	L	L	L	M	L	M	L
Ship air emissions	M	M	L	L	L	L	L	L	L	L	L	L
ST – Short Term LT – Long Term **L – Low Impact M – Moderate Impact H – High Impact**												

From these tables we can extract the high- and moderate-impact port activities which are relevant to land use management and which bear further investigation or policy attention in Philadelphia. Below we identify several of these activities and list connected land-use concerns.

Port Activity	*Land Use Issues*
dredge material placement and landfilling	proper management of fill material, particularly when it is used for reclamation and port expansion; impacts on inland hydrology; opportunity for ecological design
pavement installation	design that allows for proper management of storm runoff

automobile off-loading	design efficiency that minimizes distance to automobile washing and storage spaces
cargo handling	transfer and storage equipment and infrastructure that prevents dry materials, particularly hazardous materials, from blowing in the wind or joining stormwater runoff and that prevents chemical and liquid cargo spills or leakage from storage structures
fueling	storage and transfer infrastructure that prevents soil and groundwater contamination; security and public safety concerns
painting	structures, materials, and equipment that prevent or minimize soil and water contamination by paint residue
solid waste generation	improving waste management and recycling practices
vehicle and equipment maintenance	practices that minimize the addition of hazardous materials to stormwater runoff

Of these potential hazards at active port properties, the issue of toxic cargo spills and their management and prevention is of particular importance to the Clean Air Council's Green Ports Task Force. Toxic spills present an immediate threat to both port workers as well as to residents in the vicinity, and spills on these vast paved surfaces become a runoff hazard when they occur near storm drains or water access point, or are not quickly cleaned up. The materials in question include potentially toxic cargo as well as chemicals used in port operations such as produce fumigation. The Philadelphia ports, however, do not have a comprehensive set of polices and practices for emergency

spill response and cleanup as each tenant facility employs their own practices. The Virginia Port Authority's highly successful spill management program, supported by comprehensive employee training, provides a model that can be deployed at the Philadelphia ports.

The spill management, prevention, and reduction plan proposed for PRPA port facilities by the Green Ports Task Force, based on the Virginia Port Authority's program, includes these elements:

- Quantify the amount of toxic or potentially toxic cargo at PRPA port terminals.
- Quantify the amount of toxic chemicals routinely used and stored at PRPA port terminals.
- Educate terminal operators on what other ports have done to decrease the amount of dangerous chemicals used and stored at the ports.
- Work with port neighborhoods, PRPA and individual terminal operators to supplement the cost of transitioning to less toxic chemicals for fumigation and other potentially toxic on-site cargo cleaning.
- Work with port neighborhoods, PRPA, and individual terminal operators to implement a series of Best Management Practices (BMPs) for spill minimization and management.
- Work with PRPA and individual terminal operators to supplement the cost of implementing these BMPs.

Establishing a consistent and effective spill response protocol for the Philadelphia ports will be an important step forward in ensuring that these important industrial facilities are also good neighbors to other riverfront functions.

Related to port design and operation but not sufficiently highlighted in AAPA's impact tables is the effect of the routine operation of port equipment on stormwater runoff. Much like the problem of spill management, this is an issue that gets insufficient attention in the Philadelphia port system. As cargo-handling vehicles and cranes move about next to cargo ships and the water surface, and carry containers across sprawling paved surfaces, they can leak fluids and leave behind debris and other potentially toxic materials.

Although stormwater runoff from industrial sites like marine ports represents a significant risk to water quality and aquatic life, it remains mostly unregulated. While the Philadelphia Water Department has issued specifications for stormwater detention and retention, these regulations only apply to new development of more than 15,000 square feet, leaving most existing facilities unaffected.[9]

The Pennsylvania Department of Environmental Protection (PA DEP) has not applied any sort of leverage in this issue either. PA DEP administers the National Pollutant Discharge Elimination System (NPDES) permitting process, which regulates industrial stormwater discharge. None of the Philadelphia area ports holds a current NPDES permit. The need is clear, then, for a comprehensive approach to stormwater

management at the Philadelphia port facilities which will revitalize state and local oversight as well as engage port operators in adopting best practices towards minimizing hazardous industrial runoff.

Based on these activity lists we can also extrapolate as to possible environmental hazards at inactive former port sites. These problems might include the presence of soil that has been contaminated by the handling or warehousing of hazardous cargo materials such as fuels and chemicals; soil contamination as a result of painting and equipment maintenance as well as paint stripping; improper and unremediated disposal of ship wastes; and the presence of contaminated dredge material that has been used for landfilling and reclamation.

Cargo at Philadelphia's Port Terminals

In view of the risks posed by certain types of cargo, for instance dry bulk that is inclined to become airborne, it is useful to review the kinds of materials that the various Philadelphia port terminals handle and store in on-site warehouses. In this section we will consider the materials coming into Philadelphia terminals and posit a possible level of risk that they pose. In the table below, project cargo refers to types of cargo that are particularly large or heavy, or which require disassembly prior to shipping and re-assembly upon offloading. Break bulk cargo is that which is not shipped in containers, but is instead stowed directly into a ship's hold. Break bulk cargo frequently consists of

units such as cartons. Bulk cargo, on the other hand, is loaded into a ship in unpackaged form. Grain products are one example of bulk cargo.

Cargo Types at Philadelphia Port Terminals

Terminal	**Cargo handled**[10]	**Possible environmental risks**
Pier 122 ****Currently Inactive****	*bulk cargo* *iron ore* *aggregates* *fertilizer*	*nitrogen and phosphorus components of fertilizer as water contamination hazards*
Packer Avenue Marine Terminal	container cargo steel products frozen meat fruit heavy lift cargo paper products project cargo	low risk cargo
Pier 96 and 98 Annex ****Currently Inactive****	*automobiles & trucks* *heavy equipment* *project cargo*	*water quality risk: auto washing shed*
Pier 84	cocoa beans cocoa products	low risk cargo
Pier 82	fruits and vegetables break bulk project cargo paper products	chemicals used in fruit fumigation services possible air and water quality risk
Piers 78 and 80	newsprint paper products wood pulp lumber and forest products	low risk cargo
Piers 38 and 40	newsprint paper products wood pulp lumber and forest products	low risk cargo
Tioga Marine Terminal	containers fresh fruit paper products cocoa products automobiles palletized cargo	chemicals used in fruit fumigation services possible air and water quality risk

	project cargo break bulk steel products	
Cruise Terminal		low risk passenger activity

Some of the possible environmental issues posed by the types of cargo and its handling in the Philadelphia port terminals include the handling of fumigatives for fresh fruits.

Space and Structure at Philadelphia's Port Terminals

The Port of Philadelphia is comprised of several individual piers strung along the Delaware River between the Tioga Marine Terminal at the north, and the Packer Avenue Marine terminal at the south. The individual, stand-alone pier facilities occupy smaller spaces than Tioga and Packer. Piers 38 and 40, for example, are sandwiched between Philadelphia's heliport and the U.S. Coast Guard station and administrative building, with a residential neighborhood directly across Columbus Boulevard. These piers face Columbus Boulevard, with their container and equipment storage, warehousing, and parking taking up just 12 acres.

Piers 78 and 80, totaling 44 acres, are slightly further south on Columbus Boulevard and are located amongst retail and light industrial uses. These piers are neighbors to the big-box strip shopping center that contains Home Depot, Wal-Mart, and Superfresh. Other nearby business include warehouses, a strip club, and other retail

buildings. The empty lot between Pier 78 and the back side of the Superfresh supermarket is currently being developed by PRPA as a wood product warehouse.

Piers 82 (13.3 acres) and 84 (13.9 acres) are neighbors with the relatively new Columbus Commons big-box center, which features a few restaurants, a Lowe's, and an Ikea. There is little in the way of empty space surrounding these piers as well; the same goes for Piers 96 and 98, together comprising 54.9 acres, just a little further south on Columbus Boulevard.

The Packer Avenue Marine Terminal, with a total area of 112 acres, has considerable space devoted to container storage, automobile storage, cargo warehousing, and transfer structures. The location of this terminal relatively close to on-ramps for interstates 76 and 95 minimizes the distance trucks must travel on surface streets. This terminal probably has the greatest potential for acquiring new neighbors. There is a large empty parcel of land directly across Columbus Boulevard from the terminal, which now contains a "gentleman's club" in an odd neo-Georgian building as the first development pioneer in this largely weedy space; the PCPC is not, however, encouraging entertainment and hospitality uses near the Packer property . The Packer Avenue terminal follows the curve of Columbus Boulevard as it turns towards the sports stadiums nearer to Broad Street; there is much potential here for future entertainment and hospitality facilities as well as for new port-related infrastructure such as warehouse buildings.

The Tioga Marine Terminal at the northern end of this row of port facilities is also a large space with a total area of 116 acres, but is more definitively bounded by a residential neighborhood—Port Richmond—than the Packer Avenue terminal. There is a very small park located in the middle of the port area, where Allegheny Avenue ends at the Delaware. The park seems to be used by nearby residents for fishing and generally spending time near the river. The Tioga Terminal has access to interstate 95 that is quite efficient and which mostly prevents the need for large trucks to travel the nearby city arterials Richmond Street and Allegheny Avenue. A considerable amount of space is used for warehousing, parking and equipment storage. At both the Packer and Tioga terminals there is a massive amount of paved space, which raises concerns about storm runoff.

Southport Expansion and Produce Terminal

In 2004, Pennsylvania Governor Ed Rendell signed a bill that turned over ownership of 47 acres of waterfront property at the Philadelphia Naval Business Center, formerly the Philadelphia Naval Yard, to the PRPA. Current plans call for some degree of expansion including the Parcel 9A, and Piers 122 and 124.

A dispute between a coalition of port workers and the PRPA and the state has arisen, however, with a proposal to move the Philadelphia Regional Produce Terminal, currently located on 47 acres between Packer and Pattison Avenues in South

Philadelphia, to the Naval Business Center. The coalition argues that the produce terminal doesn't need waterfront space, and that locating it amidst active port operations will disrupt traffic flow into and out of the Packer and proposed Southport expansion. It also objects to taking up waterfront space that could otherwise be used for port activity, arguing that port expansion is critical to the health of Philadelphia's shipping industry as the size and number of container ships traveling between cities increases steadily. The other proposed location for the produce terminal has been the Pier 98 annex on Delaware avenue, also a waterfront space but not slated for new expansion development.[11]

Key environmental concerns here regarding land use patterns will relate to efficiency of traffic flows. With the addition of a casino at Reed Street and Columbus boulevard as well as other port projects expected to ramp up the traffic load on local streets, how might additional traffic to and from a more developed waterfront add to the problem?

The Philadelphia Port and Delaware Riverfront Planning

PennPraxis, the consulting and outreach arm of University of Pennsylvania's School of Design, was charged by Mayor Street to spearhead a public planning effort around seven miles of riverfront along the Delaware in October 2006. Working with a

46 member Advisory Group, PennPraxis unvelied A Civic Vision for the Central Delaware on November 14, 2007. The goal of this planning process was to address blight and underutilization along a seven-mile stretch of the Delaware in Philadelphia, and to transform the riverfront into a vibrant mixed-used space that honors the industrial nature of that corridor.[12] The Tioga and Packer Avenue terminals sit just outside the study area, but the plan does address the status of the piers along Columbus Boulevard.

The Philadelphia City Planning Commission produced a working paper on the Philadelphia port in conjunction with this effort which contained the following recommendations:

- *Preserve major areas of the working port*—protecting the major facilities while facilitating a richer mix of land uses than is currently represented
- *Evaluate the need for small nodes of port activity*—considering a shift of some port activities to other locations
- *Consider the Conrail Yards at Lehigh Avenue as a future working port facility*—this currently vacant space has potential to become a maritime terminal
- *Examine the possibility for recreational, scenic and interpretive public experiences at the working port*—honoring the port as an important economic and industrial presence in the region[13]

Some of these recommendations were echoed in the results of the Central Delaware Riverfront Planning Process, Though its final report, *A Civic Vision for the Central Delaware*, does not directly cite the Conrail yards as a future working port facility, PennPraxis does emphasize the need to preserve the integrity of the working port as an important economic driver for the city. At the same time, a consistent theme that emerged from this year-long process was the need to "Reconnect the city to the river's edge." This will inevitably mean that the ports will be in closer proximity to other land uses like retail, recreation, and residential areas.

The PennPraxis vision has a few significant implications, then, concerning land use at and around the port terminals. The consolidation of some of the lower-traffic pier activity into other areas would mean that other terminal spaces would have to absorb new activity, and that pier space could be available for other public uses. Creating a more diverse mix of uses will mean that the noise, truck traffic, and dust created by the ports will come under closer scrutiny, but it will also give residents and visitors a chance to learn more about these places.

There are some readily evident places for environmentally-friendly land-use concerns to dovetail with the PennPraxis riverfront planning process. One of the land use issues that arises frequently in the literature of ports management is that of land use efficiency. At port facilities, a certain amount of space must be available to store and stack shipping containers that have been offloaded from ships or which are waiting to

be loaded. Space is required to move these containers onto trucks and trains. Space is also required for warehousing the bulk and break-bulk products that await distribution, to store and care for operations equipment, to house administrative functions, and to give employees a place to park. Making the use of these spaces as efficient as possible has some specific byproducts: it reduces the distance and therefore the amount of noise and diesel emissions caused by transferring cargo. It reduces the amount of the paved space that feeds storm runoff. Making spatial efficiency a goal can also improve the appearance of a port facility when weedy, wasted, and unmaintained space can be minimized.

Equally notable is the opportunity to work with the Philadelphia Regional Port Authority and the terminal operators to create recreational and educational spaces alongside the port terminals. The planning and design process has placed a great deal of emphasis on establishing connected recreation spaces along the riverfront, and has posited the idea of deploying the port scenery as part of an interpretive process. The large and dramatic Tioga and Packer Avenue terminals lend themselves particularly well to scenic duty. The enormous ships, giant cranes, and the global connections that are suggested by fruit arriving from Central America, or ships with the names of foreign cities painted on them can surely be an exciting and interesting waterfront feature for both local residents and tourists. The possibility of a recreational path following the waterfront—but skirting around the port properties themselves—means

that it would be quite easy to hike, jog, or bike the distance between the large terminals, with views of the smaller pier facilities in between.

This represents a ripe opportunity for environmentalists to initiate educational and interpretive projects that illustrate the global impact of the commercial shipping industry and to discuss the massive infrastructure that is required to sustain the western hemisphere's consumer appetite. This kind of effort can be carried out within a cooperative relationship with port stakeholders. It can further go hand in hand with a program to beautify the port. Currently the terminal surroundings are distinctly unkempt looking. Rusty chain-link fences topped with barbed wire, weeds, and litter abound. It is reasonable to expect an active industrial area to have a certain amount of dust and grime, but there are many ways to spruce up the area without disrupting port operations.

Working within the riverfront redevelopment and redesign plan to establish attractive human-powered recreation spaces and trails is a valuable opportunity to insert a dialogue about the environment into the land use patterns of the port. Interpretive displays can teach about the shipping industry, Philadelphia's industrial legacy, green ports modernization initiatives that have taken place at the Philadelphia terminals, and so forth.

Models

Recreation and Tourism

The port of Zeebrugge on the North Sea coast of Belgium is a sprawling but well maintained site. A coastal recreational trail goes straight through the middle of the port area, following a public road. Visitors moving at walking, cycling, or skating speeds can easily view the movement of ships and transfer equipment through the port. The recreational route lacks decent signage and interpretive information, yet is a well-used thoroughfare that allows people to get quite close to the action.

Land Use Planning

The port of Melbourne has devised a sophisticated land use plan as part of a 20-year strategic planning framework to guide future development. The plan emphasizes issues like redevelopment of local roads to accommodate port traffic needs, ensuring efficiency in access to road and rail transportation, building landscaped and attractive buffer spaces that help shield local residential areas and light retail from the noise and dust of the port functions, working with local municipal authorities to establish recreational paths and interpretive/heritage sites alongside the working port, and improving public access to the waterfront.[14]

The Melbourne Port Corporation (MPC) identifies eight environmental risks that shape the planning process, several of which have land-use implications: emergency situations such as chemical spills, hazardous goods management, impacts of port-

related activities on residential amenities, soil contamination, ship and land waste management, stormwater management, resource use, and ballast water discharge. As part of the plan implementation, the MPC has established a stakeholder relationship with Australia's Environment Protection Authority and other local and regional environmental organizations to promote best practices. The process also encompasses citizen participation at each stage. The complete planning document can be found at the MPC's website at www.portofmelbourne.com.

The Port of San Francisco is also working with a land use plan that is part of a waterfront revitalization effort in that city. Much like Philadelphia's newly evolving riverfront redevelopment plans, the San Francisco port plan aims to balance the preservation of working port functions with a diversity of land uses surrounding the port terminals, improved public access to the waterfront, and attention to recreational and environmental preservation opportunities. San Francisco's port planning process also includes environmental organizations in its stakeholder group. An overview of the plan can be viewed at www.sfgov.org.

A major waterfront redevelopment effort is currently underway in Adelaide, also in Australia. The changes and goals here are also similar to what Philadelphia has in mind with its own redevelopment plan. Adelaide's development area is vastly smaller than the seven miles of riverfront upon which Philadelphia has focused, but it does represent a large-scale, diversifying approach.

Conclusion

The land use practices at Philadelphia port terminals represent a set of environmental management challenges. Immediate concerns include the need to better manage and regulate stormwater runoff and the potential for spills. A range of other operations issues call for further attention and investigation. At the same time these facilities offer exciting opportunities to connect newly emerging green spaces like the Frankford Creek Greenway with a redesigned Delaware riverfront, and to reshape this important regional industry as an environmental leader.

Notes

[1] Pennsylvania Department of Community and Economic Development, home page, "Port of Philadelphia," accessed 12 March 2007, <http://www.newpa.com/>
[2] Philadelphia Regional Port Authority, "Portwatch," Issue 21, Spring 2006, accessed 26 September 2007, <http://www.philaport.com/newsletters/PWSpring2006.htm>.
[3] International Maritime Organization, home page, "Marine Environment," accessed 12 March 2007, <http://www.imo.org/>.
[4] World Bank, home page, "Republic of Guatemala Modernization Program of the Port Sector: Baseline Environmental Survey in Santo Tomas de Castilla and Puerto Quetzal," accessed March 12, 2007, <
[5] American Association of Port Authorities, *Environmental Management Handbook,* pp. 2.1-2.7.
[6] AAPA, p. 2.5.
[7] AAPA, p. 2.5.
[8] American Association of Port Authorities, *Environmental Management Handbook,* p. 2.6.
[9] Philadelphia Water Department, "Philadelphia Water Department Regulations," p. 106-107
[10] Cargo information captured from the home pages of the Philadelphia Regional Port Authority at http://www.philaport.com and the Pennsylvania Department of Community and Economic Development at http://www.newpa.com.
[11] Lorraine Gennaro, "Port of Contention," South Philly Review, 8 March 2007, p.1.
[12] Philadelphia City Planning Commission, "The Riverfront Redevelopment Process," a Central Delaware Riverfront Plan working paper, February 2007.
[13] Philadelphia City Planning Commission, "The Working Port," a Central Delaware Riverfront Plan working paper, February 2007, p. 1.
[14] Melbourne Port Corporation, "Port of Melbourne Land Use Plan," 2002, http://www.portofmelbourne.com/.

Water Quality at the Philadelphia Port:

Environmental Issues and Concerns

A report by Clean Air Council

With comments from the Port Environmental Task Force

Final Draft – October 2007

Introduction

Historically, the Delaware River has been a remarkable economic and social resource for its bordering communities. Today, the river's resources are being stretched to meet the public's ever-expanding needs for goods. The Delaware River flows through one of the most highly populated areas of the United States bordering the States of: New York, New Jersey, Pennsylvania and Delaware. The Delaware River Bay is only a day's commute for 40% of the people living in the United States and is the main source of drinking water for over 17 million people.[1] According to US Census Bureau Figures, the population of the basin has increased approximately 3.7 percent between 1990 and 2000; due to growth primarily in the Philadelphia area suburbs and the Pennsylvania Pocono Mountain Region. Currently, it is estimated that the basin's population consists of over 7.31 million people.[2] Neighboring communities have relied on the river as a provider of jobs, revenue, and water.

The Delaware River Basin is home to the fifth largest port complex in the United States in terms of total waterborne commerce.[3] Annually, over 70 million tons of cargo move through its waters heading for the ports of Pennsylvania,

[1] "2004 Delaware River and Bay Integrated List Water Quality Assessment Report", (Delaware River Basin Commission, September 2004), retrieved July 11,2006 <http://www.state.nj.us/drbc/04IntegratedList/index.htm> (p.11)
[2] DRBC, (2004, September) (p.10,11)
[3] "The Athos I : Oil Spill on the Delaware River", (University of Delaware, 2004), retrieved July 11.2006 < http://www.ocean.udel.edu/oilspill/shipping.html>

New Jersey, and Delaware. It is also the second largest oil port in the United States, handling about 85% of the East Coast's oil imports. The port complex has created more than 30,000 jobs, provides more than $1 billion in wages and generates $3.5 billion in revenues a year.[4] Ensuring the continued health of the River should be a priority considering its significance as the regions most important and heavily exploited water source.

Demands on ports world-wide has risen dramatically. The steady rise of global shipping is primarily driven by free trade and the transfer of manufacturing to destinations in Asia; for that reason, "…nearly 90% of global trade is by sea."[5] The American Association of Port Authorities estimate that the volumes of cargo American ports currently handle—about 2 billion tons annually—will double over the next 15 years.[6] In response to growth in the marine sector, environmental controls may be more and more insufficient as the environmental impacts of ports have gone up.[7] Increased activity and new construction have an increased impact on water and air quality. Potential sources

[4] U.Del, (2004)

[5] Sharma, Dinesh C., "Ports in a Storm", Environmental Health Perspectives; Apr2006, Vol 114 Issue 4, pA222- A231, 10p

[6] "America's Ports Today", (The American Association of Port Authorities, February, 2006) retrieved July 11, 2006. < http://www.aapa-ports.org/pdf/8-pg_Americas_Ports_Today.pdf>

[7] Bailey, D. (2004, March). Harboring Pollution: The Dirty Truth about U.S. Ports. Natural Resources Defense Council. (1- 76). Retrieved July 5th, 2006, < http://www.nrdc.org/air/pollution/ports/ports.pdf >

of water pollution related to port activities include: ballast water, antifouling additives, stormwater runoff, oil spills, and dredging.

ANTIFOULING ADDITIVES:

By 2008, antifouling additives will not be allowed to be used in any paints and the EPA has stated that in compliance with the International Maritime Organization (IMO) Treaty there will be periodic paint testing of ship hulls. While this new rule will hopefully make antifouling additives a non-issue, additives continue to be added to paints that are used on ship's surfaces. In addition, paints containing antifouling additives that are purchased before the rule takes effect may remain in use well beyond 2008. Paint additives prevent barnacles and other marine organisms from attaching and growing on the surfaces of ships. Many additives contain tributyltin (TBT), a toxic chemical that can seep into water.[8] Although the use of harmful additives has diminished, these toxic pollutants continue to persist and damage local ecosystems. [9]
The IMO is the United Nations' specialized agency responsible for improving maritime safety and preventing pollution from ships.[10] The IMO has taken the lead in the fight to banish all use of TBT in antifouling additives. The IMO Treaty states that:

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[8] Bailey, 9
[9] Bailey, 5.
[10] "Actors in the Regional Seas Programme" (retrieved July 26, 2006)
< http://www.unep.org/regionalseas/Publications/parts_data/part_bal.doc>

-Sale and application of TBT antifoulings is to cease, under the International Maritime Organization (IMO) Antifouling System Convention agreed in October 2001
- The treaty calls for the ban on application from 1st of January 2003 and total prohibition on hulls by 1st of January 2008
- International is to cease all trading in TBT antifoulings after 31st December 2002

In the United States, the EPA is working towards the goals of the IMO treaty through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The EPA, U.S. Coast Guard, and US Department of State have represented the US's position throughout the Treaty procedures; "…has maintained the position that it would pursue retroactive enforcement of the 1/1/2003 date through port state measures after the AFS Convention comes into force, on all vessels where TBT was applied to the hull after 1/1/2003."[11]

BALLAST WATER:

Ballast water (also known as bilge water) is water that is stored in the hull of the ship to maintain stability of un-laden ships; it is then discharged into open waters before the ship is loaded with cargo. Contaminated with oil from the ship's machinery, the ballast water is then combined with other wastewater and sewage before it is pumped out.[12] In addition to the oil and toxins that are

[11] "IMO- Anitfouling Ban" (retrieved July 17th, 2006)
< http://www.international-marine.com/environmental/documents/Interswift_IMO.PDF>
[12] Bailey, 5.

discharged, ballast water often contains foreign organisms, labeled as invasive species, which can pose a threat to local ecosystems.[13]

In response to national concern regarding the invasions of foreign aquatic organisms, the National Invasive Species Act of 1996 (NISA) was enacted which reauthorized and amended the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA). The Coast Guard has been required through NISA to establish a national mandatory Ballast Water Management Program (BWP). The program has led to regulations and guidelines for ballast water management and disposal.[14] These guidelines include but are not limited to:

"…- Avoiding or minimizing ballast intake
- Avoid ballast operations in or near marine sanctuaries, marine preserves, marine parks, or coral reefs.
- Clean ballast tanks to remove sediment regularly.
- Only discharge minimal amounts of ballast water in coastal and internal waters.
- Rinse anchors and anchor chains during retrieval to remove organisms and sediments at their place of origin.
- Remove fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, state and federal regulations.
- Maintain a vessel specific ballast water management plan.
- Train vessel personnel in ballast water and sediment management and treatment procedures…"[15]

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[13] "Global Ballast Water Management Programme", (International Maritime Organization, 2000- 2006). Retrieved July 12, 2006. < http://globallast.imo.org/index.asp>

[14] "Ballast Water Management Program," United States Coast Guard, (retrieved July 9th, 2006) < http://www.uscg.mil/hq/g-m/mso/bwm.htm>

[15] "Ballast Water Management Program: Aquatic Nuisance Species" United States Coast Guard (retrieved July 9th, 2006) < http://www.uscg.mil/hq/g-m/mso/ans.htm>

Any vessel that enters US waters that has a ballast water tank is obligated to complete Ballast Water Forms in order to ensure that they follow the correct procedures. The maximum possible penalty for not complying with the requirements of the Ballast Water Program is $27,500 per day.[16] The ships submit their Ballast Water Forms to their Port of destination. However, the Coast Guard is responsible for checking up on ports to make sure that they comply with the BWP. In addition, they also perform surprise inspections of ships and review submitted ballast water forms.

In the Delaware River and Bay, 70 non-indigenous species have been evaluated and studied. These species are primarily from the Ponto-Caspian region. The most commonly found are zebra mussels, round gobies, and spiny water fleas for they have proven tolerant of mid-Atlantic estuary conditions. Many ships arriving at the ports of Wilmington, Camden, and Philadelphia come from European ports invaded by fresh and brackish-water species from the Black Sea-Caspian basin.[17] According to Clean Air Council's observations, there is minimal water monitoring at port terminals and it is unclear who at the p[ort was taking responsibility to identify invasive species which can enter the shipping canal unnoticed.

[16] "Ballast Water Management Program: Aquatic Nuisance Species"
[17] "Biological Impacts and Invasions in the Chesapeake and Delaware Bays: Patterns and Impacts", (retrieved July 26, 2006) <http://sgnis.org/publicat/proceed/aide/foforuiz.htm >

STORMWATER RUNOFF:

Storm water runoff is the water that runs off the land surface (and rooftops, piers, or other structures) during and immediately after it rains. Runoff can collect oil, toxins, pesticides, metals, sediments, debris, and air pollutants, as it runs across surfaces on its way towards a point of discharge into a receiving body of water.[18] When excesses of nitrogen are found in the water it begins the harmful process of eutrophication. The National Research Council has determined eutrophication "…as the most serious problem facing estuaries in the United States." [19] The northern branch of the Delaware River has experienced progress in the past decade by significantly diminishing eutrophication by reducing discharges into the water.[20] However, Delaware Inland Bays are still plagued by the problem.[21] Subsequently, urban runoff is the largest contributor of pollution to U.S coastal waters and the second largest polluter of U.S estuaries.[22] The effects of urban runoff (which includes runoff from ports) have

[18] Bailey, 9
[19] Bailey, 5
[20] "Inland Bay's Basin", (retrieved August 23, 2006) http://www.dnrec.state.de.us/water2000/sections/watershed/ws/map_ib.htm
[21] DNREC, "Inland Bay's Basin"
[22] Bailey, 5

negatively affected human health and natural resources in a multitude of ways, such as:

> "• fills in navigable waterways with contaminated sediment, leaving us with increased dredging and spoil disposal costs;
>
> • closes or shrinks lucrative rockfish, shad, flounder, crab, oyster, and other commercial fisheries due to chemical contamination, oxygen starvation, and the resulting loss of habitat;
>
> • fouls beaches and other recreational waters, causing losses in revenues from declines in boating, fishing, duck hunting and coastal tourism;
>
> • pollutes drinking water sources, filling in reservoirs with clogging silt and oxygen-robbing nutrients and contributing to drinking water emergencies;"[23]

Water pollution is regulated primarily by the National Pollutant Discharge Eliminations System (NPDES) Program. Enacted under the Clean Water Act Amendments of 1972, the NPDES program has resulted in substantial pollution discharge reductions. The NPDES Program requires that all facilities that discharge pollutants directly into a U.S water source obtain a NPDES permit.[24] The scope of the permit program is very broad and allows for the addition of new pollutants and discharge standards. In Pennsylvania, the Department of Environmental Protection (DEP) is the NPDES permitting authority for all municipal, industrial and private facilities in the state.

There appears to be some confusion over the ports are required to have NPDES permits. Port terminals have persistently been overlooked in terms of

[23] "The Problem of Stormwater Pollution", July 10, 2006 http://www.nrdc.org/water/pollution/fstorm.asp
[24] "Water Permitting 101", July 10, 2006 < http://www.epa.gov/npdes/pubs/101pape.pdf >

their impact on water quality and are therefore under-regulated. While stormwater runoff would be monitored under an NPDES permit, it would not necessarily be regulated or reduced.

But even having an NPDES permit is no guarantee of complaiance with Clean Water Act requirements. According to the report "Troubled Waters: An Analysis Of Clean Water Act Compliance," by PennEnvironment (a local Environmental Advocacy Group), water monitoring practices that are enforced under NPDES permits are inadequate in preventing or minimizing pollution from stormwater runoff.. The Report finds a serious lack of urgency to comply with the Clean Water Act:

> "…-More than fifty-seven percent of Pennsylvania's industrial and municipal facilities exceeded their Clean Water Act permits at least once between July 1, 2003 and December 31, 2004.
>
> - 383 facilities in Pennsylvania reported nearly 2,000 exceedances of their Clean Water Act permits during the 18-month period, ranking the state fourth in the country for the most exceedances.
>
> - On average, Pennsylvania facilities exceeding their Clean Water Act permits did so by nearly 155%. …"[25]

OIL SPILLS:

Oil spills are the number one reported issue, in the media, in terms of water pollution. The media has focused on "catastrophic" spills, such as the

[25] Masur, David. "Polluter's Foul Pennsylvania's Waters" March 23rd, 2006. < http://www.pennenvironment.org/PEwater.asp?id2=23024>

Prestige Spill off the coast of Spain in 2002. The tanker was carrying 20 million gallons of fuel oil when it began to leak, causing one of the largest environmental disasters in Spain's history. There have been many significant local oil spills. Listed below are some of the major oil spills in the Delaware River over the past few decades.

> "…• November 2004 - A single-hulled Greek oil tanker, the Athos I, twice struck a rusting ship's anchor as it prepared to dock at the Citgo Asphalt Refinery near Paulsboro, N.J. The ship spilling 265,000 gallons of heavy crude oil into the water across the river from the Philadelphia International Airport.
>
> • June 1989 - Uruguayan tanker Presidente Rivera prematurely dropped anchor. The out-of-control tanker grounded off Claymont, spilling 300,000 gallons of heating oil.
>
> • September 1986 - The Viking Osprey, registered in Singapore, ran against a rocky underwater ledge near Marcus Hook. A ruptured holding tank released 295,000 gallons of crude oil.
>
> • March 1986 - Liberian tanker Inter Mar Alliance rammed a pier at the BP Oil Co. refinery, near Marcus Hook, spilling 189,000 gallons of oil.
>
> • September 1985 - The Panamanian tanker Grand Eagle spilled more than 435,000 gallons of crude oil, polluting a 12-mile stretch of the river. The 791-foot tanker hit a rocky shoal off Claymont.
>
> • December 1976 - Liberian tanker Olympic Games ran aground near Marcus Hook, Pa., when a valve stuck as the tanker was trying to dock. The spill released 133,000 gallons of oil, contaminating 22 miles of the river.
>
> • January 1975 - Two tankers collided near Marcus Hook, Pa., as one tried to turn around in the Delaware River. Twenty-nine workers died; an estimated 315,000 to 500,000 gallons of oil spilled…"[26]

While "catastrophic" oil spills can result in major and abrupt loss of bird and aquatic life, there is more oil quantity resulting from "chronic" spills or those

[26] "Three Decades of Oil Spills", (retrieved July 26, 2006) , posted July 17, 2006, <http://www.delawareonline.com/apps/pbcs.dll/article?AID=/20060716/NEWS/60716008 >

that occur regularly. Contributing to chronic spills are runoff, unloading and loading oil tankers and the discharging of ballast water. According to a report compiled by the NRDC, oil contamination as a result of "chronic spills" account for three times as much oil contamination as tanker accidents.[27]

The EPA has been proactive in enacting regulations to regulate spill prevention and response. Many efforts have been made in oil spill prevention and response because of the disastrous effects that it has on marine ecosystems. Damage from oil spills vary depending on the type of oil spilled and the natural actions of the receiving water.[28] Petroleum based and non-petroleum based oils are equally detrimental to marine wildlife and both form emulsions and sludge. However, petroleum oil is more flammable and toxic posing a threat not only to animals but manmade infrastructures. Non-petroleum oils share many of the same characteristics of petroleum oils but may persist longer in the environment. Oil spills are environmental tragedies for many reasons, such as:

> - reducing the amount oxygen available which is needed by aquatic organisms;[29]
> - when birds are covered in oil they freeze, for the oil breaks down their feathers insulating properties, oil spills contribute to the drowning of birds;
> - Spills are contaminating the marine food chain, reducing animals ability to eat and also damages their intestinal tracts;

[27] Bailey, 5.
[28] "Oil Program: Threats from Oil Spills", (retrieved July 11, 2006) < http://www.epa.gov/oilspill/effects.htm >
[29] "Oil Program" < http://www.epa.gov/oilspill/effects.htm >

-Vapors from spills are damaging the marine animal's central nervous system, liver and lungs.[30]

The Mid-Atlantic Oil Program, created by the EPA and the Pennsylvania Department of Environmental Protection, carries out the routine inspections of regional facilities. (It is not clear if this program includes inspection of port terminals in the Mid-Atlantic region.) Any facility not in compliance is subjected to penalties. In July 2002, the congress amended the Oil Pollution Act of 1990 and added the Spill Prevention, Control and Countermeasure Rule (SPCC). The SPCC extends the EPA's power to fund and regulate oil spill prevention and response. Earlier measures covered under the Oil Pollution Program addressed post spill clean up only, the SPCC focuses on helping to prevent spills from occurring. Methods to contain and prevent oil spills include: retention walls, use of sorbent materials, and employee training. After assessing a facility, various methods of spill prevention are then incorporated into the facility's SPCC Plans.[31]

The Council could not determine whether the ports are required to have an SPCC plan, nevertheless there are additional measures they can voluntarily undertake to reduce the potential for oil spills that can also prove to be economically beneficial. In the 2000 report *Green Ports: Environmental*

[30] "Oil Program: Impact on Species" (retrieved July 11, 2006) <http://www.epa.gov/oilspill/impact.htm>
[31] "Oil Program: Spill Prevention, Control and Countermeasure", (retrieved on July 11, 2006) <http://www.epa.gov/oilspill/spcc.htm>

Management and Technology at U.S. Ports, researchers at the University of Massachusetts Boston Urban Harbors Institute concluded that the recycling of waste oil, oily bilge and oil-contaminated waste has become a feasible and cost effective option for ports; "…oil-dispensing facilities at ports can be encouraged to buy back used oil for recycling."[32] Through the use of filtration devices, runoff from paved areas and other wastes can be effectively controlled and diverted to onsite recycling facilities. In addition to chronic spills, ships have been known to illegally mix waste oil into the ballast water to avoid port fees. (While this is an industry-wide problem, no specific incidences along the Delaware River were identified at the release of this report.) The treatment plants that the ballast water is then transferred to are unable to filter the oily residue.[33] The technology to contain and filter oil spills is available and when used correctly have been proven to be very effective. Clean Air Council suggests that local port terminal operators work proactively with ship lines to promote this type of technology.

DREDGING:

Dredging is the removal of sediments that have accumulated from erosion and silt disposition to deepen or create a channel.[34] Ports rely on dredging to

[32] Sharma, A 225.
[33] Sharma, A 225.
[34] Bailey, 6.

ensure that larger ships can continue to pass through the channels to unload at the terminals.

Pennsylvania government and port operators are currently advocating a dredging project to deepen the Delaware River by 45- 50 feet. Supporters of the dredging project believe that due to increase of global shipping deepening the channel is necessary in order to remain competitive with other ports along the east coast and to accommodate the larger draft vessels.. The projected cost of the proposed dredging the Delaware will cost approximately $311 million dollars according to Environmental Network News. Opponents of the proposed dredging plan are concerned about the possible damages to ecosystems in the Delaware River in particularly the fish populations and what it will mean for fisheries. DRPA has stated that they have accounted for possible environmental implications and will attempt to dredge using technology that will minimize any harm to marine life.[35] An environmental Impact Statement (EIS) and a supplemental EIS were conducted as required by the National Environmental Policy Act (NEPA). Pennsylvania has agreed to accept 75% of the Pennsylvania-New Jersey portion of dredged material generated during the dredging project.[36]

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[35] "Public Policy, Issues Index : Dredging Update," Greater Philadelphia Chamber of Commerce (retrieved July 19, 2006) <http://www.gpcc.com/currentissues_state.asp#7>

[36] Hajna, Lawrence. "Corzine Voices Dredging Doubts," Courier-Post [Camden] 26 Feb. 2006, <http://www.courierpostonline.com/apps/pbcs.dll/article?AID=/20060225/NEWS01/602250329/1006/ARCHIVES>.

The Philadelphia Regional Port Authority believes that the resurgence of jobs due to the project and projected contracts as a result of a deeper channel compensate for the initial costs; "…there is potential for over $1 billion in revenue over the life of the project, with $600 million in personal income over the next ten years…" [37] Currently, the dredging project's environmental impact statement has been reviewed and the project has been approved at both the federal and state levels with the EPA and the U.S Fish and Wildlife Service. However, the project has been stalled due to a dispute between Pennsylvania and New Jersey.

Maintenance Dredging

Over time, sediments gradually accumulate in areas where dredging has taken place. This is a natural, unavoidable ecological process that counteracts the desired benefits of dredging a channel by decreasing the depth and width of the channel as silt is deposited along the bottom and sides of the dredged area. During maintenance dredging, the channel is restored to the original depth and width as it was after the original dredging process was completed using various environmentally appropriate methods. These might include clam buckets, drag lines, and back hoes. Invasive hydraulic methods such as propeller washing and

[37] "Regional Competitiveness" (retrieved July 11,2006) <http://www.dredgenow.org/index.php?section=learn_more>

suction dredging are avoided due to the threat posed to aquatic life by the increase in suspended sediments present in the water while dredging takes place[38].

Maintenance Dredging is an ongoing process. Since the Delaware River was last dredged to its present depth of 40 feet, in 1942, ongoing maintenance dredging results in the removal of 3 million cubic yards of sediments annually. When the depth of the Delaware River is increased to 45 feet with the current dredging project, maintenance dredging activities will likely need to continue to maintain the desired chanel depth[39]. In the case of the Delaware River, maintenance dredging will ensure the reliability of the waterway for ship navigation and result in increased efficiency of travel by ships.

POLLUTION IN THE DELAWARE RIVER

Water quality in the Delaware River is monitored in numerous ways. In Compliance with the Clean Water Act, the EPA requires that every two years states submit reports about the water quality in their state. Every two years the EPA also updates assessment and reporting protocols that the states must

[38] Fisheries and Oceans Canada. "Pacific Regional Operational Statement Routine Maintenance Dredging for Navigation." (retrieved June 11, 2007). <http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/pdfs/pacific_region_11_routine_maintenance_e.pdf>.
39 American Society of Civil Engineers. "Navigable Waterways: 2006 Report Card for Pensylvania's Infrastructure." (retrieved June 11, 2007). <http://www.pareportcard.org/graphics/PANavigableWaterways2006.pdf>.

follow.[40] At the State level, the Pennsylvania Department of Environmental Protection obtains water quality data through their statewide Citizen's Volunteer Monitoring Program. In addition, the PA DEP's Bureau of Water Standards and Facility Regulation can monitor water quality through the permit requirements of industrial and state water treatment facilities and facilities with point source discharge.[41] Numerous non-governmental groups also monitor water quality in the Delaware River. The Delaware Riverkeeper has a volunteer monitoring program with sites along the entire river and many of its tributaries. The data obtained is then distributed to government agencies or interested parties to assist with assessments, protection, and enforcement of water quality standards in the Delaware.[42] The Delaware River Basin Commission monitors the water quality of the Delaware River and works with government agencies, non-profit organizations, volunteers and staff to improve the water quality in the Delaware River estuaries.

Voluntary programs in the area– Partnership for the Delaware Estuary runs a voluntary, non-regulatory program called Clean Water Partners. The program is intended to train business owners and managers about how to

[40] "Mid-Atlantic States: Water Monitoring" (retrieved July 17)
<http://www.epa.gov/reg3wapd/monitor/state_monitoring.htm>
[41] "PA Department of Envronmental Protection" (retrieved July17th, 2006)
<http://www.depweb.state.pa.us/dep/cwp/view.asp?a=3&q=474428&pp=12&n=1>
[42] "Delaware Riverkeeper Network's Volunteer Monitoring Program" (retrieved July 17th, 2006)
<http://www.delawareriverkeeper.org/monitoring/monitoring.htm>

prevent stormwater runoff before it occurs through Best Management Practices. Clean Water Partners provides technical support and a handbook that enable program implementation for local businesses. Participating businesses sign a pledge which proclaims their dedication to the program and the environment. After completing the training they are then given decals that can be placed on windows and around the business which inform the public and employees about their environmental efforts.[43]

A recent study by the federal Environmental Protection Agency concludes that the Delaware River and Bay have some of the highest concentrations of chemicals in the nation, although overall levels appear to be decreasing. Pollution levels are highest in the stretch of river from Chester, Pa., to the mouth of Rancocas Creek in Burlington County.

The incidence of fin erosion, ulcers and abnormal growths in fish are generally low...about 5 per 1,000 fish, EPA says. Still, this rate is nearly double other estuaries in the region, including Chesapeake Bay.

Some of the Delaware River's most common pollutants include:

[43] "Clean Water Partners"(retrieved July 17th 2006) <http://www.delawareestuary.org/educationandoutreach/communityinitiatives/cleanwaterpartners.asp>

PCBs (Polychlorinated biphenyls)

This class of chemicals is suspected of causing cancer, liver damage, and respiratory distress. PCBs were once widely used in cooling electrical equipment, plasticizers, inks and dyes. They are slow to degrade in the environment and accumulate in the aquatic food chain. A 1994 study by Arthur D. Little Inc. of Cambridge, Mass., found PCBs in river sediments to be higher than previously thought. PCBs may still be getting into the river by way of leaking landfills, improper storage and illegal dumping. Locally, the Delaware River Basin Commission has completed a major basin-wide initiative on PCBs.

Metals

Toxic heavy metals including chromium, copper, lead, mercury and arsenic can have a wide range of health impacts, including causing neurological problems and cancer. These metals are found in river sediments from past industrial pollution. Industries continue to discharge metals into the river. Urban runoff and airborne pollutants also contribute to metals in the river.

Nutrients

Nitrogen, phosphorous and ammonia from the discharge of treated municipal and industrial wastes contribute to algae blooms that can result in reduced dissolved oxygen. The Delaware River has one of the nation's highest

concentrations of nutrients. But these nutrients haven't been a big problem, possibly because sediments suspended in the water may block out sunlight that algae need to grow.

Volatile Organic Compounds

Cancer-causing chemicals used by industry including 1,2-dichloroethane and tetrachloroethene have turned up in the river at levels exceeding federal drinking water criteria. Concerned about the risk of these chemicals ending up in drinking water supplies, officials are taking steps to set maximum industrial discharge limits. They are also tracking sources that discharge these chemicals into municipal wastewater treatment plants that discharge effluent into the river."[44]

NATIONWIDE EFFORTS – GREEN PORTS

Across the nation ports have recognized their environmental footprint and have started to address the issue. ALASKA - In 1991 the Port of Anchorage created the Port Area Petroleum Users Group (PUG). This group was organized with the intention of reducing pollution from petroleum-hydrocarbon contaminated soil and water. With the assistance of the Alaska Department of Environmental Conservation, PUG assessed the soils and water in the 300 acres surrounding the

[44] "Major Pollutants in the Delaware River", Courier Post Online, August 11, 2005. (retrieved August 23, 2006) <http://www.southjerseynews.com/river/toxin.html>

Port of Alaska.[45] The port believed that forming a collaborative with area land owners and users would result in a single more expansive and cost effective plan for environmental clean up than if many smaller plans were developed for individual subdivisions of the same area.[46] State regulatory agencies supported PUG to the extent that it agreed to not issue compliance orders as long as PUG functioned.[47] Participating companies were interested in joining PUG because throughout the process no individual parties were assigned blame and no binding commitment was necessary to join. PUG maintained its focus solely on financing and administering an environmental assessment and clean up.

The formation of PUG was an innovative approach for environmental clean up that incorporated fundamental keys of success such as: encouraging dialogue, discussion of time-saving strategies, making cost effective strategies, shared labor, focus on solution not blame, and increased cooperation between shareholders. By combining technical and financial resources, the PUG members have developed a nontraditional approach to remediation that has resulted in considerable cost and time savings.[48] In this case, cost effectiveness is measured

[45]" Land-Based Water Pollution" (retrieved July 21, 2006) < http://www.aapa-ports.org/govrelations/resources/GreenPorts/14.Land-base.pol.37-43%20pp.pdf>
[46] "Land-Based Water Pollution", 3.

[47] "Land-Based Water Pollution" , 3.

[48] "Land-Based Water Pollution" , 3

as avoided costs. The success of groups like PUG depends on the active commitment of its members in terms of: time, raising funds, administrative responsibilities, management, capacity for change and follow up supervision.

TEXAS – The Port of Corpus Christi Authority (PCCA) has revised its Stormwater Collection System to account for an increase in contaminated stormwater discharge due to the reconfiguration and new construction of their dry bulk docks. The PCCA formulated a Stormwater Pollution Prevention Plan that surpasses the traditional stormwater pollution controls required under the NPDES permit and has supplemented them with innovative stormwater infrastructure improvements and technologies. Infrastructure improvements include the "…construction of concrete-lined storm drains and ditches, stilling basins for runoff water, and filtration before stormwater is released into the channel or before pumping into storage ponds."[49] The filtration unit "…consists of three different beds - limestone, geo-synthetic fabric membranes and anthracite coal…these filters remove sediments, hydrocarbons, insoluble heavy metals and aeration improves the Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD)."[50] The accumulated sediments in the basins and filter traps need to be periodically removed and they can be reused as base materials for pet-coke pads. These supplemental pollution controls have proven

[49] "Land-Based Water Pollution" , 4.

[50] "Land-Based Water Pollution", 4.

to be a success, "…the PCCA has improved the quality of discharge water, improved the aesthetics of the Bulk terminal, separated and reclaimed solid wastes, captured and reused filtered storm water, suppressed dust emissions and saved money."[51]

PCCA's diligent stormwater efforts proved to be more than just effective but also rewarding.

CALIFORNIA- The Port of Long Beach completed an effective and comprehensive Stormwater Pollution Prevention Program. The Port administers the program and oversees permit compliance for applicable facilities; "…the Port strives to minimize redundancy and waste, reduce pollutant loading, and lessen the burden on tenants."[52]

What makes their stormwater program so successful is how different aspects of management are distributed throughout port departments.

- *Planning Division* – day-to-day administration; assists facilities with stormwater pollution issues
- *Maintenance Division* – maintains the storm drain system, conducts periodic cleaning, stencils inlets, and sweeps the streets
- *Engineering Division* – designs and constructs structures for tenants using Best Management Practices; obtains the necessary NPDES permits

[51] "Land-Based Water Pollution", 4.
[52] "Land-Based Water Pollution", 4.

- *Security Division* – reports on spills and tenant activities that may impact stormwater quality
- *Information Management Division* – manages a Geographic Information System database.[53]

The Port of Long Beach's Stormwater Management Program exceeds the EPA's stormwater program template and guidelines. The Port began this program in 1991 by educating its tenants about the need to comply with the general permit and asked them to join the Port's stormwater program. At the same time, the Port sought information, in the form of Stormwater Runoff questionnaires, probing each facility's operations in regards to: "…activities, potential pollutants, and control measures."[54] After the Port assessed the stormwater runoff information they created a state-of-the-art GIS database that could integrate "… information on the Port's storm drain infrastructure with facility-specific information."[55] This database allowed the port to evaluate drainage systems and isolate problem areas. This collaborative approach has been beneficial for improving communication between the Port and its' tenants, in addition to cost savings and overall reductions in runoff.[56] Though the formation of Stormwater Pollution Prevention Plans for participating tenants has been successful, critics

[53] "Land-Based Water Pollution", 4,5.
[54] "Land-Based Water Pollution", 5.
[55] "Land-Based Water Pollution", 5.
[56] "Land-Based Water Pollution", 5.

have argued that the Port should have stormwater requirements for all the facilities not just the participants who volunteered.[57]

SOUTH CAROLINA- When the Port of Charleston decided to expand one of its terminals, in 1991, they has to take into account how runoff would pollute the adjacent wetlands. The engineers designed an innovative drainage system and retention pond that collects, filters, and treats the runoff before discharging it into the surrounding ecosystem.

> "…Stormwater is collected by an extensive underground network of concrete pipes and then directed through filter cloth into a 17- acre L-shaped detention pond. Sand filters in the pond naturally remove contaminants from the water. Drains installed in the sand filtration bed a round the perimeter of the pond were made with geosynthetic materials designed to filter particulates from water and enhance soil reinforcement. During low tide conditions, hydraulic pressure pushes collected storm water through the filtration system and into the Wando River. A tide gate prevents salt water intrusion into the pond during high tides…"[58]

The Port of Charleston's environmental efforts have not only prevented wetland degradation but the surrounding wildlife have benefited from the new detention system, "…osprey nest on the terminal, ducks frequent the pond and alligators swim in the retention pond and sun bathe on the grassy embankment."[59]

[57] Bailey, 22.
[58] "Land-Based Water Pollution", 7.
[59] "Land-Based Water Pollution", 7.

NATIONWIDE – Environmental Management Systems (EMS) are becoming a popular solution for many ports across the United States when confronting environmental challenges. When these systems are integrated into port management they modernize port activities in terms of: health & safety, security, operational efficiency and community relations.[60] EMS's provide for ports the tools needed to find the roots of actual/potential environmental problems and to improve environmental performance, prevent pollution, and conserve energy and natural resources. These systems work because they integrate an innovative framework which incorporates strong operational controls and Best Management Practices into already existing jobs. [61] The benefits of Environmental Management Systems are:

> "…- Demonstrate leadership in environmental protection
> - Enhance credibility and public image
> - Reduce cost and improve efficiency
> - Lower environmental liability and improve insurance coverage
> - Improve emergency response capability
> - Increase staff awareness, competency, involvement and morale…"[62]

Across the U.S, EMS's are being assimilated into ports' daily activities. The EPA in partnership with the American Association of Port Authorities (AAPA) and

[60] "Environmental Management Systems and Public Seaports", (retrieved 7/26/06) http://www.peercenter.net/about/EMSPorts1Initiative.pdf (1-2), 1.
[61] "Environmental Management Systems and Public Seaports", 1.
[62] "Environmental Management Systems and Public Seaports", 1.

the Global Environment and Technology Foundation (GETF) have initiated a project to help ports receive EMS training, mentoring and technical assistance. Already eleven ports are included in the project and share the cost of EMS installation at $45,000 over a two year period.[63] A case study example:

> "…The Port of Houston Authority (PHA) adopted an EMS at its Barbours Cut Container Terminal and its Central Maintenance Facility in order to improve its environmental performance, reduce costs and provide regulatory benefits. Through the establishment of an internal EMS team and with the involvement of all PHA departments, the EMS effort focused on environmental issues in the following areas: stormwater impacts, air emission reductions, and waste minimization. PHA staff received assistance in preparing its EMS by participating in the U.S. Environmental Protection Agency's EMS Initiative for Local Government Entities. In its first two years, the PHA's EMS minimized stormwater impacts, reduced absorbent disposal by 75% and nitrogen oxide emissions by three tons, and completely eliminated the disposal of oily rags. In addition, the PHA expects to see substantial benefits in its insurance coverage due to its comprehensive EMS documentation and demonstrated operational controls…"[64]

EMS's are successful because they change the core methodology of the Port management, meaning that they become more aware and have established the methods necessary to continually promote improvement. [65]

Worldwide Efforts – Green Ports

NEW ZEALAND – Port Nelson is the largest fishing port in New Zealand. It has enacted an innovative environmental program that promotes continual

[63] "Environmental Management Systems and Public Seaports", 1.
[64] "Environmental Management Systems and Public Seaports", 2.
[65] "Environmental Management Systems: Systematically Improving Your Performance" (retrieved July 26, 2006)< http://www.epa.gov/sectors/ports/ports_bizcase.pdf > , (1-12), 3.

improvements to minimize environmental impacts and seeks cooperation with port users. In 1994, Port Nelson Ltd (PNL) established an Environmental Consultative Committee (ECC) to begin the process of developing an Environmental Management Plan (PNEMP). Members of the committee represent port operators, members of the surrounding community, environmental advocates and other area stakeholders. In 1996, the PNEMP was initiated as a "living public document" and it outlines the Port's environmental policies and goals. By making it a "living" document the ECC aspires to keep the PNEMP updated and modified as necessary. The ECC meets monthly in order to progress environmental issues and they have taken on a lobbying role for global issues that they cannot control. The PNEMP depends on the continual auditing, monitoring and reporting of independent consultants to pinpoint areas of priority.[66] The success of the PNEMP relies on excellent communication between the members of the ECC, port users, port employees and the community. Most importantly it is necessary that the port staff is updated on changes and new priorities of the PNEMP. To achieve that goal the PNEMP, "…ensures that there are mechanisms in place to make certain that PNL staff know about the environmental objectives and targets outlined in the various policies, codes of practice (used as forms of regulations), instructions for emergency actions and

[66] "Port Nelson Environmental Management Plan" (retrieved July 31, 2006) <http://www.portnelson.co.nz/files/environmental_full.pdf>, (1- 79), 2.

the procedures for reporting environmental incidents carried out during staff induction, and through the various internal communication networks."[67] These various internal communications are carried out, "…through the rePort magazine, Incident reports, monthly newsletters and staff notice boards are used to convey environmental messages to the various staff."[68] External communications include a monthly Environmental Update Newsletter, annual environmental reports, issues register and through ECC members. The structure of the PNEMP is categorized into 9 parts:

> "…1) Introduction providing the background behind Port Nelson's environmental approach towards sustainable management of natural and physical resources. It also outlines the history behind the Environmental Consultative Committee and two subcommittees.
>
> 2) Definitions of technical wording used throughout this Plan.
>
> 3) Port Nelson's Structure and Responsibility outlines the dynamics of the port, Port Nelson Ltd's management structure and where the Company has direct and indirect control as landowner through lease agreements.
>
> 4) Port Nelson's Commitment to the Environment presents Port Nelson's Environmental Policy Statement and also illustrates how the use of ISO 14001 can assist Port Nelson Ltd in reaching its environmental goals.
>
> 5) Legal and Other Requirements outlines the national regulations, legislation, statutory plans and policies, and codes of practice that the Port Company is obligated to follow when carrying out an activity that involves the environment.
>
> 6) Environmental Effects illustrates the environmental effects of Port Nelson's activities and the priority given to each effect to address them.
>
> 7) Environmental Policies, which contain a general noise policy, air quality policy, a water quality policy and a sustainable management policy, and the associated targets and mechanisms to reach the identified goals.
>
> 8) Training, Awareness and Communication outlines the systems in place to increase staff awareness and training of procedures associated with reporting environmental incidents and following codes of practices. This section also explains the external and internal communication processes used to keep staff and the community informed.

[67] "Port Nelson Environmental Management Plan", 3.
[68] "Port Nelson Environmental Management Plan", 3.

> 9) Environmental Reporting and Internal Auditing Environmental reporting is part of an annual reporting process that is made public. Regular internal auditing is carried out through checking activity compliance with that of the codes of practice."[69]

Due to the thorough dissemination of responsibilities and a cohesive communications structure, the PNEMP is a far reaching and persistently self improving doctrine.

ECOPORTS- EcoPorts originated as research project funded by the European Commission, "…to harmonize the environmental management approach of ports in Europe and to exchange experiences and implement best practices on port-related environmental issues."[70] In 1999, the EcoPorts Foundation, a non-profit, was founded

to create a balance in Europe, concerning port related environmental issues by establishing a pan-European network of ports with a policy of voluntary, self-regulation on environmental issues.[71] The specific goals are:

> "…- Create a 'level playing field' in terms of the implementation of environmental legislation, and to remove the environmental component as a competitive factor between ports.
>
> - Develop and implement cost effective and practicable solutions specifically targeted at environmental protection and sustainable development
>
> - Provide a focus for business opportunities and port development

[69] "Port Nelson Environmental Management Plan", 8.
[70] "Ports Sharing Environmental Experience", (retrieved July 26, 2006) <http://www.ecoports.com/ports/index.asp>
[71] "Ports Sharing Environmental Experience"

- Demonstrate good performance and best practice of the European port sector in terms of environmental duties and responsibilities

- Contribute to continuous improvement of the port environment…"[72]

The foundation's unique approach depends on the ability of Port managers to identify environmental problem areas and to take effective action. The tools that the foundation provide so as to assist ports in their evaluations and actions are as follows:

"…- Self Diagnosis Methodology (SDM): a validated procedure that assists ports to establish their base-line performance in terms of comparison with best practice guidelines and to assess their environmental management status against the European benchmarks. The feed-back provides GAP and SWOT analysis which assists ports to identify priorities for action.

-Port Environmental Review System (PERS): another validated procedure that assists ports to implement the first stages of a credible Environmental Management System. It can be used as a preliminary step to a more comprehensive system such as ISO 14000 but allows phased development. Following PERS establishes the core elements of an EMS. PERS is identified as a standard for port environmental management by the ECOPORTS Foundation, and as such, it carries the voluntary option of independent review (currently carried out by Lloyd's Register, Rotterdam, on behalf of the Foundation) with a Certificate of Validation for ports that reach the standard. This is an important new development for ports in Europe as it demonstrates attainment of a benchmark standard…"[73]

The foundation also provides the following packages to make these processes easier:

[72] "Ports Sharing Environmental Experience"
[73] "Ports Sharing Environmental Experience"

> "…- Strategic Overview of Significant Environmental Aspects: a methodology for ports to assess the major impacts of their activities and to check that they have sufficient information by which to manage their liabilities and responsibilities.
>
> - Decision Support System: a methodology to examine the range of factors involved in environmental issues, their interactions, and response options in decision-making.
>
> - Database of best-practice solutions to key environmental challenges.
>
> - Environmental Management Information System: a networked system that integrates all the components of ECOPORTS into an easily accessed system that can be interrogated by port professionals for purposes of practicable and cost-effective management options…"[74]

Membership to the EcoPort Foundation is strictly voluntary but the benefits are worthwhile:

> "…-Identification of business opportunities by applying smart solutions to environmental issues
>
> - Saving of costs by applying best practices from other ports, and by avoiding duplication of effort
>
> - Shared costs of developing new techniques and management tools
>
> - Access to network of environmental experience and expertise
>
> - Opportunity to influence policy development…"[75]

The success of this project and the formation of the EcoPort Foundation is directly related to the emphasis on reformulating port management methodology and refocusing from the burdens associated with environmental challenges to the benefits of new practices.

[74] "Ports Sharing Environmental Experience"
[75] "Ports Sharing Environmental Experience"

CONCLUSION

The pressing environmental issues affecting the Philadelphia port terminals are consistent with those at port terminals across the country. There are signs that the port industry is beginning to address these environmental issues and develop proactive strategies to reduce their environmental footprint. Philadelphia port terminals need to do their part in the larger vision of a "greener", healthier US port system. Clean Air Council is optimistic that Philadelphia port operators will participate in more voluntary measures to that end.