NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

INVENTORY AND ASSESSMENT OF WATERBORNE TRANSPORTATION RESOURCES STUDY

Final Report | December 2016

Prepared by WSP | Parsons Brinckerhoff in association with Cheng Solutions LLC., and CH2M

WSP | PARSONS BRINCKERHOFF CHENG SOLUTIONS LLC ch2m

DISCLAIMER

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

ABOUT THE NJTPA

The North Jersey Transportation Planning Authority (NJTPA) is the federally authorized Metropolitan Planning Organization for 6.7 million people in the 13-county northern New Jersey region. Each year, the NJTPA oversees the investment of more than $1 billion in federal funding for transportation projects and provides a forum for interagency cooperation and public input into funding decisions. It also sponsors and conducts studies, assists county planning agencies and monitors compliance with national air quality goals.

The NJTPA Board of Trustees includes 15 local elected officials, including one representative from each of the 13 northern New Jersey counties – Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren – as well as from the cities of Newark and Jersey City. The Board also includes the Commissioner of the New Jersey Department of Transportation (NJDOT), the Executive Director of NJ TRANSIT, the Chairman of the Port Authority of New York and New Jersey, a Governor's Representative and a Citizens' Representative appointed by the Governor.

ACKNOWLEDGEMENTS

The North Jersey Planning Authority (NJTPA) thanks the Technical Advisory Committee for their time, effort, and expertise in supporting the formulation of the NJTPA Inventory and Assessment of Waterborne Transportation Resources Study:

Bergen County	Donna Orbach
Essex County	David Antonio
Hudson County	Megan Massey
Jersey City	Maryann Bucci-Carter
Jersey City	Barkha Patel
Middlesex County	Bruce McCracken
Monmouth County	James Bonanno
Monmouth County	David Schmetterer
NJ DOT Maritime Resources	Scott Douglas
NJ DOT Maritime Resources	Genevieve Boehm Clifton
NJ Transit	Todd DiScala
NYNJ Rail Corp. (PANYNJ)	Donald Hutton
Ocean County	Mark Jehnke
Ocean County	Vicki Pecchioli
Port Authority of New York and New Jersey	Steven Brown
Port Authority of New York and New Jersey	Ahmed Ismail
SUNY Maritime College	Dr. Sam Yahalom
Union County	Liza Betz
USDOT Maritime Administration	Jeffrey Flumignan

NJTPA also thanks the many public and private sector organizations and staff that facilitated field visits and provided information and insights for this project. The organizations include the county and municipal transportation and economic development departments, property owners, developers, private sector companies, ferry operators, tug companies, the U.S. Coast Guard, the U.S. Army Corps of Engineers and the New York-New Jersey Harbor Navigation and Operations Committee.

CONTENTS

FIGURES AND TABLES

EXECUTIVE SUMMARY

About this Study

The North Jersey Transportation Planning Authority (NJTPA) region, as the location of the vast majority of maritime activity for the greater New York/New Jersey region, is home to many regionally, nationally, and internationally significant waterborne freight and passenger services. The waterways serve the ongoing needs of the goods movement industry and commuters, and also function as a vital artery for emergency services when highway or rail infrastructure is compromised. The goal of this study was to identify key "opportunity sites" for further consideration by public and private sector freight and passenger service providers and facility developers. Importantly, this study does not produce recommendations for development or for services – it is designed to provide critical information that will allow other public and private entities to explore and possibly advance their development plans.

As land uses have shifted over the decades, many waterfront sites that once hosted private marine industrial uses in the past now are now in a variety of conditions, ranging from dormant to redevelopment that eliminate the potential for future maritime use for transportation services. The challenge is to identify opportunities where potential maritime passenger and freight services could be located in the future in productive, contextual land use settings.

Accordingly, the North Jersey Transportation Planning Authority (NJTPA) in August 2015 initiated an assessment of the region's potentially available land resources to support waterborne freight and passenger transportation. Through this effort, NJTPA has developed an up-to-date and accurate inventory of the available marine transportation infrastructure for the region. This area includes the Ocean County coastline northward to Bergen County, the Raritan River and Bay, lower Passaic River, the lower Hackensack River, the Kill Van Kull, Arthur Kill, and the western lower Hudson River and Bay shoreline.

Regional Data Collection

The development of an up-to-date inventory was a crucial outcome of this effort. As such, the work of many local transportation and economic development agencies, and property owners, public agencies begun with a review of existing data and then was extensively updated through field work and validation efforts. Data was collected both on the landside and waterside of the potential sites, with the assistance of those with waterway responsibilities.

Freight Movement

The analysis began with a region-level review and context setting: NJTPA analysis of year 2014 information published by the US Army Corps of Engineers Statistics Center shows the top four commodities – distillate fuel oil, gasoline, crude petroleum, and residual fuel oil – account for about 57% of New York, New Jersey Harbor waterborne freight tonnage. Foreign imports account for some of this tonnage, but the coastwise, internal, and local, exceeded foreign crude imports by 70% according to 2014 data.

It should be noted movement patterns for crude and refined fuels have undergone rapid change in the past few years being commodity driven; with the rapid development of the Bakken and Marcellus shale oil fields, movement of crude by rail saw dramatic increases; now, with low international oil prices,

movements of crude by rail have fallen off somewhat, and waterborne flows seem to be recovering. Crude oil and its petroleum byproducts is a market driven commodity and the balance between domestic and foreign oil imports will fluctuate accordingly. As it becomes available, more current data should help shed light on these changes.

The region's leading export tonnage commodities include distillate fuel oil, pulp and waste paper, iron and steel scrap, vehicles and parts, machinery, smelted products, plastics, machinery, and other manufactured products.

Besides tonnage, container volumes are another important metric for waterborne freight movement. The Port of New York and New Jersey includes container terminals in New Jersey (at Port Newark-Elizabeth-Port Authority Marine Terminal (Elizabeth Terminal) and Bayonne) and in New York (at Staten Island and Brooklyn). In a typical year, roughly 90% to 95% of the Port's container volumes are handled through New Jersey facilities.

For decades, the Port of New York and New Jersey has been the leading east coast gateway for container traffic, and this leadership continues, with strong post-recession recovery and growth. According to the American Association of Port Authorities, in 2014 the Port handled a total of 5,772,303 TEUs (twenty-foot equivalent container units), ranking third in North America and trailing only Los Angeles and Long Beach. The next largest Atlantic Coast container port – Savannah – handled 3.4 million TEUs.

Passenger Movement

According to the U.S. Department of Transportation's National Census of Ferry Operators, the NJTPA region originated and terminated almost 4.4 million commuter passenger ferry person-trips in 2014.

The primary service providers are NY Waterways and BillyBey Ferry LLC (which operates some of the NY Waterways routes using NY Waterways equipment) and Seastreak LLC. The NY Waterways/BillyBey routes link Bergen, Hudson, and Monmouth counties with Manhattan. The two Seastreak routes link Monmouth County with Manhattan.

There are a variety of plans and studies that could impact future port and waterway utilization in the NJTPA region. The consultant team obtained and reviewed more than ten previous studies for information and lessons learned applicable to the identification and documentation of waterborne freight and passenger opportunity sites.

Site Data Collection

The assessment then proceeded to the local, site specific level. The primary sources of site-level data for this study consisted of The US Army Corps of Engineers (USACE) Port Series Database for New York/New Jersey Harbor; data on marine recreational facilities made available by NJTPA; property information from existing databases; environmental conditions from existing databases; landside access conditions developed from new geospatial analysis ; waterside conditions from site inspections; and considerations relating to dredging, vessel accessibility, vessel navigability, and vessel operations from a review panel of vessel operators. In addition, input was received from stakeholders including the study Technical Advisory Committee, NJTPA subregions, and public and private sector freight, passenger, and land use experts.

The results were compiled, validated, and presented in a "study database." This was used to prepare a Planning Visualization Tool, which allowed for on-line graphic display and analysis of key site information during the development process, to facilitate data development and review.

Screening, Profiling, and Future Use of Study Information

The full NJTPA waterborne sites database includes 696 individual sites. To focus on a more limited set of sites where NJTPA wanted to develop updated information, and to develop detailed Opportunity Site profiles, a screening process was developed in close cooperation with the TAC.

It must be emphasized that the selection of sites for enhanced data collection, or for the development of Opportunity Site Profiles, does not imply a recommendation or endorsement for development by NJTPA. Nor does the absence of a site from enhanced data collection or the list of Opportunity Site Profiles imply disinterest or a recommendation against development on the part of NJTPA.

Working closely with the TAC, the study team developed a set of suggested screening criteria to filter the total population of sites down to a smaller number for development of updated data. The various factors identified were as follows:

- 1st Tier (exclusion) criteria
  - Channel and berth depth (current and potential with dredging), air draft restrictions (fixed bridges), property size and ability to provide suitable berthing, known environmental issues
- 2nd Tier (ranking) criteria
  - Water: channel and berth depth, ease of dredging, waterway traffic and navigational risks, environmental risks
  - Site: dimensions and acreage, zoning, ownership, flooding, environmental, historical, security
  - Context: access by freight and people, parking, land use and community, permitting and development activity

Working with the TAC. It became clear that every site poses a different – and unique – set of opportunities and constraints. Therefore, the study sought to include as many sites as practical in the data enrichment process. From the original 696 sites, a total of 218 sites were retained for the "long list" of sites for data enrichment. The criteria were simple:
Any site that was identified by a study stakeholder (see Table 7) as being of potential interest was retained, regardless of its other attributes.

- Any site that was recognized by the consultant team as a past or present ferry site – some of which did not exist at the time the Corps collected its data, or were formerly a different use (marina, ramp, other).
- Any other site defined as a "dock" by the Corps, excluding apparent duplicates and bad records.

Opportunity Site Profiles

The Opportunity Site Profiles developed as part of this effort address, for a representative sample of sites in the NJTPA region: location and community context; history, current operation, and development plans; key data on waterside and landside access; parking requirements on site for ferry operations; market potential for passenger or freight services; and possible steps for implementation. Graphic content could include locations maps, aerial imagery, and development plans if known. The sites were identified in collaboration with the TAC and selected to represent known development interest, high potential, and other factors of interest. Opportunity Site Profile reports, covering more than 20 specific sites, were prepared. These sites – numbered generally north to south -- are listed below, and are shown in the map on the following page.

Passenger

1. Bergen County - Englewood Cliffs (1A), Hess (1B), and Allied Chemical (1C)
2. Jersey City - Harbor Side Place (2A), Paulus Hook (2B)
3. Newark Downtown (3A), River Terminal (3B)
7. Carteret Waterfront Park Ferry Site
11. South Amboy Ferry Site
12. Belford (12A), Atlantic Highlands (12B), Highlands Ferry Terminals (12C)
13. Long Branch Ferry Site

Freight

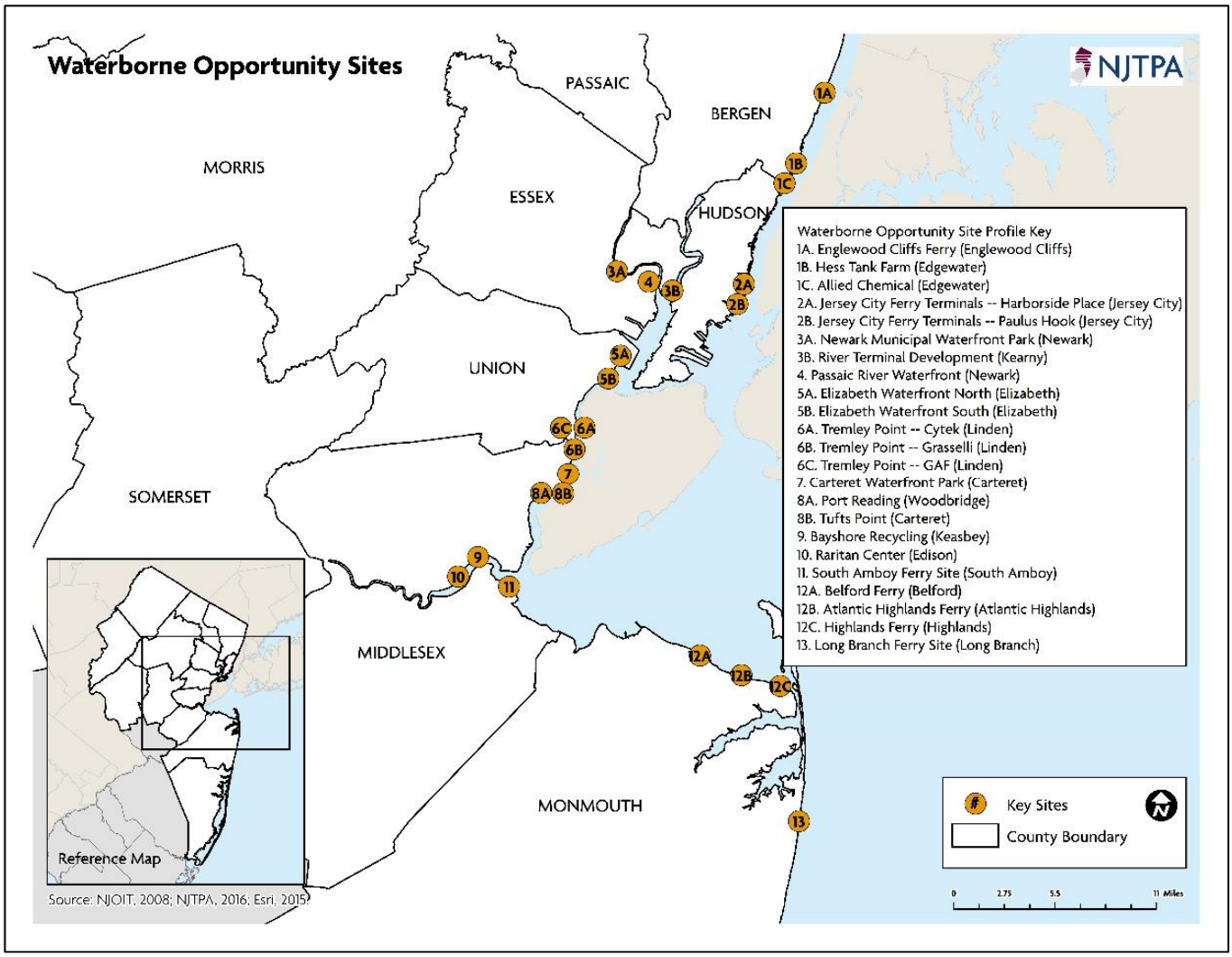
4. Passaic River North of Port Newark
6. Tremley Point (Linden) - Cytek (6A), Grasselli (6B), GAF (6C)
8. Port Reading - Woodbridge (8A), Tufts Point-Carteret (8B)
9. Bayshore Recycling Corporation
10. Raritan Center (Federal Business Centers)

Freight or Passenger

5. Elizabeth Waterfront-North (5A), Elizabeth Waterfront South (5B)

Next Steps

The assessment has resulted in a new comprehensive and updateable database that can serve multiple uses in the NJTPA and broader region. In addition, the Opportunity Site profiles provide succinct information for organizations to consider and use in the potential evaluation of potential future waterborne services. New Jersey is a maritime state, and the NJTPA region is one of the leading maritime freight and passenger transportation regions in the country. NJTPA and its stakeholders are keenly aware of the critically important role water has played in the development of the region, and of the vital role that waterborne transportation will play in the future success of the region. This project, as part of an ongoing program of NJTPA activities, seeks to advance understanding of this maritime heritage and maritime future.


Waterborne Opportunity Sites
NJTPA
PASSAIC
BERGEN
MORRIS
ESSEX
HUDSON
UNION
SOMERSET
MIDDLESEX
MONMOUTH
Waterborne Opportunity Site Profile Key
1A. Englewood Cliffs Ferry (Englewood Cliffs)
1B. Hess Tank Farm (Edgewater)
1C. Allied Chemical (Edgewater)
2A. Jersey City Ferry Terminals -- Harborside Place (Jersey City)
2B. Jersey City Ferry Terminals -- Paulus Hook (Jersey City)
3A. Newark Municipal Waterfront Park (Newark)
3B. River Terminal Development (Kearny)
4. Passaic River Waterfront (Newark)
5A. Elizabeth Waterfront North (Elizabeth)
5B. Elizabeth Waterfront South (Elizabeth)
6A. Tremley Point -- Cytek (Linden)
6B. Tremley Point -- Grasselli (Linden)
6C. Tremley Point -- GAF (Linden)
7. Carteret Waterfront Park (Carteret)
8A. Port Reading (Woodbridge)
8B. Tufts Point (Carteret)
9. Bayshore Recycling (Keasbey)
10. Raritan Center (Edison)
11. South Amboy Ferry Site (South Amboy)
12A. Belford Ferry (Belford)
12B. Atlantic Highlands Ferry (Atlantic Highlands)
12C. Highlands Ferry (Highlands)
13. Long Branch Ferry Site (Long Branch)
Reference Map
Key Sites
County Boundary
0
2.75
5.5
11 Miles
Source: NJOIT, 2008; NJTPA, 2016; Esri, 2015

1.0 INTRODUCTION

1.1 ABOUT THE STUDY

The North Jersey Transportation Planning Authority (NJTPA) in August 2015 initiated an assessment of the region's critical land resources to support waterborne freight and passenger transportation.

The NJTPA region, as the center of maritime activity for the greater New York/New Jersey region, is home to many regionally, nationally, and internationally significant waterborne freight and passenger services. Water serves the regular needs of the goods movement industry and commuters, and also functions as a vital artery for emergency services when highway or rail infrastructure is compromised.

With general declines in regional manufacturing, which mirror changes in the national economy, many waterfront sites that have hosted private marine industrial uses in the past now lay dormant, in declining condition. In some cases proposals for commercial or other redevelopment could foreclose future maritime use for transportation. The challenge is to find suitable maritime-related uses that match the capabilities of different sites, identifying opportunities for them to be returned to productive maritime use, while also accommodating other beneficial uses

Through this effort, NJTPA is developing an up-to-date and accurate inventory of the available marine transportation infrastructure for the region. This area includes the Ocean County coastline northward to Bergen County, the Raritan River and Bay, the lower Passaic River, the lower Hackensack River, the Kill Van Kull, Arthur Kill, and the western lower Hudson River and Bay shoreline.

The goal is to identify key "opportunity sites" for further consideration by public and private sector freight and passenger service providers and facility developers. Importantly, this study is not intended to produce recommendations for development or for services – it is designed to provide critical information that will allow other public and private entities to explore and possibly advance their development plans.

The effort was conducted for the NJTPA by a consultant team of WSP | Parsons Brinckerhoff, CH2M, and Cheng Solutions. The key work tasks included:

- A comprehensive inventory of past and present maritime freight and passenger facilities and sites throughout the NJTPA region
- Extensive outreach to regional and local governments, passenger and freight transportation companies, freight shippers/receivers, economic development agencies and others
- An inventory of primary characteristics of sites of potential interest
- More detailed investigations and profiles of approximately 20 leading opportunity sites
- Preparation of Draft and Final Reports
- Public information and briefings

1.2 STUDY WORK PLAN

The study work consisted of five primary task areas, as described below.

Task 1: Assemble and Integrate Key Datasets

The objective of Task 1 was to establish and baseline information on the location and utilization of key port facilities potentially suitable for accommodating waterborne freight and passenger movement in the NJTPA region. Task 1 included the following subtasks.

- Create initial version of waterborne facilities dataset and populate with US Army Corps of Engineers (USACE) facilities data. The consultant team utilized the most current available USACE Navigation Data Center Port Facilities database to develop interactive GIS mapping and tabular data for facilities in the 13-county NJTPA region. The database is structured not only to accommodate information that can be directly extracted from USACE data, but also to accommodate a wide variety of information from other data sources and investigations, including but not limited to: channel width; channel depth at Mean Low Water; overhead bridge clearances at Mean High Water; number and type of berths and docks; parcel/site area, ownership, and land use; landside access; environmental conditions; and surrounding community context.
- Document current freight and passenger movement by waterway and facility. To complement the Task 1.1 inventory of existing port facilities and locations, which can be looked at as "supply" assets, the team compiled an inventory of potential demand for new or expanded waterborne services, based on published information and datasets.
- Review platform studies relating to port facilities and waterway utilization. There are a variety of plans and studies that could impact future port and waterway utilization in the NJTPA region. The team reviewed each for information and lessons learned applicable to the identification and documentation of waterborne freight and passenger opportunity sites.
- Perform operator/regulator interviews, and obtain stakeholder input on potential future waterborne sites. The team conducted interviews with: subregional planning agencies; passenger and freight vessel operators serving the region; and regulatory and advisory bodies. The team also presented to the study Technical Advisory Committee (TAC) and NJTPA's Freight Initiatives Committee for additional feedback. A second round of outreach to subregional planning agencies and private sector interests was conducted in parallel with Task 2.

Task 2: Identify and Update Data Attributes for "Long List" of Opportunity Sites

From the information developed in Task 1, Task 2 developed updated information for more than 200 sites of potential interest. The original work plan called for developing information for 100 sites, but the team was able to allocate resources to accommodate a much larger and more useful analysis. Task 2 included the following subtasks.

- Perform screening to identify approximately sites of potential interest, using criteria developed in collaboration with the TAC and analysis of preliminary data collection results.
- Create updated and enhanced facilities inventory and dataset based on available information. In this task, additional data was developed to supplement and update the USACE data. The information was compiled and maintained in an Excel spreadsheet and an interactive Planning Visualization Tool, and delivered to NJTPA as Access files compatible with applicable GIS standards.
- Perform landside inspections and develop image library for selected sites, and provide links to aerial and street level imagery for all sites through the Planning Visualization Tool.
- Develop and apply screening evaluation factors to select, in collaboration with the TAC, opportunity sites to be profiled.

Task 3: Identify and Provide Additional Evaluation of Approximately 20 Leading Opportunity Sites

In this task, the study developed additional information for promising opportunity sites and created profiles of key site attributes, their market opportunities, and their readiness for utilization. Task 3 included the following subtasks.

- Perform waterside inspections of more than 20 opportunity sites by boat, addressing marine structural conditions and water depths. This work was actually performed in parallel with Task 2.

- Develop summary planning-level forecasts of passenger and freight demand.
- Develop list of site requirements to serve key markets.
- Develop Opportunity Site Profiles.

Task 4: Final Report and Deliverables

Study deliverables included:

- Meeting presentations and summary notes
- Technical Memorandum #1
- Technical Memorandum #2
- Opportunity Site Profiles
- Draft Final and Final Report
- Final PowerPoint Presentation
- A Database of Waterborne Opportunity Site Information (the "study database"), in three formats: as MS Access files in a format compatible with NJTPA GIS standards; as an MS Excel data file; and as an interactive Planning Visualization Tool, built using the Tableau software package.
- An image library

Task 5: Project Management

The study was guided by a Technical Advisory Committee (TAC) for this study. As planned, a total of four (4) TAC meetings were held over the duration of the study.

1.3 ABOUT THIS REPORT

This Report draws from all interim project documents and deliverables, and is organized as follows.

Main Report

- Section 1 – Introduction
- Section 2 – Regional Data Collection
- Section 3 – Site Data Collection
- Section 4 – Stakeholder Input
- Section 5 – Screening, Profiling, and Future Use of Study Information

Appendices

- Appendix A– Summaries of Technical Advisory Committee Meeting #1
- Appendix B– Summaries of Technical Advisory Committee Meeting #2
- Appendix C– Summaries of Technical Advisory Committee Meeting #3
- Appendix D– Summaries of Technical Advisory Committee Meeting #4
- Appendix E – Planning Visualization Tool User Guide
- Appendix F – Waterside Inspection Results
- Appendix G – Opportunity Site Profiles
- Appendix H – Glossary of Key Terms

2.0 REGIONAL DATA COLLECTION

The primary initial sources of regional-level data for this study consisted of:

1. Waterborne freight volume data from the USACE Waterborne Commerce of the US Database and American Association of Port Authorities (AAPA) Annual Statistics
2. Passenger volume data from operators and the US Census of Ferry Operators Database (CFOD)
3. Review of other literature and relevant studies

Each of these sources are discussed below.

2.1 WATERBORNE FREIGHT VOLUME DATA

The NJTPA region is one of the nation's leading shippers and receivers of waterborne freight. There are many different types of waterborne freight, but all of them can be moved on either large ocean-going ships or on smaller coastal or harbor barges.

Table 1. General Classification of Waterborne Freight

Type	Description	Examples	Moved on Large Ocean-Going Ships?	Moved on Smaller Coastal and Harbor Barges?
Containerized General Cargo	Any freight moved in a shipping container of standard dimensions (usually 20', 40' or 45')	Containerized electronics, food, parts, etc.	Yes	Yes
Breakbulk	Any freight moved in packages or units, like bags or pallets	Bagged grain, bananas, waste paper, dimensioned lumber	Yes	Yes
Neo-bulk	Freight moved in units such as sacks, slabs, or rolls	Coiled steel, slab steel, logs, tin plate	Yes	Yes
Project Cargo	Very large single pieces of freight	Wind turbines, precast concrete sections, metal girders, electrical generators	Yes	Yes
Roll on/Roll off	Any freight rolled or driven on and off a vessel	Automobiles, construction equipment	Yes	Yes
Liquid Bulk	Any freight moved in liquid form without packaging	Crude and refined fuels, bulk orange juice	Yes	Yes
Dry Bulk	Any freight moved in dry form without packaging	Coal, stone, loose grain	Yes	Yes

Source: WSP | Parsons Brinckerhoff

NJTPA analysis of year 2014 information published by the US Army Corps of Engineers Statistics Center shows the top four commodities – distillate fuel oil, gasoline, crude petroleum, and residual fuel oil – account for about 57% of New York, New Jersey Harbor waterborne freight tonnage. Foreign imports account for some of this tonnage, but the coastwise, internal, and local, exceeded foreign crude imports by 70% according to 2014 data.

It should be noted movement patterns for crude and refined fuels have undergone rapid change in the past few years being commodity driven; with the rapid development of the Bakken and Marcellus shale oil fields, movement of crude by rail saw dramatic increases; now, with low international oil prices, movements of crude by rail have fallen off somewhat, and waterborne flows seem to be recovering. Crude oil and its petroleum byproducts is a market driven commodity and the balance between domestic and foreign oil imports will fluctuate accordingly. As it becomes available, more current data should help shed light on these changes.

The region's leading export tonnage commodities include distillate fuel oil, pulp and waste paper, iron and steel scrap, vehicles and parts, machinery, smelted products, plastics, machinery, and other manufactured products.

For imports, the region's leading tonnage commodity is crude petroleum, mostly from Canada; distillate fuel oil is a close second. The next leading commodity types are a mixture of consumer goods and industrial commodities: manufactured products, textile products, alcoholic beverages, vehicles and parts, chemical additives, fabricated metal products, non-metallic minerals, rubber and plastic products, food products, non-electrical and electrical machinery, fruit juices, and vegetables and produce.

For coastwise traffic moving between NJTPA and other US port districts, the leading commodities were gasoline, distillate fuel oil, residual fuel oil, and alcohols. Lower tonnages were associated with sand and gravel, sugar, asphalt, cement and concrete, crude petroleum, and manufactured products.

For traffic moving over the NJTPA region's inland waters, the leading tonnage commodities were gasoline, distillate fuel oil, sand and gravel, and crude petroleum. Lower tonnages were associated with cement and concrete, iron and steel scrap, and residual fuels.

Finally, looking at local traffic within the Port district, the leading commodities were residual fuel oil, distillate fuel oil, gasoline, crude petroleum, alcohols, iron and steel scrap, manufactured products, naphtha and solvents, and waste and scrap.

Besides tonnage, container volumes are another important metric for waterborne freight movement. The Port of New York and New Jersey includes container terminals in New Jersey (at Port Newark/Elizabeth Terminal and Bayonne) and in New York (at Staten Island and Brooklyn). In a typical year, roughly 90% to 95% of the Port's container volumes are handled through New Jersey facilities located within the NJTPA region. . For decades, the Port of New York and New Jersey has been the leading east coast gateway for container traffic, and this leadership continues, with strong post-recession recovery and growth. According to the American Association of Port Authorities, in 2014 the Port handled a total of 5,772,303 TEUs (twenty-foot equivalent container units), ranking third in North America and trailing only Los Angeles and Long Beach. The next largest Atlantic Coast container port – Savannah – handled 3.4 million TEUs.

This study is not designed to identify sites for major container handling facilities related to deep-draft ocean-going vessels. However, the potential for containers moving on shallow draft vessels and barges, in local or coastwise Marine Highway services, has been under discussion. Terminals for shallow draft vessels and barges can be considerably smaller than major container terminals, and may be a potentially compatible use for some of the sites evaluated in this study.

2.2 WATERBORNE PASSENGER VOLUME DATA

According to the U.S. Department of Transportation's National Census of Ferry Operators, the NJTPA region originated and terminated almost 4.4 million commuter passenger ferry person-trips in 2014.

Table 2. NJTPA Commuter Passenger Ferry Trips, NJ and NY Origins and Destinations, 2014

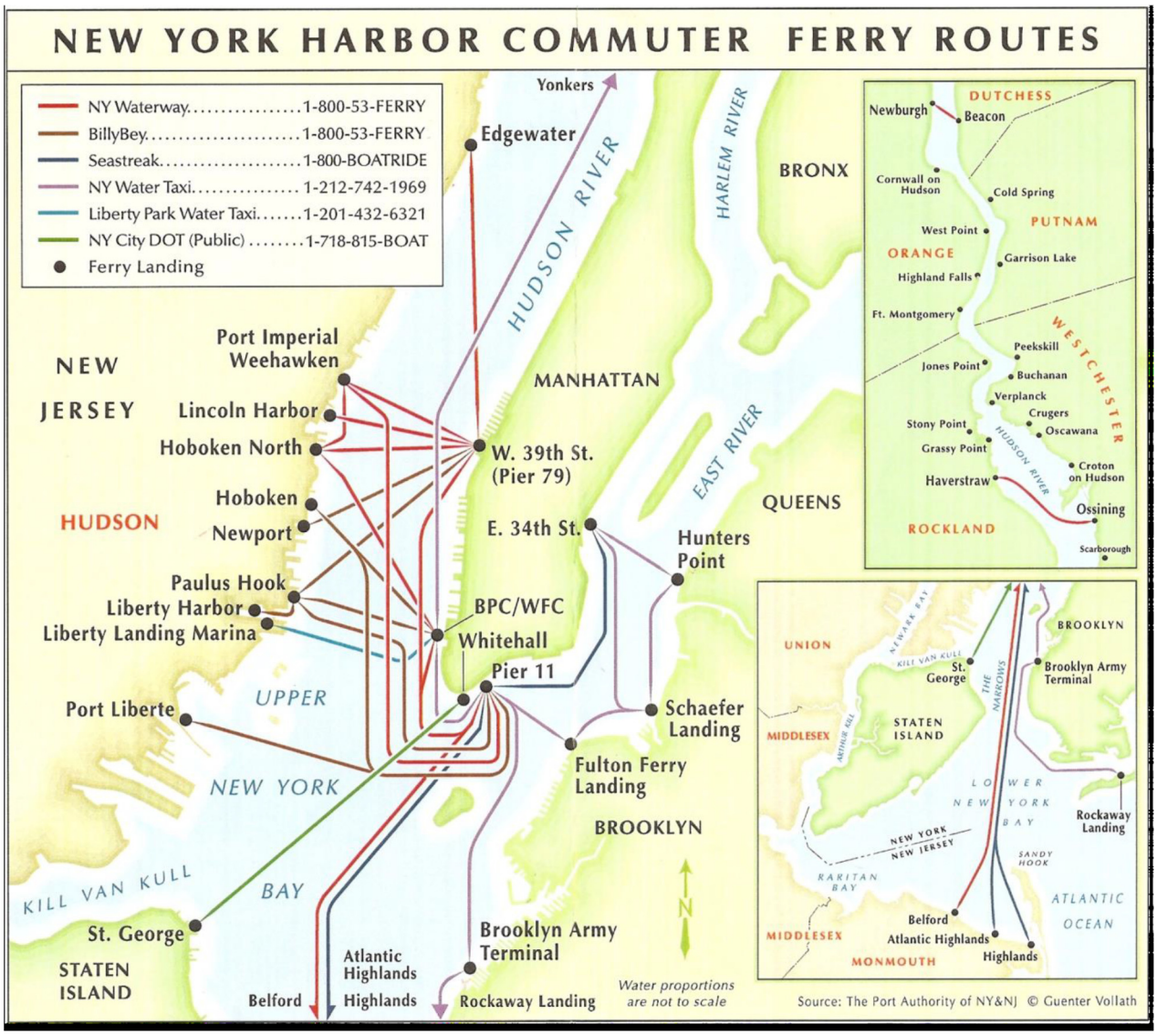
Operator Name	Terminal City Pairs	Origin Terminal	Destination Terminal	Annual Passengers	Vessel Trips/Day (Wed)
New York Waterway	Belford, NJ to New York, NY	Belford	Pier 11	240,889	24
	Edgewater, NJ to New York, NY	Edgewater	Midtown - W. 39 Street	98,543	32
	Hoboken, NJ to New York, NY	North Hoboken	Midtown - W. 39 Street	353,408	102
	Hoboken, NJ to Weehawken, NJ	North Hoboken	Lincoln Harbor	76,185	0
			Port Imperial	0	40
	New York, NY to Belford, NJ	Pier 11	Belford	151,984	24
	New York, NY to Edgewater, NJ	Midtown - W. 39 Street	Edgewater	76,598	30
	New York, NY to Hoboken, NJ	Midtown - W. 39 Street	North Hoboken	239,083	102
		World Financial Center	North Hoboken	103,638	40
	New York, NY to Weehawken, NJ	Midtown - W. 39 Street	Lincoln Harbor	217,952	108
			Port Imperial	838,997	148
		Pier 11	Port Imperial	98,116	48
	Weehawken, NJ to Hoboken, NJ	Port Imperial	North Hoboken	60,208	38
	Weehawken, NJ to New York, NY	Lincoln Harbor	Midtown - W. 39 Street	234,571	108
		Port Imperial	Midtown - W. 39 Street	896,445	148
			Pier 11	104,680	46
Seastreak, LLC	Atlantic Highlands, NJ to Manhattan, NY	Hesse Pier	E 35th St	70,614	20
	Atlantic Highlands, NJ to New York, NY	Hesse Pier	Pier 11	119,296	16
	Highlands, NJ to Manhattan, NY	Highlands Terminal	E 35th St	106,976	20
	Highlands, NJ to New York, NY	Highlands Terminal	Pier 11	70,445	16
	Manhattan, NY to Highlands, NJ	E 35th St	Sandy Hook Beach	98,207	4
	New York, NY to Highlands, NJ	Pier 11	Sandy Hook Beach	115,665	4
Grand Total				4,372,500	1,118

Source: Analysis of National Census of Ferry Operators data

The primary service providers are NY Waterways and BillyBey Ferry LLC (which operates some of the NY Waterways routes using NY Waterways equipment) and Seastreak LLC. The NY Waterways/BillyBey routes link Bergen, Hudson, and Monmouth counties with Manhattan. The two Seastreak routes link Monmouth County with Manhattan.

Passenger ferry services are periodically introduced and/or discontinued, as market opportunities warrant. Several NJTPA subregions are actively exploring, or have at least expressed interest in, expanded or new passenger ferry service as well as water taxi service. Sites for passenger ferry operations are therefore an important consideration for this study.

Figure 1. Commuter Ferry Route Map Produced by the Port Authority of New York and New Jersey



Source: Port Authority of New York and New Jersey

2.3 RELEVANT STUDIES AND LITERATURE

There are a variety of plans and studies that could impact future port and waterway utilization in the NJTPA region. The consultant team obtained and reviewed each for information and lessons learned applicable to the identification and documentation of waterborne freight and passenger opportunity sites. Key platform documents include:

- NJDOT Office of Maritime Resources studies: Ferry Wake in New York Harbor (2002). This study addressed wake impacts from operations of passenger vessels.

- NJTPA Brownfields (2003). This study examined market and development factors in restoring brownfield sites to productive use, and provided detailed case studies of several sites where waterfront transportation features could be integrated with redevelopment.
- NYMTC's Long Island Sound Waterborne Transportation Plan and Hunts Point Waterborne Freight Assessment (2005). While this study focused primarily on Long Island Sound, it did discuss the market potential of truck ferry service to/from Northern New Jersey.
- New Jersey Economic Development Authority (NJEDA) Portfields Study (2005). The Portfields initiative identified 17 properties with the potential for redevelopment as warehouse/industrial space to meet the needs of NJTPA region importers and exporters. Waterborne transportation services could be integrated into many of these sites.
- NYCEDC Maritime Support Services Location Study (2007). This is a comprehensive analysis of the need for maritime support services (repair, drydock, fuel, provisioning, etc.) and existing and potential future service locations.
- PANYNJ Interagency Regional Ferry Study (2011). This study provides a high-level view of the current state of the region's bi-state ferry system, and identifies a number of new sites and services that could prove viable.
- NJDOT Office of Maritime Resources Draft Final Passenger Ferry Report (2012). This study identifies several potentially promising passenger ferry routes between Northern New Jersey and Manhattan.
- MARAD M-95 Study (2013). This is a comprehensive study of many possible freight service combinations between origin-destination city pairs along the US Atlantic Coast paralleling I-95. The study identified several potential services involving the New York/New Jersey region. Subsequent MARAD-funded studies have looked in more detail at a Portland ME to NY/NJ service.
- New York Comprehensive Citywide Ferry Study (2011) and Citywide Ferry Study Update (2013). These studies focused on New York City, but did address one site in New Jersey (South Amboy) for possible future service.
- NJ Transit/NJTPA Ferry Customer Study Report (2014). This study reported ferry ridership data and survey results related to existing services.
- Cross Harbor Freight Movement Tier I EIS (2015). This massive EIS considered a wide range of freight movement alternatives, including an "enhanced float" option that would expand the use and utility of the existing rail float operation between Greenville Yard in Bayonne and 65th Street in South Brooklyn. The enhanced float is one of two preferred alternatives in the FHWA Record of Decision.

In addition, several other unpublished reports in various stages of completion were reviewed for this study. The studies provided important guidance on potential development sites and planning activities.

3.0 SITE DATA COLLECTION

The primary sources of site-level data for this study consisted of:

1. The US Army Corps of Engineers (USACE) Port Series Database for New York/New Jersey Harbor
2. Other data on marine recreational facilities made available by NJTPA
3. Stakeholder input
4. Property information (adapted from existing databases)
5. Environmental conditions (adapted from existing databases)
6. Landside access conditions (developed from new geospatial analysis)
7. Waterside conditions (from site inspections)
8. Considerations relating to dredging, vessel accessibility, vessel navigability, and vessel operations (from a review panel of vessel operators active in the waters of the New York/New Jersey region)

Each of these sources are discussed below.

3.1 USACE PORTS AND WATERWAYS FACILITIES DATABASE

The USACE Ports and Waterways Facilities Database is the single most comprehensive inventory of port and waterway facilities available for the US. The USACE Navigation Data Center website describes the basic features of the database.[1]

> "The Navigation Data Center maintains a database (Master Docks Plus) of over 40,000 port-and-waterway facilities and other navigation points of interest. The data describe the physical and inter-modal (infrastructure) characteristics of the coastal, Great Lakes, and inland ports of the United States. Data are also included for facilities in Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands, and the trust territories of the Pacific. The data include, but are not limited to location (latitude/longitude, waterway, mile, and bank); operations (name, owner, operator, purpose, handling equipment, rates, and details of open-and-covered storage facilities); type and dimension of construction (length of berthing space for vessels and/or barges, depth, apron width, deck elevation, and details of rail-and-highway access); and utilities available (water, electricity, and fire protection).
>
> The data are available in several formats.
>
> - The Complete Dock List spreadsheet contains a list of all facility types (dock, anchorage, mile point, etc.) that may be reported as the origin or destination of commercial waterborne vessel moves. Attributes included in the list are the unique navigation-unit identifier, official name, facility type, latitude/longitude, United Nations Location Code, service initiation date, service termination date, port name, waterway name, and mile. Data included is for all facility types that were available for use during the previous two years.
> - The Port Facility spreadsheet is similar to the Complete Dock List but has an expanded list of attributes not including mile points. The additional attributes include a location description, street address, city, state, zip code, county, congressional

[1] See http://www.navigationdatacenter.us/ports/ports.htm

district, owners, operators, highway-and-railway connections, commodities, type of construction, cargo-handling equipment, water depth alongside the facility, berthing space, and deck height. Data included is for all facility types (except mile points) that were available for use during the previous two years.

- The Master Docks plus Public Extract database is a Microsoft Access database that contains a complete extract of the Navigation Data Center's dock database with all data that may be released to the public."

For this study, the consultant team downloaded the latest Master Docks Plus database. Analysis of Master Docks plus shows almost 700 listed docks, marinas, or boat ramps (places to launch and recover boats) in twelve of the thirteen NJTPA counties.

Table 3. Number of USACE-Listed Ports and Waterways Facilities in the NJTPA Region

Count of Index Number	Column Labels			
Row Labels	Dock	Marina	Ramp	Grand Total
Bergen	9	12	1	22
Essex	43	1	1	45
Hudson	89	17	4	110
Hunterdon			4	4
Middlesex	55	20	6	81
Monmouth	15	81	12	108
Morris		23		23
Ocean	14	203	20	237
Passaic	1	10	3	14
Sussex		14		14
Union	32	2		34
Warren			4	4
Grand Total	**258**	**383**	**55**	**696**

Source: Analysis of USACE Ports and Waterways Facilities Database

Each site in the dataset is identified by type of facility, latitude-longitude, address location, and name. The dataset includes data fields for owner, use, channel depth, berthing characteristics, and other attributes.

One limitation of the dataset is that for most sites, the information is not complete and not all the data fields are populated. The other limitation is that the data was originally developed more than 20 years ago, and changes since then have not always been captured. Some sites have entered or left active maritime use, and many have changed ownership.

Despite these limitations, the USACE Ports and Waterways Facilities Database is an excellent platform to document baseline information on waterborne transportation resources. Much of the work in this study focuses on validating, updating, and enriching this data to make it more useful. The specific data fields contained in this database and transcribed to the study database are described in Appendix E, the Planning Visualization Tool User Guide.

3.2 Other Data on Marine Recreational Facilities

Although marine recreational facilities are not a focus of this study, examination of the development of ferry landings in the region over the past 20 years shows that in some cases, they have been built at former or current marine recreational facility sites. Having access to good information on these facilities is therefore of general utility, even if the updating and enhancement of this information is not part of the current project. Therefore, additional information for marine recreational facilities was collected and made available by the NJTPA and considered in the study data collection and documentation effort.

3.3 Stakeholder Input

Stakeholder input was a critical component of the overall data collection effort, at multiple stages throughout the study. Stakeholder involvement and stakeholder-generated/stakeholder-informed information is discussed at length in Section 3 of this Report.

In general terms, stakeholders consisted of:

- The study Technical Advisory Committee (see Appendices A through D for summaries of each of the four TAC meetings, along with participating individuals and agencies);
- Land use and economic development planners from each of the NJTPA's subregions;
- Private sector passenger ferry service operators; and
- Private sector landowners, developers, and freight shippers.

Input from different stakeholders addressed, as applicable:

- Sites that should be included in the analysis, including some sites that were not part of the USACE dataset
- The types of information that should be collected for these sites
- Screening guidelines and criteria for identifying sites of particular interest, differentiating between sites of potential interest (where the development of enhanced data was appropriate), leading opportunity sites (where the development of site Profiles was appropriate), and other sites (which were appropriate to report, but without data enhancement or profile development)
- Recommendations and feedback on the study's Planning Visualization Tool
- Updated information on selected sites
- Review and input to study documents and products

With respect to data collection, the TAC identified a range of information types – in many cases, going well above and beyond the information available from the USACE -- that would be valuable to include in the waterborne facilities database, as shown on Table 4 on the following table.

To develop as much of this information as practical within the parameters of the study effort, the consultant team undertook several parallel efforts: extracting relevant data from other available sources; performing new geospatial analyses; performing new waterside inspections; and developing new assessments addressing the issues of dredging, vessel navigation, vessel accessibility, and vessel operations. This enhanced data was developed for more than 200 sites, which were selected consistent with screening guidelines established by the TAC.

Table 4. Database Fields Recommended by TAC Members

	Information Type Within Database Structure
Water and Navigation	Channel depth (MLLW) and width, berth depth, tidal ranges Fixed bridge restrictions (MHHW) and moveable bridges Rate of siltation and dredging history Number and type of structures (berth, dock, etc.) Waterway traffic / utilization (from Harbor Ops) Known water-based environmental conditions Presence of sub-surface utilities Known navigational issues (piloting)
Site Attributes	Dimensions and acreage Current use and zoning Ownership and users Known environmental issues Vulnerability to storm/surge and sea level rise Visual observations/photos MTSA security area designation Historic register designation (state or Federal)
Landside Context	Truck and freight rail access Auto access and parking Transit services and routes Bike and ped access Adjoining land uses/densities Permitting and development activity

3.4 Extraction of Relevant Data from Other Available Sources

The state of New Jersey has extensive information on the land use and environmental attributes of specific properties, but this information resides in multiple datasets. The USACE and National Oceanographic and Atmospheric Administration (NOAA) have extensive information on the conditions of navigable waterways. NOAA has consultant team worked to identify this information, and to integrate it within the study database along with the original USACE and Maritime Facilities data. Key data sources included:

- For land use information: NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), 201303, New Jersey 2012 - 2013 High Resolution Orth photography, NAD83 NJ State Plane Feet, MrSID Tiles; Republished May 2013: NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), Trenton, NJ.
- For environmental information: the New Jersey Department of Environmental Protection website, accessed at various times during 2016.
- For storm surge impacts: the NOAA on-line analysis tool at http://noaa.maps.arcgis.com/apps/StorytellingTextLegend/index.html?appid=b1a20ab5eec149058bafc059635a82ee.

- For authorized channel depths and widths and recent channel soundings: the USACE New York District Controlling Depth Reports

(http://www.nan.usace.army.mil/Missions/Navigation/Controlling-Depth-Reports/) and the Philadelphia District website (http://www.nap.usace.army.mil/).

- For recent channel soundings and overhead bridge restrictions: NOAA charts accessible at www.charts.noaa.gov/OnLineViewer/AtlanticCoastViewerTable.shtml.

The specific data fields derived from each of these sources are described in Appendix E, the Planning Visualization Tool User Guide.

3.5 New Geospatial Analysis

To address questions of site distance from interstate and divided highways, rail transit, and bus transit, the consultant team performed a geospatial analysis using latitude/longitude coordinates of sites from the study database, in relation to the locations of highways, rail transit stations, and bus stops. The specific data fields developed from geospatial analysis are described in Appendix E, the Planning Visualization Tool User Guide.

3.6 New Waterside Inspections

Water depths around berthing areas and the condition of berthing structures (wharfs, docks, piers, etc.) are of significant interest when considering the possible introduction or reactivation of waterborne freight or passenger services. This information, however, does not exist in any database. Therefore, the consultant team undertook a series of waterside investigations using a small boat. The investigations produced evaluations of structural conditions and berth depths, as well as photographs of important conditions. Inspection reports are attached as Appendix F, and the results were also documented as data fields within the study database (as described in Appendix E).

While it was not possible to perform waterside inspections for all sites of potential interest – given more than 200 were identified in the study – it was possible to visit a generally representative sample of 23 sites. The selection was based on the following criteria:

- Known historic or current interest in development, or strong development potential suggested by the project team;
- Potential for commuter ferry or freight barge services requiring deeper drafts and more extensive wharf and depth improvements;
- Exclusion of water taxi site locations – these facilities can be accommodated on small land areas; and with shallow-draft channels, which means they can be sited in many locations where passenger ferries or freight barges would be precluded or restricted;
- Representation across a range of waterways and geographic regions; and/or
- Of general interest as examples of waterfront facility types.

For some of the inspected sites, Opportunity Site Profiles were developed, with substantial additional detail (see Appendix G). For other sites, the analysis did not extend beyond the site inspection stage. The sites inspected included:

- Shoreline Investigation – Site No. 1, Hess Tank Farm. This site is located on the west bank of the Hudson River in Edgewater. The site is an abandoned, non-active product loading/unloading pier which extends offshore from a rocky, undeveloped shoreline approximately 400 feet into the Hudson River. It has been identified as a potential location for a new passenger ferry.

- Shoreline Investigation – Site No. 2, Allied Chemical. This site is located on the west bank of the Hudson River in Edgewater, approximately 3.75 miles south of the George Washington Bridge. The site is currently abandoned, and is comprised of a variety of partially or completely collapsed structures on or adjacent to an undeveloped shoreline. It has been identified as a potential location for a new passenger ferry.
- Shoreline Investigation – Site No. 3, former Englewood Cliffs Ferry. This is the site of a former passenger ferry operation, located on the west bank of the Hudson River, approximately 1.7 miles north of the George Washington Bridge in Palisades State Park. It has been identified for the potential to reactivate passenger ferry service.
- Shoreline Investigation – Site No. 4, Buckeye Terminal. This site is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.3 miles north of the Goethals Bridge.
- Shoreline Investigation – Site No. 5, Motiva Enterprises. This site is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.7 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.
- Shoreline Investigation – Site No. 6, Stratus Petroleum Corp. This is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.8 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.
- Shoreline Investigation – Site No. 7, North of Stratus Petroleum. This site is located on the west bank of the Passaic River, approximately 1.0 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.
- Shoreline Investigation – Site No. 8, Passaic Valley Sewage Commission. This is an active sewage treatment and transport facility located on the west bank of the Passaic River, approximately 1.1 miles north of the Goethals Bridge. It is located between other sites of potential interest that were inspected.
- Shoreline Investigation – Site No.9, DART Site Waterfront. This is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 1.2 miles north of the Goethals Bridge. At the time of inspection, it was believed that DART might be a possible site for handling waterborne freight, but further investigation confirmed no active interest.
- Shoreline Investigation – Site No. 10, Sun Co. Newark. This is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 1.4 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.
- Shoreline Investigation – Site No. 11, General Chemical is located on the west bank of the Passaic River, approximately 1.8 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.
- Shoreline Investigation – Site No. 12, Essex Co. Corrections Waterfront. This site is located between other sites of potential interest that were inspected.
- Shoreline Investigation – Site No. 13, Essex County Waste to Energy. This site is located on the west bank of the Passaic River, approximately 3.2 miles north of the Goethals Bridge. At the time of inspection, it was believed that DART might be a possible site for handling waterborne freight, but further investigation confirmed no active interest.
- Shoreline Investigation – Site No.14, Jersey City Landing. This site is an active ferry landing that has been in use for several years. The inspection report is intended as a model of a modern, efficient passenger ferry facility.

- Shoreline Investigation – Site No. 15, South Amboy. This site is located on the south bank of Raritan Bay, approximately .8 miles east of the New Jersey Transit railroad bridge, near downtown South Amboy. A passenger ferry service is planned for near-term development at the site.
- Shoreline Investigation – Site No. 16, Carteret Waterfront Park. This site is located on the west bank of the Arthur Kill, and consists of a new waterfront park and marina, with planned near-term development of a passenger ferry at the site.
- Shoreline Investigation – Site No. 17, Raritan Steel. This site is located on the north bank of the Raritan River, adjacent to New Jersey Transit Rail Bridge. At the time of the inspection, it was considered a possible location for either freight or passenger service development; the site currently has a small freight operation, and the developer anticipates no change from current service conditions.
- Shoreline Investigation – Site No. 18, Raritan Center. This site is located on the north bank of Raritan River, approximately 1.8 miles west of New Jersey State Parkway Driscoll Bridge. The site currently has a small freight operation.
- Shoreline Investigation – Site No. 19, Elizabeth Waterfront North. This site is located on the southernmost portion of Newark Bay, just north of the confluence of the Arthur Kill and Kill van Kull. The property borders Site 20 to the south and Berth 98 at Elizabeth Terminal to the north. It has been identified as potentially suitable for a diverse range of freight and passenger uses.
- Shoreline Investigation – Site No. 20, Elizabeth Waterfront South. This site is located on the southern-most portion of Newark Bay, just north of the confluence of the Arthur Kill and Kill van Kull. The property borders Site No. 19 to the north. It has been identified as potentially suitable for a diverse range of freight and passenger uses.
- Shoreline Investigation – Site No. 21, Tremley Point. This site is located on the north bank of Rahway River, approximately .9 miles upstream of Arthur Kill. It provides an example of typical conditions along this waterway.
- Shoreline Investigation – Site No. 22, Cytek Industries. This site is located at the juncture of the Rahway River and Arthur Kill waterways, with developed frontage on each, at the tip of Tremley Point. It has been identified as part of a cluster of properties potentially suitable for freight development in the immediate area.
- Shoreline Investigation – Site No. 23, Old Bridge/Marquis Creek. This site is located on the south bank of Raritan Bay, approximately 3.8 miles east of the New Jersey Transit railroad bridge. The development of a new passenger ferry service to this area is a possibility, and there are many sites that could be considered; this was chosen as one representative example for analysis.

3.7 New "Level of Action" Analysis

Many TAC members stressed the need to look at the region's waterways from a risk analysis perspective, addressing factors that could impact decisions to develop waterborne facilities and services. These included:

1. Need for channel maintenance dredging
2. Need for berth dredging
3. Accessibility (physical ability to reach a site with typical vessels, based on channel/berth depth and overhead bridge conditions)
4. Navigability (physical ability to reach a site based on current, channel dimension and shape, and similar characteristics); and
5. Operations (potential conflicts with known or anticipated freight, passenger, and recreational uses of the waterways).

This information is not in any database, but it does exist within the larger community of waterway operators and regulators. To document this knowledge, the study team worked with the NY/NJ Harbor Operations Committee Steering Committee – a consortium of public agencies (US Coast Guard, State of New Jersey, City of New York, et al), private vessel operating companies, shipping associations, and regional universities – to develop assessments of these factors for the region's primary waterways.

Interestingly, while the exercise started as a risk assessment, it became clear that a more accurate way to describe it was a level of action assessment. The reasoning is that while all sites and operations involve some level of risk, most levels of risk can be addressed and overcome if appropriate, sufficient action is taken – site improvements, physical design of facilities, operating strategies, choice of vessels, adequate funding and investment, etc.

The resulting assessments were documented in a simple way. On any of the five dimensions listed above:

- A rating of "Low" means that conditions are very favorable and little to no action is needed to address issues;
- A rating of "High" means that significant challenges exist and significant actions must be taken to address issues; and
- A rating of "Medium" means that some challenges exist and some actions must be taken to address them, but not to a high level of cost or difficulty.

The resulting ratings are provided in the Facilities Database for each of the 157 updated sites. It is important to stress that these ratings are not recommendations for or against development at certain sites or along certain waterways – they are meant only to identify conditions where higher or lower levels of action and response would be appropriate or required to develop certain uses or services, as input to future planning and decision-making.

3.8 STUDY DATABASE DELIVERABLES

As previously mentioned, the "study database" actually consists of three related data files:

- An MS Excel file, in which all data was recorded as it was developed and validated
- An MS Access file, created from the Excel file, consistent with NJTPA's GIS standards, allowing the information to be migrated to the NJTPA GIS/data platforms as appropriate
- A Planning Visualization Tool, developed in a commercial software package called Tableau. The Planning Visualization Tool was intended to facilitate the display and discussion of study data, in real time, via the web, Its goals were to:
    - Provide information to working planners and other stakeholders without the need for specialized GIS software, licenses, or expertise, on their desktops and laptops, without any software installations
    - Allow users easily sort, filter, query, and display data with a simple, visual interface.

The Planning Visualization Tool User Guide (see Appendix E) contains information on all data fields compiled or developed in the course of the study effort, for both the Excel and Access formats. It also provides a step-by-step guide to the Planning Visualization Tool. The tool is an interim product and will be supplanted by NJTPA GIS database products in the future.

4.0. STAKEHOLDER INPUT

Stakeholder input for this study comes from the following sources:

- Interviews and meetings with County/Subregion economic development, land use, and transportation planners
- Interviews and meetings with freight and passenger vessel operators
- Interviews and meetings with selected regulatory agencies
- Interviews and meetings with selected private sector freight industries
- Technical Advisory Committee (TAC) member input

4.1 OUTREACH PLAN

The initial study Work Plan called for all interviews and meetings to be conducted in Task 1. However, it was recognized that these interviews and meetings could be used to add value throughout all phases of the study. Therefore, at NJTPA's direction, interviews were split into three stages:

- A first round with the TAC and with county/subregion public agencies (focusing on economic development), vessel operators, and regulatory agencies, to gather general information;
- A second round with public agencies (focusing on land use and transportation planners) aimed at validation and deeper discussion of initial data collected by the study team; and
- A third round with private property owners and development interests.

4.2 FIRST ROUND PROCESS AND KEY FINDINGS

Counties and Subregions

To help identify waterborne opportunities at an early stage of the study process, the consultant team requested the assistance of NJTPA's Regional Technical Advisory Committee (RTAC) in the development of a list of stakeholders with an interest in passenger and/or freight water transportation operations.

The method was similar to the strategy used on the NJTPA's Rail Freight Capacity study to ensure comprehensive input from the NJTPA's subregions. After an introduction email from NJTPA staff, the team e-mailed a short survey to county land use planners, economic development agency representatives, and/or other key representatives, to be discussed over a follow-up telephone interview. Subregions contacted included:

1. Bergen County
2. Hudson County
3. Essex County
4. City of Newark
5. Jersey City
6. Union County
7. Middlesex County
8. Monmouth County
9. Ocean County

Interviews were successfully completed with:

- Bergen County Department of Economic Development and Town of Edgewater
- Jersey City Department of City Planning
- Middlesex County Department of Business Development
- Monmouth County Division of Planning
- Ocean County, Tourism and Business Development and Department of Planning
- Newark Community Economic Development Corporation
- Union County Division of Planning

Questions guiding each interview included the following:

1. Are there any ongoing initiatives for passenger ferry facilities development along your waterfront?
2. Are there any ongoing initiatives for freight ferry or tug barge facilities development along your waterfront?
3. Do you or any of the towns in your county have specific interests in other initiatives to develop freight or passenger ferry facilities along your waterfront, over and above any ongoing initiatives?
4. Are there local businesses, industrial parks or warehouse sites that have voiced an interest in developing freight waterfront facilities? If so, who are they and where?
5. Are there sites that have been used for freight or passenger transportation in the past, but are currently inactive? If so, where?
6. Are there specific sites not already mentioned you would recommend NJTPA consider for inclusion in this study?
7. What considerations and issues should we be aware of as we consider potential waterfront development or services in the area?
8. Who should we talk with locally if we identify a potential site?
9. What are the overall economic development goals of the County?
10. What other organizations and individuals should we be speaking to with regard to this analysis?

Although first round interviews could not be scheduled with Hudson and Essex counties during the period of initial outreach, those interviews were subsequently performed concurrently with second round interviews.

Vessel Operators and Regulatory Agencies

These interviews fell into several categories. The team interviewed:

- Passenger ferry operators serving the NJTPA counties to discuss service volumes and attributes, operational issues, and future service opportunities. The interviewees were NY Waterways and Seastreak LLC.
- Freight vessel operators to discuss service volumes and attributes, operational issues, and future service opportunities. The interviewees were McAllister Tug and Tow and Weeks Marine.
- The Port of New York and New Jersey Maritime Association, which manages and distributes vessel operations information for New York Harbor.
- The US Coast Guard (Sector New York) at Fort Wadsworth, Staten Island, which is responsible for vessel operations in NJTPA's waterways
- Harbor Safety Operations and Navigation Committee of Port of New York and New Jersey

Passenger vessel operator interviews addressed the following questions:

- Target questions (higher level):
  - Please provide historic and current passenger volumes, as well as vessel fleet characteristics, or (alternatively) confirm the information the Ferry Customer Study Report. What do you see as the growth potential for existing services, and will your current facilities and services be adequate?
  - Please provide thoughts on future service opportunities at a general route level. What types of services, routes, volumes and timeframes might you anticipate?
  - Have you considered specific sites for possible new terminals to support future service opportunities?
  - When considering potential new sites, what characteristics do you require? e.g. water depth, acreage and parking, highway/transit access, community density, etc.?
  - Would you be willing to talk with us again about specific site opportunities as they are explored later in the study?
- Issues for deeper drilling:
  - Are you operating at full capacity and if not, what capacity are you operating at?
  - What are the constraints that are preventing greater ridership and reaching at-capacity operations?
  - If given the opportunity, what other location(s) in New Jersey would you like to operate a ferry service? What would be the preferred destination?
  - What are the constraints preventing you from operating at this (desirable) location?
  - Please confirm the infrastructure you require in order to operate your ferry service (access to fueling trucks, pump out trucks, waterfront footage, parking area size, snow stockpiling area, office space, proximity to repair facilities, depth of water).
  - Are there wharf alignments that are preferred for loading and unloading passengers?

Freight vessel operator interviews addressed the following questions:

- Please provide historic and current information on freight services currently provided – routes, volumes, frequencies, commodities, terminals served, customers
- What do you see as the growth potential for existing services, and will your current facilities and services be adequate?
- Please provide your thoughts on future service opportunities at a general route level. What types of services, routes, volumes and timeframes might you anticipate?
- Have you considered specific sites for possible new services?
- Have you been contacted re the availability of possible sites?
- Are you aware of any sites near manufacturing or warehousing that could be developed for waterborne freight?
- When implementing new services, what characteristics do you require? e.g. water depth, wharf dimensions, turning basin radius, location and clearance of bridges, lay down areas, etc.?
- Are you aware of other East Coast ports where a marine highway approach to freight movement would be feasible?
- Would you be willing to talk with us again about specific site opportunities as they are explored later in the study?

Regulatory agency interviews addressed the following questions:

- Can we access your vessel tracking database to map vessel volumes and activity for our study area?
- Can you describe vessel operating strengths and weaknesses in different parts of the waterway system? (Review each maintained channel for dimension, known strengths and weaknesses, unique operating issues, etc.
- Discuss other navigable waterways potentially capable of accommodating passenger vessels or tug and barge traffic (or ATB) , particularly with respect to perceived fatal flaws
- Are there significant regulatory, safety, or other hurdles to implementing expanded freight or passenger service to the NJTPA region?
- Are there particular sites or waterways you are aware of that would be more or less suitable for expanded service, from the standpoint of meeting required USCG approvals and standards?
- Would you be willing to talk with us again about specific site opportunities as they are explored later in the study?

Key Findings and Guidance

The interviews provided valuable input, some of it general in nature and much of it site-specific and opportunity related. General findings can be summarized as follows:

- Passenger sites and services
  - Some types of ferry terminals require large parking areas, if collecting from large driving markets -- growth constrained by parking
  - Other types of ferry terminals depend on transit, bicycle, pedestrian, and kiss-and-ride access– parking is not critical for these terminals, but better transit connections and lower (subsidized) fares would drive higher ridership
  - Growth potential for expanding ferry service from South Amboy to NYC; interest in Staten Island; only competitive in certain locations due to route distance, time, cost vs. other modes
  - Exploring possibilities of water taxi services

- Freight
  - Optimism about potential for increased cross-harbor and coastal movement of containers and trailers; roll-on/roll-off preferred due to high cost of container lifts in NYNJ region
  - Key site considerations include: overhead clearances, conflicting traffic, site acreage, environmental work, channel/berth conditions
  - Support locations (repair, maintenance, construction)

Extensive feedback was offered regarding specific sites and areas of interest. Stakeholders identified 17 such sites. Some of these are in the development planning stages, others represent potential future opportunities. The study team committed to collect data for each of these sites, and to document stakeholder interest as a consideration in the screening process to be undertaken later in the project.

Table 5. First Round of Outreach – Identified Sites and Areas of Interest to Stakeholders

Location	Sites and Areas of Interest			
Bergen	Main Street in downtown Edgewater	Allied Chemical site in Edgewater	Former Hess tank farm site in Edgewater	
Union	Elizabeth waterfront	Arthur Kill waterfront	Tremley Point	
Middlesex	Carteret	South Amboy	Perth Amboy	Raritan Center
Monmouth	Overflow alternatives to Belford	Town of Long Branch	Earle Naval Base in Colts Neck	
Ocean	Barnegat Bay	Existing Oyster Creek Nuclear Plant	Point Pleasant	Beach Haven to Atlantic City

Technical Advisory Committee (TAC) Meeting #1

As the first round of outreach was nearly completed, the first meeting of the study Technical Advisory Committee was held on January 7, 2016. At that meeting, the results of outreach completed to that point were presented, and the TAC provided feedback and guidance on next steps in the study. A particular area of emphasis was the selection of data categories and types that should be included in the waterborne sites dataset. Minutes of TAC Meeting #1 are attached as Appendix A.

4.3 Second Round Process and Key Findings

Following the first round of outreach and TAC meeting #1, the consultant team advanced into the second round of outreach.

- NJTPA and the consultant team made follow-up contacts with planners at each county/subregion targeted in the first round.
- The consultant team completed the initial working version of the waterborne site database for use in the second round interviews.
- The consultant team developed a short interview guide. The primary goal was to validate collected information regarding the various sites in the initial database, with each county/subregion representative focusing on sites within their respective counties and cities. This included:

- Confirmation of basic site information previously collected (to the extent available) from other sources: location, dimensions, ownership, historic and current and planned uses, zoning, landside access (infrastructure and performance), marine access, flood risk and other known environmental issues.
- Subregion development plans, goals, or aspirations for each of these sites – freight and passenger.
- Perceived 'fatal flaws' that would suggest deleting a site from the long list, and/or perceived opportunities associated with sites not listed.
- Where applicable, names and contacts with property owners/developers, freight industries, and potential freight/passenger service providers for subsequent follow-up by the Consultant.

In the second round of outreach, the consultant team talked with each of the nine subregions listed below at least once, and with the City of Newark twice. Meetings were held in person or as webinars, as participants preferred. As previously mentioned, this allowed the team to obtain "first round" information from two subregions (Essex and Hudson) that had not been reached during the first round period. Additionally, during this period the consulting team had the opportunity to follow up on a suggestion by the US Coast Guard to brief the Harbor Safety Operations and Navigation Committee of Port of New York and New Jersey Steering Committee, "Harbor Ops" Committee, The Harbor Ops Committee is comprised of federal agencies, state and local governments from New Jersey and New York, and private industry representatives. Harbor Ops members offered additional insight into how vessel operating factors could be addressed as part of the study.

In general terms, the main outcomes were as follows:

- Validation of study data using the interactive Planning Visualization Tool
  - Site ownership and operations, current and future plans
  - History, condition, regional planning context
  - Deeper drilling on previously identified sites and their possible uses
- More information on sites of interest for data collection
  - Some additions: marina sites of potential interest, industrial site clusters
  - Some suggested exclusions based on general conditions (navigation distance, channel depth, land use, access) or specific characteristics (environmental, dimensions, future plans, etc.)
- Availability of new data to support screening evaluation
  - Vessel traffic data from Army Corps of Engineers
  - Waterway (not site) operational risk assessments: depths and widths, obstructions, known hazards and conflicts, etc., which could be developed through Harbor Ops members
  - Electronic chart data (depths, tides, currents) from commercial vendors

4.4 Third Round Process and Key Findings

Coordination with the US Army Corps of Engineers and Waterway Operators and Regulators

Coordination with the Corps was anticipated to occur as part of the first phase of outreach, but was deferred until the third phase so that study questions could be more sharply focused. In the interim, the TAC framed a series of question about waterway restrictions, operability, navigability, etc. which were appropriately addressed by the Corps and its partners on the NY/NJ Harbor Operations Committee

Steering Committee (Harbor Ops). Harbor Ops is a group that meets regularly to address special events and ongoing activities that impact public and private operation of the region's waterways. It includes representatives from the Corps, state of New Jersey, City of New York, tug and tow companies, shipping associations, and regional research institutions. The study team made one presentation to Harbor Ops and held a follow-up Workshop, which generated the "Level of Action" Assessments discussed in Section 3.7 of this Report.

Private and Public Sector Outreach on Key Sites of Potential Interest

The final planned component of outreach targeted property owners/developers, freight industries, and their public sector planning partners. Working with NJTPA and regional stakeholders, the study team identified candidates for site visits and field inspections, based on the following considerations:

- Known or likely private-sector interest in waterborne transportation at the site;
- Site has navigable water and low or moderate development requirements;
- Potential high demand for freight or passenger development; and/or
- Little is known about the potential site but its size, economic development potential and/or local road congestion conditions merit an interview for public interest purposes.

Topics covered in the interviews included:

- Market interest in sites, particularly for waterborne uses
- Transportation access and parking
- Adjoining land use compatibility and economic development synergies
- Environmental conditions
- Development plans and stage of development
- Other important information for preparing detailed Opportunity Site Profiles

With respect to passenger opportunities, site visits and interviews were conducted with:

- Edgewater, which has three strong site possibilities.
- Carteret, which is planning a passenger ferry at its Waterfront Park. Planning is underway but a ferry operator has not been selected yet. The city completed a ferry test run to Lower Manhattan in 42 minutes going north via the Arthur Kill and Kill van Kull.
- South Amboy, which has huge sites and joint development possibility. Planning is underway for 1700 new residential units. There is a permitted, funded and existing dock there as well as commitment for service from New York Waterway. They expect to release a RFP for design and engineering soon and expect to be in operation in 2019.
- Raritan Steel in Perth Amboy, which offers a large site with strong parking potential. However, it is also an attractive freight site, and the developer is planning a large warehouse. Gerdau, the current steel cable tenant, uses freight barges in its operation and will continue on as a tenant, but the new owners have no plans for passenger or expanded freight operations.
- River Terminals (former Hugo Neu property on the east side of Kearny Point) is being developed as an industrial innovation center, and their primary need is workforce access. They were not interested in freight service, but were interested in the potential for water taxi service to improve workforce accessibility.

With respect to freight opportunities, site visits and interviews were conducted with:

- Bayshore Recycling. Bayshore does multipurpose recycling and does modular construction deployment and construction materials from the water. They use barges today and expect to continue waterfront use and is interested in rail access to become a full multimodal hub. They were added to list of potential sites.
- Federal Business Centers (Raritan Center) in Edison, which has a timber-pile wharf in disrepair. A longstanding concern regarding the possible risk from unexploded munitions in the water approaches to the site has been addressed. There is current waterborne activity there but most of the site is truck-oriented. Project cargo handling along the waterfront is being phased out as part of the development plan for more truck parking. The owner is interested in opportunities to improve the wharf but does not see an immediate near-term business opportunity.
- 1160 State Street in Perth Amboy, where the new owners have a plan is to put in warehouse facility with truck parking. It has an operational wharf but there are no current plans to expand water-oriented freight use.
- The team also toured an undeveloped areas around Port Reading Yard and at Toth Point (behind Amazon) that can be accessed via Prologis Way. The consultant team was unable to arrange discussions with the responsible owners and developers, but this may be a future opportunity.

4.5 Utilization of Outreach Results

The results of these three rounds of outreach were used in several ways.

First, outreach helped identify sites that should be considered in the database development process. This study does not recommend for or against the development of any particular sites, but it does respect the desire of stakeholders to have sites included in the database. Table 6 following represents a final summary of sites suggested for consideration through all stages of the outreach process.

Second, outreach helped provide current and validated information for a number of sites.

Third, outreach helped frame a prioritization process for selecting sites to undergo enhanced data collection and Opportunity Site Profile development. This process is described in Section 4 following.

Table 6. Sites of Potential Interest Identified Through All Rounds of Outreach

Subregion	Sites and Areas that Should be Considered in Data Collection	
	Passenger Opportunities	Freight Opportunities
Bergen	Commuter (to/from 125th St. et al) • Former Hess Tank Farm • Former Allied Chemical • Englewood Cliffs (former ferry site) Water Taxi / Recreational • Foot of Main Street • River Barge Park	
Essex / City of Newark	Commuter / Water Taxi • Newark Municipal Dock	Freight Development • Passaic Riverfront E. of Doremus
Hudson / Jersey City	Commuter • Jersey City Landing/Harborplace/Harborside • Kearny Point/NJ Rail Carriers	
Middlesex	Commuter • South Amboy (planning underway) • Carteret (planning underway) • Old Bridge / Marquis Creek	Freight Development / Ferry • Raritan Center • Bayshore Recycling • Tufts Point./Port Reading
Monmouth	Commuter • Long Branch (new pier) • Belford, Highlands, Atlantic Highlands (parking for existing ferries)	Truck Ferry Service • Leonardo Wharf / Earle Naval Base (with haul road to GSP)
Ocean	Water Taxi / Recreational • Barnegat Bay USCG • Point Pleasant • Beach Haven • City of Toms River Wharf • Manasquan River	Freight Development • Exelon Nuclear Oyster Creek
Union	Commuter • Elizabeth Waterfront (Allied Signal / Catellus property)	Truck/Rail Ferry • Elizabeth Waterfront (Allied Signal / Catellus property, NS E-Rail) Freight Development • Tremley Point • Other Arthur Kill (Tosco/Phillips 66, Cytek/Avenden Marine, et al)

5.0 SCREENING, PROFILING, AND FUTURE USE OF STUDY INFORMATION

The full NJTPA waterborne sites database includes 696 individual sites. To focus on a more limited set of sites where NJTPA wanted to develop updated information (originally projected to be 100 sites) and to develop detailed Opportunity Site profiles (originally projected to be 20 sites), a screening process was developed in close cooperation with the TAC.

It must be emphasized that the selection of sites for enhanced data collection, or for the development of Opportunity Site Profiles, does not imply a recommendation or endorsement for development by NJTPA. Nor does the absence of a site from enhanced data collection or the list of Opportunity Site Profiles imply disinterest or a recommendation against development on the part of NJTPA. The database and Opportunity Site Profiles are intended to enhance and support general regional understanding and awareness of waterborne transportation resources, and to highlight illustrative examples of sites that are potentially suitable for freight or passenger service development. Development and implementation decisions will, of course, be up to the responsible regulatory authorities and funding parties.

5.1 TOTAL POPULATION OF SITES

The NJTPA waterborne facilities database includes information on 696 individual sites. This list was compiled from three sources:

- The US Army Corps of Engineers (USACE) Port Facilities data for the NJTPA region.
- Additional data on New Jersey marina and recreational boating facilities provided by NJTPA.
- Sites not included in either dataset, but known to exist because of past or current passenger ferry operations, or because of identification by study stakeholders

Table 8 below presents a tabulation of the number of database sites by county and facility type. The "Ferry" site designation did not exist in the USACE Port Facilities data; it was added by the consultant team, and includes locations where commuter or recreational ferry services exist currently, or existed at some time previously. The other facility types represent designations in the USACE Port Facilities Data.

- "Dock" is a traditional mooring structure (pier, wharf, etc.) for a vessel. Most of the sites of interest in this study are Docks.
- "Dock and Dine" is a tie-up location, primarily for recreational vessels, with adjacent dining. Since Dock and Dine sites also generally offer parking, they may be of some interest to planners and have been included in the database.
- "Ferry" as noted above is a consultant-added field. Some Ferry sites were not present in the USACE Port Facilities data; others were classed as Dock or Marina based on their previous use.
- "Marina" is a tie-up and service location for recreational vessels.
- "Ramp" is a boat ramp for launching and recovering watercraft.
- "Other" is facilities not included in other classifications, and largely consists of marine support services – boat repair and outfitting, fueling, and other operations utilizing waterfront access.

Table 7. Distribution of Database Sites by County and Type (Modified from Original USACE Database)

	Dock	Dock & Dine	Ferry	Marina	Other	Ramp	Grand Total
Bergen	12		2	11	1	1	**27**
Essex	38			1	4	1	**44**
Hudson	76		11	17	2	4	**110**
Hunterdon						4	**4**
Middlesex	50			20	1	5	**76**
Monmouth	9	2	3	78	10	10	**112**
Morris		2		1			**3**
Ocean	15	3	1	200	47	19	**285**
Passaic	1						**1**
Union	30			2	1		**33**
Warren						1	**1**
Grand Total	**231**	**7**	**17**	**330**	**66**	**45**	**696**

5.2 Review of Screening Methodology

Working closely with the TAC, the study team developed a set of suggested screening criteria to filter the total population of sites down to a smaller number for development of updated data. The various factors identified were as follows:

- 1st Tier (exclusion) criteria
  - Channel and berth depth (current and potential with dredging), air draft restrictions (fixed bridges), property size and ability to provide suitable berthing, known environmental issues
- 2nd Tier (ranking) criteria
  - Water: channel and berth depth, ease of dredging, waterway traffic and navigational risks, environmental risks
  - Site: dimensions and acreage, zoning, ownership, flooding, environmental, historical, security
  - Context: access by freight and people, parking, land use and community, permitting and development activity

There was significant and productive discussion about setting quantitative threshold values for each of these factors, and a general consensus around the range of acceptable values. However, it also became clear that every site poses a different – and unique – set of opportunities and constraints. For example, a site might have every desirable attribute except water depth, and it would be unreasonable to screen it out from further consideration simply on that basis, since water depth is an issue that can be addressed with dredging. This specific case was identified by TAC members as a potential concern.

Therefore, the direction taken by the study team was as follows:

- The "long list" was defined using very simple criteria, to allow the inclusion of a maximum number of potential sites of interest, even in cases where those sites may not meet identified thresholds on one or more factors.

- For the "long list" of sites, the Planning Visualization Tool includes data directly relevant to the screening factors identified by the TAC, along with various active filters (sliders, buttons, etc.) to allow users to set their own desired thresholds for these factors. For example, users can choose to look only at sites offering minimum channel depths, minimum overhead bridge restrictions, particular "level of action" requirements, etc. In this way, screening becomes an interactive, user-driven process, depending on user considerations and requirements. Using the database in this way was not originally anticipated, but as it developed, this valuable capability was identified and developed. The available screening filters are discussed in the User Guide, attached as Appendix E.

5.3 "Long List" of Sites for Data Enrichment

From the original 696 sites, a total of 218 sites (more than the anticipated 100) were retained for the "long list" of sites for data enrichment. The criteria were simple:

- Any site that was identified by a study stakeholder (see Table 7) as being of potential interest was retained, regardless of its other attributes.
- Any site that was recognized by the consultant team as a past or present ferry site – some of which did not exist at the time the Corps collected its data, or were formerly a different use (marina, ramp, other).
- Any other site defined as a "dock" by the Corps, excluding apparent duplicates, bad records, and PANYNJ marine terminals.

Note that current Port Authority of New York and New Jersey marine facilities – at Port Newark, Elizabeth Terminal, and the Bayonne Peninsula – were excluded from data enrichment. These sites are fully-developed and their attributes are well known. See http://www.panynj.gov/about/facilities-services.html.

Table 8. Distribution of "Long List" of Sites by County and Facility Type

	Dock	Ferry	Other	Ramp	Grand Total
Bergen	10	2			**12**
Essex	38		2		**40**
Hudson	66	11			**77**
Middlesex	43				**43**
Monmouth	7	3	1		**11**
Ocean	7	1	1	1	**10**
Union	25				**25**
Grand Total	**196**	**17**	**4**	**1**	**218**

5.4 "Short List" of Sites Recommended for Detailed Profiling

A series of Opportunity Site Profiles are presented in Appendix G. These profiles address, for a representative sample of sites in the NJTPA region: location and community context; history, current operation, and development plans; key data on waterside and landside access; parking requirements on site for ferry operations; market potential for passenger or freight services; and possible steps for implementation. Graphic content could include locations maps, aerial imagery, and development plans if known.

Sites chosen for Opportunity Site Profiles were discussed with the TAC (at TAC Meeting #4), An initial list of candidates was presented, based on the most promising opportunities identified by TAC members and other stakeholders throughout the course of the study, excluding sites that failed to meet minimum threshold criteria (insufficient water depth, lack of development interest/potential, etc.) and also excluding sites that involved only shallow-draft water taxi service (as these have very small physical footprints and minimum land/water development requirements). The intent was to identify sites that offer strong examples of the kinds of opportunities available in the NJTPA region – and not, as has been noted earlier, to endorse or recommend development plans for any specific sites.

Opportunity Site Profiles were developed for the following sites:

- Passenger Services
    - South Amboy
    - Carteret
    - Edgewater (including Hess, Allied Chemical, and Englewood Cliffs)
    - Long Branch
    - Jersey City (multiple sites)
    - Newark/River Terminals
    - Belford/Highlands/Atlantic Highlands
- Freight and/or Passenger Service
    - Elizabeth Waterfront/former Allied Signal
- Freight Service
    - Federal Business Centers
    - Bayshore Recycling
    - Tremley Point
    - Tufts Point/Port Reading
    - Passaic River North of Port Newark (multiple sites)

5.5 Ongoing Use and Maintenance of the Study Results and Products

The study information, analyses, and database products – including MS Access and MS Excel files and the Planning Visualization Tool – have been designed as 'living deliverables." NJTPA will make available the information and data online following the conclusion of the study.

Some potential future activities might include:

- The addition of new data fields. TAC members noted that the identification of facilities subject to the Marine Transportation Security Act (secured facilities requiring federally issued credentials for access) would be useful to know.
- Expanded cooperation and coordination with other state and regional public agencies in New Jersey and New York. One goal could be to provide the collected information as a resource to planning initiatives; another might be to explore opportunities for database enhancements serving multiple agencies and regions.

New Jersey is a maritime state, and the NJTPA region is one of the leading maritime freight and passenger transportation regions in the country. NJTPA and its stakeholders are keenly aware of the critically important role water has played in the development of the region, and of the vital role that waterborne transportation will play in the future success of the region. This project, as part of an ongoing program of NJTPA activities, seeks to advance understanding of this maritime heritage and maritime future.

APPENDIX A

SUMMARY OF TECHNICAL ADVISORY COMMITTEE MEETING #1

TECHNICAL ADVISORY COMMITTEE MEETING #1

Thursday, January 7, 2016 – 10:00am

NJTPA, One Newark Center, 17th Floor, Newark, NJ

Meeting Overview

The primary objective of this meeting was to provide an introduction and overview of the NJTPA Inventory and Assessment of Waterborne Transportation Resources. The TAC is a key resource for this effort, providing guidance to the overall effort as well as critical input on specific sites and freight and passenger transportation services to be considered in the study effort. A total of four TAC meetings are planned for the duration of the project.

The meeting was organized around a core presentation addressing: the study purpose and work plan; the study's extensive outreach effort; and the criteria for evaluating potential sites and services, which informs the kinds of data that should be collected about each site / service as part of the data collection process. There was extensive discussion and dialog with TAC members at each stage of the presentation.

Presentation

Dave Dawson, NJTPA's Project Manager, began the presentation with a discussion of the core purposes of the study:

- Develop information on locations in the NJTPA region that could accommodate expanded or new waterborne transportation services for freight or passengers.
- Select primary opportunity sites for further investigation.

Alan Meyers from Parsons Brinckerhoff, the consultant team Project Manager, followed with a summary of the major work plan steps:

- Assemble and integrate key datasets, starting with the US Army Corps of Engineers Facilities Database and other Federal, State, and regional data.
- Develop enhanced/validated data for a "Long List" of potential freight and passenger sites, incorporating the key information to support informed screening decisions regarding the potential suitability of sites for particular uses, and reflecting additional outreach to regional stakeholders.
- Perform additional evaluation of primary opportunity sites, including more detailed field investigations and creation of "site profiles."
- Deliverables and project management.
- Anticipated project schedule, including four proposed TAC meetings. The next TAC meeting is expected in May 2016 to discuss the "Long List" of sites.

Alan Meyers then continued with a discussion of the initial public outreach component of the work, which reached two key stakeholder groups: economic development interests and service operators. This work was designed to:

- Collect first-round site information of parcels and public and private interest in waterborne transportation from regional economic development planners/officials.

For the economic development outreach effort, seven counties and two cities were contacted for input. Prior to the TAC meeting, five counties provided input on nearly 20 sites they believed to be of significant interest and potential suitability for freight and passenger transportation services.

Mark Jaworski of CH2M, Inc., the consultant team's lead maritime engineer, presented the results of operator interviews. As of the TAC meeting, interviews had been completed with: McAllister Tug and Tow; NY Waterway Inc.; Seastreak Inc.; and the Maritime Association of the Port of New York and New Jersey. (Note: soon after the TAC meeting, an interview was completed with Weeks Marine and efforts continued to schedule with others). Each operator identified one to three sites of particular interest.

Alan Meyers described the next steps in the outreach process. Once the initial data collection is complete to a suitable stage – including consideration of each site discussed during the outreach process – NJTPA and the consultant team will meet with planners from each subregion to review and validate the information collected, and identify useful enhancements.

Alan Meyers then led a workshop discussion of the potential criteria for determining whether particular sites/services should be considered suitable development opportunities. This was a critical step, because the database design and enrichment process should ideally focus on collecting and reporting the information that supports these types of decisions. Alan presented a working framework for the database structure and screening criteria, considering: water and navigation factors; site attributes; and landside context factors.

Finally, Alan Meyers closed the formal presentation with a discussion of next steps in the process.

Discussion and Feedback

There was strong engagement and lively discussion with TAC members and NJTPA staff in attendance throughout the course of the meeting. Almost everyone in attendance offered constructive input; following the meeting, the working framework for the database structure and screening criteria was updated to reflect the guidance received. Current work now focuses on populating the database with the desired information. Key discussion points are summarized below.

- Input on Specific Sites
  - It was noted that Earle Naval Base (Highlands), which had been noted as a possible site of interest, is still currently active and has high security, which could limit its utility for freight or passenger services.
  - It was noted that Bergen County is interested in a potential water taxi service to supplement its bus and rail transportation options.

- Input on Outreach
  - Participants suggested reaching out to Columbia Coastal, which currently operates a container barge service between Norfolk and Baltimore, and which in the past has operated container barges elsewhere on the US East Coast. (Note: team members have since spoken with Columbia Coastal, and will continue to follow up to determine their potential interest.)

- Input on Data for Screening – Water and Navigation
    - Attendees had many valuable suggestions, including: waterborne traffic/volume conditions (which might be obtainable from the Harbor Operations Committee); overhead bridge restrictions and openings (such as the New Jersey Coast Line crossing which impacts access to the Raritan Center site); berth depth; tidal range; rates of siltation (which affect the frequency of required maintenance dredging); historic dredging activities; known water-based environmental conditions; subsurface utility impacts in waterways; dock types (finger pier, floating pier, marginal wharf, etc.); and known navigational issues or hazards (channel configurations, currents, obstructions, hazards related to previous uses, etc.).

- Input on Data for Screening – Site Attributes
    - Regarding site attributes, attendees recommended that the team provide data related to: site vulnerability to sea level rise; previous or planned capital improvements; MTSA security area designation; historic status; condition/capacity of piers and berths; and (this was emphasized at several points) resiliency factors.

- Input on Data for Screening – Landside Context
    - Regarding landside context, attendees recommended that the consultant team address: historic and planned permit activity; proximity to rail and bus transit services; and to the extent practical, current utilization of rail and bus transit service routes serving potential sites.

- Input on Screening Thresholds
    - Screening thresholds – that is, setting particular values or performance levels for each of the data categories, as a means of evaluating whether a site is a strong candidate to host waterborne freight or passenger service – will be a primary agenda item for TAC meeting #2.

    - Looking ahead to that meeting, attendees suggested: developing thresholds that apply to freight facilities, passenger facilities, and facilities that could combine both functions.

In Attendance

	Name	Affiliation
Project Team	Dave Dawson	NJTPA
	Anne Strauss-Weider	NJTPA
	Jakub Rowinski	NJTPA
	Zenobia Fields	NJTPA
	Megan Kelly	NJTPA
	Doug Greenfield	NJTPA
	Lois Goldman	NJTPA
	Mary K. Murphy	NJTPA
	David Schmetterer	NJTPA
	Alan Meyers	WSP | Parsons Brinckerhoff
	Stephen Chiaramonte	WSP | Parsons Brinckerhoff
	Mark Jaworski	CH2M
TAC Members	Don Hutton	NY/NJ Rail
	Ahmad Ismail	PANYNJ
	John Lane	Hudson County
	Dr. Sam Yahalom	SUNY Maritime College
	Scott Douglas	NJDOT- Maritime Resources Div.
	Capt. Jeff Flumignan	Maritime Administration-NY Office
	Todd DiScala	NJ Transit
	Bruce McCracken	Middlesex County
	Jordan Kocak	City of Newark
	Naomi Hsu	Jersey City (by phone
	Mark Jehnke	Ocean County (by phone)
	Victoria Pecchioli	Ocean County
	Maciej Maslonka	Ocean County
	Liza Betz	Union County (by phone)
	Donna Orbach	Bergen County (by phone)

APPENDIX B

SUMMARY OF TECHNICAL ADVISORY COMMITTEE MEETING #2

TECHNICAL ADVISORY COMMITTEE MEETING #2

April 19, 2016 – 10:00am – 12:00n

WSP | Parsons Brinckerhoff

Two Gateway Center, 2 Center Street, Newark, NJ

Introductions, Review of Objectives and Work Plan

Dave Dawson, the study manager for NJTPA welcomed attendees to the second technical advisory committee (TAC) for the Inventory and Assessment of Waterborne Transportation Resources study.

Alan Meyers, the WSP Parsons Brinckerhoff project manager for study, reviewed the three goals for the meeting: reviewing study progress to date; receiving TAC feedback and validation of input received as part of the outreach process; and receiving guidance on the application of screening criteria for the next step of the study.

Next, Alan also reviewed study objectives: developing information on locations in the NJTPA region that could accommodate expanded or new waterborne transportation services for freight and passengers; and selective primary opportunity sites for further analysis. Alan noted that the focus of this study is not on developing future services, and is geared towards identifying sites that can be advanced to allow for the provision of future services.

Alan reviewed the study work plan and status to date.

- Task 1 is done with the collecting of data and reviewing sources. A Technical Memo is under review by NJTPA.
- Task 2, currently underway, involves developing the long list of sites from US Army Corp of Engineers (ACOE) data, and selecting 20 primary opportunity sites for deeper analysis. The draft Tableau database has been built to accommodate the site attribute categories defined by the TAC in Meeting #1. The next steps are to assign screening values to the data categories (a topic of this meeting), followed by assembly of remaining data needed.
- Task 3 is to perform enhanced research and data collection for the primary opportunities sites, and to develop site profiles. Draft results of this task will be shared with the TAC at the next meeting, expected in summer 2016.

Regarding the study schedule, the study team is a little ahead of schedule. TAC meeting #3 may be moved up to July. November is being targeted now for the TAC meeting #4 with the goal to be done by December of this year, unless there is a reason to extend the study subject to NJTPA approval. There were no questions from the TAC members on the process.

Update on Outreach

Alan provided an update on outreach elements of the work. Two rounds have been completed thus far. The 1st round focused on county and city development interests, vessel operators, and the US Coast Guard. The second round targeted county and city land use and transportation planners. It also included a presentation to the NY & NJ Harbor Operations Committee Steering Committee. The 2nd round of outreach consisted of WebEx an in person meetings with the subregions that ran 1 to 1.5 hours each to follow up on research. Through both rounds, all targeted subregions had been contacted at least once, and most were contacted twice.

Feedback from the 2nd round of outreach included:

- Validation of specific sites, additional information on sites of potential interest, and information that allowed the project team to exclude sites based on specific characteristics
- Dot-by-dot site information based on live review of the Tableau database. In some cases, the team received additional information to support screening, e.g. Union County Tremley Point traffic study and insight to specific docks and marinas
- Discussion of risk to sites from storm surge, difficulty in navigation, anything that might make a location easier or more difficult to access from an operations standpoint, depths, known hazards. The team is working with the Coast Guard on getting info on waterway activity maps as well as electronic National Oceanic and Atmospheric Administration (NOAA) data for depths, tides, and currents for mapping.

- Bergen
  - Sites for expanded commuter opportunities such as a link between Edgewater and 125th Street Manhattan
  - Water taxi links between waterside terminals and recreational opportunity
- Newark
  - Newark Municipal Dock – the team discussed redundancy and water taxi opportunities, as the dock could useful in an emergency
  - On freight development, there is a triangle of sites between Doremus Avenue north of Port Newark which may offer some opportunities. In Newark, the Essex County waste-to-energy and DART sites came up as locations where a waterborne links could be useful. Donna Orbach noted a labeling correction that American Dream is not at River Bridge Park but River Barge Park.
- Hudson/Jersey City
  - Jersey City Landing, which is a high density residential and commercial development with thousands of new units expected to come to market
  - On freight, there are opportunities at Kearny Point with Hugo Neu and NJ Rail Carriers
- Middlesex
  - Opportunities at Perth Amboy were discussed. One possible site in downtown was questioned due to proximity to the NJT station. Another possible site is Raritan Steel, which has ample room for parking. Scott Douglas suggested that Raritan Steel and an adjoining site also be considered for freight use given existing nearby freight use by recyclers and the availability of deep water. .
  - On the north side of county, the team looked at Atlantic Highlands opportunities but limited by parking. There could be opportunity at Old Bridge / Marquis Creek to relieve commuter demand at the Atlantic Highlands. The Old Bridge site did not have parking but would need it to be more successful.
- Monmouth
  - The Naval Base was discussed. It has a munitions pier with a dedicated haul road, which is also close to the Garden State Parkway. This site may represent an opportunity for truck ferry with an access point at the GSP which allows trucks south of interchange 105. The pier also has rail which begins at Colts Neck and terminates at Leonardo. It is thought that the rail could eventually join the New Jersey Transit Jersey Coast Line to move cargo north. This may be a useful to note as a different kind of transportation opportunity for the region given the deep draft/no air draft restriction at this pier.
- Ocean
  - Interested in a recreational water taxi local service with many marinas. Commuter service may be less likely as there is not adequate parking.

- The decommissioning of Oyster Creek nuclear site was mentioned but unclear if the site presents a future warehouse opportunity. Scott Douglas noted potential concerns with dredging at this site.
- Barnegat Bay was described as a challenge for freight use given existing residential and recreational land uses.

– Union

- Allied Signal was listed as a passenger ferry location.
- Discussed older NYTMC study which looked at a truck ferry around Port Newark by that site, but the idea was not advanced. Anne Strauss-Weider mentioned FedEx had also looked at the possibility of a truck ferry but did not advance it. This site may however be suitable for a truck or rail ferry.
- Liza Betz mentioned that the Elizabeth waterfront is very busy. Jersey Gardens Mall will be expanding with additional retail uses, which may pose some traffic conflicts for industrial traffic. The team will follow up on this.
- Tremley Point has a connector road project and a lot of freight sites on Arthur Kill that could host different kinds of freight development that could be reactivated in the future. Liza mentioned there is a lot of history there as businesses have moved on or changed hands. There could be potential "opportunity clusters" there.

<u>Update on Data Assembly and Analysis – Workshop Session</u>

The team presented the opportunity sites database to the TAC in a live demonstration. A repository and framework has been built using software called Tableau. Sites are shown as dots on a map, by latitude and longitude, and each lat/long corresponds to a unique record in the database. Clicking on a dot displays a live Google image/map of the site corresponding to that record, as well as the underlying data associated with that record. NJTPA staff had a trial subscription (at the meeting, Alan mistakenly stated it was a full license) for Tableau and anyone can download the free "reader" version, which allows data to be viewed and analyzed but not changed.

Zenobia Fields asked about thoughts as to a maintenance plan for this inventory in terms of examining future opportunities, i.e., how does the database get updated? Alan Meyers replied the data is stored in a simple excel spreadsheet that can be easily updated to keep the underlying information current, or to add new information of interest.

The database currently includes channel depth, highway access, length of berth, fields for adjoining land uses, rail access, and other attributes, and also has a field for entering general comments. The database structure will continue to evolve throughout the remainder of this study, to include fields and data of interest. Risk factors – from conflicting vessel operations, storm surge, etc. -- have not been incorporated into the dataset at this point, but this work is upcoming. The team intends to work with the Harbor Operations Committee and other stakeholders in this effort.

The team showed examples of what can be done with the Tableau database and looked at several sites in Hudson County and Edgewater. Regarding Edgewater, Scott Douglas noted that that western bank of the Hudson River is difficult to maintain at depth; Mayor McPartland noted that active ferry sites tend not to lose depth because of constant vessel activity. A question was raised as to the definition of "dock." In the USACE data, a dock is a wharf, pier, dock, or similar location for mooring a vessel, excluding marinas.

There are about 550 sites currently in the Tableau database, and the goal is to focus on selecting 100 sites for more detailed data collection. Alan stated that any site identified or suggested by a subregion would be automatically considered in that list of 100 potential sites of interest, but that others would be

included or excluded based on a set of simple criteria. Alan led a workshop discussion of those criteria with the TAC members.

- 1st tier exclusion criteria could include:
  - Regarding the suggested water depth criteria of 12' for passenger ferries, Mike McPartland said ferries operate with lesser mean water depth and suggested a lower threshold. Alan noted that we could look instead at 8' and see the effects.
  - Regarding the suggested local zoning criteria, Lois Goldman said local zoning may not be a good first tier screening criteria, as it can be changed.
  - Regarding the suggested air draft criteria of 30' to 150', the TAC felt that 30' was sufficient for all vessels except large ocean-going vessels.
  - The suggested endangered species criteria was felt to be useful.
  - The suggested freight berth length of 600' was felt to be overly generous, and the TAC suggested reducing the requirement to 300' for screening purposes.
  - Overall, the TAC suggested these criteria should be simple, easy to apply, and quantitative or binary (yes/no) in nature. The consultant team welcomed the TAC to provide further comments as needed.

Next, Alan led a workshop discussion of the "2nd Tier" screening criteria, which would be used to help select 20 primary opportunity sites from the longer list of 100 potential sites of interest.

- 2nd Tier criteria discussion included the following:
  - Scott Douglas noted that NJDOT gets their siltation info form the ACOE and some from their experience, and this information can be utilized. Inferences about sites with no data can be made from dredging records and from adjoining or nearby sites on the same waterway.
  - Since there are no fixed standards, we will have to rely on best professional judgement as a planning factor.
  - On to moveable bridge criteria, this becomes factor for accessibility. This would be constraint for a commuter passenger service versus a once-a-week barge service.
  - TAC members suggested adding utility lines on the maps
  - Doug Greenfield noted that FEMA flood maps do not account for sea level rise, and suggested using recent NYC factors for sea level rise.
  - A question arose as to how hazmat issues are addressed. Suggested protection issues can be identified versus hazmat.
  - Anne Strauss Weider noted that criteria for FRIO (Freight Rail Industrial Opportunity) site analysis can be adopted for this effort as well, merits a look to see how criteria match up.
  - For landside characteristics, the TAC suggested the data should note "pending development" for sites where this is applicable.
  - The team welcomed additional comments on these criteria from the TAC following the meeting.

Conclusions and Next Steps

As its next steps, the consultant team will update the screening criteria based on guidance from the TAC, collect additional data (on vessel activity, vessel operational risk, surge and sea level rise, siltation, and other factors), apply the first tier screening criteria, populate the data for 100 sites of potential interest, and perform an initial draft screening to identify 20 primary opportunity sites. To advance work on vessel operational risk, Scott Douglas will be the liaison for the TAC at the Harbor Operations Committee. The team will also engage in the third round of study outreach, this time with a set of private sector interests, to be identified in consultation with NJTPA and its subregions. The meeting was adjourned at 11:50 AM.

In Attendance

	Name	Affiliation
Project Team	Dave Dawson	NJTPA
	Anne Strauss-Weider	NJTPA
	Jakub Rowinski	NJTPA
	Zenobia Fields	NJTPA
	Doug Greenfield	NJTPA
	Lois Goldman	NJTPA
	Alan Meyers	WSP | Parsons Brinckerhoff
	Stephen Chiaramonte	WSP | Parsons Brinckerhoff
	Kyle Winslow	WSP | Parsons Brinckerhoff
	Jenn Grenier	WSP | Parsons Brinckerhoff
	Sebastian Guerrero	WSP | Parsons Brinckerhoff
	Laura Shabe	WSP | Parsons Brinckerhoff
	Alice Cheng	Cheng Solutions
TAC Members	Don Hutton	NYNJ Rail
	Ahmad Ismail	PANYNJ
	Scott Douglas	NJDOT
	Michael McPartland	Bergen County Economic Development
	Todd DiScala	NJ Transit
	Capt. Jeff Flumignan	USDOT Maritime Administration (by phone)
	Mark Jehnke	Ocean County (by phone)
	Liza Betz	Union County (by phone)
	Donna Orbach	Bergen County (by phone)

APPENDIX C

SUMMARY OF TECHNICAL ADVISORY COMMITTEE MEETING #3

TECHNICAL ADVISORY COMMITTEE MEETING #3

September 13, 2016 – 9AM

One Newark Center, 17th Floor, Newark, NJ

Introductions, Review of Objectives and Work Plan

Dave Dawson, the study project manager, welcomed attendees, as well as those participating on the phone via WebEx, to the third Technical Advisory Committee (TAC) for the Inventory and Assessment of Waterborne Transportation Resources study. Alan Meyers of Parsons Brinckerhoff, reviewed study objectives as well as accomplishments since the TAC 2 meeting. He noted that our goal today is to seek guidance on last steps to finish the work.

Task 2 was to develop a long list of sites. The technical memo on that will be available for review shortly. We have developed screening criteria and soundings have been done on a number of sites. The remaining work is in developing key site profiles and assessing demand. Some sites are in the planning phase while others are farther ahead. The study is on schedule and the team is targeting completion this winter, with the next TAC meeting likely in either November or December.

Outreach and Site Visits

Alan noted that we are in the third phase of outreach. Outreach was made to counties as well as visits to private parties, often hosted by NJTPA's subregion partners.

On specific sites for passenger opportunities, we discussed:

- Edgewater, which has 3 strong site possibilities.
- Carteret Waterfront Park, where planning is underway but a ferry operator has not been selected yet. The city completed a ferry test run to Lower Manhattan in 42 minutes going north via the Arthur Kill and Kill van Kull.
- South Amboy, which has huge sites and joint development possibility. Planning is underway for 1700 new residential units. There is a permitted, funded and existing dock there as well as commitment for service from New York Waterway. They expect to release a RFP for design and engineering soon and expect to be in operation in 2019.
- Raritan Steel in Perth Amboy has lots of parking and freight potential. The developer is planning a large warehouse. Gerdau, the current steel cable tenant, uses freight barges in its operation and will continue on as a tenant but the new owners have no plans for passenger or expanded freight operations.

Doug Greenfeld asked if there was consideration of pricing and elasticity of ferry demand for the sites. Alan responded not at this stage. We will look at Census journey-to-work information and use some ranges but we will not do ridership modeling per se. Doug noted that a passenger ferry is specific to a very niche clientele. Alan agreed, and noted the key differences between 'park and ride' type ferry terminals versus transit/pedestrian-oriented ferry terminals. Carteret and South Amboy may be hybrids, serving nearby residents (pedestrians) as well as the larger communities (via car parking).

On specific sites for freight, Alan noted that from the outreach conducted, there was less interest in freight for most sites. Examined were:

- Bayshore Recycling does multipurpose recycling and does modular construction deployment and construction materials from the water. They use barges today and expect to continue waterfront

use and is interested in rail access to become a full multimodal hub. They were added to list of potential sites.

- Federal Business Center in Edison has a timber-pile wharf in disrepair. Good news is that the longstanding underwater issue from unexploded ordinance, given the military history of the site, has been addressed. There is current waterborne activity there but much majority of site serves truck-served activity. Project cargo from the waterfront is being phased out as part of the development plan for more truck parking. The owner is interested in opportunities to improve the wharf but they don't see an immediate business opportunity.
- 1160 State Street owners have a plan is to put in warehouse facility with truck parking. It has an operational wharf but there are no current plans to expand water-oriented freight use.
- Port Reading Yard behind Amazon can be accessed via Prologis Way and is undeveloped right now. There is a lot of acreage and berthing potential there. The team will be looking to meet with the owners to get clarification on the current plans there.
- River Terminals (former Hugo Neu property on the east side of Kearny Point) is being developed as an industrial innovation center, and their primary need is workforce access. They were not interested in freight service, but were interested in the potential for water taxi service.

Todd DiScala mentioned looking at information on construction-related businesses in Carteret. Alan said he was looking at sites in-flux with acreage. Todd said he is referring to a site that is several hundred acres large. Dave Dawson mentioned that the NJ Transit draw bridge is a constraint. There is a new bridge planned for 2019 with an air draft of 110' for overhead catenary clearance when the bridge is in the lifted position, should accommodate anticipated traffic. The key constraint will be scheduling around the NJ Transit, North Jersey Coast Line during peak demand periods and height of the tugs, not the barges, when the draw bridge is in closed position.

Alan mentioned that the Doremus Ave facility was contacted but that they were not interested in waterborne freight. The Essex County Resource Recovery plant was also on the list to be contacted. PANYNJ reps contacted about the facility noted that there was no interest in waterborne freight at that site.

Update on Waterside Inspections

Reports on the waterside inspections will be part of tech memo #2, which will be available at the end of the month. Alan showed the TAC examples of what the report will look like. They have info for 16 different sites and will be available for the review. It should be useful information that has not been available before to planners.

Risk Assessment Update

Risk assessment is also being done on the sites from the standpoint of operators and regulators, which hasn't been part of the public profile before, but would be useful for the planning process. The team met several months ago with Harbor Operations Steering Committee, which includes Coast Guard, Sandy Hook Pilots, Army Corp of Engineers, tow companies and other major maritime users. Alan noted that the team will be doing a workshop with this group on 21 September to develop a consensus view of risk categories for waterway access to the various sites. Alan noted that they did a beta testing exercise with NJ Office of Maritime Resources. This is info was are hoping to get from others. The team will look for input on dredging risk as well as environmental risk, accessibility risk, and navigability risk. The operational assessment will be based conflict issues. Alan noted the possibility where there may be conflict between recreational use and passenger ferry use, e.g. kayaking with ferry operations, as have been seen with recent events on the Hudson River.

A question was asked as to what input the Coast Guard may have on the site piers themselves. Alan noted that we are not asking for approval of development of any sites, but rather an assessment of maritime operations to these sites.

Update on Data Collection and Screening

The team collected a lot of information from NJDEP databases for various aspects such as brownfields as well as flood risk. They added fields for transportation access to per NJTPA request, as well as fields for risk assessment results. Alan noted that he has built in fields for screening criteria directly in the tool.

For tier 1, there is simple criteria for yes / no. For tier 2, factors to consider, e.g., ease of access, context, parking, permitting. He then showed a live screening pre-test of the database for feedback. There are 800 dots for entire database, which also includes marinas, boat ramps, docks and others. He showed a filtering capability with South Amboy look and what data looks like. Google earth image exists in the web-enabled version of the data base. They have thought about how to keep the database updated. The primary source is U.S. Army Corp of Engineers data, added with NJTPA data, and then there are consultant-added fields. PB will continue to add updated information on owners and operators, risk assessment findings, and any additional comments. The database can be updated indefinitely with open-ended structure whereby new information can be inserted into an Excel sheet which can then be put back into the Tableau interface for the database.

Liza Betz questioned the data source on the field with site valuation. Alan said it is assessed value as reported. Doug Greenfeld suggested changing the name of that field from "net value" to "assessed value". This made sense to all present.

On the NOAA "SLOSH" model results, Doug asks if it includes sea-level rise. Alan believes its inundation potential today, and not a forecast of future levels. Liza questioned on ferry sites, whether is it clear if there is active service there, or if the site is inactive. Alan notes that it will be flagged in a field showing current service or past service but currently inactive.

Todd noted that the information is site specific, and asked about the best way to consider route options. Alan noted that the link to Google maps within the database should be useful. Alan noted that one can look at best attributes for operations, and the filtering process would be useful, e.g. selecting dredging risk. However, this project focuses on NJTPA region sites, not the total universe of potential sites (including New York City) that would be important in a larger study of potential services.

Alan wanted the group to look at buttons and fields for their input. Todd noted that for the button, "lift bridge," it would be useful for have two fields to note allowable maritime height for the open and closed position for moveable bridges. Doug suggested renaming it to read "bridge clearance" versus "bridge height". Dave thought it more correct to call it clearance at mean high water as described on NOAA charts) Alan will check for the correct terminology.

Site acreage turned out to be less interesting as originally thought, since ferry sites can be located at very small parcels, versus freight. Todd DiScala said size would be useful for ferry parking potential.

On transit attributes, Alan asked if distance to highways and rail was useful. Todd said yes, it was useful. Liza asked how the team will fill out that data. Alan will map out walking path with Google map to nearby transit so one can screen by distance. Todd also added that bus stops are also on Google maps. Dave mentioned yes, for both freight and passenger connectivity.

Site information on 40 sites of interest will be inputted but the goal is to drill down with more data on the sites where there is more opportunity. Alan asked if there was anything missing. Doug asked for clarification on how dots are keyed in legend. Alan answered color keys and noted that docks can also be ferry sites.

Alan noted that in the next few weeks, they will be finalizing the database with the Harbor Ops Committee so we can then focus on the profile level process, where out of the 40 sites, we will want to focus on 10 sites for more detailed analysis. A webinar next month would be useful to show the group where we are and get input before November. Dave agreed.

Alan also noted that water taxis feedback was also a new development from when started. A water taxi network may be more useful to look at then the individual sites themselves.

Conclusions and Next Steps

The team welcomed additional comments, other suggestions, guidance and feedback. Dave also asked the TAC to keep materials close to vest until we are finished. Todd asked if there is an opportunity for the public to provide input. Dave said the goal is to work through county and city planners, economic development agencies and the towns. Todd asked if there is a "wiki" element planed. Dave said no but it is geared to be useful to the counties. Alan also noted that this is compilation of pros and cons of sites for planners to use in their analysis, and not service recommendations per se. Dave noted that this is preparation for analysis of marine highways for planning as roadways get more congested.

Liza noted that the database is helpful since it opens up conversations that were difficult to have before as private land owners tend to be reluctant to sharing their site information, while a lot of the information is publicly available. It has been intriguing. Doug said that the project team has done a fantastic job.

Donna Orbach said it's a good tool for thinking about long-term options for development, and that this underscores that parking is key in the Edgewater example. They don't have water taxis in the area but they may be more economical than large ferries. This is a great tool for thinking outside of the box.

Juan Feijoo asked who will maintain the database. NJTPA will. Alan said it is easy to maintain given with the structure and suggested setting up a web link for use by the subregions, and then subregions can send notes to NJTPA with new information as a two-way tool. Once Alan finishes the second update, a web link can be provided for the draft version for further subregion review and comment.

Dave thanked attendees for coming and their comments. The meeting was adjourned at 11:50am.

In Attendance

	Name	*Affiliation*
Project Team	Dave Dawson	NJTPA
	Jakub Rowinski	NJTPA
	Lois Goldman	NJTPA
	Doug Greenfeld	NJTPA
	Alan Meyers	WSP | Parsons Brinckerhoff
	Alice Cheng	Cheng Solutions
TAC Members	Ahmad Ismail	PANYNJ
	Donna Orbach	Bergen County (by phone)
	Todd DiScala	NJ Transit
	Juan Feijoo	City of Newark
	Kimberly Singleton	City of Newark
	James Bonanno	Monmouth County
	Barkha R. Patel	Jersey City Planning Division
	Liza Betz	Union County
(Via WebEx)	Bruce McKracken	Middlesex County
	Donna Orbach	Bergen County
	Jeff Flumignan	MARAD
	Mark Jenke	Ocean County
	Megan Massey	Hudson County

APPENDIX D

SUMMARY OF TECHNICAL ADVISORY COMMITTEE MEETING #4

TECHNICAL ADVISORY COMMITTEE MEETING #4

November 15, 2016 – 10AM to 11:30AM

NJTPA Office (1075 Raymond Blvd, Newark NJ 07102) and via NJTPA WebEx

Introductions, Review of Objectives and Work Plan

Dave Dawson, the study manager for NJTPA, welcomed attendees and those participating on the phone via WebEx to the fourth technical advisory committee (TAC) for the Inventory and Assessment of Waterborne Transportation Resources study. Dave took roll call of TAC members for attendance and asked that the study, contents and comments be treated as confidential by the TAC until the study is completed. At the completion of the study, the product will be available on the NJTPA website.

Agenda and Goals

Alan Meyers from WSP | Parson Brinckerhoff provided an overview of the agenda. The goal of the meeting was to review work, discuss results thus far, and note work to be completed in remainder of November and December. The agenda items included: a discussion of the draft Technical Memo #2 distributed prior to the meeting; opportunity sites and screening; data updates; opportunity sites to be profiled in greater detail; and next steps in remainder of study. Alan reviewed the numerous work tasks on project and noted that the final task 5 work (final report) will be completed in December.

Draft Tech Memo #2 Discussion

Alan gave an overview of the main sections of Draft Tech Memo #2, which covers final public-sector outreach, waterside inspections, level-of-action analysis, and an interim user guide for the project database.

Alan noted that the level-of-action analysis was formerly called risk analysis. The reason for this renaming is to make clear that while all conditions pose a level of risk, the risk itself does not preclude development. This change in nomenclature acknowledges that action is necessary to address the risk, hence the change in distinction. Hence a "high risk" means that a high level-of-action is required to move the site forward, which may be appropriate for different sites and needs.

Opportunity Site Discussion

Alan began by noting that the study database includes 696 individual sites, from which 218 were identified for enhanced data collection using screening criteria.

Alan walked the TAC through the non-web enabled version desktop for the WebEx meeting; the only difference from the web version is that real-time Google earth imagery for each site could not be displayed. Alan reviewed all the data fields provided in the database, using the Amboy Aggregates site as an example. Alan then reviewed the sort and query functions of the database, enabling users to perform dynamic real-time screening on a wide range of criteria. (Details of each field are in the Interim User Guide in Tech Memo #2).

Alan asked the TAC to review the sites in their region of interest and provide feedback so that the team can make the tool as useful as possible. Liza Betz (Union), who was unable to log onto the WebEx link, asked about the timeframe for comments. Alan noted the goal is to complete the project in December as early as possible, and would thus appreciate any comments before Thanksgiving. Alan also offered to walk Liza through the tool at another time. NJTPA also asked for comments on the draft Tech Memo sent out to TAC members in addition to the database itself. Donna Orbach (Bergen) asked where the link is located, and Alan noted that it is listed in the Interim User Guide in draft Tech Memo #2.

Liza Betz mentioned Tech Memo #2 had great photos of the sites that were inspected, but the locations of these sites were not always clear. Ms. Betz requested that the site descriptions include the County and Municipality. Additional TAC members also made this request, which Alan noted would be made in the database.

Dave noted per Ms. Orbach's request that a map with sites and county outlines will be added to the final report. Alan added than other comments are welcome as the team is on a fast track to finish, but the consultant team is keen on verification of the data. NJTPA will be looking to work with the TAC on use of the tool.

Selecting Opportunity Sites to be Profiled

Alan then shifted to discussion about the work plan for the 20 profiles of opportunity sites. He was clear to note that the sites selected for profiling are not to be considered preferred or recommended; rather they are intended to be illustrative of known or emerging opportunities that are being or may be pursued by the NJTPA subregions through appropriate development decision-making channels.

Alan reviewed a list of possible base content for each profile report, which could address: location and community context; history, current operation, and development plans; key data on waterside and landside access; market potential for passenger or freight services; and possible steps for implementation. Graphic content could include locations maps, aerial imagery, and development plans if feasible.

Alan provided an initial suggested list of passenger, mixed use, and freight opportunity sites to be profiled. The list was based on leading opportunities identified by TAC members and other stakeholders throughout the course of the study, excluding sites that failed to meet minimum threshold criteria (insufficient water depth, lack of development interest/potential, etc.) and also excluding sites that involved only shallow-draft water taxi service (as these have very small physical footprints and minimum land/water development requirements).

Alan suggested that profiles of passenger service sites could include: South Amboy, Carteret, Edgewater (multiple sites), Long Branch, Jersey City (multiple sites), Newark/River Terminals and Belford/Highlands/Atlantic Highlands. Profiles of "mixed use" sites could include Allied Signal (passenger, freight, or both) and Earle/Leonardo (water, truck, rail freight). Profiles of freight service sites could include: Federal Business Centers; Bayshore Recycling; Tremley Point; Tufts Point/Port Reading; and the Passaic River east of Doremus Avenue (multiple sites). *[Note: it was subsequently recommended by Monmouth County that Earle/Leonardo not be profiled. Site information will remain in the database for use as needed.]*

Alan noted that the TAC should provide feedback and guidance on the content of the profiles and on the sites to be profiled. Highlights of the following discussion included:

Donna Orbach asked if we are looking at the Englewood Cliffs site as part of the Edgewater examination, and the answer was that we are.

Donna noted that the sites could be very large in Bergen and that some sites could be multi-use for commercial and residential development that would support passenger ferry service, and this should be noted in the profiles; Alan agreed.

Donna also noted that it would be worthwhile to discuss the parking requirements for a passenger ferry service. In Edgewater, the lack of available parking is limiting the growth of the ferry service. She asked if we can have a rule-of-thumb in the suggested level of parking required. Alan said we will talk about parking in terms of whether a lot is needed and we can benchmark the ridership share on existing services. However, we won't be able to provide a detailed ridership as ridership is linked to site design, which is unknown at this point.

Lois Goldman asked how one can cross reference opportunity sites with the database. Alan noted that the site name would be consistent in the two sites and ultimately linkable, but it will depend on how the data transfers into NJTPA's EGIS format.

Lois also asked if we would flag sites that already have good transit access. Alan noted that this is part of the discussion and is in the database.

Dave Schmetterer (Monmouth County) asked that we make sure that bicycle/pedestrian access is part of the discussion regarding potential passenger service sites.

Jeff Flumignam (MARAD) asked if there is a field in the database for Marine Transportation Security Act (MTSA) regulated facilities. This is a federal designation which regulates physical access to maritime facilities for security purposes via federal credentials; marine terminals handling international freight and sensitive materials are typically included. Alan said that the designation is not included, because it depends on uses that could be changed (either introduced or eliminated) through the development of opportunity sites. Jeff mentioned that a paragraph or two on the subject would still be useful, and Alan agreed. Alan asked Jeff for list of these secured facilities. Jeff can get this list from the Coast Guard and Alan will build a corresponding field into the database, if received in time. Otherwise, it can be added easily appended to the database as part of updates in the future.

Anne mentioned that many agencies will be interested in this product, including NJ OEM, NYC EDC and NYC OEM, and hopes that the database can be updated and used as a living resource, as well for the NJ State Master Plan to optimize resources.

Dave Dawson mentioned that for some of the sites, while the current owners may not be interested in waterborne access, new owners may have a different view in the future. Alan will consider how to reflect that in the analysis.

Anne mentioned that ProLogis developing the Allied property in Elizabeth and should be contacted regarding waterfront access. She will follow up. Liza Betz asked for more discussion on those sites after the meeting.

Lois Goldman asked for further explanation of terms used. It was suggested that a glossary of terms be added to the report.

Next Steps

Alan reviewed next steps with the TAC, which includes developing a draft and final report (including the opportunity site profiles), the Tableau workbook and underlying excel spreadsheet dataset, and a NJTPA GIS-compatible data product.

Liza Betz asked a question about element on Tech Memo Page 10 (Section 3.1) and asked about the category "other" – wanting to know what the catch-all category includes. Alan noted that these are marine support services (fueling, repair, dry dock) and not typical facilities that move goods/people. Liza asked that this be made clearer in the report; Alan agreed to do so.

Anne Strauss-Wieder asked for any last comments. Attendees indicated, in various ways, that the work was on the "right track" and should be of use to participating agencies, and were highly complementary to NJTPA staff and the consultant team. Anne thanked attendees for their outstanding contributions and noted that the conclusions will be presented formally at an NJTPA meeting scheduled for Feb 21st.

The meeting was adjourned at 11:25am.

In Attendance

Meeting Participants				
Host: North Jersey Transportation Authority **Consultant Team:** Alan Meyers (WSP|PB), Steve Chiaramonte (WSP|PB), Alice Cheng				
Name	Title	Company	Attended	Phoned
Ahmed Ismail	Transportation Analyst	PANYNJ	✓	
James Bonanno		Monmouth County	✓	
Anne Strauss-Wieder		NJTPA	✓	
David Dawson		NJTPA	✓	
Lois Goldman		NJTPA	✓	
Jakub Rowinski		NJTPA	✓	
Bruce McCracken	Principal Planner Transportation	Middlesex County	✓	
Liza Betz		Union County		✓
Donna Orbach		Bergen County		✓
Jeffrey Flumignan		US DOT MARAD	✓	
Todd DiScala		NJ Transit	✓	
Scott Douglas		NJ DOT	✓	
David Schmetterer		Monmouth County	✓	
Donald Hutton		NYNJ Rail Corp. (PANYNJ)		✓

APPENDIX E

NJTPA WATERBORNE FACILITIES PLANNING VISUALIZATION TOOL USER GUIDE

About the Planning Visualization Tool

A major product of this study is the Planning Visualization Tool (Tool) which facilitated the collection, review, and validation of waterborne site opportunity data pertinent to this study. The tool was designed to be interactive with waterborne sites of interest to NJTPA and its stakeholders. It should be noted that NJTPA will not be maintaining the Tool – particularly since the information has been provided in an MS Access format for integration into the larger NJTPA data/GIS environment. NJTPA will manage and distribute that information in a manner consistent with NJTPA policy.

In developing the Tool, the main goals were to:

- Provide information to working planners and other stakeholders via a web browser, on their desktops or laptops, without the need for specialized software, licenses, or database / GIS expertise
- Allow users to easily sort, filter, query, and display data with a simple, visual interface
- Allow the integration of static information (collected and maintained in a spreadsheet input to the tool) with dynamic information (current Google mapping and imagery)
- Build an information resource that could be transmitted to NJTPA at the conclusion of the project, in a format consistent with its applicable data/GIS standards

The "front end" visualization was built in a software package called Tableau. The Tableau visualization – known as a "workbook" – is hosted on a web-server via a WSP|PB license. During the study period, users could access the Tableau workbook by visiting a web link (available from NJTPA for authorized users only) and, once the workbook appears, entering the password provided.

Figure E-1. NJTPA Waterborne Facilities Tool – Password Entry Location

The Planning Visualization Tool was designed as a developmental resource, and was used for accessing and investigating the data collected as part of this study. The information was also made available in two other forms:

- As MS Access files, provided to NJTPA in a format consistent with NJTPA GIS standards. This will allow NJTPA to integrate the information into its larger data/GIS systems, and to utilize and manage the information as desired within that environment.
- As an Excel spreadsheet, provided to NJTPA.

Information and Sources

The Tool contains information from three types of sources. The association of each data type with its source is shown in the metadata attached to this User Guide. The main sources can be summarized as follows:

- **Original data**. A main purpose of the study is to update the US Army Corps of Engineers (USACE) Port Facilities data for the NJTPA region. The USACE conducted an exhaustive effort to compile information on national facilities in the 1990s, but their data has for the most part not been updated since that time. The majority of the facility locations in the Visualization Tool begin with USACE data. To this information, the consultant team appended additional data on New Jersey marina and recreational boating facilities provided by NJTPA. Finally, in cases where important sites are known to exist but are not contained in either data set, the consultant team provided the corresponding information. Original data is presented for 696 individual sites. Note that original data, where sourced from USACE, may no longer be current -- uses and/or owners have changed in many cases. These changes are captured in the "updated data" and "new data" areas for selected sites.
- **Updated data**. The updated data area consists primarily of information that exists about these sites, but needs to be extracted or adapted from various original sources. The full list of 696 sites was screened to 218 sites to be updated, according to the screening process described in the Final Report. Each of these sites was researched using the following datasets and sources: property attributes from NJDOT Orthography data; environmental attributes from various NJDEP datasets; storm surge data from the National Oceanographic and Atmospheric Administration (NOAA) "SLOSH" model; authorized channel depths and measured channel depths (2012-current) from USACE's New York and Philadelphia Districts; berth depths from NOAA charts; and transportation access information from Google mapping.
- **New data.** For the 218 sites that were updated, new data (not available from any previous sources) was developed for this study. This includes: updated facility names (where known) from stakeholder interviews, NJDOT Orthography data, Google maps, or other available sources; stakeholder comments (where provided during public outreach); results of waterside inspections for 17 areas of interest (covering wharf/pier conditions and berth depths); and "level of action" assessments for the introduction of passenger or freight operations at each site. The "level of action" assessments were developed by the NY/NJ Harbor Operations Steering Committee, a consortium of public agencies (US Coast Guard, State of New Jersey, City of New York, et al), private vessel operating companies, and regional universities. The assessments address: channel dredging; berth dredging; accessibility (physical ability to reach a site with typical vessels, based on channel/berth depth and overhead bridge conditions); navigability (physical ability to reach a site based on current, channel dimension and shape, and similar characteristics); and operations (potential conflicts with known or anticipated freight, passenger, and recreational uses of the waterways). A rating of "Low" means that conditions are very favorable and little to no action is needed to address issues; a rating of "High" means that challenges exist and actions must be taken to address them. Importantly, the ratings are not meant to suggest that certain uses are recommended or not recommended at certain locations; the ratings are meant only to identify places where higher or lower levels of action and response would be appropriate or required to develop certain uses or services.

For each site, this data is displayed on multiple lines. From the top line of the Tool, the user can scroll down to locate the particular data of interest. Examples of original data, updated data, and new data available in the Visualization Tool are presented on the following pages.

Figure E-2. Display of Data Fields Provided as "Original Data" for Amboy Aggregates Site

Original Data -- Facility

Facility Name	City Or Town	Data Source	County Name	Historic Owners	Facility Type
AMBOY AGGREGATES SOUTH AMBOY PIER	SOUTH AMBOY	USACE	Middlesex	Current Owner and Operator: Amboy Aggregates. Phone: 732-525-0620 FAX: 732-525-9398	Dock

Original Data -- Usage

Historic Operators	Purpose	Commodity Classes and Types	Mechanical Handling	Remarks
Null	Receipt and shipment of sand by barge.	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material	One traveling barge-loader with loading spouts on 20-foot outboard reach over each side of dock serves a 42-inch, electric belt-conveyor extending along center of wharf from open storage area in rear; rate 1,200 tons per hour.	Sand is received directly from company-owned dredge; dredge moored to steel barges served by receiving hopper served by a 48-inch, fixed electric belt-conveyor extending to open storage area in rear. Open storage area has capacity for approximately 14,000 tons.

Original Data -- Water, Rail and Highway Access

Berth Depth (Min)	Berth Depth (Max)	Largest Berth	Berthing Total	Rail Access	Highway Access
18	18	235	470	None.	Via plant road, part asphalt, various widths; from Lower Main Street, asphalt, 30 feet wide.

Figure E-3. Display of Data Fields Provided as "Updated Data" for Amboy Aggregates Site

Updated Parcel Data (NJ High Resolution Orthography 2012-2013)

Parcel Link	Owner Name	Acreage	Net Value
1220_161.02_25	GREAT LAKES DREDGE & DOCK CO &ETALS	29.12	4,481,000

Updated Environmental Data (NJDEP 2016 and NOAA/SLOSH 2016)

In Brownfield Area?	In Coastal Flooding Region?	In Deed Notice Extent Region?	In Historical Properties region?	100 ft. of Known Contamination Sites?	In Natural Heritage Region?	In Shellfish Classification region?	In Wetlands Region?	NOAA Storm Surge
No	No	No	No	No	No	No	No	> 9 feet in Cat 3

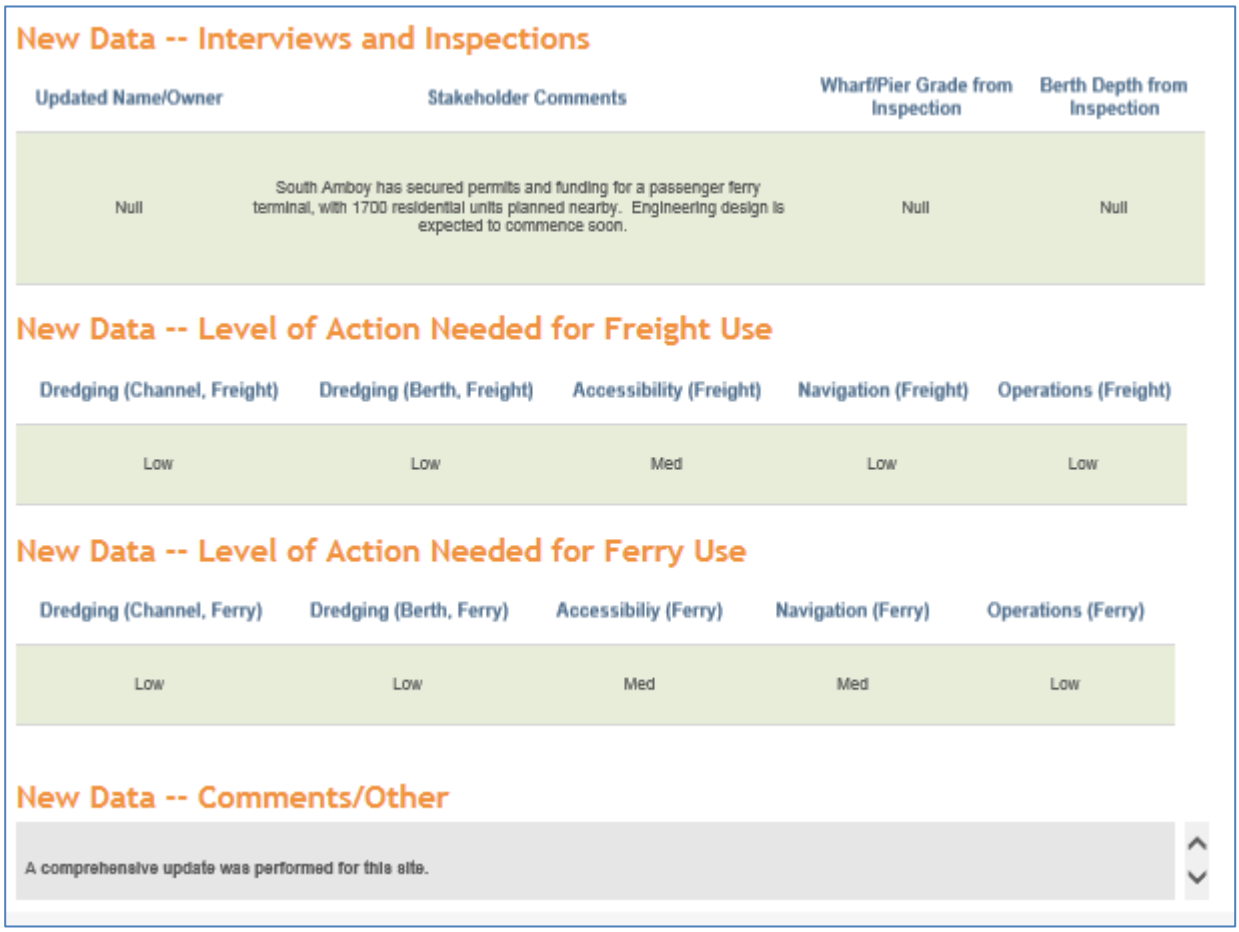
Updated Waterside Access Data (USACE and NOAA)

Waterway Name	Bridge Info From NOAA Charts	Authorized Channel Depth from USACE (MLLW)	Channel Depth from NOAA Charts (MLLW)	Berth Depth from NOAA Charts (MLLW)
Raritan River	Null	25	24	11

Updated Landside Access Data (Google Maps and Transit Maps)

Distance to Divided Highway	Distance to 4-Lane Highway	Direct Rail Service?	Distance to Rail Transit	Distance to Bus Route
Null	Null	No	Null	Null

Figure E-4. Display of Data Fields Provided as "New Data" for Amboy Aggregates Site



New Data -- Interviews and Inspections

Updated Name/Owner	Stakeholder Comments	Wharf/Pier Grade from Inspection	Berth Depth from Inspection
Null	South Amboy has secured permits and funding for a passenger ferry terminal, with 1700 residential units planned nearby. Engineering design is expected to commence soon.	Null	Null

New Data -- Level of Action Needed for Freight Use

Dredging (Channel, Freight)	Dredging (Berth, Freight)	Accessibility (Freight)	Navigation (Freight)	Operations (Freight)
Low	Low	Med	Low	Low

New Data -- Level of Action Needed for Ferry Use

Dredging (Channel, Ferry)	Dredging (Berth, Ferry)	Accessibiliy (Ferry)	Navigation (Ferry)	Operations (Ferry)
Low	Low	Med	Med	Low

New Data -- Comments/Other

A comprehensive update was performed for this site.

The Tool also provides live links to Google mapping. Along with the information above, the tool also includes aerial photography for each site. The aerial photograph can be zoomed in or out (using the + and – controls), moved around (by holding down the left mouse button and moving the mouse), and/or toggled between map view and satellite view (by clicking the box in the lower left corner of the image). This provides the viewer with recent visual information on the development and use of each site, its neighboring context, and its road/rail/transit access systems.

At the top of the image, the latitude and longitude representing the site is displayed, along with a link to other Google map functions. Clicking "directions" brings up the full Google maps application, allowing the user to zoom in and explore street views in the vicinity of each site, if desired.

Figure E-5. Example of Embedded Google Map Data, Satellite View of Amboy Aggregates Site

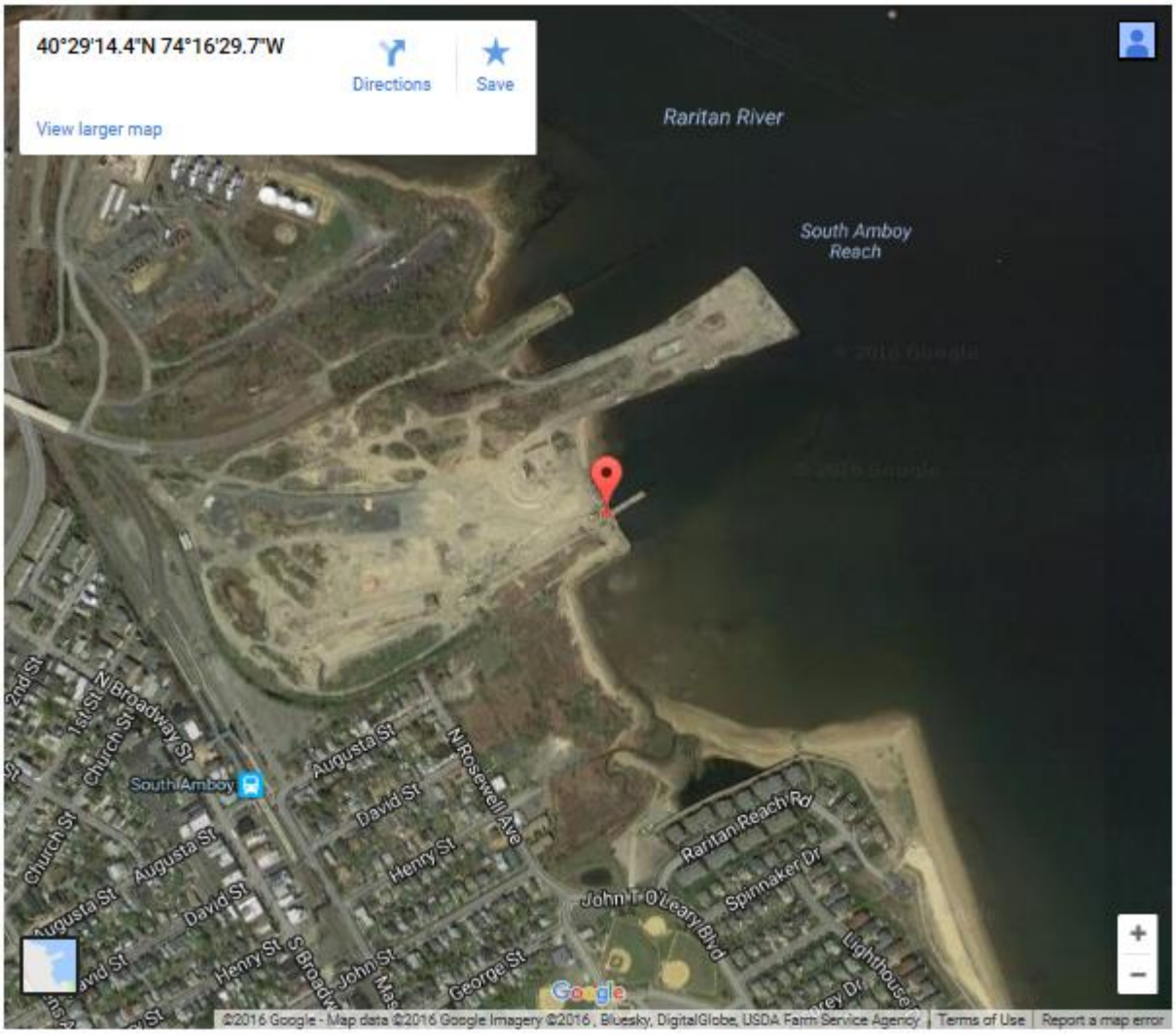
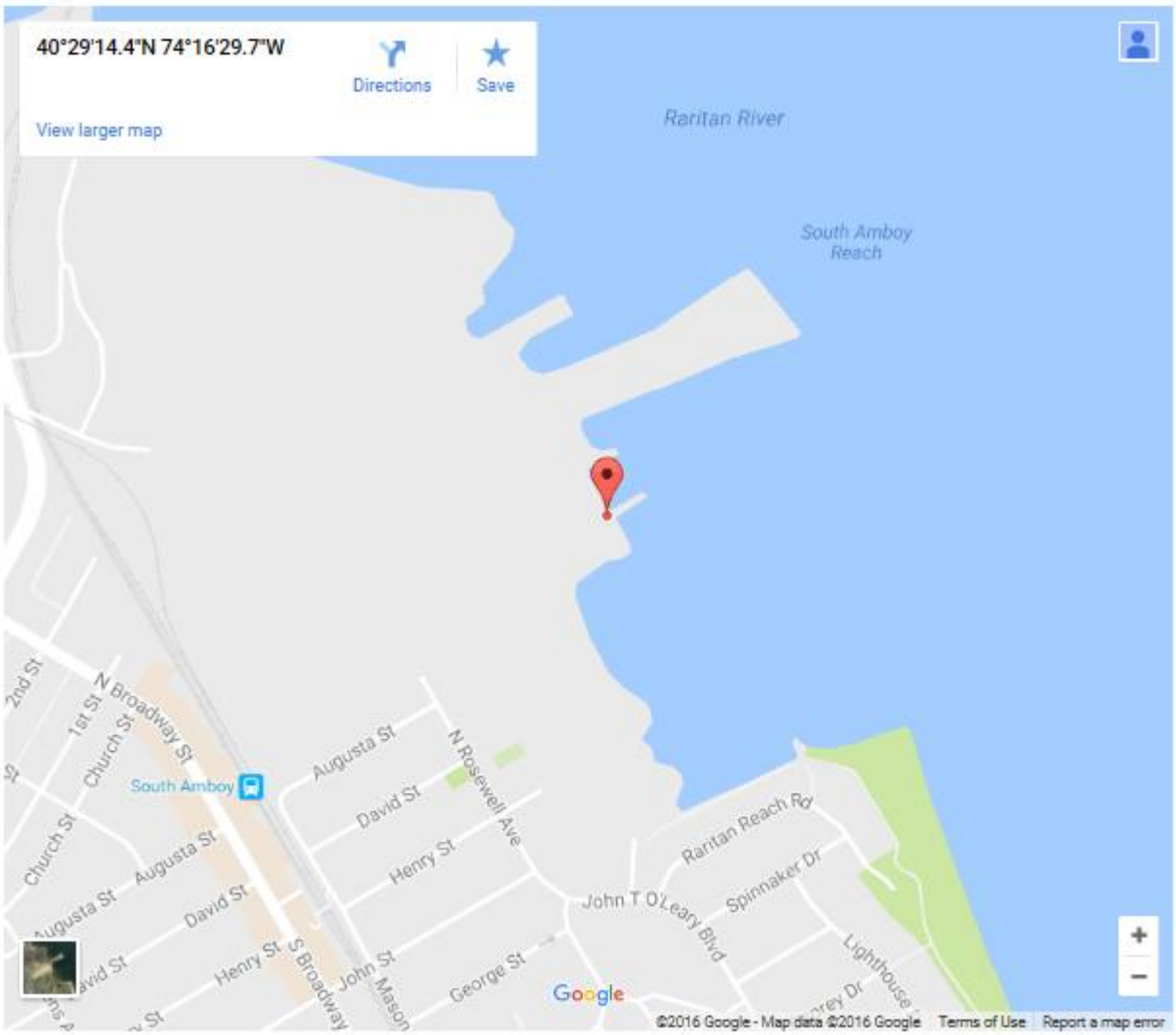


Figure E-6. Example of Embedded Google Map Data, Map View of Amboy Aggregates Site



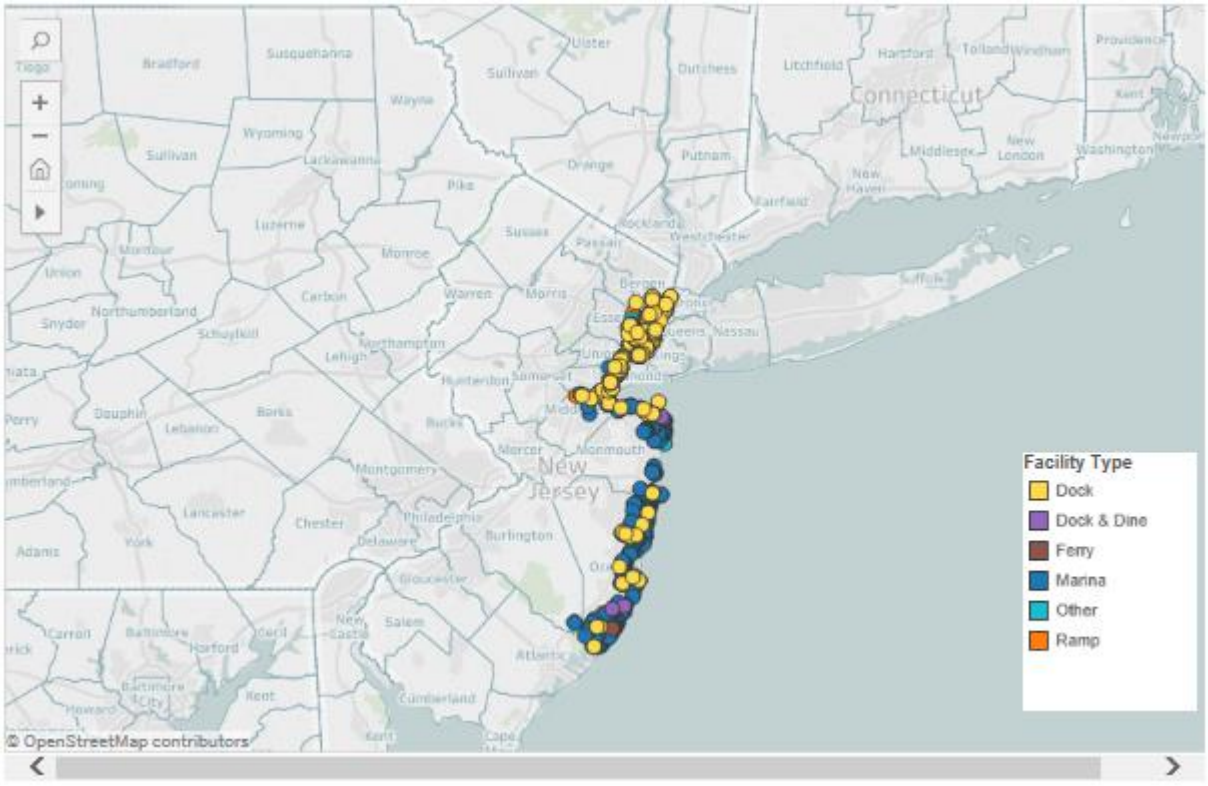
Using the Tool

Using the Tool involved the following steps:

- Selecting sites of interest. Users can filter for single sites, or for groups of sites, in various ways.
- Single sites can be selected using a location map or by facility name. For single sites, the Visualization Tool displays the location information, the associated Google map image, and all of the data fields (original data, updated data, and new data).
- Multiple sites were selected by geographic location or by sets of attributes (for example, all sites over a certain channel depth). When multiple sites are selected, the summary map is harder to read, because the workbook is trying to display multiple records at the same time; the information is there but the user has to scroll down through each line to read it (using the up and down buttons on the right of each data line). When working with multiple records, the easier approach is to first select the group of records of interest, and then select each one of those records individually to view the details.

The Tool included a live map with road, rail, and water features. Each site is displayed as a dot on this map. The dots are color-coded by facility type. The available types, defined in the USACE data, are: dock; dock and dine; ferry; marina; ramp; and other (primarily marine service industries or unknown).

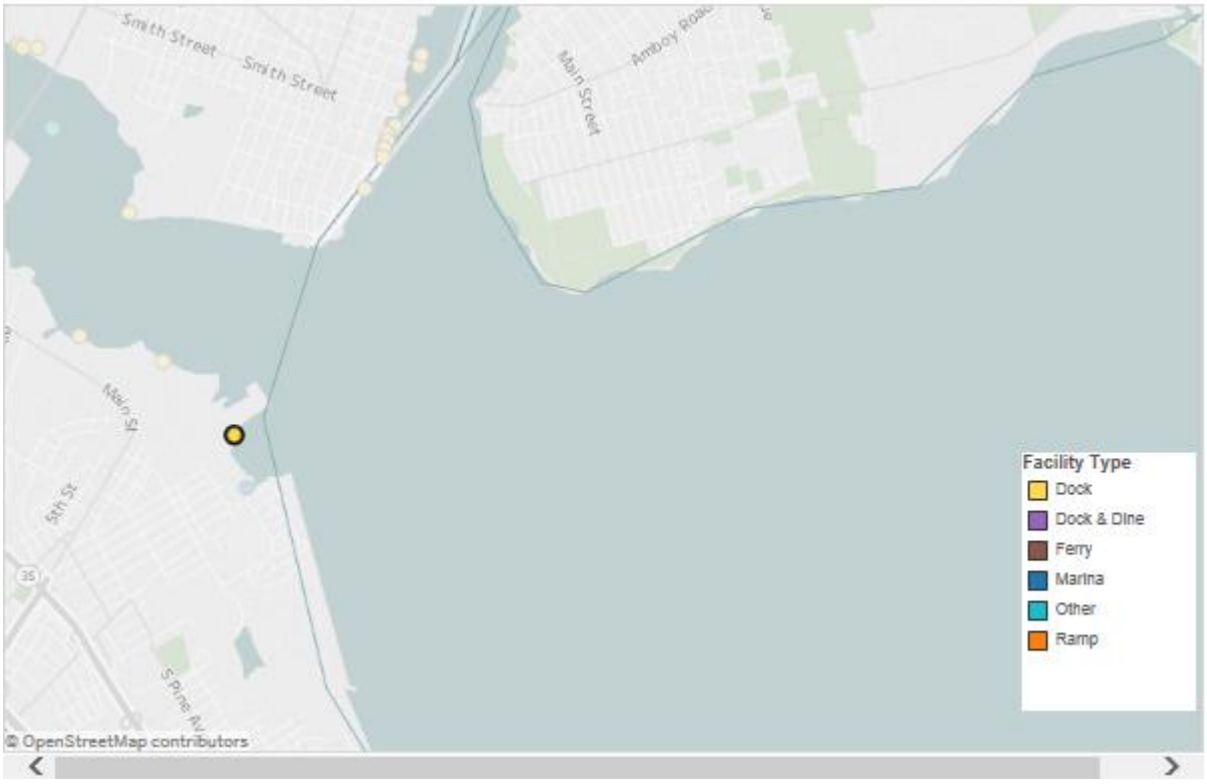
Figure E-7. Site Location Map, Full Area View



With 696 dots, the map is obviously congested at the full scale. There are several ways to make the information more readable.

- To examine a particular site, the user could use the toolbar at the top left of the map. The + button zooms in; the – button zooms out; and the user can left-click to reposition the map. After zooming in to an area of interest, the user could see individual sites more clearly.
- Moving the pointer over a site – but not clicking – brought up a pop-up display with the facility, town, county, and waterway name from the original data sets.
- Left-clicking on any site highlights it, and fades out the other sites; the Tool then displayed all the data for the selected site. Left-clicking a selected site removes the highlighting, bringing back all the sites. In the example below, the Amboy Aggregates site in South Amboy is highlighted; selecting this site generates all the data shown in Figures E-2 through E-6 shown previously.

Figure E-8. Site Location Map, Zoomed View with Amboy Aggregates Site Selected



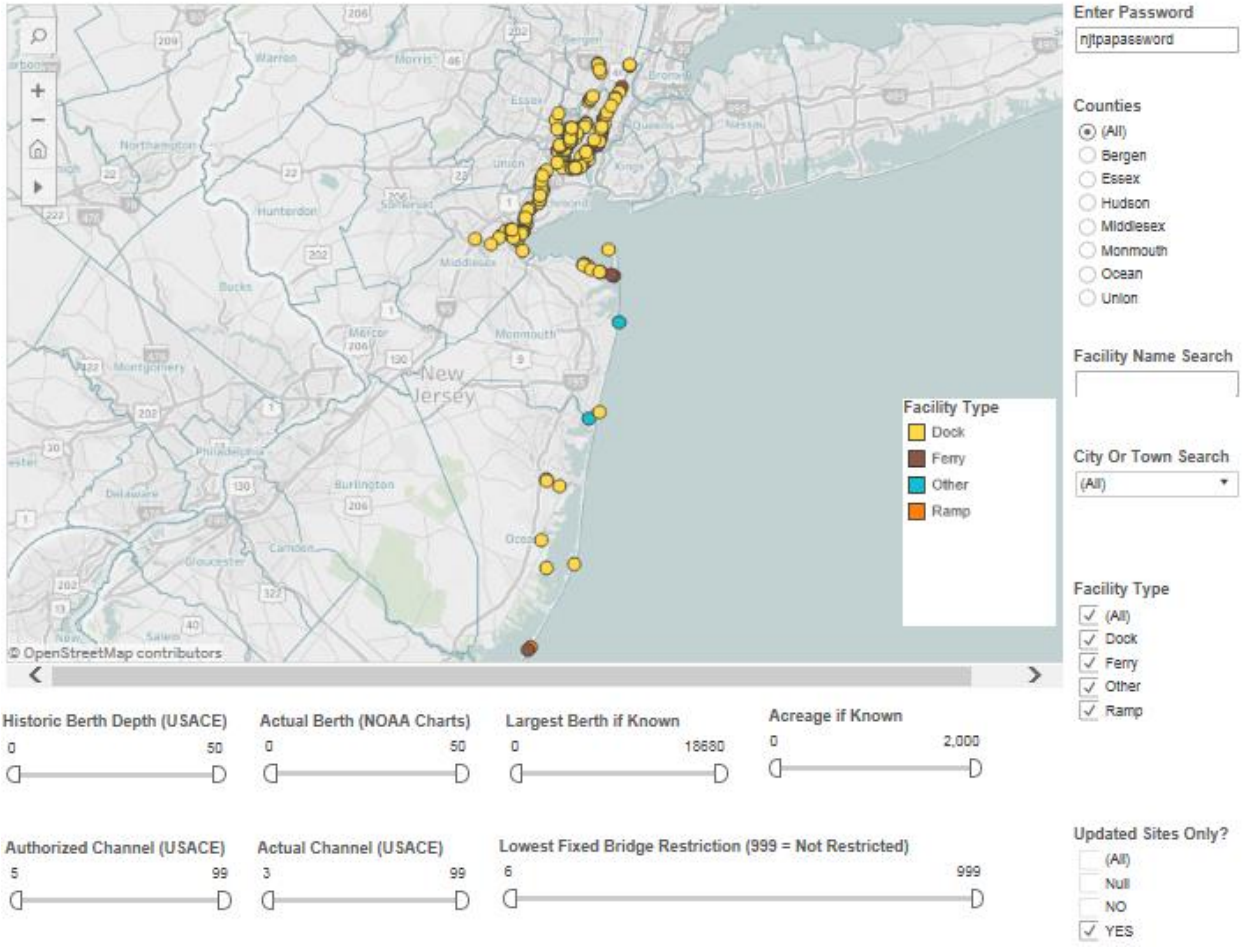
The map view was especially useful when analysts are interested in "browsing" general areas, or are interested in a specific site with a known location. In cases where analysts are interested in a specific site but do not know where to look on the map for it, they can enter the name of the facility manually, and the Visualization Tool will find and highlight the site automatically.

Users could also select groups of sites by:

- County. By default, all counties are selected. Clicking on a county name selects just the facilities in that county. When not displaying all counties, only one county may be selected.

- City or town. By default, all cities are selected. Clicking on the small arrow within the selector box brings up a pull-down menu of city and town names. Clicking the "All" box at the top of the menu unchecks all the selections; then the user can click to add check marks next to the city and town names of interest. Facility type. By default, all facility types are selected. The user could de-select All by clicking the All box, then clicking to select individual types of facilities (dock, dock and dine, ferry, marina, ramp, other) to be examined.
- Updated sites only. By default, the Tool displays 639 sites. Most analysts will be interested in the 218 sites for which updated and new information was developed. Clicking the All box de-selects all values, then clicking the Yes box displays only the sites that were updated.
- Stakeholder Identified sites only. Throughout the course of the study, multiple public and private stakeholders were consulted, and they identified 39 sites as being of particular interest for activation or development. Clicking the All box de-selects all values, then clicking the Yes box displays only the sites that were identified by Stakeholders.

Figure E-9. Filter Menus for County, Facility Name, City/Town Name, Facility Type, Updated Sites, and Stakeholder ID Sites, with Site Location Map Filtered to Include Only Updated Sites



Using any of these filtering steps has two effects. One effect is that the filtering choices change. For example, selecting only Dock and Dine facilities eliminated counties and cities that have no such facilities from the menu choices. The other effect is that the sites map will only displayed the selected sites. From this filtered view, the user can explore and select/de-select individual sites for examination, using the procedure described earlier.

For "power users," there is an additional set of filter options, which apply only to sites that were updated. Located directly below the site location map, there is a set of buttons and sliders. The sliders can be moved back and forth to select only sites that fall within the selected range of values for:

- Historic berth depths and largest berth (from original USACE data) at Mean Low Water
- Authorized and actual channel depths (from updated USACE data) at Mean Low Water
- Actual berth depths (from most recent available NOAA charts) at Mean Low Water
- Fixed overhead bridge restrictions (from most recent available NOAA charts and other sources) at Mean High Water; where there are multiple restrictions, the most restricted value between the site and open water is used
- Site acreage, if available from the NJDOT Orthography data; this is useful information but can be misleading because adjoining parcels that might be part of a larger site (whether current or future) may not always be captured
- By default, the sliders include null values. The non-updated sites will have many null values for these variables. If the user wants to use the sliders while looking at all sites, excluding the null values is recommended. To do this, hover the mouse pointer over the title of the slider; to the right, a small arrow will appear; click on the arrow and a pull-down menu will appear; then click to exclude null values. Normally this will not be an issue, but the capability is available.

The buttons can be clicked to turn on and turn off filters for the various "level of action" attributes. There are five sets of buttons for freight uses and five for passenger uses. By default, all values are selected. To filter for a particular variable, click All to de-select all values, then click the desired level of action (low, medium, or high). Null values can be excluded by de-selecting them; again, there are no null values for the updated sites, but the filtering capability is available if needed.

Figure E-10. Enhanced Filter Area, Set for Updated Sites with Authorized Channels of 35 feet or more

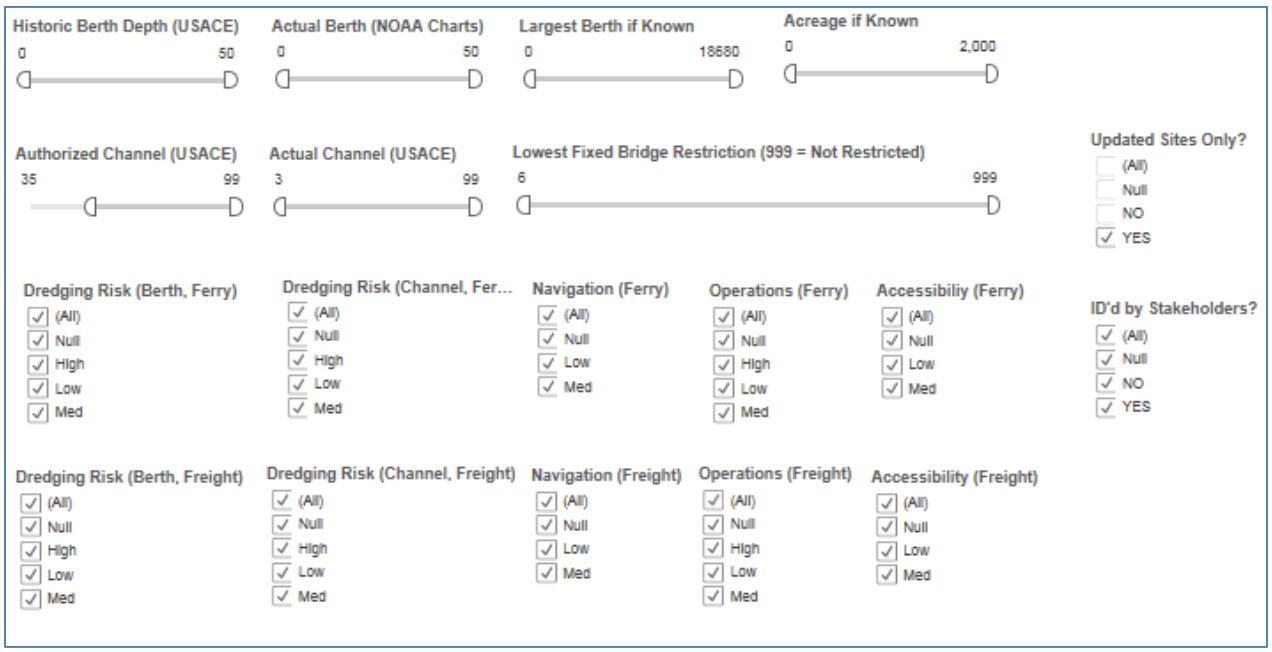
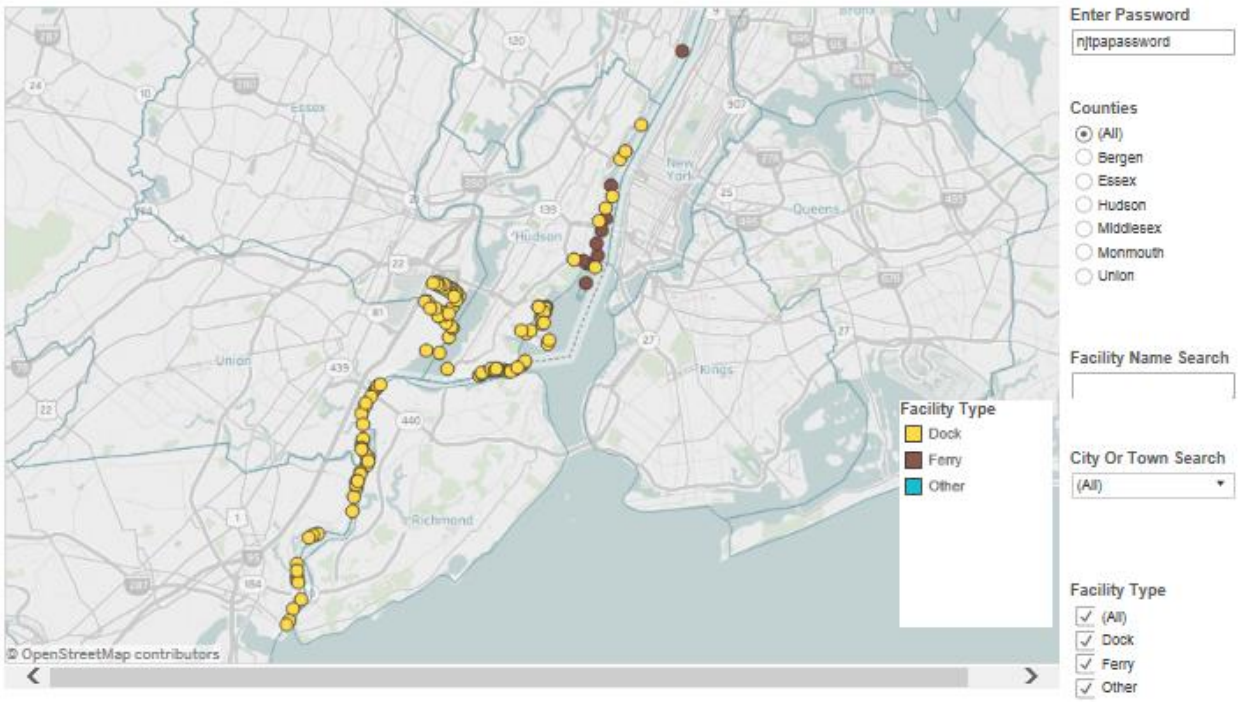


Figure E-11. Site Map Corresponding to Filter Settings from Figure E-10



Metadata

Complete metadata was developed and provided to NJTPA in electronic form.

APPENDIX F

WATERSIDE SITE INSPECTION REPORTS

SITE INSPECTION TASK SUMMARY

The CH2M, Inc. inspection team conducted a rapid visual assessment by boat of potential freight and passenger waterborne transportation sites. The assessment was made during the period June 27, 2016 through July 7, 2016 so as to take advantage of maximum daylight and favorable weather conditions. As a result, the inspections precluded a number of the final Opportunity Sites chosen near the study's end. In cases where an inspection corresponds with an Opportunity Site, the relevant Opportunity Site number (keyed to the map in Appendix G) is noted.

Location	Waterside Inspection Site Number	Opportunity Map Site Number
Englewood Cliffs	1	1A
Hess Oil	1	1B
Allied Chemical	1	1C
Jersey City- Paulus Hook	14	2B
Elizabeth Waterfront North	19	5A
Elizabeth Waterfront South	20	5B
Cytec Industries	22	6 A
Tremley Point	21	6 B-C
Carteret Waterfront	16	7
Raritan Center – Bayshore	18	10
South Amboy	15	11

The scope of the inspection was limited to what could be seen above water from the boat deck while traveling alongside the structures. Site inspections were scheduled as close to low water as possible to enable maximum viewing of structural elements, and to record soundings at minimal water depths. Structure types are based on engineering judgment from what was observed above water during the time of inspection. Upland property and retained fill inspections were not performed. It should be noted that condition assessment ratings were not assigned to structures that were inaccessible to the boat, or where the inspector was not able to get close enough to the structure for a meaningful visual inspection. The condition of individual site structures was characterized using the scoring system presented in the Table below, which was created to accommodate the timeframe allotted to complete the inspection.

Condition Rating Scale for All Inspected Sites

Rating	Description
NEW	No apparent structural problems. Structural elements may show some very minor deterioration, but no overstressing observed. Structure can be utilized as-is, or with routine maintenance issues addressed.
MID-LIFE	Primary structural elements are sound; minor to moderate defects and deterioration observed. Localized areas of moderate to advanced deterioration may be present but may not significantly reduce the load bearing capacity of the structure.
SEVERE	Advanced deterioration or overstressing observed on widespread portions of the structure, significantly reducing the load carrying capacity of the structure. Localized failures. Structure requires substantial rehabilitation effort to regain use.
END OF LIFE	Very advanced deterioration, overstressing, or breakage has resulted in global failure(s) of primary structural elements. More widespread failures are ongoing or likely to occur. Portions of the structure no longer exist. Structure can no longer be utilized as intended, and is beyond rehabilitation.

Each of the following Site Inspection Reports includes:

- A short description of the site location and general conditions
- A Table with ratings of observed structural conditions developed by CH2M during its inspections between June 27, 2016 and July 7, 2016
- A Map of depth soundings developed by CH2M during its inspections between June 27, 2016 and July 7, 2016, adjusted to Mean Low Water; and
- For selected sites, photographs of waterfront structures and surrounding areas

SHORELINE INVESTIGATION – SITE NO. 1, HESS TANK FARM

OPPORTUNITY SITE MAP NUMBER - 1B

The Hess Tank Farm, Site No, 1, is located on the west bank of the Hudson River. The site is an abandoned, non-active product loading/unloading pier which extends offshore from a rocky, undeveloped shoreline approximately 400 feet into the Hudson River. The primary berthing and loading platform is accessed by a timber trestle/pipe rack. Mooring hardware is located on the berthing platform. Additional mooring hardware is provided on independent adjacent structures located on either side of the primary platform which are accessed by a series of secondary trestles. To the south are three, free standing timber dolphins in varying conditions.

Hess Tank Farm Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
HESS TANK FARM	A	Primary timber access trestle	Severe
	B	Secondary timber connector trestle	Severe
	C	Expanded steel deck connector trestle	Midlife
	D	Mooring bollard	Severe
	E	Primary timber breasting/loading platform	Midlife
	F	Dolphins: F1- Midlife, F2-Midlife, F3-Severe, F4-Endlife	Multiple

Hess Tank Farm Depth Soundings

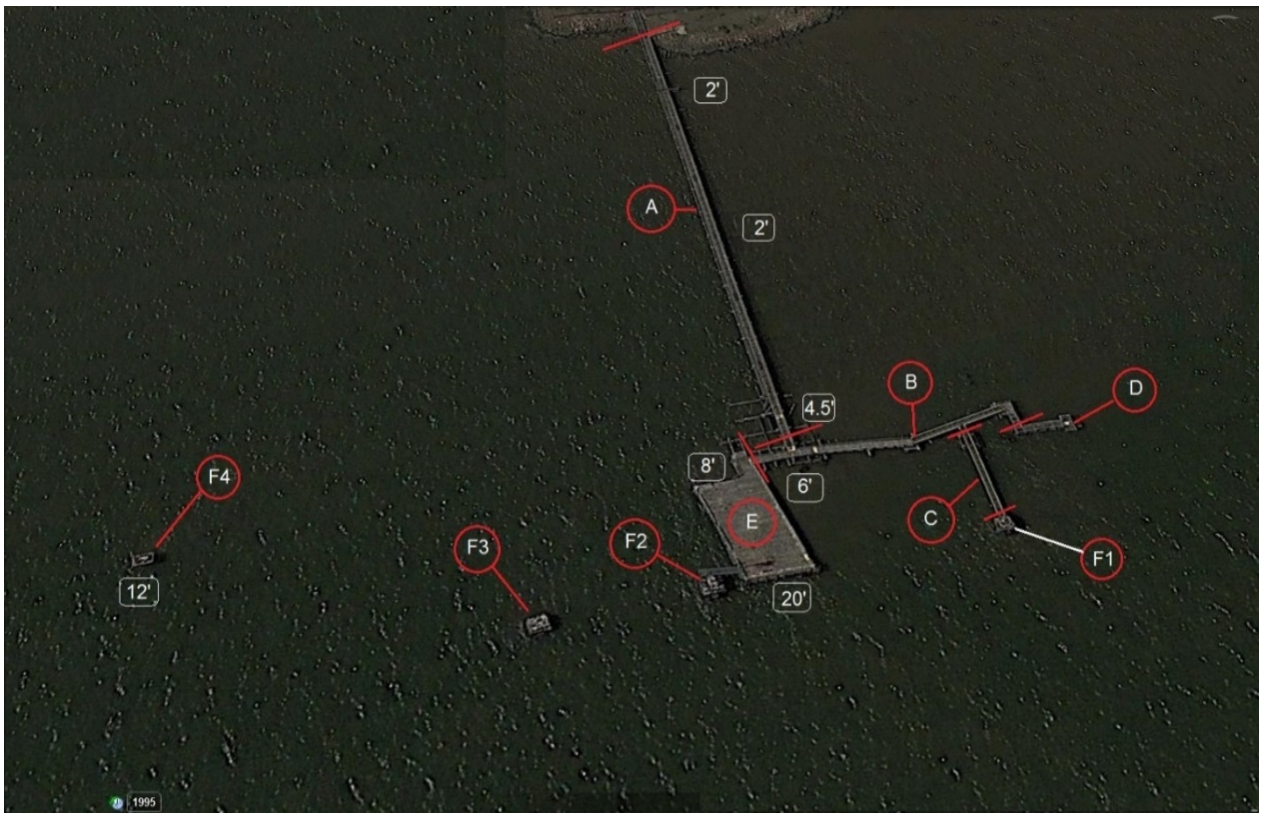


Photo No. 1 – Main timber berthing and transfer platform.

Photo No. 2 – Timber access trestle and pipe rack.

SHORELINE INVESTIGATION – SITE NO. 2, ALLIED CHEMICAL

OPPORTUNITY SITE MAP NUMBER 1C

The former Allied Chemical, Site No. 3, is located on the west bank of the Hudson River, approximately 3.75 miles south of the George Washington Bridge. The site is currently abandoned, and is comprised of a variety of partially or completely collapsed structures on or adjacent to an undeveloped shoreline. A timber pile supported pier with a concrete deck and approach trestle extend offshore at the north border of the site. The concrete deck of the pier is badly broken, however the majority of concrete remains on the pile caps. The concrete deck of the approach trestle has fallen to the mudline alone the entire length. Two inshore piles fields located at the north and south sides of the site, indicate the existence of former pile supported structures. Several concrete foundation pedestals remain in place inside the perimeter of the north pile field. The remnants of a ± 250ft long high level platform remain along the shoreline at the center of the site. Low tide conditions expose a mud flat extending to ± 200ft offshore, with the water depths less measured throughout the site at less than three feet, to ± 600ft from the shoreline.

Allied Chemical Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Allied Chemical	A	Timber pile supported, concrete deck pier (collapsing)	End of Life
	B	Timber approach pier (remnants)	End of Life
	C	Timber pile field with concrete pedestals	End of Life
	D	Undeveloped loose stone shoreline.	Mid Life
	E	High level timber pile supported platform (collapsing)	End of Life
	F	Small timber pier	Severe
	G	Timber pile field (presumed high level platform)	End of Life

Allied Chemical Depth Soundings

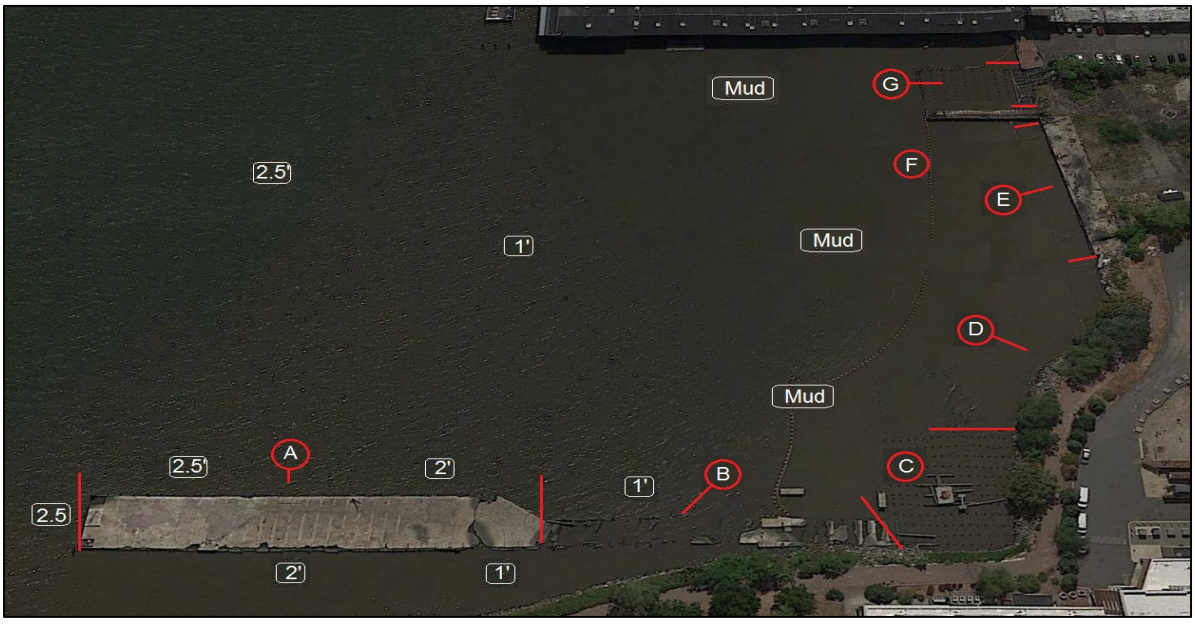


Photo No. 1 – Deteriorated timber platform along shoreline. Shallow water approach.

Photo No. 2 – Collapsing timber pier and concrete deck at north side of the site.

SHORELINE INVESTIGATION – SITE NO. 3, ENGLEWOOD CLIFFS FERRY

OPPORTUNITY SITE MAP NUMBER 1A

The former Englewood Cliffs Ferry, Site No.3, is located on the west bank of the Hudson River, approximately 1.7 miles north of the George Washington Bridge in Palisades Interstate Park. It is comprised of a 480ft seawall and an abandoned vessel landing to the south. The seawall is constructed of 2ft to 3ft stone blocks with mortar joints. The majority of the mortar is missing and a number of stones have been displaced or fallen several feet to the base of the seawall. A cast-in-place concrete bulkhead backs the stone blocks, reinforcing the seawall and retaining upland fill for an active, asphalt topped parking field use by the marina located immediately upriver from the site. The remains of a collapsing stone-filled boat landing border the south end of the site. The landing is ±60ft wide by 40ft deep, however the outer half of the landing has been undermined and the asphalt-topped concrete deck has collapsed. Security fencing is in place to restrict public access to the landing. Adjacent to the landing is a one story fieldstone structure currently supporting an active commercial business.

Englewood Cliffs Ferry Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Englewood Cliffs	A	Concrete backed, stone masonry block sea wall	Mid Life
	B	Rubble filled, concrete and asphalt topped landing	End of Life

Englewood Cliffs Ferry Depth Soundings

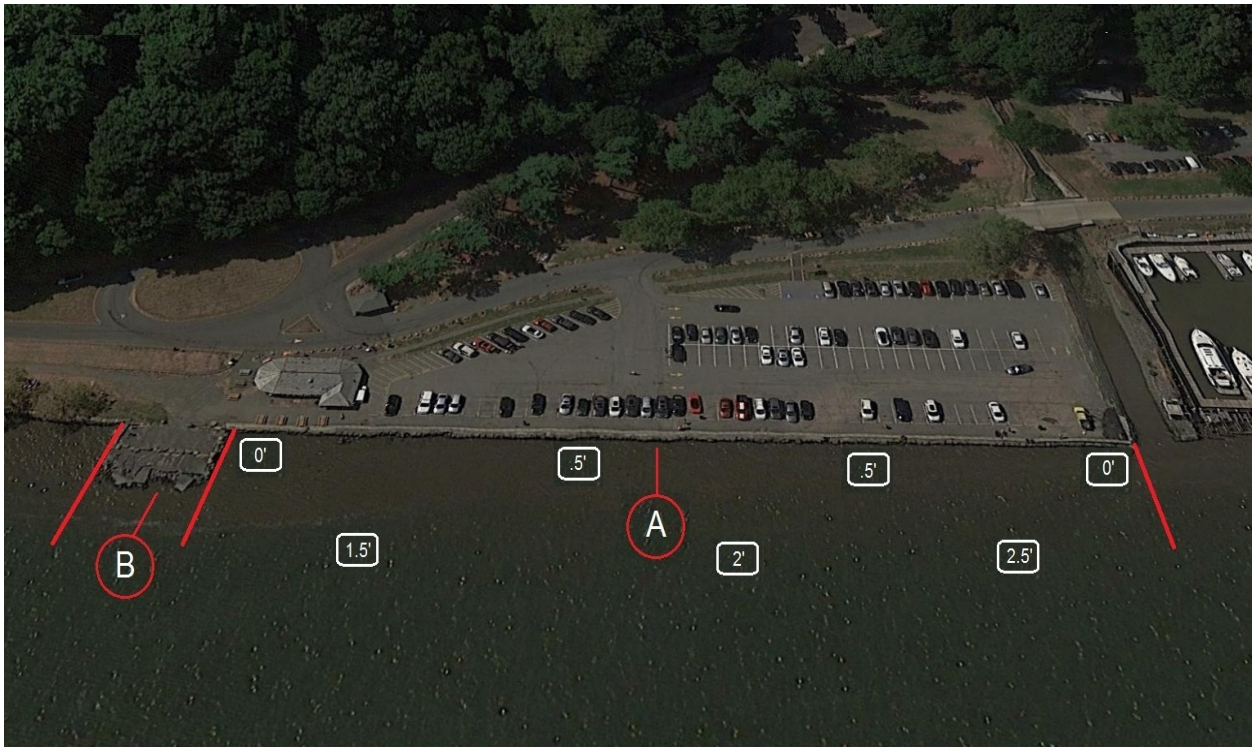


Photo No. 1 – View to north of concrete and stone seawall. Note marina to the north.

Photo No. 2 – View to north from abandoned landing. Commercial business located inshore of seawall.

SHORELINE INVESTIGATION – SITE NO. 4, BUCKEYE TERMINAL

Buckeye Terminal, Site No. 4, is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.3 miles north of the Goethals Bridge. The site is comprised of two, steel sheet pile mooring cells positioned on opposite sides of a larger, steel sheet pile breasting cell. The breasting cell supports the loading platform and pipe manifold. The three cells and associated mooring hardware provide the berthing requirements for vessels utilizing the facility. A timber pile supported trestle and pipe rack extend from the shoreline, providing access to the product loading platform. Two secondary, timber pile supported catwalks provide access to the mooring hardware on the adjacent cells. The shoreline on either side of the primary access trestle is protected by a rip rap slope which drops off toward the channel. The remains of a small timber boat ramp are located approximately 175ft south of the access trestle, after which the shoreline is overgrown and not regularly maintained.

Buckeye Terminal Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Buckeye Terminal	A	Primary Access Trestle and Secondary Trestles (typ.)	Mid Life
	B	Steel Sheet Pile Mooring Cell	Mid Life
	C	Steel Sheet Pile Breasting/ Loading Platform	Mid Life
	D	Steel Sheet Pile Mooring Cell	Mid Life

Buckeye Terminal Depth Soundings

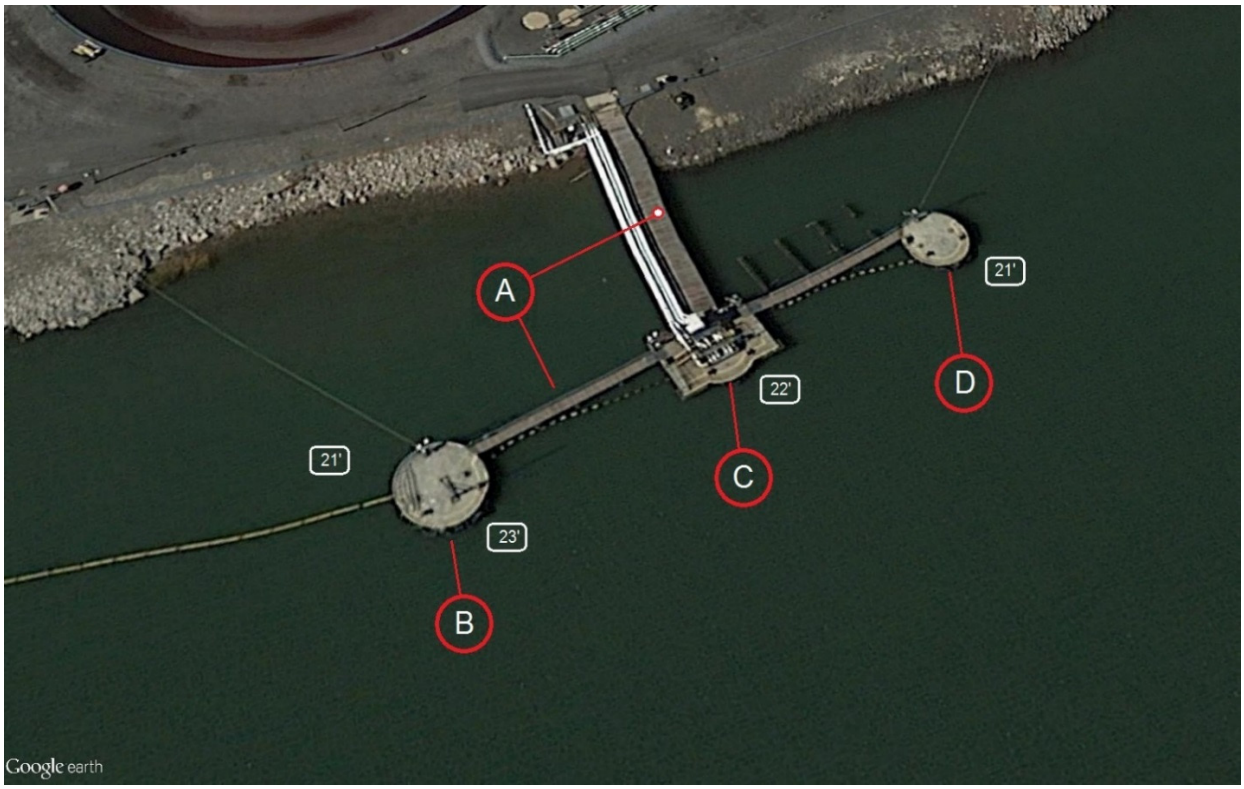


Photo No. 1 – Three steel sheet pile cell berth. Center cell is the loading platform.

Photo No. 2 – South Breasting Cell and timber supported access trestle.

SHORELINE INVESTIGATION – SITE NO. 5, MOTIVA ENTERPRISES

The Motiva Enterprise site, Site No. 5, is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.7 miles north of the Goethals Bridge. The site is primarily comprised of three centrally located steel H pile loading platforms, one steel H pile breasting cell to the north, and one steel pipe pile breasting cell to the south. All five structures have concrete decks in good condition. The three loading platforms extend from a concrete capped steel sheet pile bulkhead, while each breasting dolphin is accessed utilizing pile supported trestles extending from the bulkhead.

Motiva Enterprises Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Motiva Enterprises	A	Main Loading Platform – Steel H pile supported	Mid Life
	B	South Loading Platform – Steel H pile supported	Mid Life
	C	North Loading Platform – Steel H pile supported	Midlife
	D	Steel Pipe Pile Breasting Cell (south)	Severe
	E	Steel H Pile Breasting Cell (north)	New
	F	Steel Sheet Pile Bulkhead with Concrete Cap	Mid Life

Motiva Enterprises Depth Soundings

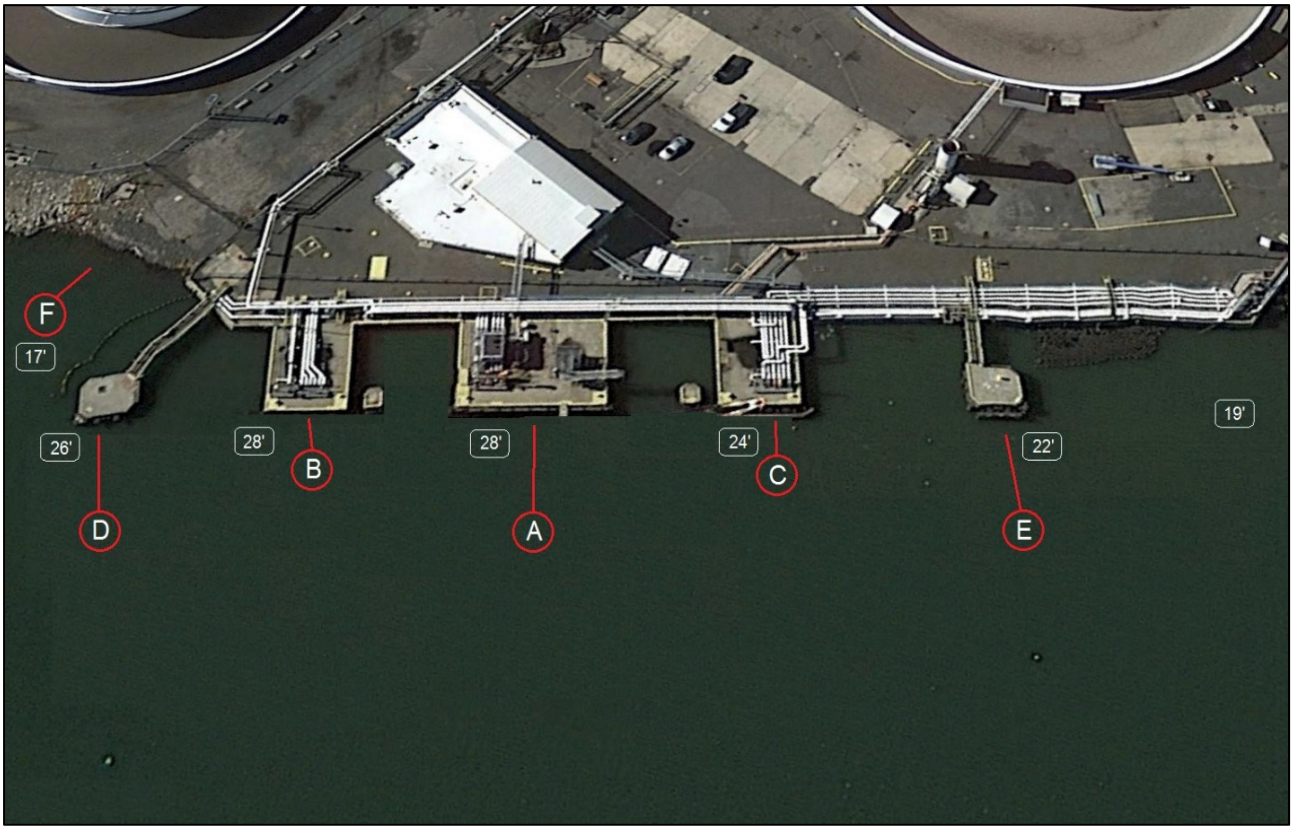


Photo No. 1 – Main loading platform supported by steel pipe piles.

Photo No. 2 – Secondary pipe pile supported loading platform.

SHORELINE INVESTIGATION – SITE NO. 6, STRATUS PETROLEUM CORP.

Stratus Petroleum Corp., Site No. 6, is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.8 miles north of the Goethals Bridge. The waterfront facility is primarily comprised of one primary loading/breasting platform with a timber fender system located on the offshore breasting face. Four independent breasting dolphins, two on each side of the primary platform, are positioned to cover the remaining berthing area. The primary platform extends from a sloping rip rap shoreline. A row of cut off H piles parallels the shoreline, inshore of the breasting cells. All five structures are supported by steel pipe piles and are connected to each other with pile supported walkways. Two access trestles also extend from the shoreline to the north and south dolphins.

Stratus Petroleum Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Stratus Petroleum Corp	A	Main Loading Platform – Steel H pile supported	Mid Life
	B	South Loading Platform – Steel H pile supported	Mid Life
	C	North Loading Platform – Steel H pile supported	Midlife
	D	Steel Pipe Pile Breasting Cell (south)	Severe
	E	Steel H Pile Breasting Cell (north)	New
	F	Steel Sheet Pile Bulkhead with Concrete Cap	Mid Life

Stratus Petroleum Depth Soundings

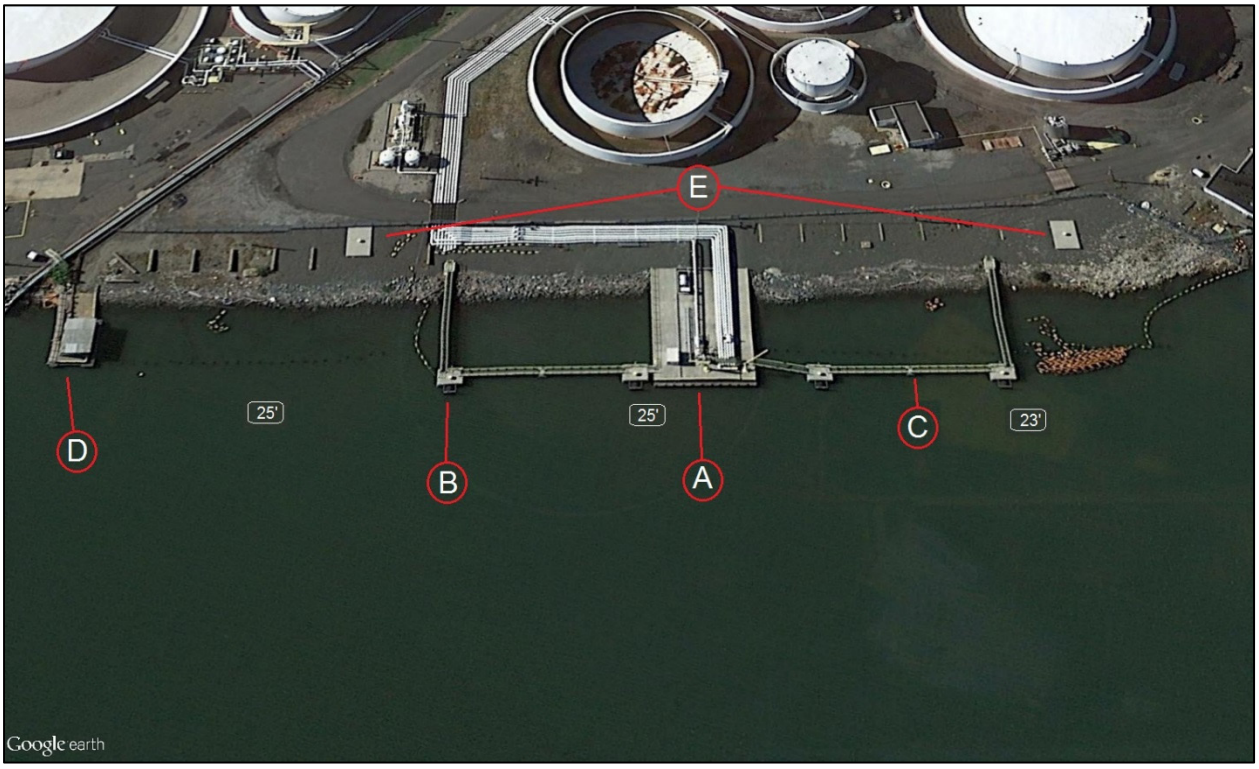


Photo No. 1 – Pipe supported trestle connecting platforms.

Photo No. 2 – Primary transfer area.

SHORELINE INVESTIGATION – SITE NO. 7, NORTH OF STRATUS PETROLEUM

North of Stratus Petroleum, Site No. 7, is located on the west bank of the Passaic River, approximately 1.0 miles north of the Goethals Bridge. The site has no viable waterfront mooring or berthing structures, and the upland appears undeveloped. A pile supported concrete platform is located at approximately the center of the shoreline, with an adjacent pile field to the south. The shoreline north of the concrete platform is retained by a rip rap slope. The shoreline inshore of the concrete platform and southward is protected by a concrete retaining wall with a rip rap slope place against the offshore face. The remains of a collapsed concrete deck are visible on the shoreline at the south end of the property.

North of Stratus Petroleum Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
North of Stratus Petroleum	A	Concrete Platform and Adjacent Pile Field	End of Life
	B	Collapsed Concrete Deck	End of Life
	C	Rip Rap Slope with Concrete Retaining Wall	Mid Life
	D	Rip Rap Slope without Concrete Retaining Wall	Mid Life

North of Stratus Petroleum Depth Soundings

Photo No. 1 – Collapsed timber platform with concrete deck.

Photo No. 2 – Undeveloped and unprotected shoreline.

SHORELINE INVESTIGATION – SITE NO. 8, PASSAIC VALLEY SEWAGE COMMISSION

Passaic Valley Sewage Commission, Site No. 8, is an active sewage treatment and transport facility located on the west bank of the Passaic River, approximately 1.1 miles north of the Goethals Bridge. The waterfront of the site is comprised of a wharf approximately 775 feet long that retains the upland and provides vessel berthing. The north and south ends of the wharf are asphalt topped and actively used as a parking facility for employees working at the site. The center section of the wharf is used for vessel access and conducting waterfront activities associated with the site. The upper edge of the wharf is a deep concrete cap that extends into the water. Mooring hardware is spaced along the cap as needed. A small boat landing is located at the south end of the wharf. Two timber dolphins are in place on the north side that provide protection for the landing. A collapsed concrete deck and plugged outfall are located at the north end of the property.

Passaic Valley Sewage Commission Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Passaic Valley Sewage Commission	A	Main Wharf, ± 775' long	Mid Life
	B	Small Boat Landing	New
	C	Timber Dolphins	Midlife
	D	Collapsed Concrete Deck and Plugged Outfall Pipe	End of Life

Passaic Valley Sewage Commission Depth Soundings

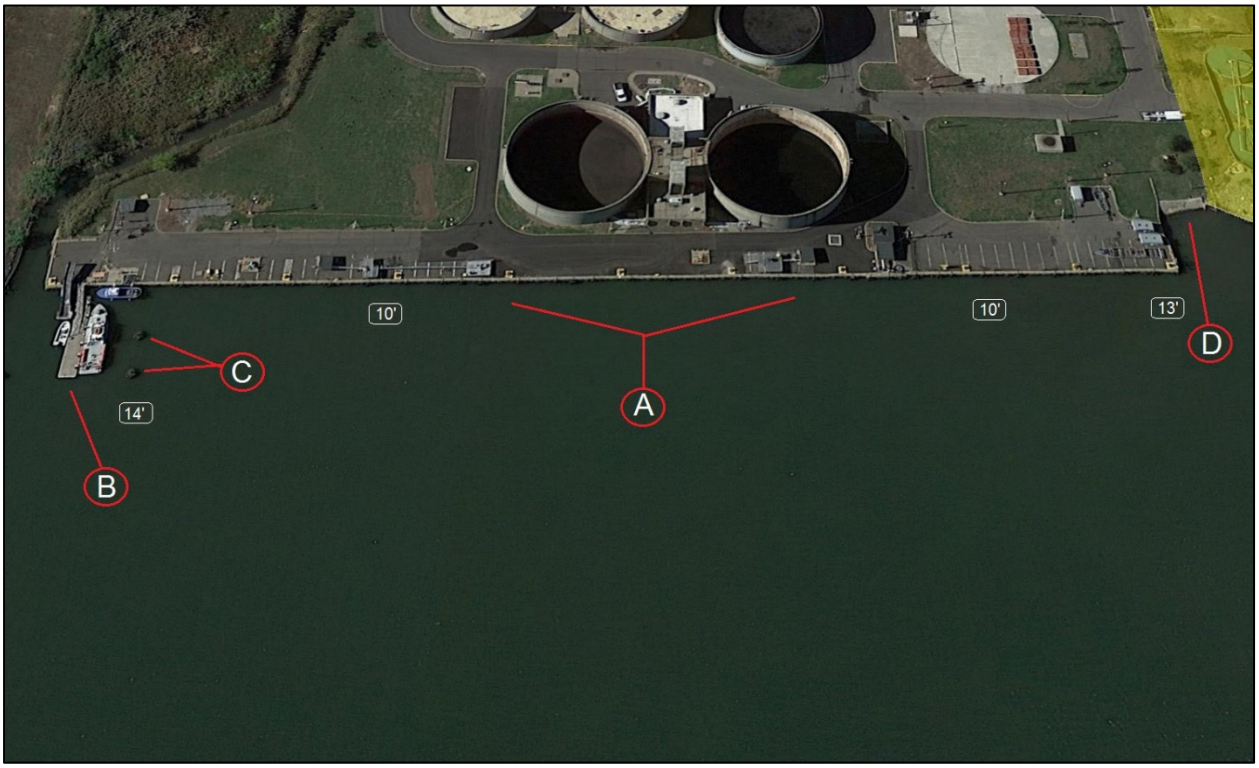


Photo No. 1 – Concrete fascia that provides the berthing area. Rubber breasting panels in place.

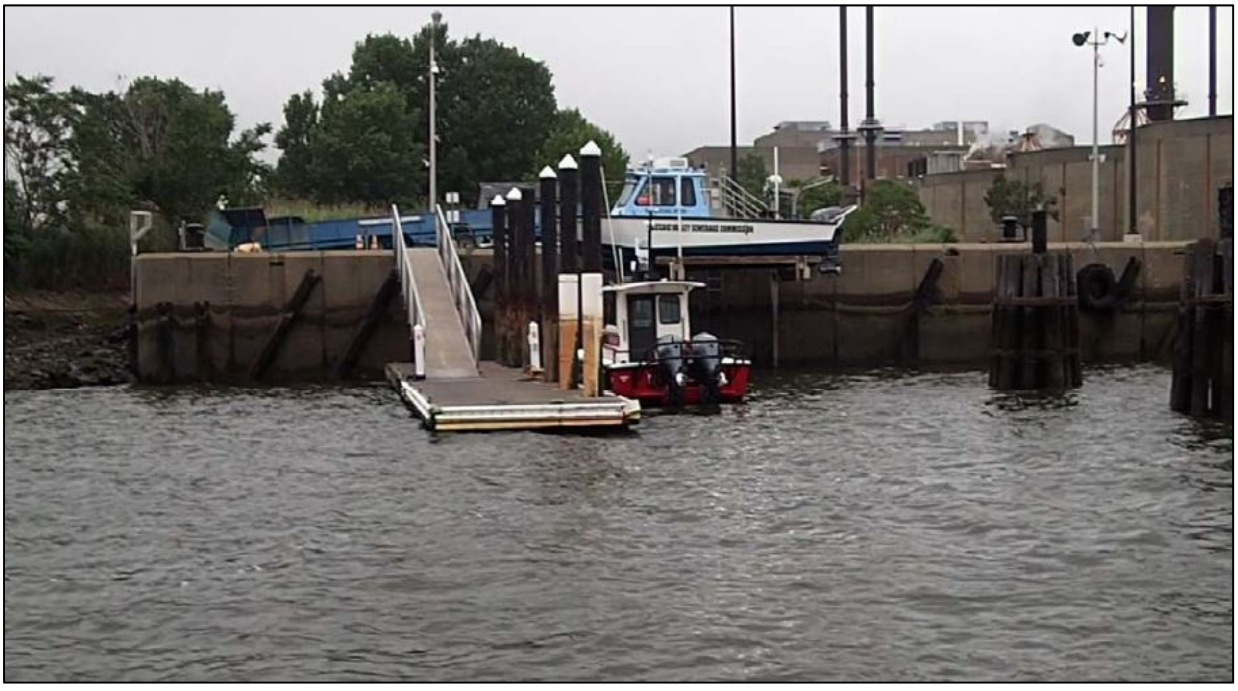


Photo No. 2 – Small boat landing and timber dolphins located at the south end of the berth.

SHORELINE INVESTIGATION – SITE NO.9, DART SITE WATERFRONT

The DART Site Waterfront, Site No. 9, is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 1.2 miles north of the Goethals Bridge. The waterfront facility is comprised of a berthing platform for product transfer, and adjacent riprap shoreline protection extending in both directions. North of the upland storage tanks, the waterfront is no longer actively maintained and the formal riprap slope reverts to concrete rubble. A collapsing, timber supported platform and concrete deck is located along this section off shoreline. The upland through the north section is undeveloped.

DART Site Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
DART Site Waterfront	A	Primary Berthing Platform	Severe
	B	Timber Platform and Concrete Deck	End of Life
	C	Riprap Slope Protection Along Shoreline	Mid Life

DART Site Waterfront Depth Soundings

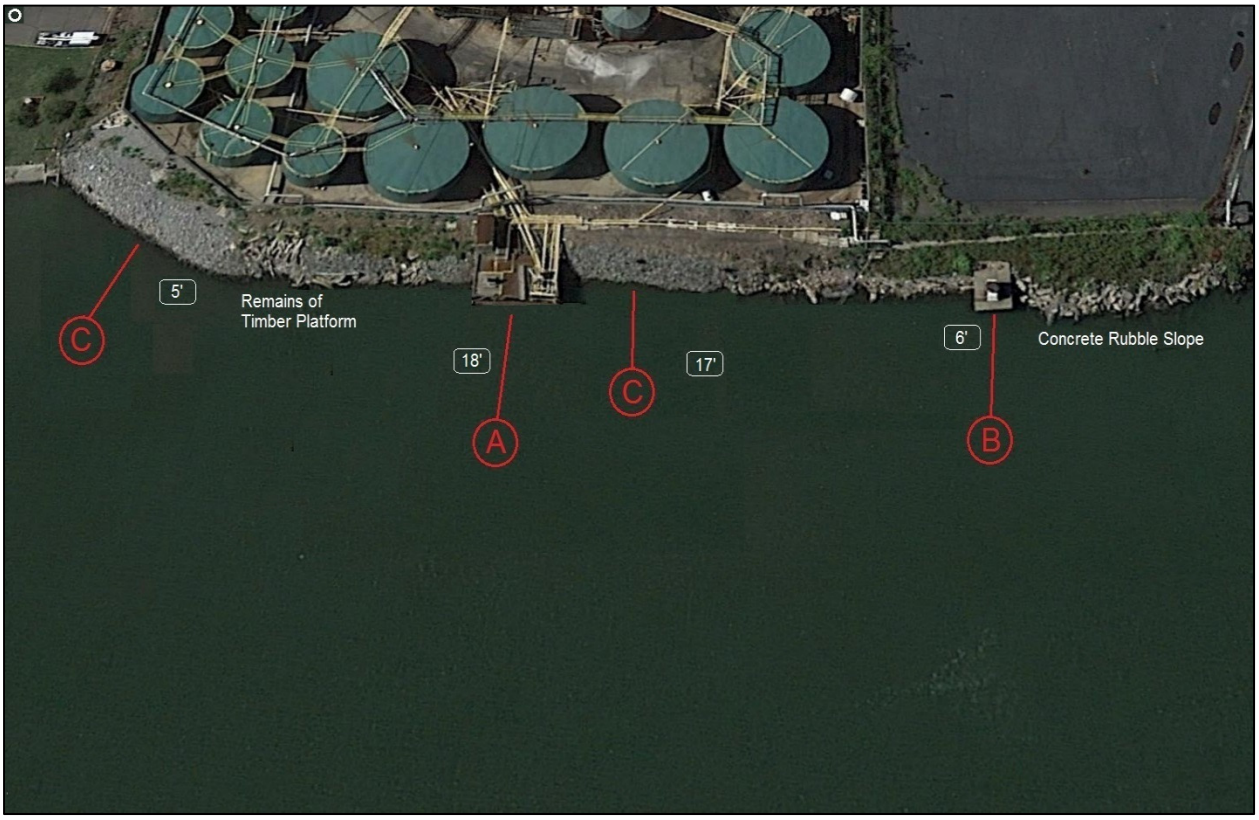


Photo No. 1 – Abandoned intake structure at north end of berth.

Photo No. 2 – Two barges moored at loading platform, obstructing view.

SHORELINE INVESTIGATION – SITE NO. 10, SUN CO. NEWARK

Sun Company, Newark Terminal, Site No. 10, is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 1.4 miles north of the Goethals Bridge. The waterfront facility is comprised of three primary loading/breasting platforms, each with a fender system located on the offshore breasting face Eight steel sheet pile breasting cells are spaced along the berth line to support berthing requirements; three cells between the center loading platform and each adjacent platform, and one cell at either end. The platforms and cells are connected with a common, pile supported trestle. Four additional concrete trestles extend from the shoreline providing access to the structure and supporting product piping. The shoreline id retained with steel sheet pile between the center and north loading platforms. The remainder of the shoreline is protected with rip rap stone south of the sheet piling, and softly sloping natural material to the north. A small boat landing and ramp are located at the north end of the berth and the remains of a timber structure are visible at the south end.

Sun Company Newark Terminal Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Sun Company, Newark	A	Loading/Breasting Platforms (x3)	Mid Life
	B	Breasting Cells (x8)	Mid life
	C	Access and Connecting Trestles (x4 +1)	Mid Life
	D	Small Boat Landing and Ramp	Mid Life
	E	Remains of Timber Pile Supported Platform	End of Life

Sun Company Newark Terminal Depth Soundings

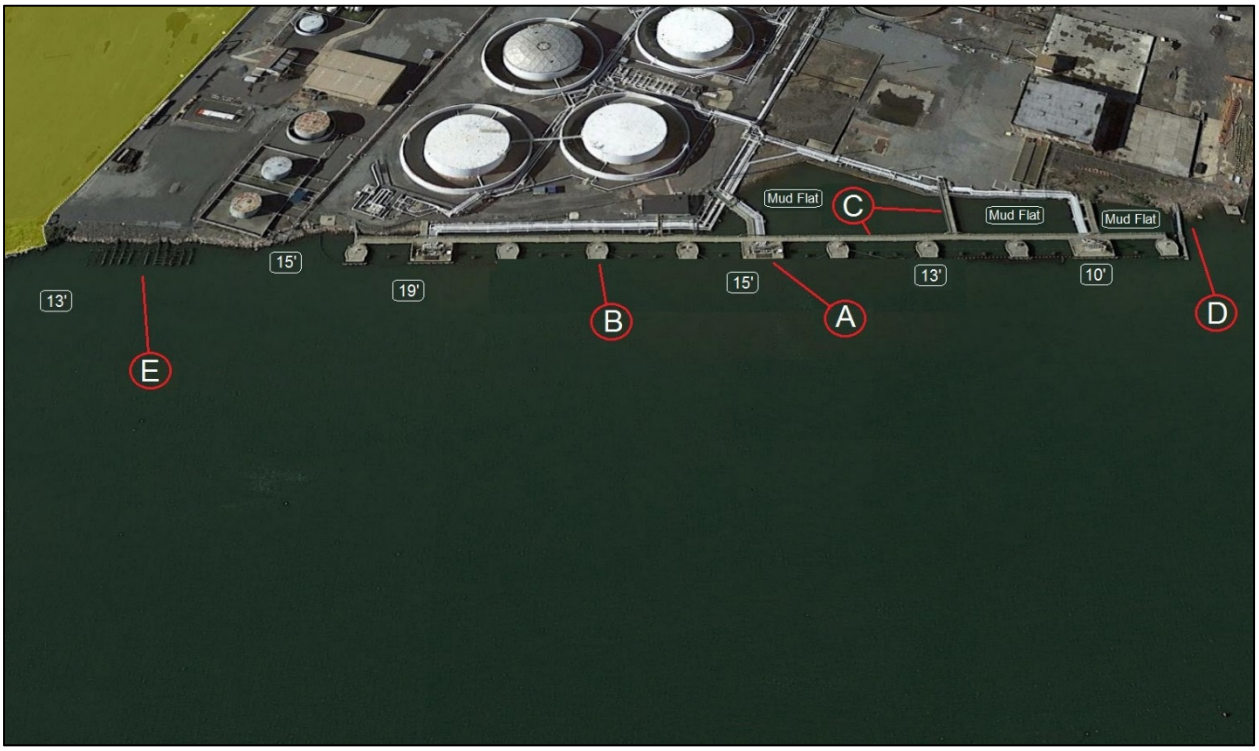


Photo No. 1 – Small boat landing at the north end of the site replaced a collapsed timber platform.

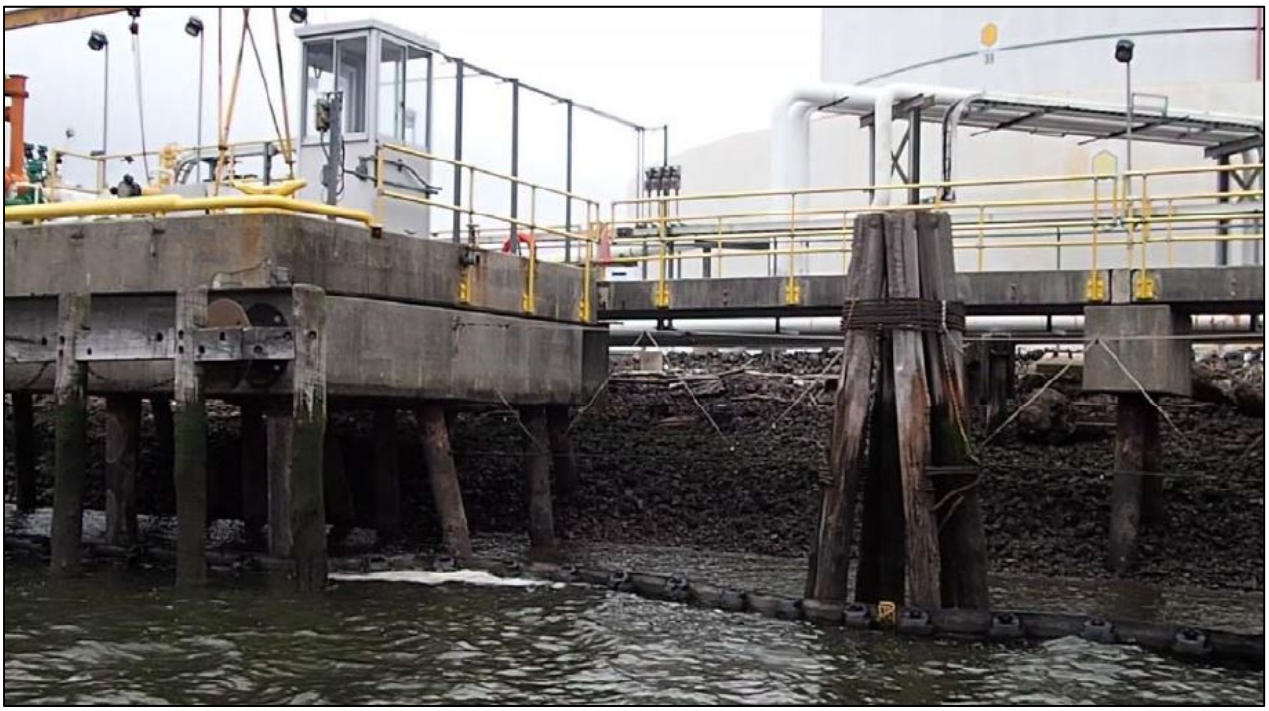


Photo No. 2 – North breasting platform.

SHORELINE INVESTIGATION – SITE NO. 11, GENERAL CHEMICAL

General Chemical, Site No. 11, is located on the west bank of the Passaic River, approximately 1.8 miles north of the Goethals Bridge. The waterfront structures have been abandoned and are no longer being maintained. The shoreline is retained by a horizontally stacked, concrete plank seawall. Large sections of the seawall have failed. The remainder of the seawall is undermined and rotating offshore. At the south end of the site the seawall no longer exists and the shoreline has reverted to a natural state. A steel sheet pile mooring cell and access trestle are located close to the natural shoreline. Near the middle of the seawall are the remains of a collapsing intake/discharge building on a pile supported platform. North of the platform, the seawall turns inshore before returning to the original line, creating a small man-made cove. The remains of a timber pile supported platform and trestle are located in the cove. Six timber dolphins are evenly spaced offshore of the intake platform and the cove area.

General Chemical Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
General Chemical	A	Intake Structure, Non-functioning	End of Life
	B	Pile Supported Timber Structure and Trestle	End of Life
	C	Steel Sheet Pile Mooring Cell	End of Life
	D	Timber Dolphins (6)	Severe
	E	Concrete Retaining Wall	End of Life

General Chemical Depth Soundings

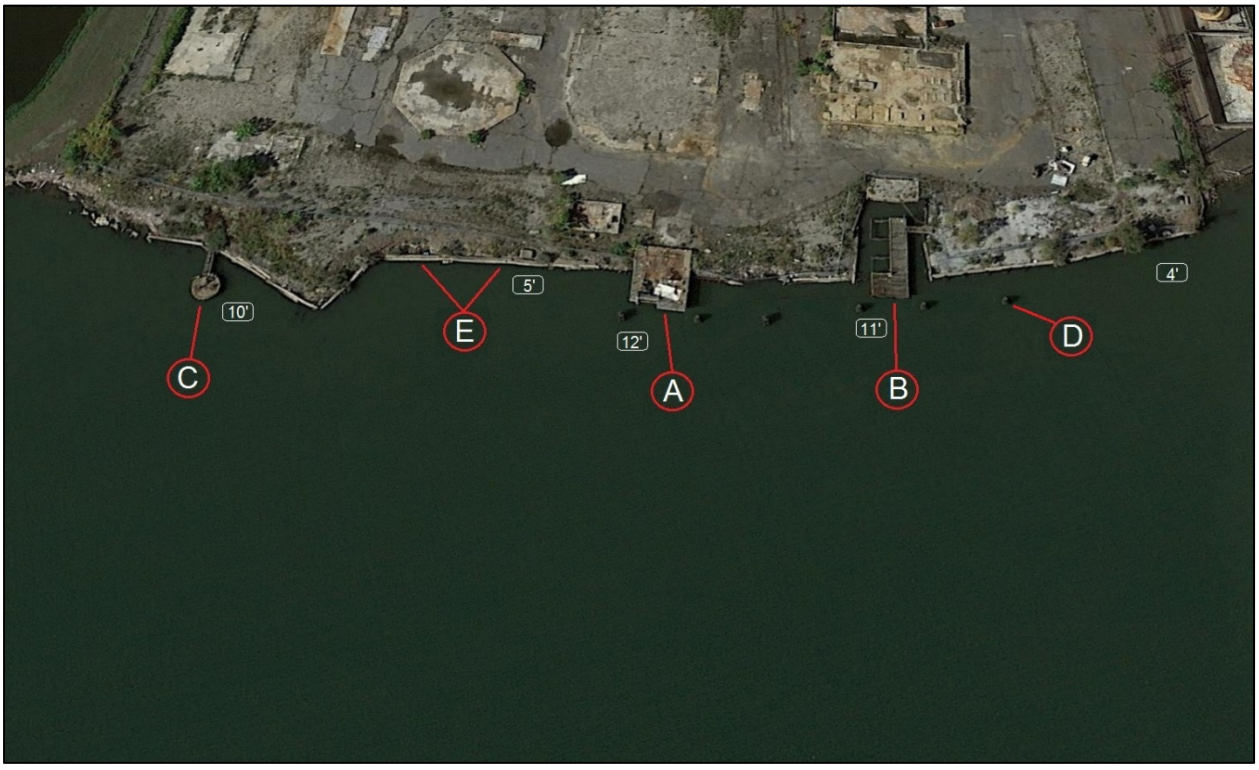


Photo No. 1 – Main breasting platform and trestle. Barge moored at berth.

Photo No. 2 – South end of berth. Abandoned intake structure to left, barge in berth to right.

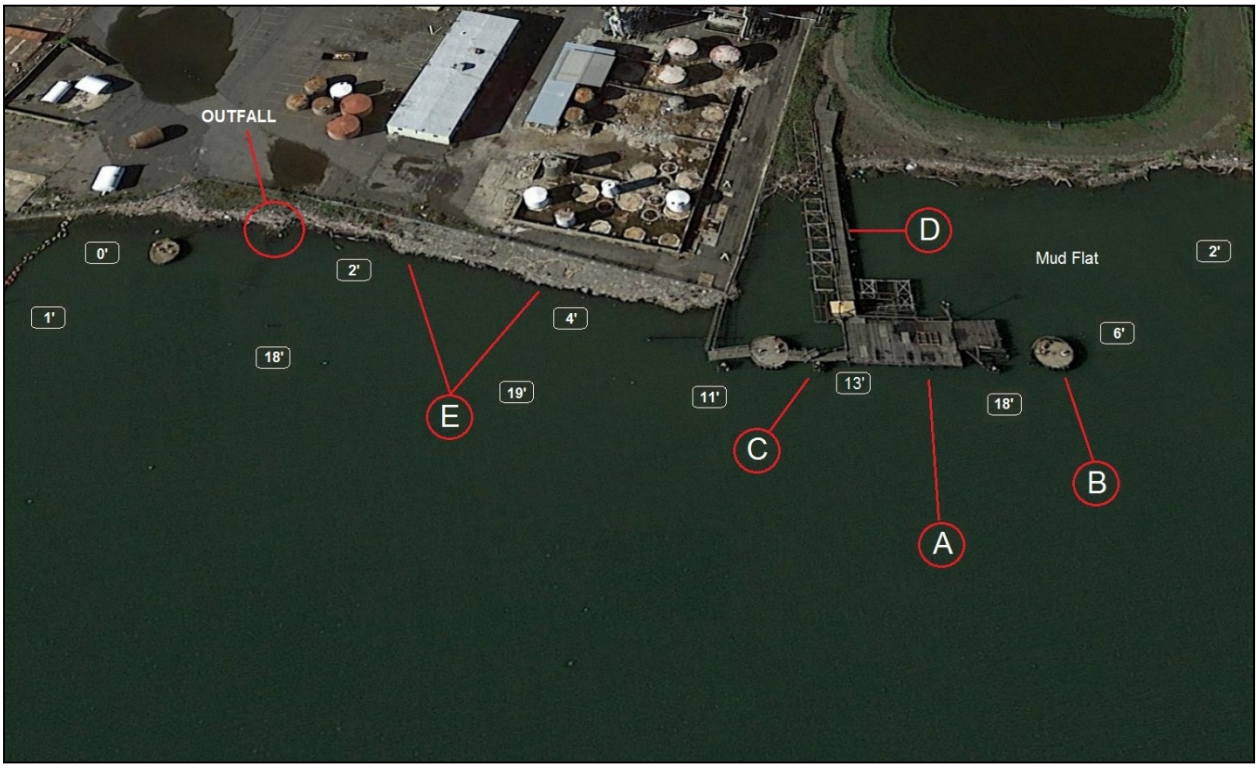
SHORELINE INVESTIGATION – SITE NO. 12, ESSEX CO. CORRECTIONS WATERFRONT

Essex County Corrections Facility Waterfront, Site No. 12, is located on the west bank of the Passaic River, approximately 1.7 miles north of the Goethals Bridge. The site is active however the waterfront no longer appears support marine activities. The waterfront facility is comprised of a pile supported loading/breasting platform and pipe rack, and two steel sheet pile mooring cells positioned near the center of the shoreline. A third mooring cell is located at the south end of the site. Three timber breasting dolphins are positioned on the offshore berthing face of the platform. The platform is accessed by a timber trestle extending from the shoreline which also supports the pipe rack. The southern section of waterfront is protected by a concrete seawall and rip rap stone placed against the offshore face. The riprap revetment runs northward and ends as the seawall turns inland and terminates. Natural shoreline continues to the north border of the site.

Essex County Corrections Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Essex County Corrections Waterfront	A	Timber Breasting/ Loading Platform with Pipe Rack	End of Life
	B	Steel Sheet Pile Mooring Cells (x3)	Severe
	C	Timber Breasting Dolphins (x3)	End of Life
	D	Timber Access Trestle and Pipe Rack	End of Life
	E	Concrete Sea Wall with Rip Rap Slope	Mid Life

Essex County Corrections Waterfront Depth Soundings



SHORELINE INVESTIGATION – SITE NO.13, ESSEX CO. WASTE TO ENERGY

Essex County Waste to Energy, Site No. 13, is located on the west bank of the Passaic River, approximately 3.2 miles north of the Goethals Bridge. The upland site is active, however the waterfront no longer appears to be supporting marine activities. The waterfront area is comprised of a large concrete storm drain located mid site with collapsed, low level platforms on each side extending to the north and south. The storm drain is in a state of disrepair. The shoreline to the north is undeveloped with remnants of a placed stone slope visible throughout, and does not appear to be actively maintained. South of the low level platforms, a section of steel sheet pile bulkhead is partially retaining the upland, however the sheeting is failing and no longer functioning as intended. The southern section of waterfront is protected by a concrete seawall and natural shoreline. Further south, the concrete sea wall ends and an undeveloped, natural shoreline continues to the property line. During low water conditions, a mud flat is exposed offshore throughout the southern end of the site.

Essex County Waste to Energy Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Essex County Waste to Energy	A	Low Level Platform (x2)	End of Life
	B	Concrete sheeting/Natural Shoreline	Severe
	C	Steel Sheet Pile Bulkhead	End of Life
	D	Rip Rap Shoreline	Severe
	E	Timber Sheeting Retaining Wall/ Natural Shoreline	End of Life

Essex County Waste to Energy Depth Soundings

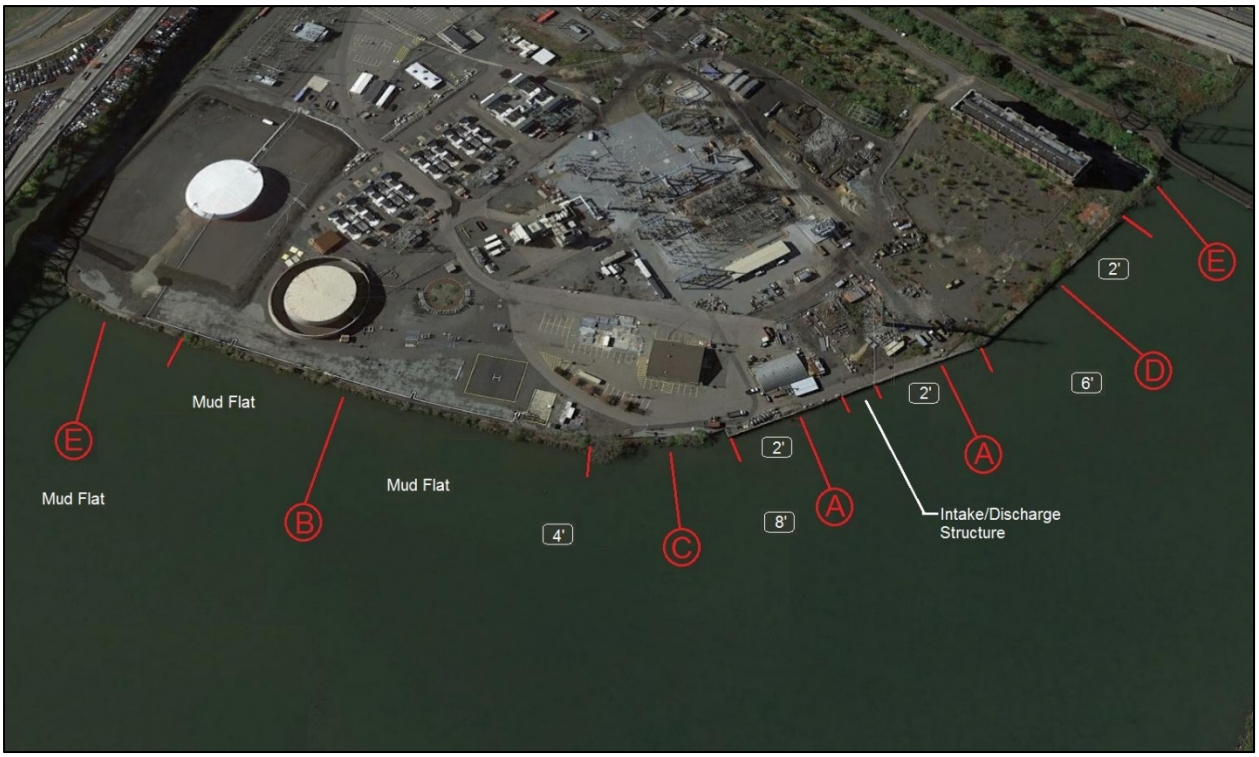


Photo No. 1 – Concrete bulkhead at the south end of the site.

Photo No. 2 – Undermined concrete bulkhead at the north end of the site.

SHORELINE INVESTIGATION – SITE NO.14, JERSEY CITY LANDING

OPPORTUNITY SITE MAP NUMBER 2B

The Jersey City Landing Site, Site No. 14, is located on the west bank of the Hudson River at Paulus Hook. The site is an active ferry landing that has been in use for several years. The facility is comprised of a precast concrete pier supported by steel pipe piles. The pier extends from a concrete capped, steel sheet pile bulkhead. The sheet pile bulkhead retains fill that supports a pedestrian promenade running along the waterfront. A series of interconnected steel floats are located on the north side of the pier. The floats are anchored by steel pipe guide piles and act as berthing structures for the vessels. Two additional pipe pile supported appendages located on the south side of the pier, opposite the berthing areas, provide the foundations for a ticket office and helicopter landing pad. An expanded steel walkway located between the pier and the steel floats provides pedestrian access to the individual vessel slips.

Jersey City Landing Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Jersey City Landing	A	Steel Floats Anchored with Steel Guide Piles, (Berths)	New
	B	Pipe Pile Supported Vessel Control and Ticket Office	New
	C	Pipe Pile Supported Pier	New
	D	Pipe Pile Supported Helicopter Landing Pad	New

Jersey City Landing Depth Soundings

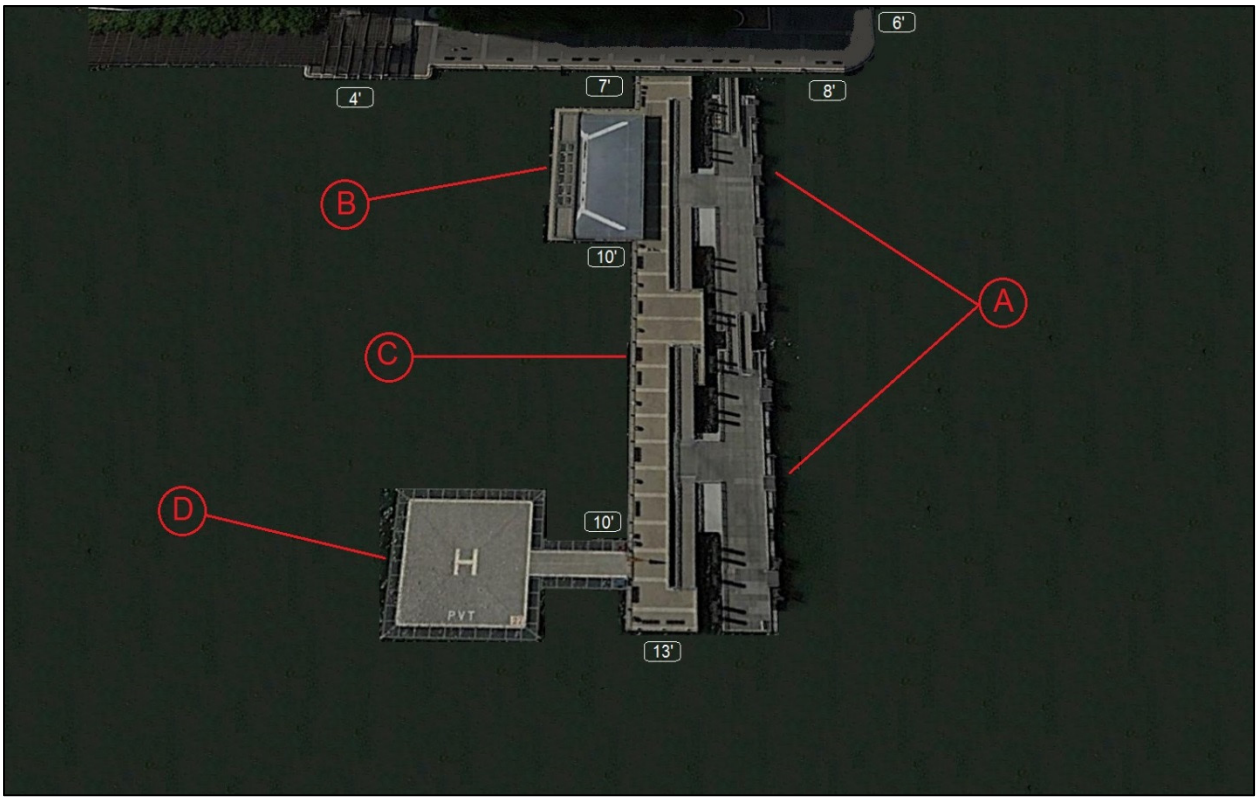


Photo No. 1 – Vessel berthing.

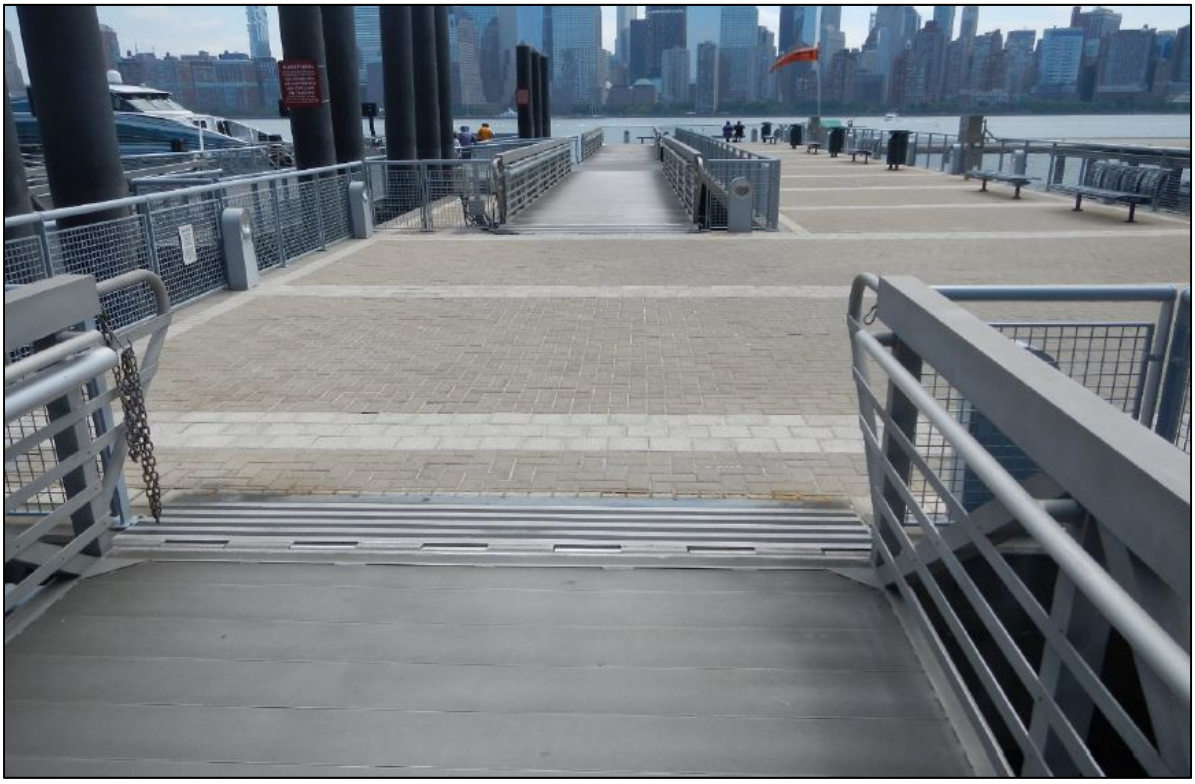


Photo No. 2 – Pedestrian access.

SHORELINE INVESTIGATION – SITE NO. 15, SOUTH AMBOY

OPPORTUNITY SITE MAP NUMBER 11

South Amboy, Site No. 15, is located on the south bank of Raritan Bay, approximately .8 miles east of the New Jersey Transit railroad bridge. The upland area at the site is undeveloped and overgrown. The shoreline throughout the site is a mix of sand and mud that form a natural cove that has silted in. A concrete seawall defines the east border of the site, and protects against erosion of upland residential properties. The west end of the site returns offshore at a revetment of concrete rubble and sheet pile During low water conditions, a sand bar is exposed at the east end of the cove. The sand bar forms a tidal pool and encompasses over half the shoreline of site. Water depths are extremely shallow for a considerable distance from the shoreline. A passenger ferry service is planned for this immediate area.

South Amboy Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
South Amboy	A	Natural Beach Shoreline, Undeveloped Upland	NA
	B	Concrete Rubble and Sheet pile revetment.	End of Life

South Amboy Depth Soundings

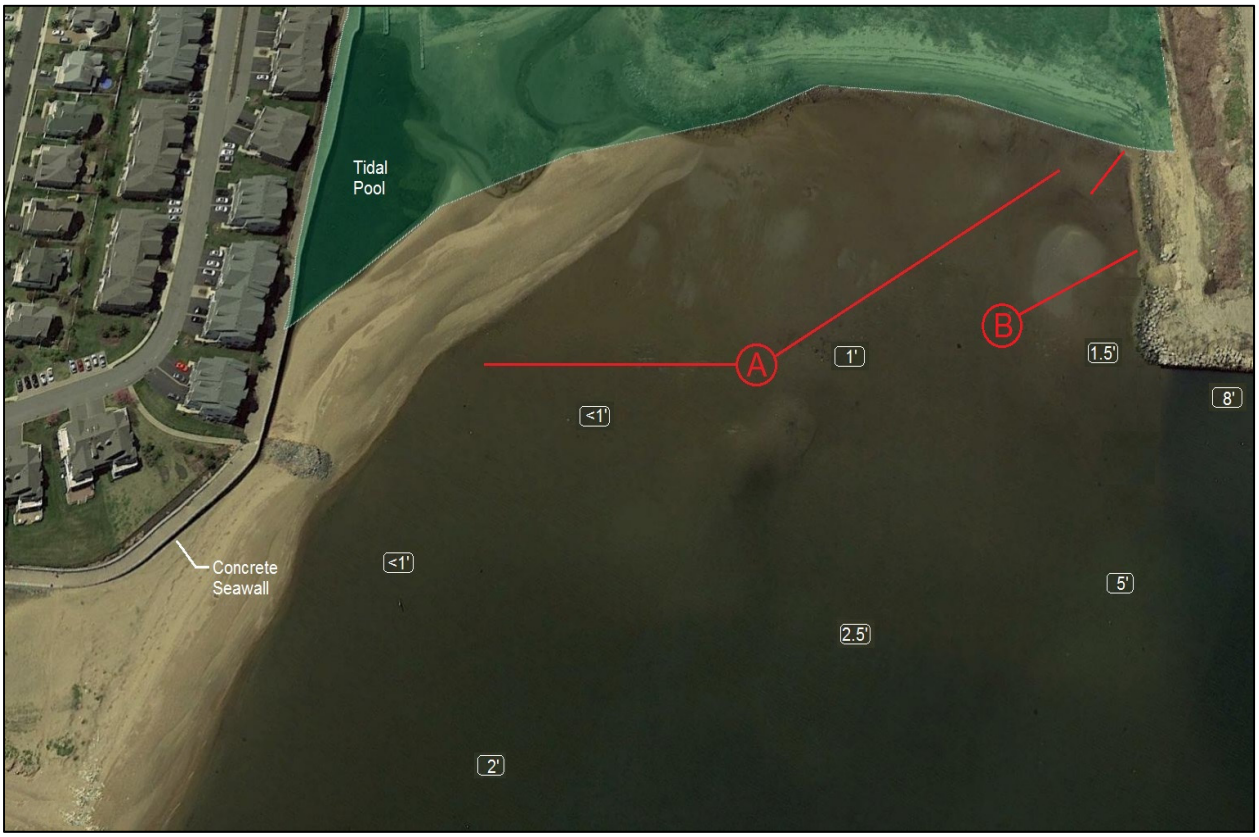


Photo 1 – North end of site. Shoreline returns offshore at concrete rubble and stone revetment.

Photo 2 – Residential community at the south end of the site. Upland and shoreline are undeveloped.

SHORELINE INVESTIGATION – SITE NO. 16, CARTERET WATERFRONT PARK

OPPORTUNITY SITE MAP NUMBER 7

The Carteret Waterfront Park, Site No. 16, is located on the west bank of the Arthur Kill, adjacent to Fresh Kills Landfill on the east bank. The site supports a newly completed public park, pier and promenade, municipal boat launch and parking plaza. Four breasting panels and two steel mono-piles fitted with mooring hardware have been installed on the offshore face of the pier in preparation of receiving mid-sized vessels. A steel H pile supported trestle extends from the south end of the pier, forming the offshore border for a natural, undeveloped cove. Two parallel rows of timber piles border the south side of the cove. A municipal boat launch and landing are located at the north end of the pier, with vehicle and boat trailer parking provided upland. A passenger ferry service is planned for this immediate area.

Carteret Waterfront Park Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition)
Carteret Waterfront Park	A	Municipal Boat launch and Small Boat Landing	New
	B	Free-Standing Timber Pier with Berthing Capabilities	New
	C	Steel H pile Trestle/Promenade	New

Carteret Waterfront Park Depth Soundings

Photo 1 – New timber pier with breasting panels and hardware for mid-sized vessel berthing capabilities.

Photo 2 – New municipal boat launch and boat landing.

SHORELINE INVESTIGATION – SITE NO. 17, RARITAN STEEL/BAYSHORE RECYCLING

OPPORTUNITY SITE MAP NUMBER 9

Perth Amboy Raritan Steel, Site No. 17, is located on the north bank of the Raritan River, adjacent to New Jersey Transit railroad bridge. The upland site area is actively supporting commercial industry. The shoreline forms a peninsula that projects southward into the river. A steel pipe pile supported concrete wharf is located at the head of the peninsula which is used for barge berthing. The wharf has a timber fender system in place with rubber compression elements intact on the offshore face. The shoreline west of the wharf is undeveloped with scattered concrete rubble and construction debris. The shoreline east of the wharf is protected by a revetment of two to three feet diameter placed stone. To protect against erosion and undermining, a steel sheet piling return has been driven at both inshore corners of the wharf.

Perth Amboy Raritan Steel Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Perth Amboy, Raritan Steel	A	Pipe Pile Supported Barge Wharf	Mid Life
	B	Rip Rap Shoreline Protection	Mid Life
	C	Steel Sheet Pile Bulkhead	End of Life
	D	Natural, Undeveloped Shoreline With Debris	Mid Life

Perth Amboy Raritan Steel Depth Soundings

Photo 1 – Pipe pile supported concrete wharf with timber fender system intact

Photo 2 – Sheet pile return precedes rip rap shore protection to the east of the wharf.

SHORELINE INVESTIGATION – SITE NO. 18, RARITAN CENTER

OPPORTUNITY SITE MAP NUMBER 10

Raritan Center, Site No. 18, is located on the north bank of Raritan River, approximately 1.8 miles west of New Jersey State Parkway Driscoll Bridge. The site is primarily comprised of a high level timber wharf, approximately 2,200 feet long, constructed along the shoreline. The eastern end of the wharf is currently occupied and being utilized for barge mooring and fabrication. A bulkhead that once retained upland fill has failed along the entire length of the structure and the wharf now stands independent of a naturally sloping shoreline. The deck of the wharf no longer exists leaving resulting in a field of the timber piles, pile caps and bracing. Multiple areas of fire damage are apparent throughout the remaining structure. A row of steel H piles remains in place at the offshore face. The wharf is divided into three similar sections by two breaks in the construction. The eastern break is used as a small boat ramp.

Raritan Center Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Raritan Center	A	Abandoned Timber Platform-Piles and Caps Only	End of Life
	B	Abandoned Timber Platform-Piles and Caps Only	End of Life
	C	Utilized Timber Platform-Piles and Caps Only	End of Life

Raritan Center Depth Soundings

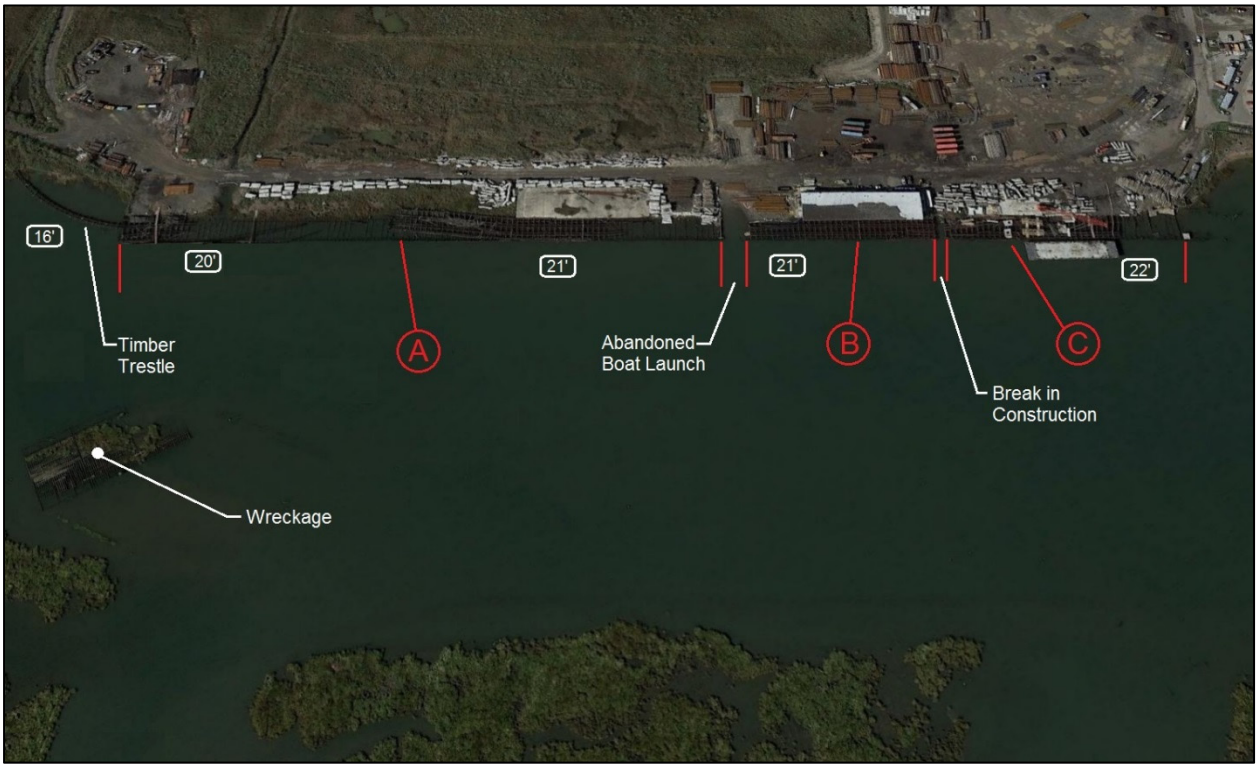


Photo 1 – West end of abandoned wharf structure. Piles and partial caps remain.

Photo 2 – East end of abandoned wharf structure. Piles and caps remain. Area is utilized by contractor.

SHORELINE INVESTIGATION – SITE NO. 19, ELIZABETH WATERFRONT NORTH

OPPORTUNITY SITE MAP NUMBER 5A

Elizabeth Waterfront North, Site No. 18, is located on the southernmost portion of Newark Bay, just north of the confluence of the Arthur Kill and Kill van Kull. The property borders Site 19 to the south and Berth 98 at Elizabeth-Port Authority Marine Terminal (Elizabeth Terminal) to the north. The site is comprised of a narrow timber pier extending from an undeveloped shoreline and heavily wooded upland. The remains of a timber fender system are located on each side of the pier and mooring hardware is in place along each upper edge. Two timber dolphins are located at each offshore corners. Water depths around the pier and along the shoreline are extremely shallow. No additional structures exist along the waterfront.

Elizabeth Waterfront North Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition)
Elizabeth Waterfront North	**A**	**High Level Timber Pier**	**Severe**
	B	**Undeveloped Shoreline and Upland**	**NA**

Elizabeth Waterfront North Depth Soundings

Photo 1 – Timber pier at north end of site.

Photo 2 – Undeveloped upland and shoreline with shallow water from all approaches.

SHORELINE INVESTIGATION – SITE NO. 20, ELIZABETH WATERFRONT SOUTH

OPPORTUNITY SITE MAP NUMBER 5B

Elizabeth Waterfront South, Site No. 20, is located on located on the southernmost portion of Newark Bay, just north of the confluence of the Arthur Kill and Kill van Kull. The property borders Site No. 19 to the north. The site is an undeveloped shoreline with erosion protection provided by riprap stone. The upland is undeveloped and heavily wooded. A large diameter concrete outfall structure is located at the midpoint of the shoreline. No other structures exist at the site. At low water conditions, a mud flat is exposed along the shoreline to approximately one hundred feet offshore. Beyond the mudflats, offshore water depths are shallow through the north and midpoints of the site, but begin to drop off sharply toward the south approaching the navigation channel of the Arthur Kill.

Elizabeth Waterfront South Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Elizabeth Waterfront South	**A**	**Undeveloped Shoreline With Stone Protection**	**Severe**

Elizabeth Waterfront South Depth Soundings

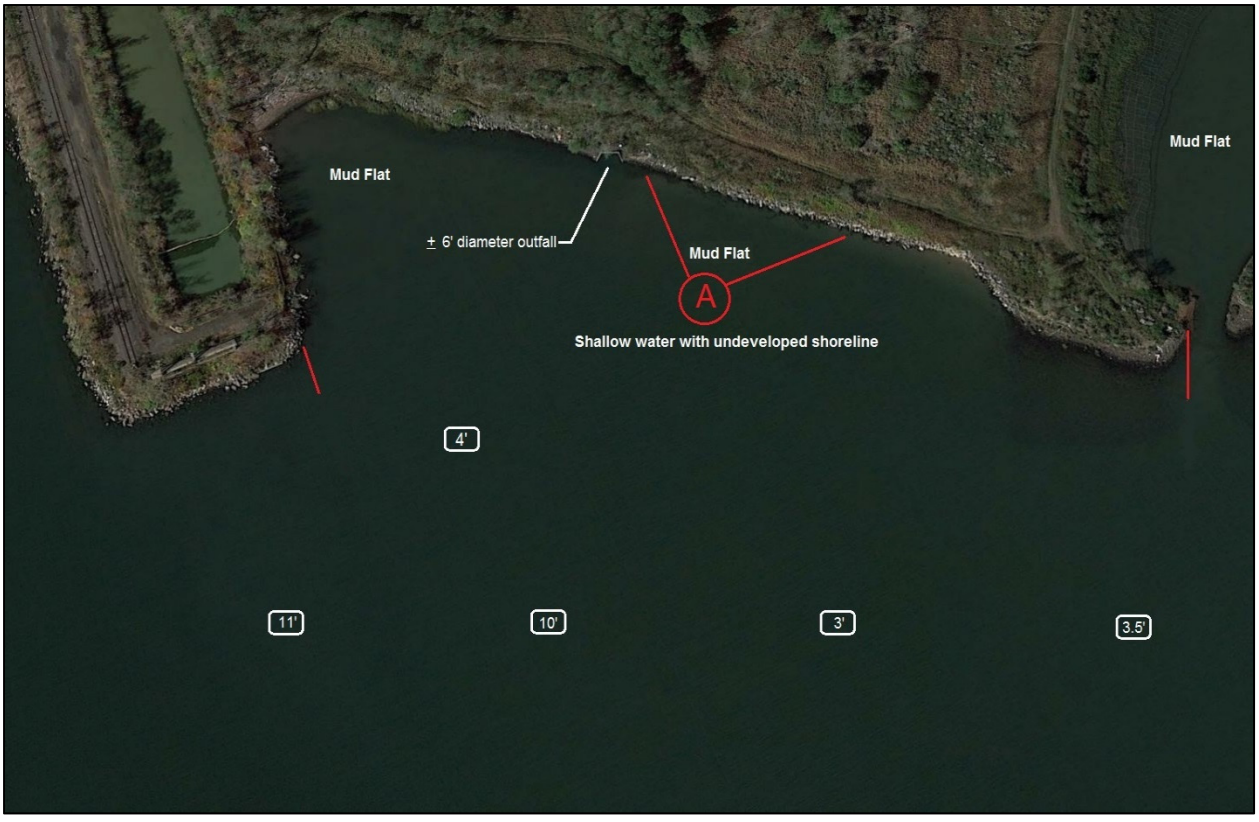


Photo 1 – Site No.14. Undeveloped upland and shoreline. Water depth is 3ft. where photo was taken.

Photo 2 – Large diameter outfall located along the shoreline at Site No. 20

SHORELINE INVESTIGATION – SITE NO. 21, TREMLEY POINT

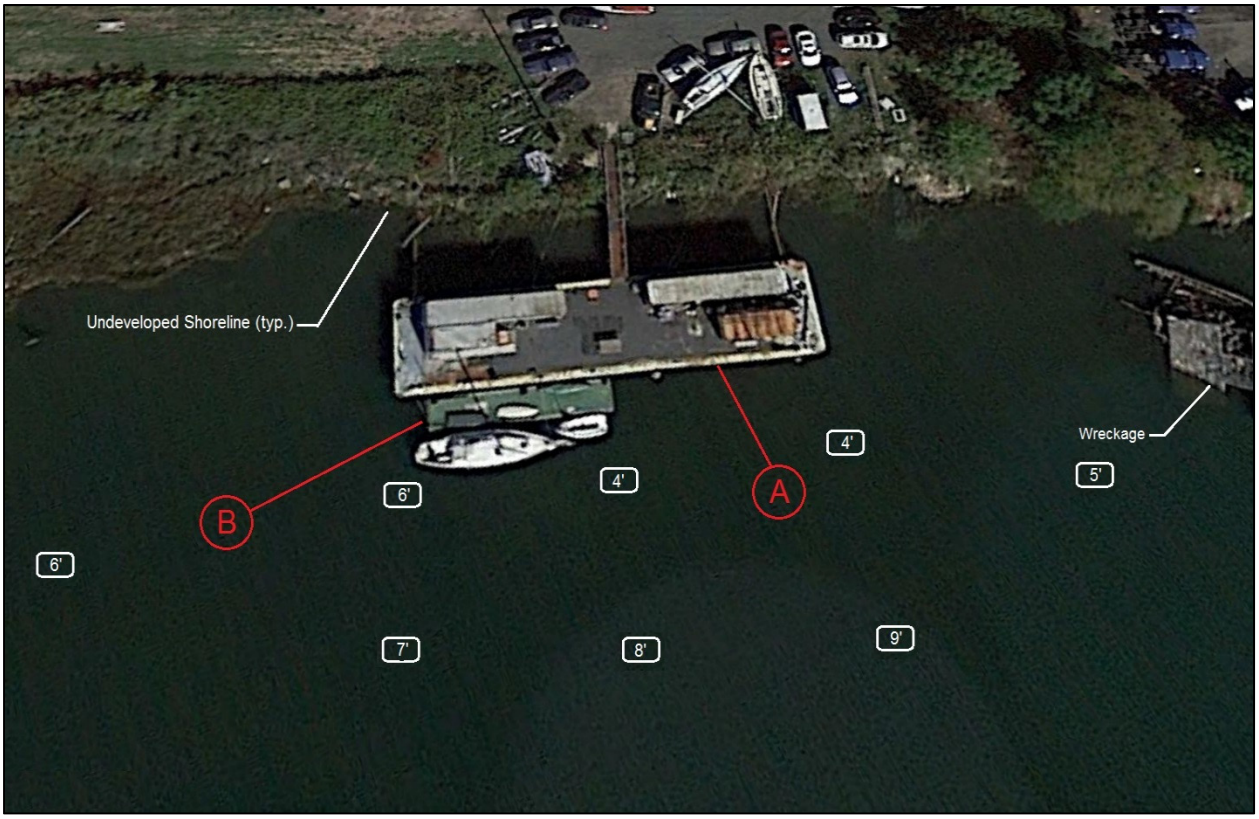
OPPORTUNITY SITE MAP NUMBER 6B-C

Tremley Point, Site No. 21, is located on the north bank of Rahway River, approximately .9 miles upstream of Arthur Kill. The site has no permanent mooring structure, however a steel barge anchored to the shoreline provides temporary mooring for several vessels. A floating dock is moored offshore of the barge acting as a small boat landing. The steel barge sits on the riverbed, listing offshore during low water conditions. A collapsed timber pier and other unknown sunken wreckage is located along the shoreline, approximately 250 feet downstream of the barge. There is no formal bulkhead or slope retention, however sections of the shoreline are covered with concrete slurry and construction debris which provide minimal protection from erosion. A section of the upland has been cleared for parking. The upland adjacent to the parking lot is undeveloped and overgrown.

Tremley Point Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Tremley Point	**A**	**Steel Barge Anchored To the Shoreline**	**Mid Life**
	B	**Timber Float Used As Small Boat Landing**	**Mid Life**

Tremley Point Depth Soundings



* Condition rating is based on a Rapid Assessment Inspection of the structure performed by CH2M in June/July 2016.

Photo 1 – Approach to Site No. 15 is narrow. Water depth in center of channel is 9 feet.

Photo 2 – Vessels berthed at barge moored to the shoreline.

SHORELINE INVESTIGATION – SITE NO. 22, CYTEK INDUSTRIES

OPPORTUNITY SITE MAP NUMBER 6A

Cytek Industries, Site No. 22, is located at the juncture of the Rahway River and Arthur Kill waterways, with developed frontage on each. The upland and waterfront structures currently appear inactive, and no longer maintained. The waterfront is comprised of a variety of collapsing, pile supported concrete structures and failing bulkheads. Security fencing has been installed along the waterfront, isolating it from the upland. One timber pile, and two pile supported berthing platforms are located on the eastern exposure where deeper water occurs naturally. Additional smaller pile supported platforms are located at the north end of the site. The southern exposure of the site is comprised of a collapsed concrete platform and failing bulkheads.

Cytek Industries Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition
Cytek Industries	A	Timber Supported Platform with Concrete Deck	End of Life
	B	Primary, Pipe Pile Supported Berthing Platform	End of Life
	C	Pipe Pile Supported Concrete Platform	Severe
	D	Concrete Capped Timber Bulkhead with Batters	End of Life
	E	Timber Platform and Failed Sheet Pile Bulkhead	End of Life
	F	Steel Sheet Pile Bulkhead with Concrete Cap	Severe

Cytek Industries Depth Soundings

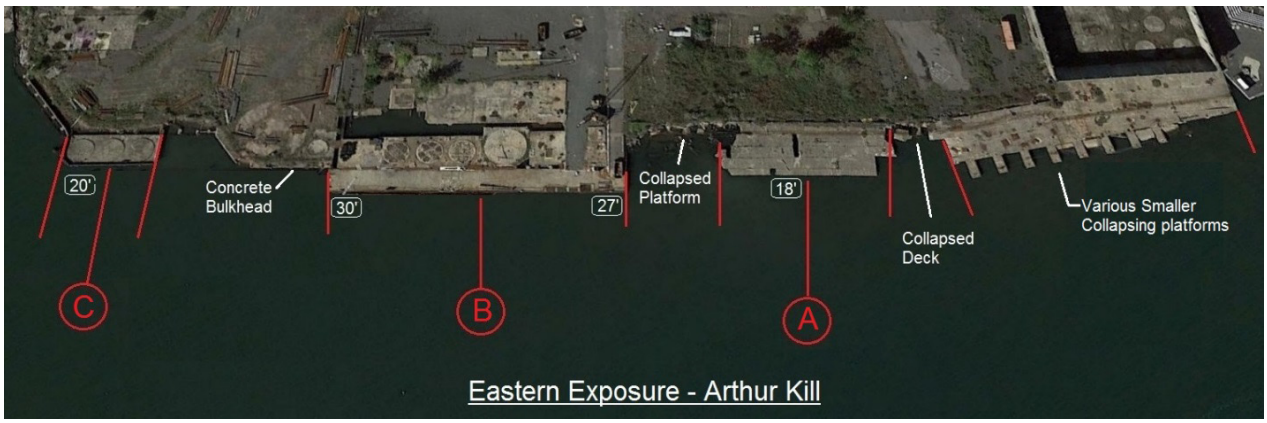


Photo 1 – Pipe pile supported concrete platform and timber dolphins at southeast corner of property.

Photo 2 – Pipe pile supported wharf with timber fender and mooring hardware at eastern exposure.

SHORELINE INVESTIGATION – SITE NO. 23, OLD BRIDGE/MARQUIS CREEK

Old Bridge/ Marquis Creek, Site No. 23, is located on the south bank of Raritan Bay, approximately 3.8 miles east of the New Jersey Transit railroad bridge. The shoreline throughout the site is primarily sandy beach, and the upland area is undeveloped and overgrown. The east end of the shoreline and adjacent upland structures are protected by a concrete seawall and riprap revetment. A timber bulkhead extends offshore from the east end of the seawall. Three additional timber bulkheads are located along the shoreline to the west and extend offshore. A creek flows from the upland property into the bay, bisecting the shoreline at the west end of the site. The elevation rises at the west end of the site, and the shoreline intersects a large riprap slope which continues as shore protection for an adjacent public park. Water depths are extremely shallow for a considerable distance from the shoreline.

Old Bridge/Marquis Creek Waterfront Structure Inventory

Site Name	Reference	Structure Type	Condition)
Old Bridge, Marquis Creek	A	Concrete seawall	New
	B	Natural Sandy Beach Area	NA

Old Bridge/Marquis Creek Depth Soundings

* Condition rating is based on a Rapid Assessment Inspection of the structure performed by CH2M in June/July 2016.

Photo 1 – Old Bridge Site. Shoreline is sandy, undeveloped beach and upland with shallow approach.

Photo 2 – Property at east end of site is protected by a concrete seawall and rip rap revetment.

APPENDIX G

PROFILES OF SELECTED OPPORTUNITY SITES

INTRODUCTION

Overview

As part of NJTPA's Inventory and Assessment of Waterborne Transportation Resources, a series of Opportunity Site Profiles were developed.

As discussed in the Final Report, sites chosen for Opportunity Site Profiles were discussed with the project Technical Advisory Committee (TAC). An initial list of candidates was presented, based on leading opportunities identified by TAC members and other stakeholders throughout the course of the study, excluding sites that failed to meet minimum threshold criteria (insufficient water depth, lack of development interest/potential, etc.) and also excluding sites that involved only shallow-draft water taxi service (as these have very small physical footprints and minimum land/water development requirements).

Generally, these represent sites identified by study participants as having high potential for waterborne transportation services. These are by no means the only sites in the NJTPA region with high potential for waterborne freight or passenger services, but they offer a representative sample of opportunity types and locations. The inclusion of a site in these Opportunity Site Profiles should not be interpreted as a recommendation by NJTPA for the development or implementation of improvements or services. Nor should the absence of a site from the list of Profiles be taken as a suggestion by NJTPA that improvements or services are not desirable.

The following Opportunity Site Profile reports, covering more than 20 specific sites, were prepared. These sites – numbered generally north to south -- are listed below, and are shown in the map on the following page.

Passenger

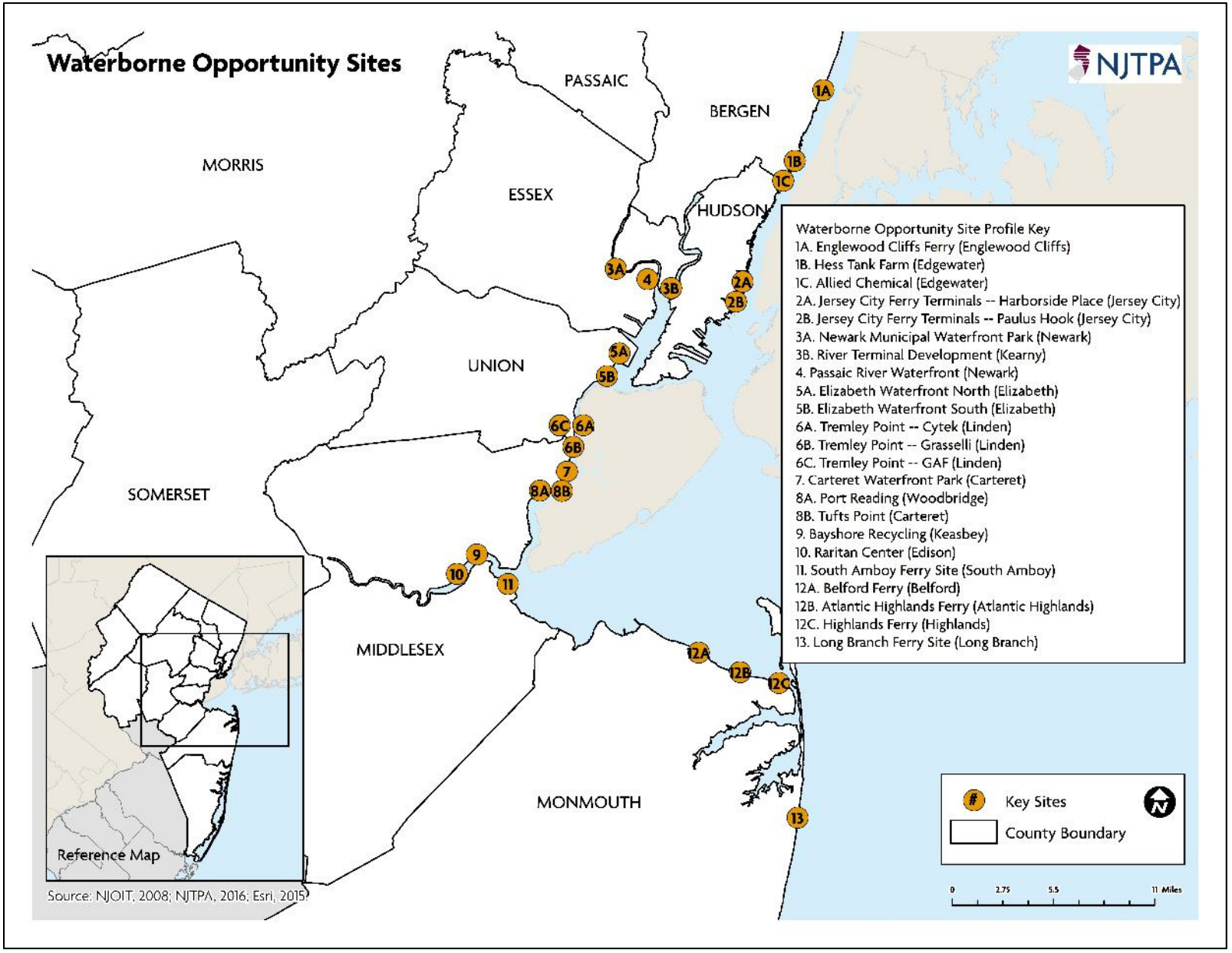
1. Bergen County - Englewood Cliffs (1A), Hess (1B), and Allied Chemical (1C)
2. Jersey City - Harbor Side Place (2A), Paulus Hook (2B)
3. Newark Downtown (3A), River Terminal (3B)
7. Carteret Waterfront Park Ferry Site
11. South Amboy Ferry Site
12. Belford (12A), Atlantic Highlands (12B), Highlands Ferry Terminals (12C)
13. Long Branch Ferry Site

Freight

4. Passaic River North of Port Newark
6. Tremley Point (Linden) - Cytek (6A), Grasselli (6B), GAF (6C)
8. Port Reading - Woodbridge (8A), Tufts Point-Carteret (8B)
9. Bayshore Recycling Corporation
10. Raritan Center (Federal Business Centers)

Freight or Passenger

5. Elizabeth Waterfront-North (5A), Elizabeth Waterfront South (5B)


Waterborne Opportunity Sites
NJTPA
PASSAIC
BERGEN
MORRIS
ESSEX
HUDSON
UNION
SOMERSET
MIDDLESEX
MONMOUTH
Waterborne Opportunity Site Profile Key
1A. Englewood Cliffs Ferry (Englewood Cliffs)
1B. Hess Tank Farm (Edgewater)
1C. Allied Chemical (Edgewater)
2A. Jersey City Ferry Terminals -- Harborside Place (Jersey City)
2B. Jersey City Ferry Terminals -- Paulus Hook (Jersey City)
3A. Newark Municipal Waterfront Park (Newark)
3B. River Terminal Development (Kearny)
4. Passaic River Waterfront (Newark)
5A. Elizabeth Waterfront North (Elizabeth)
5B. Elizabeth Waterfront South (Elizabeth)
6A. Tremley Point -- Cytek (Linden)
6B. Tremley Point -- Grasselli (Linden)
6C. Tremley Point -- GAF (Linden)
7. Carteret Waterfront Park (Carteret)
8A. Port Reading (Woodbridge)
8B. Tufts Point (Carteret)
9. Bayshore Recycling (Keasbey)
10. Raritan Center (Edison)
11. South Amboy Ferry Site (South Amboy)
12A. Belford Ferry (Belford)
12B. Atlantic Highlands Ferry (Atlantic Highlands)
12C. Highlands Ferry (Highlands)
13. Long Branch Ferry Site (Long Branch)
Reference Map
Key Sites
County Boundary
0 2.75 5.5 11 Miles
Source: NJOIT, 2008; NJTPA, 2016; Esri, 2015

Information Included in the Opportunity Site Profiles

These profiles address the following characteristics:

- Location and community context;
- History, current operation, and development plans;
- Key data on waterside and landside access;
- Parking requirements on site for ferry operations;
- Market potential for passenger or freight services; and
- Possible steps for implementation.

Graphic content includes location maps, aerial imagery, and development plans, if known.

Much of the data presented in these Profile Reports is contained in the NJTPA Planning Visualization Tool developed for this study, and readers are directed to Appendix E of this Report for a full description of the data fields and data sources available in the Tool.

One of the unique measures developed in this study, and referenced in the Profile Reports, is a "Level of Action" analysis addressing:

- Need for channel maintenance dredging
- Need for berth dredging
- Accessibility (physical ability to reach a site with typical vessels, based on channel/berth depth and overhead bridge conditions)
- Navigability (physical ability to reach a site based on current, channel dimension and shape, and similar characteristics); and
- Operations (potential conflicts with known or anticipated freight, passenger, and recreational uses of the waterways).

Assessments of the level of action needed to address challenges and risks in each of these areas were developed for this study by the NY/NJ Harbor Operations Committee Steering Committee, a consortium of public agencies, private vessel operating companies, shipping associations. The Final Report (Section 3.7) describes the process and ratings in detail, and relevant information has been summarized in the profiles.

The Profiles refer to different types of waterborne transportation services. For readers unfamiliar with these service types, the main types addressed in this project are described in the table on the following page.

Illustrations of Waterborne Services[1]

Name	Description	Typical Vessel
Commuter Ferry	Ferry designed for regular, high capacity commuter service. Typically handling more than 75 passengers and offering service speeds of 25 to 35 knots; may be capable of handling open water conditions. Generally used on routes with a limited number of stops, like an express bus. The ferry shown to the right belongs to NY Waterway and is used on the Belford-Manhattan route.	
Water Taxi	Smaller passenger vessels, typically operating at slower speeds in protected waters. Mostly used over short distances; may be used on routes with many stops, like a local bus, or to provide "shuttle" services. The ferry shown on the right belongs to NY Water Taxi and provides service between Lower Manhattan and Ikea on the Brooklyn waterfront.	
Freight Barge	Freight handled on a barge with a tug assist. The freight itself may be: containerized; in large units ("project cargo"); unpackaged liquids (liquid bulk); unpackaged solids ("dry bulk"); or packaged in bags, pallets, or other small units ("break-bulk"). The container barge shown to the right operates between Port Newark and the Red Hook Container Terminal in Brooklyn, reducing the need to truck containers across congested bridges.	
Truck Ferry	Tug-assisted barge or self-powered ferry vessel capable of carrying trucks and/or truck trailers. The truck ferry shown to the right operates between Detroit and Windsor, Ontario, accommodating oversize and hazardous cargo that cannot use the privately-owned bridge between the two cities. In the US, dedicated truck ferries are rare; trucks are more often handled on large ferries that combine passenger, automobile, and truck handling options.	
Rail Barge	Barge capable of carrying freight railcars. Also called "rail float" or "car float" service. NYNJ Rail operates a car float shown to the right between Bayonne and Brooklyn, providing a key rail link between North Jersey and New York City.	

[1] Photo sources: http://www.nywaterway.com/BelfordFerry.aspx; https://www.nywatertaxi.com/tours#transportation; http://www.redhookterminal.com/; http://truckferry.com/; http://nynjr.com/about-nynjr/

Where waterside inspections have been performed (see Appendix F of the Final Report), the relevant information has been included in the Profile Reports. The Waterside Inspections include evaluations of marine structural conditions, which are ranked according to the following scale.

Condition Rating Scale for Inspected Sites

Rating	Description
NEW	No apparent structural problems. Structural elements may show some very minor deterioration, but no overstressing observed. Structure can be utilized as-is, or with routine maintenance issues addressed.
MID-LIFE	Primary structural elements are sound; minor to moderate defects and deterioration observed. Localized areas of moderate to advanced deterioration may be present but may not significantly reduce the load bearing capacity of the structure.
SEVERE	Advanced deterioration or overstressing observed on widespread portions of the structure, significantly reducing the load carrying capacity of the structure. Localized failures. Structure requires substantial rehabilitation effort to regain use.
END OF LIFE	Very advanced deterioration, overstressing, or breakage has resulted in global failure(s) of primary structural elements. More widespread failures are ongoing or likely to occur. Portions of the structure no longer exist. Structure can no longer be utilized as intended, and is beyond rehabilitation.

Additional information has been included from site visits, stakeholder input, and published reports and news articles, as available, and these sources are footnoted.

Finally, although the type of information and level of detail presented in the Profiles will vary depending on the site, each of the Profiles presents and discusses, in order, the following:

- Facts at Glance
- Site Location and Context
- Marine Conditions
- Landside Access
- Site and Service Development Factors

PROFILE #1 – BERGEN COUNTY FERRY SITES

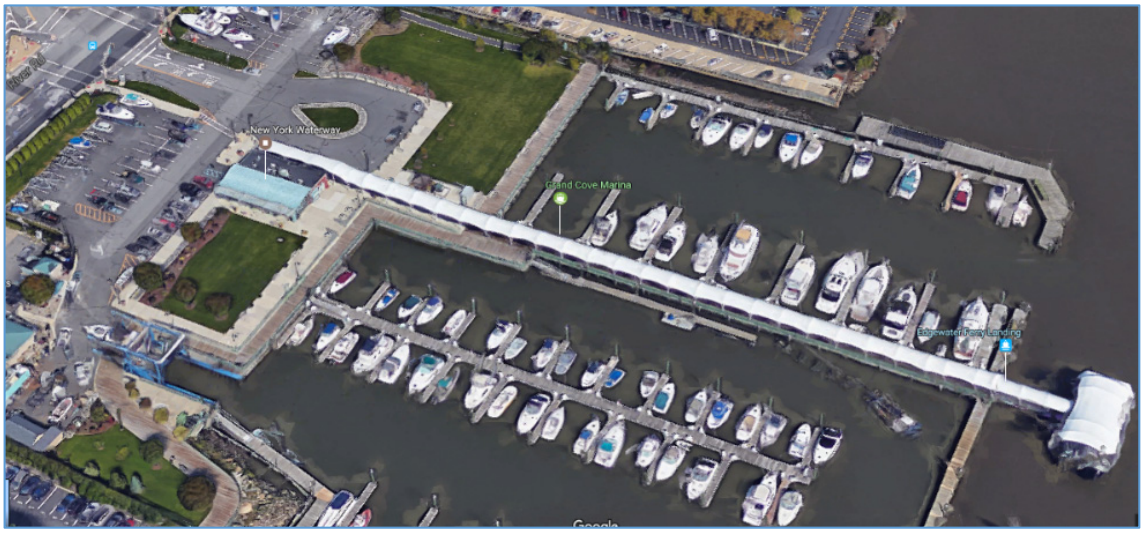
Facts at a Glance

Location	Two sites (Hess and Allied Chemical) in the Borough of Edgewater, Bergen County, on the Hudson River; one site (former Englewood Cliffs Ferry) is in Palisades Interstate Park about 1.7 miles north of the George Washington Bridge on the West bank of the Hudson River
Land Use	Hess and Allied Chemical are abutted by developed and developing commercial and residential mixed use. The Englewood Cliffs site is in Palisades Interstate Park at a yacht basin.
Marine Conditions	30' authorized channel. 23' current depths, 0' to 20' foot berth depths
Access	Hess and Allied Chemical are located on and accessible from River Road by cars, pedestrians, bicycles and bus transit. Englewood Cliffs is accessed via Palisades Road / Palisades Parkway primarily by car.
Future Plans	Edgewater and Bergen County are currently served by a small NY Waterway ferry terminal. They are interested in significantly expanding passenger ferry service opportunities for the community and are exploring new sites.

Site Location and Context

Bergen County is currently served by a New York Waterway Ferry service calling at Edgewater. The location offers no on-site parking for commuters, and accommodates only drop-off, pedestrian, and bicycle users. The terminal itself is a simple floating barge, covered for weather protection, moored off the Englewood Boat Basin.

Englewood Ferry -- Image from Google Maps[2]



[2] All Google aerials are those displayed by the Maps application as of 2016.

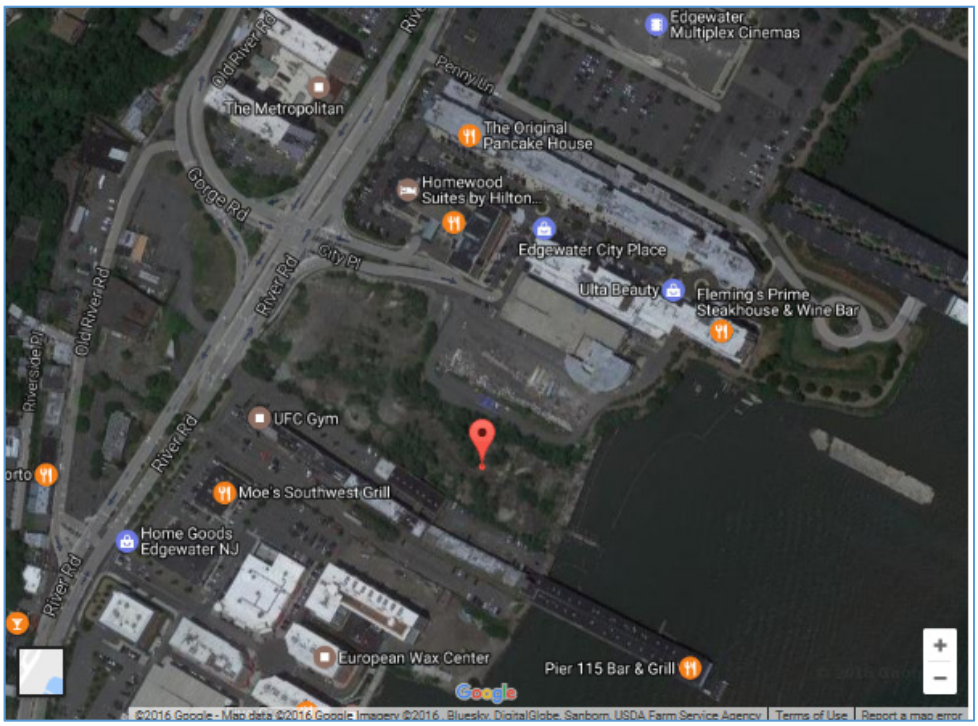
Three sites have been identified for the expansion of ferry services to Lower Manhattan, including a possible relocation of the existing terminal. These include:

1) The former Englewood Cliffs Ferry site in Englewood Cliffs (1A). The site is located on the west bank of the Hudson River, approximately 1.7 miles north of the George Washington Bridge. It is comprised of a 480ft seawall and an abandoned vessel landing to the south. The seawall is constructed of 2ft to 3ft stone blocks with mortar joints. The majority of the mortar is missing and a number of stones have been displaced or fallen several feet to the base of the seawall. A cast-in-place concrete bulkhead backs the stone blocks, reinforcing the seawall and retaining upland fill for an active, asphalt topped parking field use by the marina located immediately upriver from the site. The remains of a collapsing stone-filled boat landing border the south end of the site. The landing is ±60ft wide by 40ft deep, however the outer half of the landing has been undermined and the asphalt-topped concrete deck has collapsed. Security fencing is in place to restrict public access to the landing. Adjacent to the landing is a one-story fieldstone structure currently supporting an active commercial business. The site is located in Palisades Park, adjacent to the Englewood Boat Basin, an active marina.

2) The former Hess Tank Farm site in Edgewater (1B). The site is located on the west bank of the Hudson River, north of the Allied Chemical site and south of the current Edgewater Ferry. The site is an abandoned, non-active product loading/unloading pier which extends offshore from a rocky, undeveloped shoreline approximately 400 feet into the Hudson River. The primary berthing and loading platform is accessed by a timber trestle/pipe rack. Mooring hardware is located on the berthing platform. Additional mooring hardware is provided on independent adjacent structures located on either side of the primary platform which are accessed by a series of secondary trestles. To the south are three, free standing timber dolphins in varying conditions. The site is adjoined by auto-oriented commercial development along the waterfront to the north and south, but is near high-density residential development; it offers significant acreage on both sides of River Road to accommodate ferry terminal development, on-site parking, and substantial on-site mixed use development.

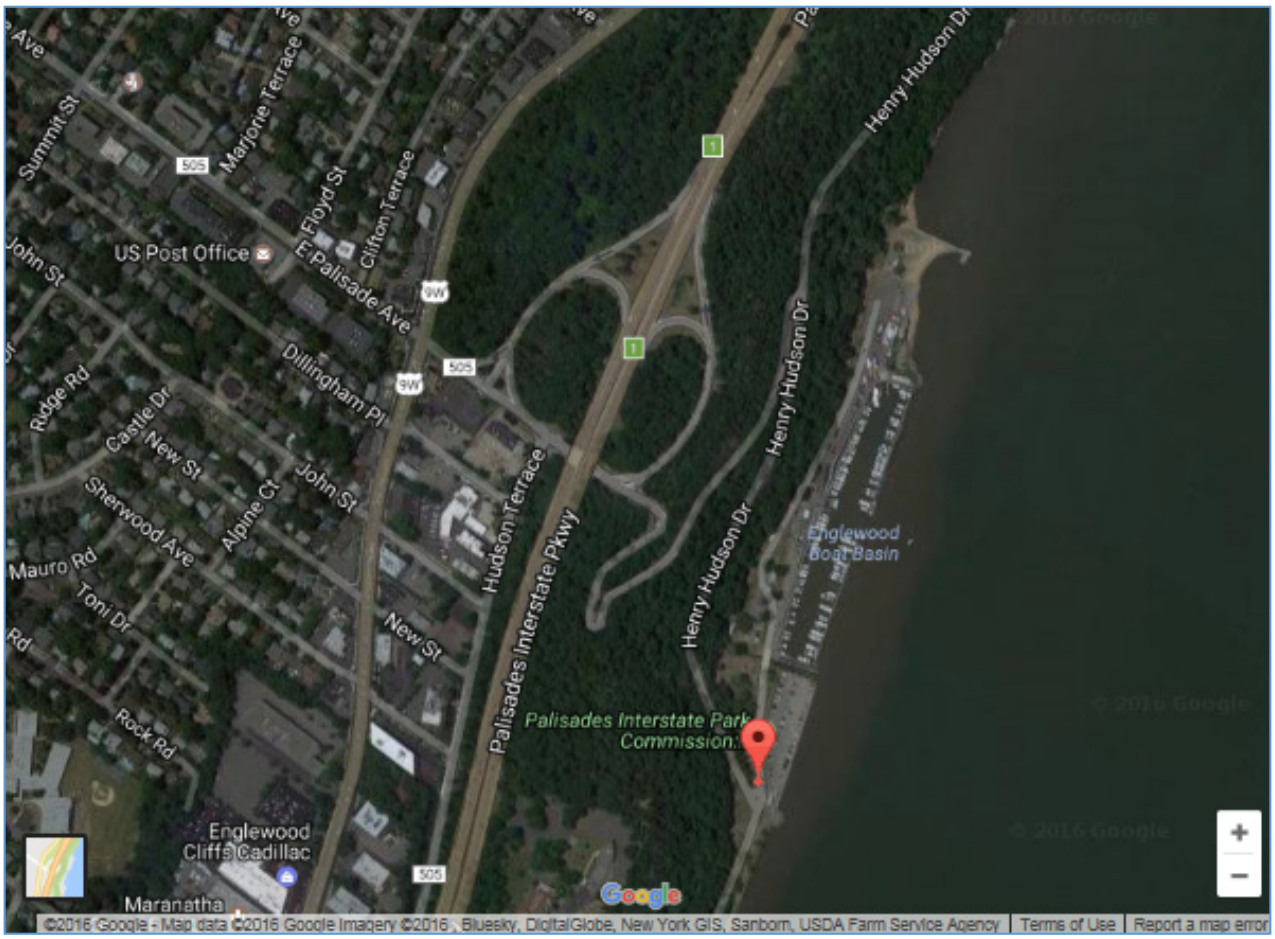
3) The former Allied Chemical property in Edgewater (1C). The site is located on the west bank of the Hudson River, approximately 3.75 miles south of the George Washington Bridge. It is currently abandoned, and is comprised of a variety of partially or completely collapsed structures on or adjacent to an undeveloped shoreline. A timber pile supported pier with a concrete deck and approach trestle extend offshore at the north border of the site. The concrete deck of the pier is badly broken, however the majority of concrete remains on the pile caps. The concrete deck of the approach trestle has fallen to the mudline alone the entire length. Two inshore piles fields located at the north and south sides of the site, indicate the existence of former pile supported structures. Several concrete foundation pedestals remain in place inside the perimeter of the north pile field. The remnants of a ±250ft long high level platform remain along the shoreline at the center of the site. Low tide conditions expose a mud flat extending to ±200ft offshore, with the water depths less measured throughout the site at less than three feet, to ±600ft from the shoreline. The site is bounded on two sides by new, high-end retail, restaurant, hotel, and residential development; on the third side, there is a large parcel with development potential; and the site itself is large enough to accommodate significant mixed-use development and on-site parking to support a ferry.

Allied Chemical Site – Image from Google Maps



Hess Tank Farm Site – Image from Google Maps

Englewood Cliffs Ferry Site – Image from Google Maps



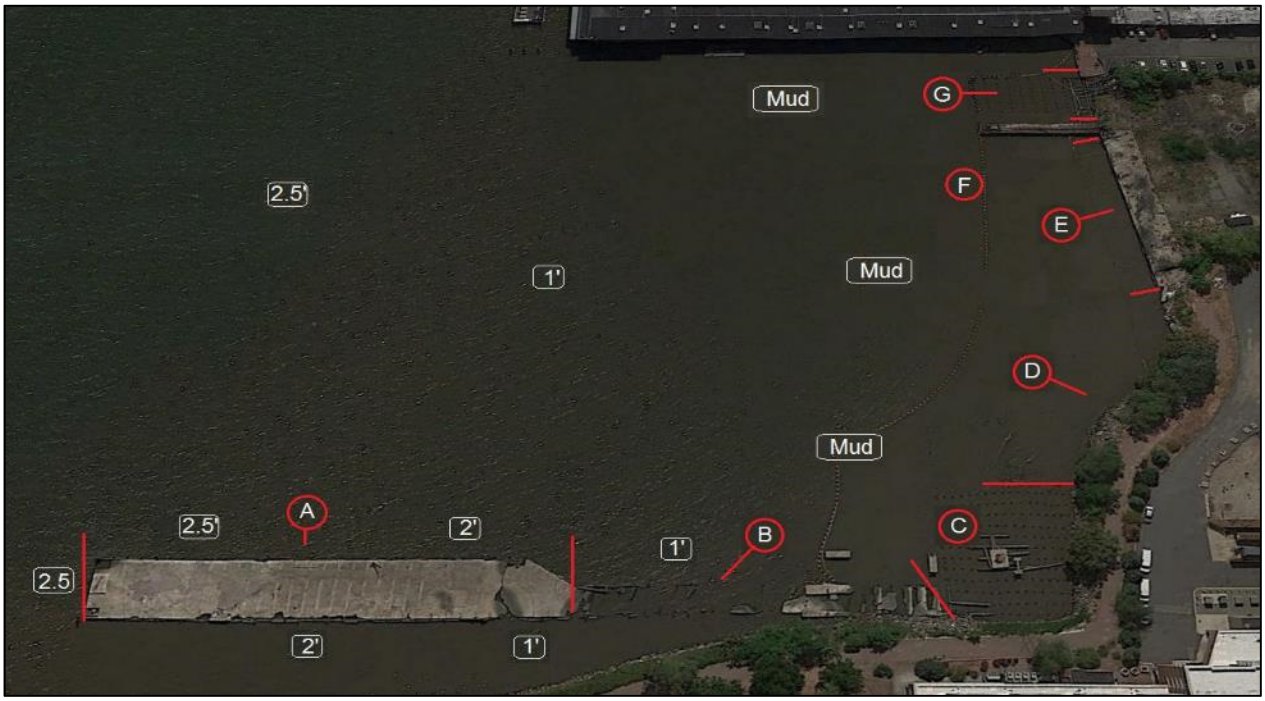
Additionally, Edgewater is considering a fourth site, at the foot of Main Street, which could potentially accommodate a smaller passenger vessel service (a "water taxi") running east-west across the Hudson (to 125th street, connecting to the MTA for access to Manhattan employment centers) and/or north-south (providing connections between different commuter ferry sites and waterfront commercial/residential clusters.)

Marine Conditions

Allied Chemical Site

A waterside inspection was performed at the Allied Chemical site. The site adjoins the Hudson River, a federal channel authorized at 30 feet but with areas currently as shallow as 23 feet. Depths at the site are from 1 to 2.5 feet at a distance from the shoreline, with essentially no navigable depth (mud flats) near the shoreline. The undeveloped loose stone shoreline (see area "D" below) is in mid-life condition; all other existing timber structures on site (see areas A-C and E-G below) appear to be in very poor or collapsing condition according to the consultant visual marine inspection undertaken for this project.

Allied Chemical Site – Inspections and Depth Soundings



Allied Chemical – Deteriorated Timber Platform along Shoreline and Shallow Water Approach

Allied Chemical – Collapsing Timber Pier and Concrete Deck at North Side of the Site

Hess Tank Farm Site

A waterside inspection was performed at the Hess Tank Farm site. The site adjoins the Hudson River, a federal channel authorized at 30 feet but with areas currently as shallow as 23 feet. The site has an existing timber loading platform in midlife condition offering 20 water depths, but the trestles connecting to this platform are all in severe condition (requiring significant repair). Depths moving inland from the loading platform at the site are generally between 2 and 4.5 feet.

Hess Tank Farm Chemical Site – Inspections and Depth Soundings

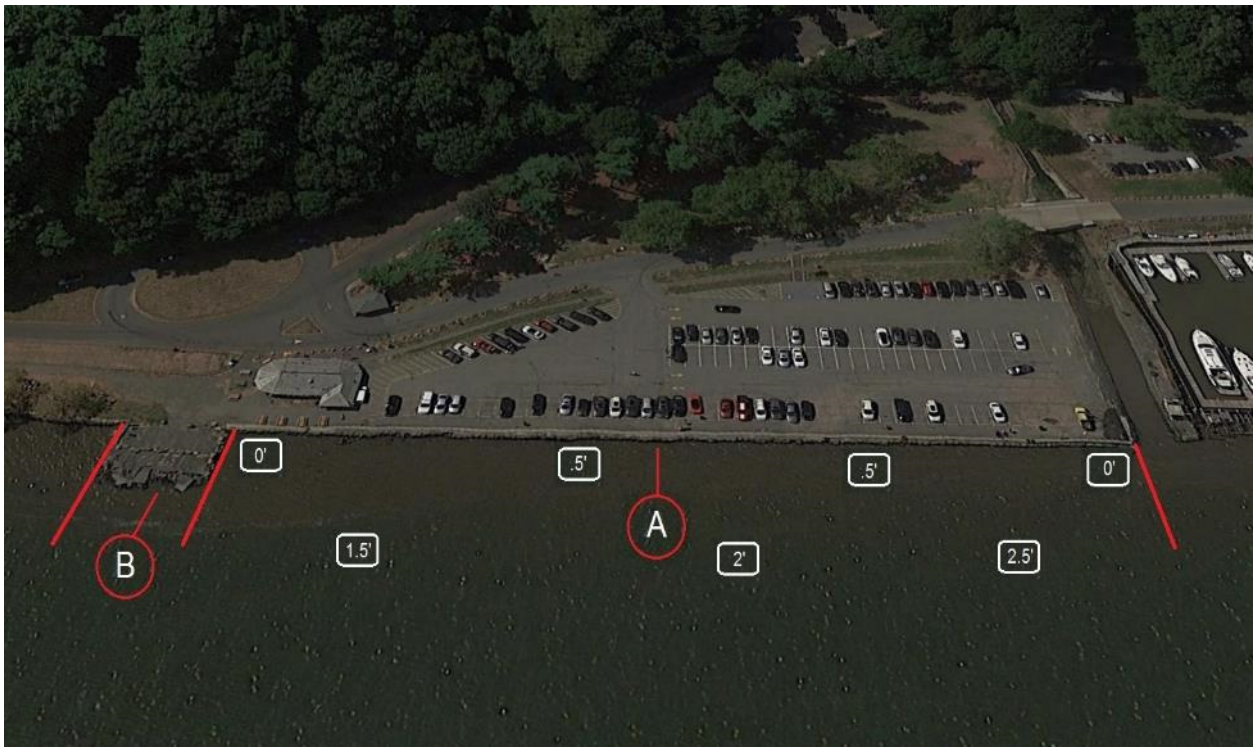
Hess Tank Farm – Main Timber Berthing and Transfer Platform

Hess Tank Farm – Timber Access Trestle and Pipe Rack

Englewood Cliffs Ferry Site

A waterside inspection was performed at the former Englewood Cliffs Ferry site. The site adjoins the Hudson River, a federal channel authorized at 30 feet but with areas currently as shallow as 23 feet. The site has an existing concrete-backed masonry seawall in midlife condition, but the landing platform itself – a rubble-filled, concrete and asphalt-topped structure – appears to be abandoned and collapsing. Water depths along the seawall are between 0 and 2.5 feet.

Englewood Cliffs Ferry Site – Inspections and Depth Soundings



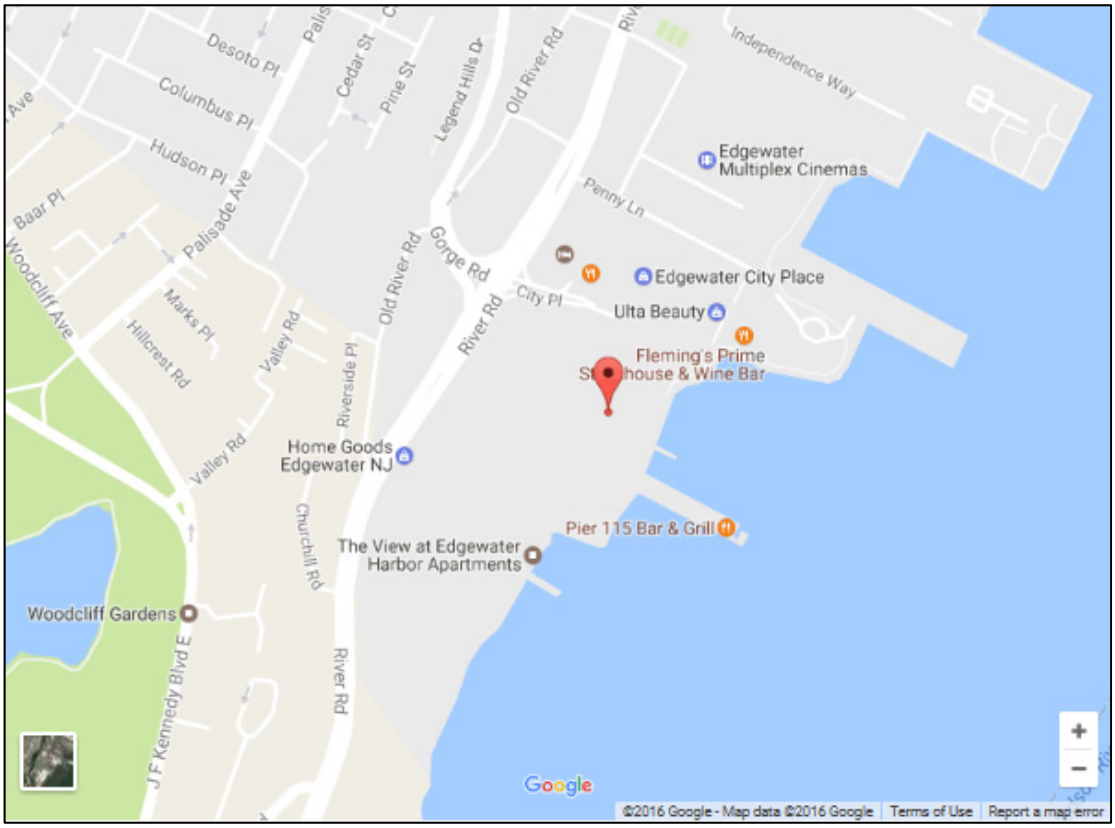
Englewood Cliffs – View to North of Concrete and Stone Seawall; Note Marina to the North

Englewood Cliffs – View to North from Abandoned Landing

Landside Access

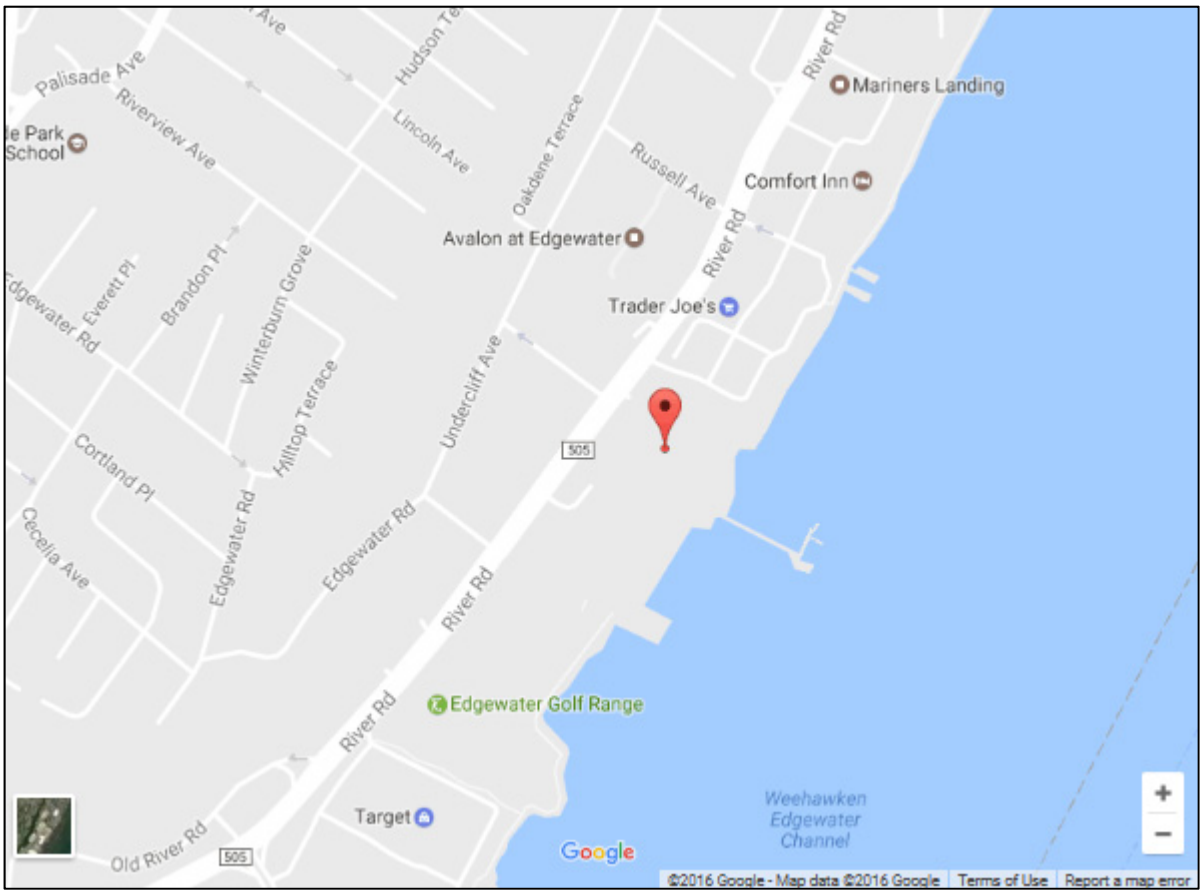
Landside access to the Allied Chemical and Hess Tank Farm Sites is via River Road, a heavily-used four-lane road running north-south along the Edgewater waterfront. The Allied Chemical site is close to Gorge Road, providing convenient access to the local community at higher elevation. River Road offers good pedestrian, bicycle and bus transit access. Both sites can accommodate the development of large auto parking lots.

Access to Allied Chemical Site – Map Image from Google Maps



View of River Road at Gorge Road – Image from Google Maps

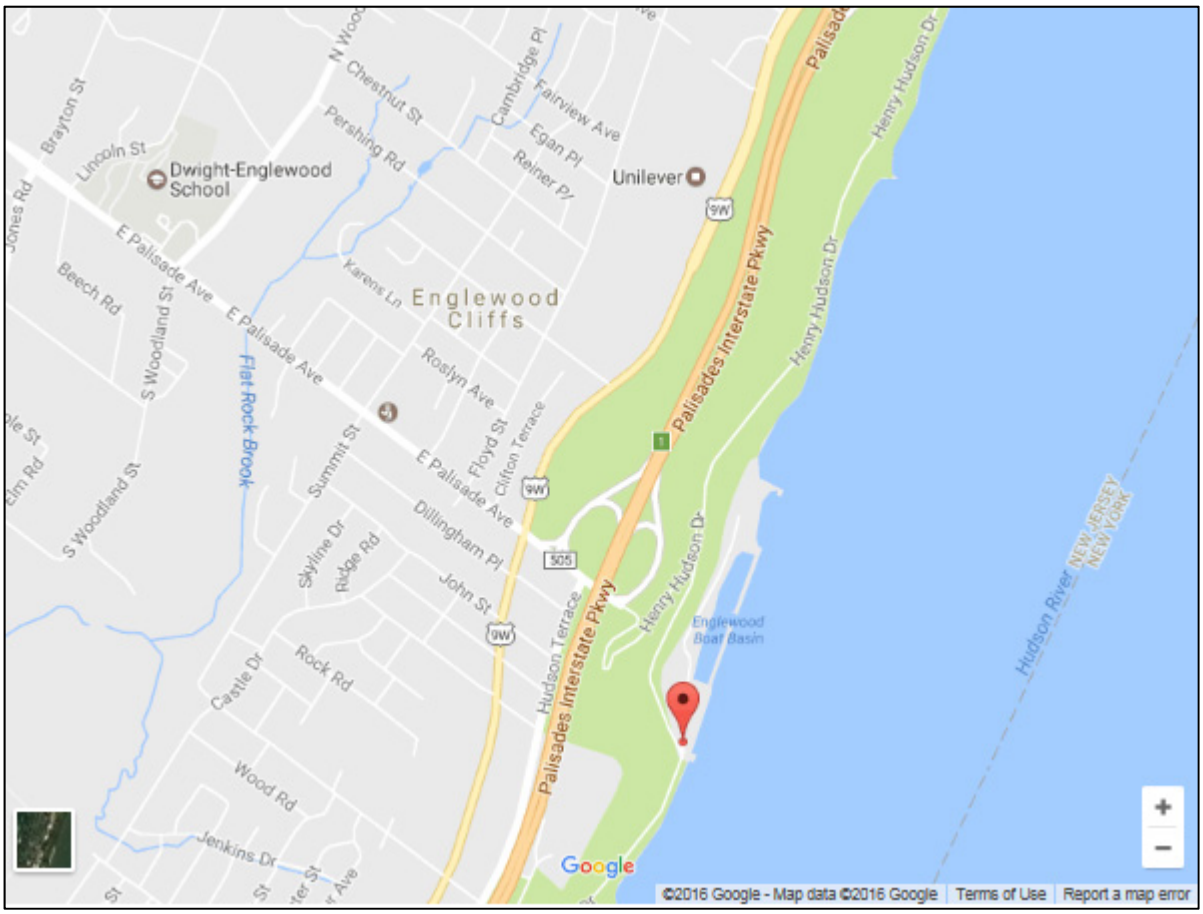
Access to Hess Tank Farm Site – Map Image from Google Maps



View of River Road at Hess Tank Farm Site – Image from Google Maps

Access to the Englewood Cliffs Ferry site is via East Palisades Avenue / Palisades Interstate Parkway and Henry Hudson Drive, a winding switchback road. Access for cars is good but access for pedestrians and bicycles is less attractive according to the consultant site review.

Access to the former Englewood Cliffs Ferry Site – Map Image from Google Maps



View from top of Henry Hudson Drive – Image from Google Maps

Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee suggest several areas of attention. The most significant is berth dredging, as many facilities along the Hudson River have not been maintained at operable depths. Investigations reveal this to be true for the Allied Chemical site and the Englewood Cliffs Ferry site (basically no usable berth depths at either location). The Hess Tank Farm site does offer good depth -- 20' at the existing loading platform – although the timber pier to reach the platform is not usable. The other area of attention is vessel operations, as passenger ferries must run through congested areas of the Hudson River and New York Harbor; however, they do so today with safety, so the required procedures are known and in place.

The consultant team performed a very high-level analysis of potential demand for a passenger ferry service to lower Manhattan, based entirely on existing commute patterns reported in US Census Journey to Work data. At market capture rates of 7.5% to 15.0% of daily commuters, ferry services supporting the Edgewater and Bergen markets might expect to see between 147 and 881 riders per day. In 2014, the National Census of Ferry Operators Database reported 98,514 passenger trips on the existing service; this is roughly 49,000 passengers, or just under 200 passengers per workday on average. There is high variability in the demand estimates because of the uncertain effects of better auto access and increased residential density within walking distance of the ferry terminals – both would support capture rates at the higher end of the scale. Besides total demand, there is also the question of whether to split demand among multiple sites, or concentrate it at one or two sites. One option suggested by Englewood is to operate commuter services from one or two locations, and then link these (and other) locations with a 'water taxi' service consisting of frequent service by small vessels. This would essentially operate like a local transit bus service on the water.

The Allied Chemical and Hess Tank Farm sites may be stronger long-term candidates for ferry service than the existing Englewood Ferry landing (no parking available) or the former Englewood Cliffs Ferry site (limited access and no adjacent development potential), but both sites have significant challenges. Allied Chemical is a designated Superfund site with an active remediation plan for addressing on-site contamination from historic operations[3]; it also requires substantial dredging and/or a long pier to reach deep water. The Hess site may also require remediation[4] and will need reconstruction of a long pier to reach the existing platform.

Assuming these issues can be addressed, both the Allied Chemical and Hess Tank Farm sites have the potential to offer excellent access (on-site parking, pedestrian/bicycle, and bus transit), along with significant residential populations and supporting commercial activities on-site. There are no other obvious impediments to development of passenger ferry terminals and services at these sites. The land is suitable; highway access has been provided for; pedestrian, bicycle, and bus transit connections exist, a base of provable demand exists; and vessel operation has previously been done in this location.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

[3] http://archive.northjersey.com/news/epa-explains-toxic-cleanup-plan-for-quanta-site-in-edgewater-1.1251910
[4] http://archive.northjersey.com/towns/hess-sells-tank-property-open-to-development-1.1086619

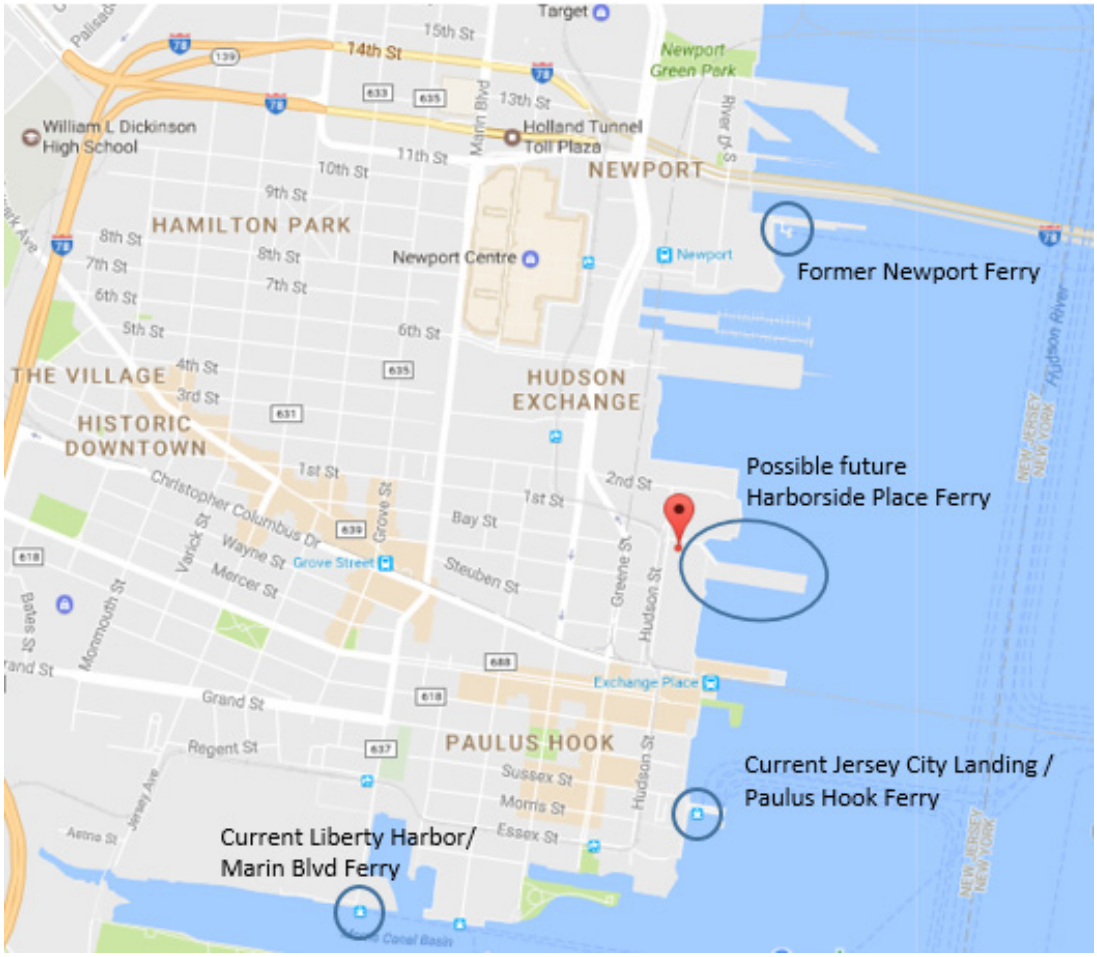
PROFILE #2 – JERSEY CITY FERRY TERMINALS

Facts at a Glance

Location	City of Jersey City, Hudson County, on the Hudson River
Land Use	Former, existing, and potential future passenger ferry terminals in close proximity to existing and planned high-density residential development
Marine Conditions	45' authorized channel, 44' current channel depths, 8'-10' berth depths
Access	Close proximity to high density residential and commercial centers, PATH, Hudson-Bergen Light Rail, and bus transit, with excellent pedestrian and bicycle access. Auto access via City street grid.
Future Plans	The Jersey City waterfront is redeveloping rapidly, and Jersey City is interested in an expansion of commuter ferry service for new residential development.

Site Location and Context

Jersey City Ferry Sites – Annotated Map Image from Google Maps



Commuter passenger ferry service is currently provided to two terminals in Jersey City:

- Liberty Harbor / Marin Boulevard (in the Morris Canal basin, south of Paulus Hook) (2A) – served by New York Waterway
- Jersey City Landing (Paulus Hook) – served by New York Waterway and Seastreak (2B)

Until 2014, New York Waterway provided service out of Newport. The service was discontinued due to the deteriorating condition of the pier.[5]

Jersey City has continued to see rapid development of its waterfront, including major new high-density residential projects such as Harborside Place. Harborside Place is a complex of office, commercial and residential development. The first of three high-rise residential towers topped out in 2015, and the three towers together will provide more than 2,300 residential units.

Harborside Place – Image from Google Maps

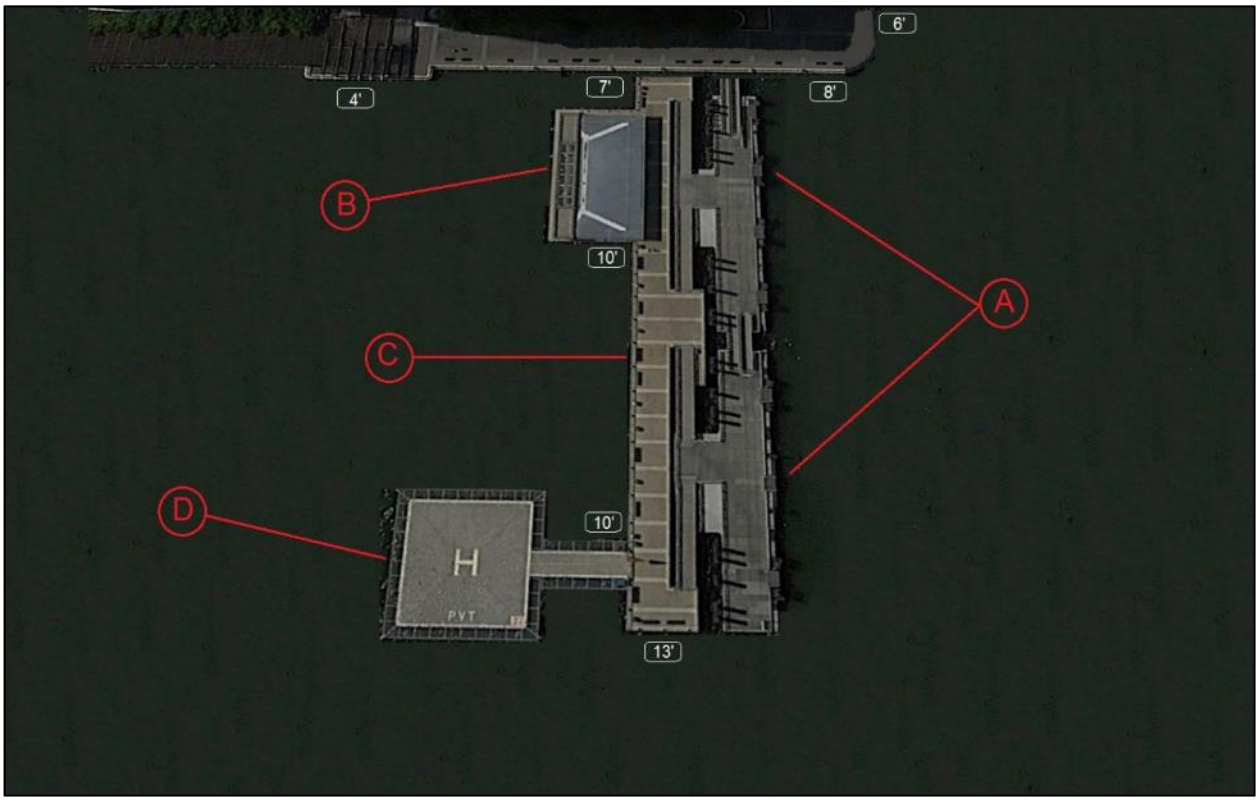
[5] http://www.nj.com/hudson/index.ssf/2014/01/ny_waterway_not_restarting_ferry_service_out_of_newport_terminal.html

With this density of development in mind, Jersey City is interested in the potential for a direct ferry stop to serve the Harborside community. While there appear to be no formal studies underway, there are some investigations, such as an on-line survey of potential interest posted by a Jersey City Councilwoman.[6]

Marine Conditions

As a model for potential future ferry terminal development, a waterside inspection was performed at the Jersey City Landing (Paulus Hook) site. The facility is comprised of a precast concrete pier supported by steel pipe piles. The pier extends from a concrete capped, steel sheet pile bulkhead. The sheet pile bulkhead retains fill that supports a pedestrian promenade running along the waterfront. A series of interconnected steel floats are located on the north side of the pier. The floats are anchored by steel pipe guide piles and act as berthing structures for the vessels. Two additional pipe pile supported appendages located on the south side of the pier, opposite the berthing areas, provide the foundations for a ticket office and helicopter landing pad. An expanded steel walkway located between the pier and the steel floats provides pedestrian access to the individual vessel slips. All structures are in "new" condition and water depths alongside the vessel berthing area are measured at 10 feet.

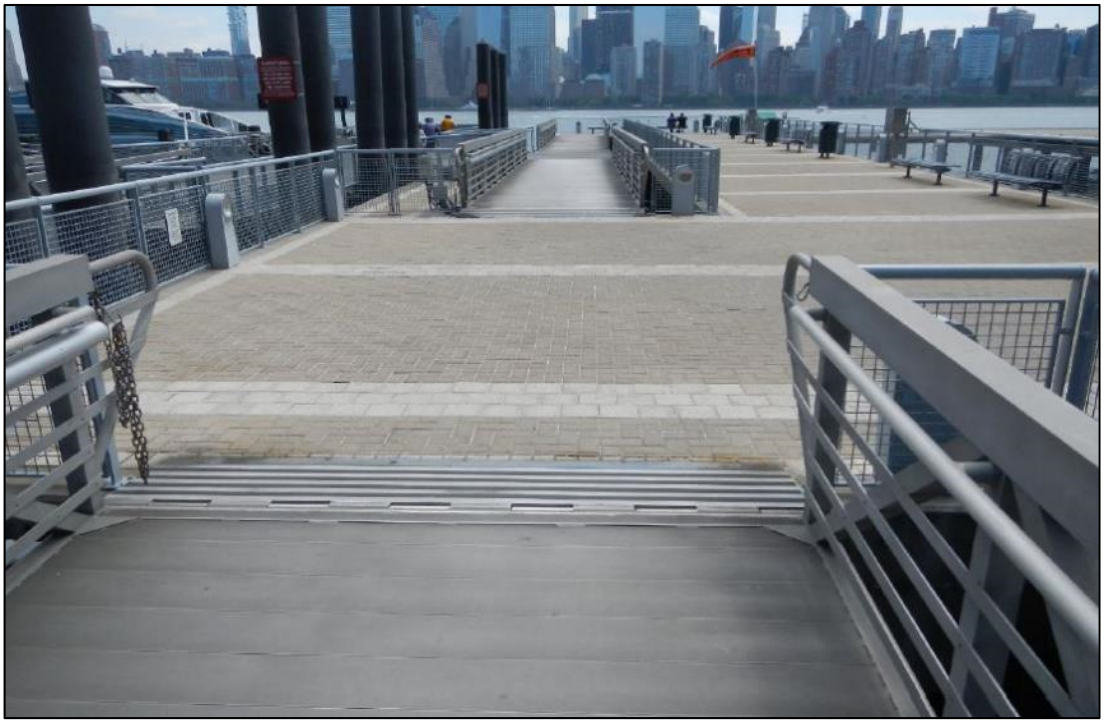
Jersey City Landing Ferry Site – Inspections and Depth Soundings



[6] https://www.surveymonkey.com/r/Z7XBT8Y

Jersey City Landing Ferry Site – Vessel Berthing

Jersey City Landing Ferry Site – Pedestrian Access



Landside Access

The Jersey City ferry sites have exceptional access for pedestrians and bicycles. They are located within walking distance of major office, residential, and retail clusters; and they are within walking distance of PATH, the Hudson Bergen Light Rail, and bus routes. Auto access is possible via the city street grid. Ferry locations and transportation access are shown in the annotated map in the Site Location discussion.

Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that berth dredging may be a concern for ferry facilities located along the Hudson River. Berth depths around Harborside Place appear to be around 8 feet – adequate for passenger ferry service – but site-specific investigations would be needed to confirm this.

The consultant team did not estimate the ferry demand associated with new residential development at Harborside Place. With 2,300 new units coming on line, one might expect a large share of them to be Manhattan-bound commuters who would could find the ferry attractive. However, with PATH service so close, PATH is also an option for those commuters. More detailed market studies would be needed to quantify this demand, and also determine whether a third active ferry location would supplement active ferry terminals in Jersey City and Hoboken or compete with them for the same business.

Finally, it is not clear whether the necessary land will be made available, although the space requirements should be minimal, given that no on-site auto parking would be needed.

While there are questions to be addressed relating to water depth, demand, and land availability, there are no obvious impediments to development of a passenger ferry terminal and service at Harborside Place. Ferry service between Jersey City and Manhattan is a proven success; the opportunity now is to build on that success to the benefit of the community, in a manner that is sustainable and attractive for a service operator. Further study of market demand and service viability may be appropriate next steps.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #3 – NEWARK DOWNTOWN / RIVER TERMINAL

Facts at a Glance

Location	City of Newark, Essex County, on the Passaic River Town of Kearny, Hudson County, on the Hackensack River
Land Use	Newark: Municipal Park near Penn Station and commercial office development Kearny: River Terminal Development (industrial/flex/office center) on the east side of Kearny Point, within large heavily-industrial community
Marine Conditions	15' authorized channel in the Hackensack River, berth depth unavailable 16' authorized channel in the Passaic River, berth depth unavailable
Access	Newark Municipal Waterfront Park accessible by all regional rail and bus transit River Terminal accessible by Truck Route 1 & 9
Future Plans	No formal plans. Concept to investigate a small-vessel "water taxi" type service linking the two sites emerged from stakeholder discussions and interviews.

Site Location and Context

In 2013, Newark opened its Municipal Waterfront Park (3A) on a former superfund site, inviting the City to celebrate its historic marine heritage. The City is planning to expand park development further east in coming years.[7] The Newark Municipal Waterfront Park does not include provisions for berthing vessels, but to the east is the historic municipal dock, and it appears provisions for a small-vessel "water taxi" type service could be made within the park, or to the east of the park along the waterfront.

If Newark offered the capability to handle small passenger vessels, it might conceivably serve as the hub for a larger service network, on both directions along the Passaic River, across the Passaic River to Harrison, and further up the Hackensack.

Today, this is just a concept that has emerged through discussions with multiple parties; it is not a formal proposal; nor it is not the adopted policy of the City of Newark; nor does it have a formal commitment from River Terminals. It is documented here solely to facilitate further discussion, as warranted and useful.

River Terminal Development Park (3B) is a diversified industrial / flex / office space complex located on the southeast portion of Kearny Point. Although it is surrounded by traditional freight infrastructure – railyards and truck terminals – its market focus is "industrial innovators." It is less dependent on truck access or rail service, and more dependent on workforce accessibility, since it competes with other innovation centers. Today, its workforce access is heavily oriented to cars, via Truck 1 & 9 traversing Kearny Point. This is not a pedestrian, bicycle, or transit-friendly route. The site has a large vessel basin and historic berthing areas, and to expand its workforce access options,

River Terminal Development is interested in exploring the concept of waterborne passenger transportation. This would not be a conventional passenger ferry service, like the commuter ferries linking New Jersey and

[7] http://newyork.cbslocal.com/2013/08/04/newark-riverfront-park-built-along-superfund-site-opens-to-public/

Manhattan. It would be more of a local, lower-volume service with smaller vessels, serving as a last-mile connector between the site and the region's multimodal transportation network.

Apart from potential demand, the main question with this concept is: what does the service link to on the other end? Ideally it would be a major regional multimodal transportation hub serving multiple rail lines as well as local and regional buses. The obvious candidate is the waterfront adjoining Newark Penn Station, located approximately 4.5 nautical miles from the River Terminal basin.

Newark Municipal Waterfront Park and River Terminal – Image from Google Maps

Municipal Waterfront Park and Vicinity -- Image from Google Maps

River Terminal Development -- Image from Google Maps

Marine Conditions

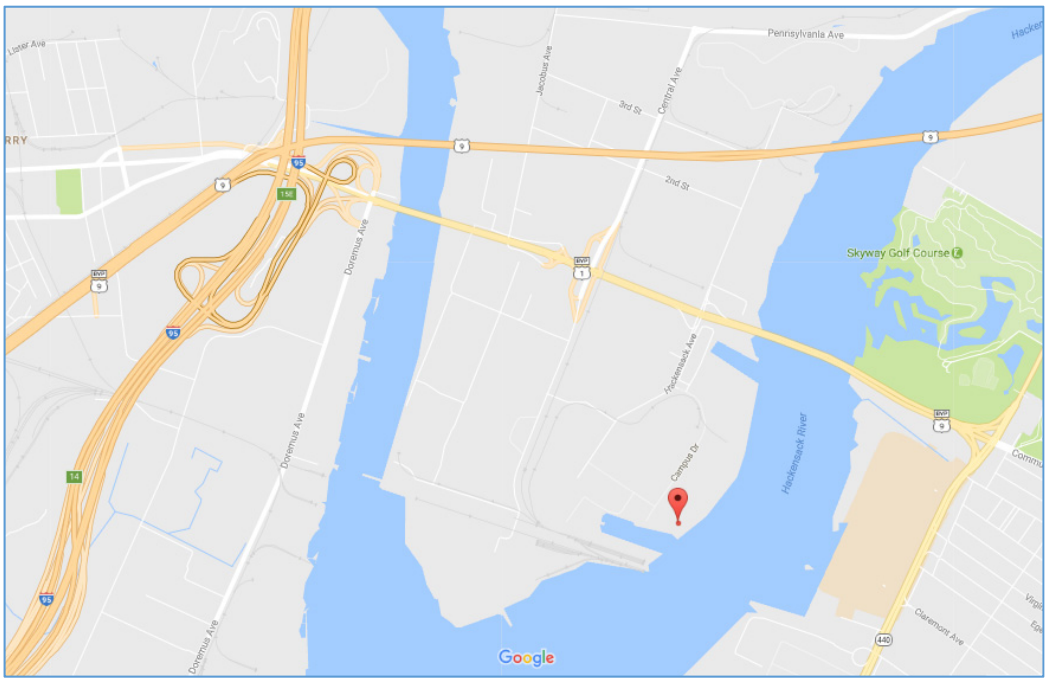
Both sites are on maintained channels. At the two sites, the Hackensack is authorized to 15' and the Passaic is authorized to 16'; current depths are believed to be equal or greater to authorized depths in the channels, but depths alongside potential berthing areas have not been investigated. For smaller water-taxi type vessels that might be used on a service between the two sites, deep berths and channels are not required; 4 to 6 feet at berths may in fact be sufficient, depending on the selected vessel.

Landside Access

Landside access deficiencies, and the opportunity to address them via waterborne services, is the key driver for this concept. River Terminal Development is highly dependent on auto access; with a water taxi, its workforce could use transit to Newark Penn, then transfer to water for the final leg of the trip.

Pedestrian's View toward River Terminal Development from Truck 1 & 9 – Image from Google Maps

Access to River Terminal Development – Map Image from Google Maps



Site and Service Development Factors

Again, this is a preliminary concept for discussion only. Further investigations would be required to evaluate: land availability and feasibility of developing vessel berthing facilities; potential demand between the two sites, and between Newark and other sites; vessel operability; dredging or other requirements; and financial viability for an operator. Once these facts are known, the concurrence of responsible property owners and service operators would be required.

While this is just a concept today, if the region wants to explore all possible options to build a robust, resilient and sustainable multimodal transportation system, this is one approach that may prove useful – not only at these two sites, but possibly elsewhere as well.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #4 – PASSAIC RIVER NORTH OF PORT NEWARK

Facts at a Glance

Location	City of Newark, Essex County, on the Passaic River
Land Use	Active petrochemical terminals; recycling and waste transfer; sewage treatment; corrections; truck parking; barge mooring; vacant parcels
Marine Conditions	30' authorized channel; berth depths vary
Access	Excellent vehicle access via NJ Turnpike, I-78, and Truck 1 & 9
Future Plans	Not known

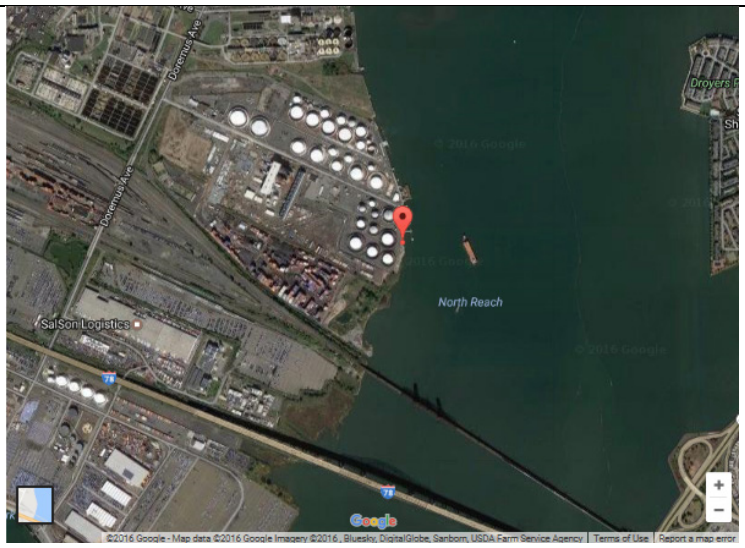
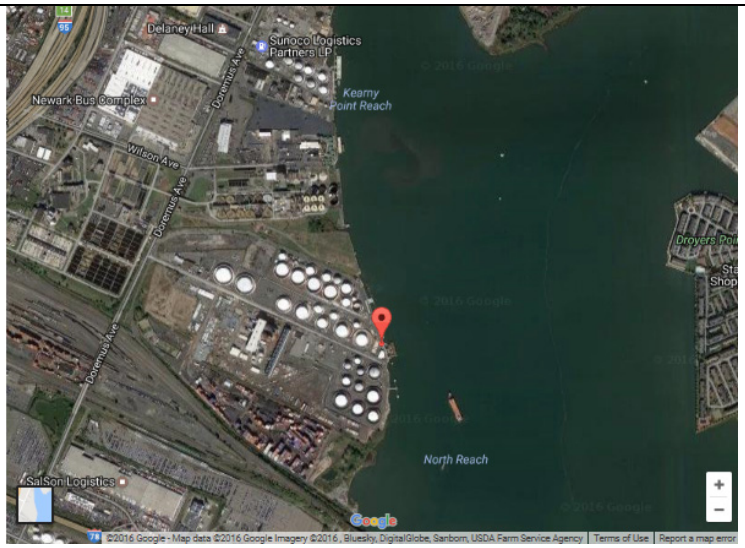
Site Location and Context

This profile addresses an entire industrial district – Newark's Passaic River waterfront from the New Jersey Turnpike bridge/Pulaski Skyway Bridge/Truck 1 & 9 bridge south to the Port Newark Container Terminal. This area hosts an incredibly rich, diverse, and often unappreciated mix of uses and activities. These are uses few people want to live next to – petrochemical facilities, waste handling, sewage, corrections, etc. – but they represent the critical service infrastructure essential to running a city, a county, and a region.

Newark's Passaic River Waterfront – Image from Google Maps

Marine Conditions

This reach of the Passaic River is authorized to 30' and currently measures at this depth. Berth depths vary at different sites in this area. Many of the sites in this area were inspected from the water as part of the Inventory and Assessment of Waterborne Transportation Resources, and the results of those investigations – including water depth measurements and marine structural condition assessments – are presented in Appendix F of the study's Final Report. The inspected sites in this area are described below.

Shoreline Investigation – Site No. 4, Buckeye Terminal (Newark). This site is an active petroleum transfer Figure 1. Site Inspection Locations	
Shoreline Investigation – Site No. 5, Motiva Enterprises (Newark). This site is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.7 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.	
Shoreline Investigation – Site No. 6, Stratus Petroleum Corp. (Newark). This is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 0.8 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.	

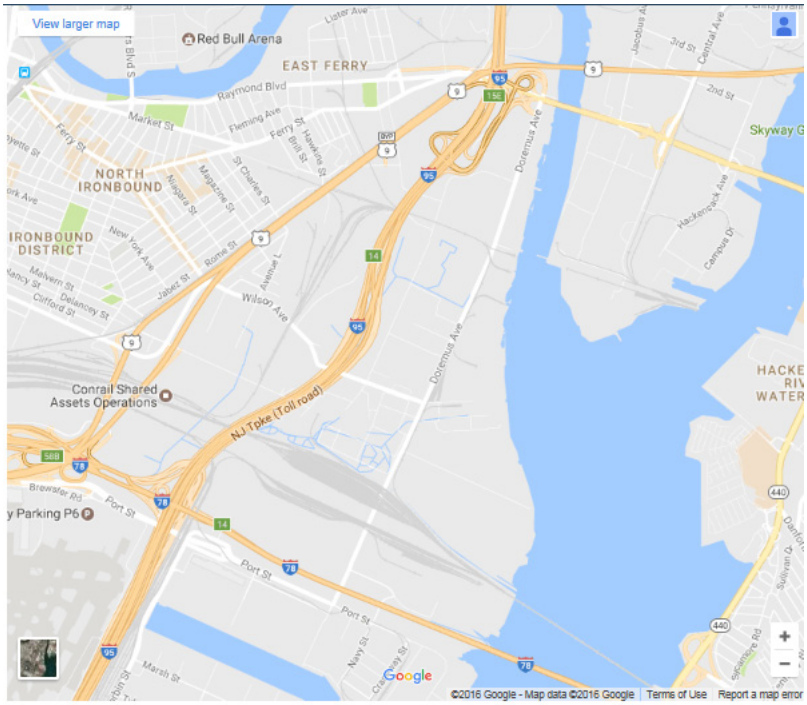
Shoreline Investigation – Site No. 7, North of Stratus Petroleum (Newark). This site is located on the west bank of the Passaic River, approximately 1.0 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.	See image above
Shoreline Investigation – Site No. 8, Passaic Valley Sewage Commission (Newark). This is an active sewage treatment and transport facility located on the west bank of the Passaic River, approximately 1.1 miles north of the Goethals Bridge. It is located between other sites of potential interest that were inspected.	
Shoreline Investigation – Site No.9, DART Site Waterfront (Newark). This is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 1.2 miles north of the Goethals Bridge. At the time of inspection, it was believed that DART might be a possible site for handling waterborne freight, but further investigation confirmed no active interest.	See image above
Shoreline Investigation – Site No. 10, Sun Co. Newark. This is an active petroleum transfer facility located on the west bank of the Passaic River, approximately 1.4 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.	

Shoreline Investigation – Site No. 11, General Chemical (Newark). This site is located on the west bank of the Passaic River, approximately 1.8 miles north of the Goethals Bridge. It has been identified as part of a general cluster of sites north of Port Newark that could ultimately be improved.	
Shoreline Investigation – Site No. 12, Essex Co. Corrections Waterfront (Newark). This site is located between other sites of potential interest that were inspected.	See image above
Shoreline Investigation – Site No. 13, Essex County Waste to Energy. This site is located on the west bank of the Passaic River, approximately 3.2 miles north of the Goethals Bridge. At the time of inspection, it was believed that DART might be a possible site for handling waterborne freight, but further investigation confirmed no active interest.	

Landside Access

The site is extremely well-located for vehicle access via the New Jersey Turnpike, I-78, and Truck 1 & 9.

Highway Access – Map Image from Google Maps



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that berth dredging can be a significant concern in the Passaic River, as can vessel operations due to conflicting traffic. However, these concerns become reduced in sections of the river closest to Newark Bay, where these sites are located. There are three opportunities worth noting for this set of sites:

- **Infill.** Several of the properties along Doremus Avenue appear to be underutilized, or not actively utilized for marine freight transportation. Further planning could seek to identify and implement marine uses for these sites.
- **Active monitoring**. Over time, some currently active sites in this area may become inactive, possibly coming up for sale and potential redevelopment. Planners should remain attentive, and be prepared to promote the resumption of marine freight activities, if appropriate.
- **Area-wide preservation**. The NJTPA region is developing quickly. Much of its industrial history – especially along its waterfront -- is being rewritten, with modern industrial, commercial, retail and residential uses. This is largely a welcome development, bringing new job opportunities, new residents, and stronger public revenues. Notwithstanding the benefits of development and growth, this particular length of waterfront is fascinating and important not only for its diversity, but also for the fact that it has not yet seen these types of development pressures. It continues to provide critical services the region expects and demands. The opportunity here is to preserve, protect, and defend these essential uses.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

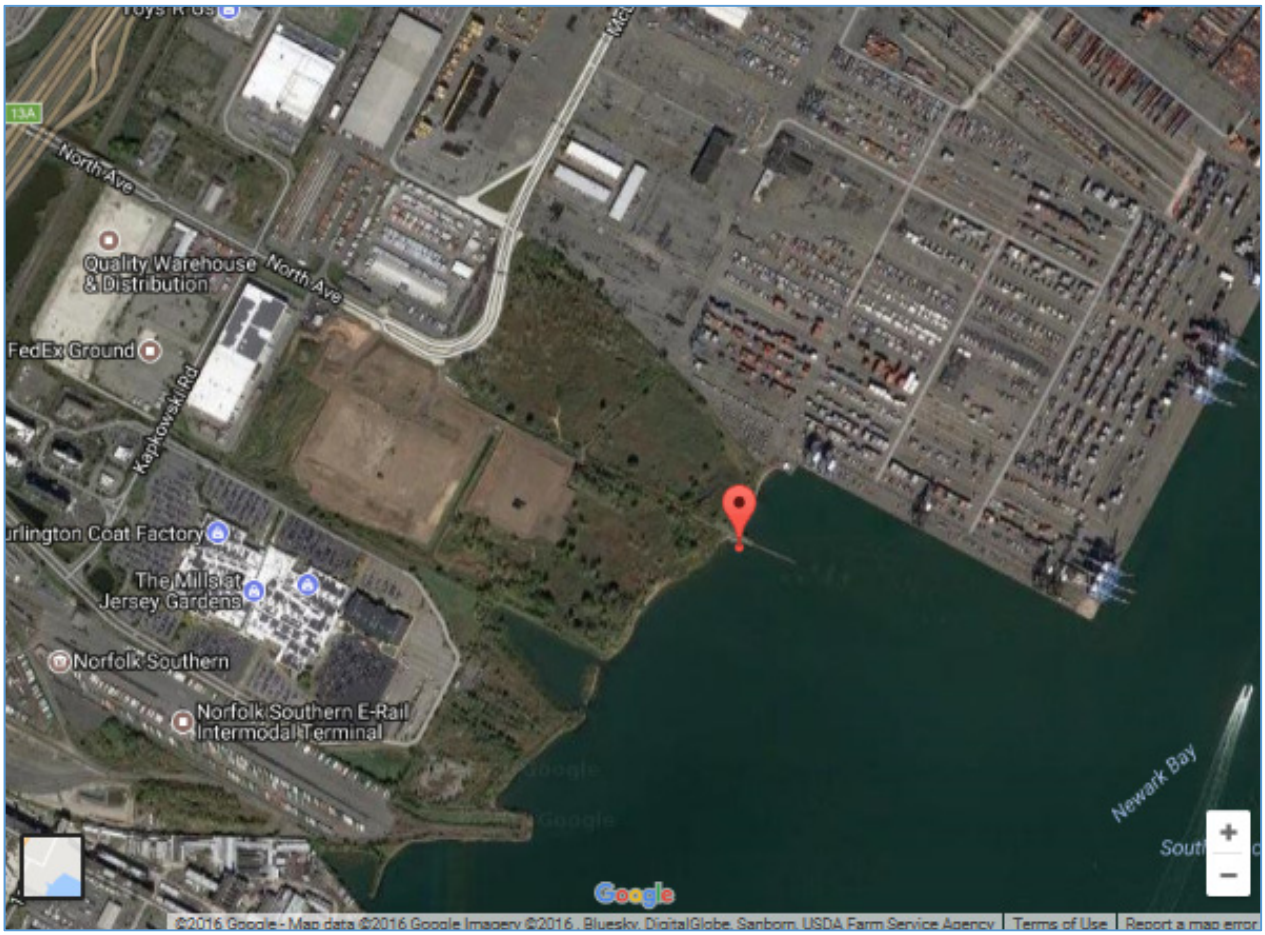
PROFILE #5 – ELIZABETH WATERFRONT

Facts at a Glance

Location	City of Elizabeth, Union County, on Newark Bay
Land Use	Vacant property adjoining Elizabeth-Port Authority Marine Terminal (Elizabeth Terminal), Norfolk Southern E-Rail Yard, and Jersey Gardens Mall, and Warehouse/Distribution uses
Marine Conditions	50' channel but little to no depth at shoreline
Access	Access via NJ Turnpike and North Avenue/McLester St. Poor pedestrian and bicycle access
Future Plans	Prologis is developing two major warehouse/distribution buildings on part of the site. Fedway Associates, a wines and spirits distributor, will occupy one of the buildings.

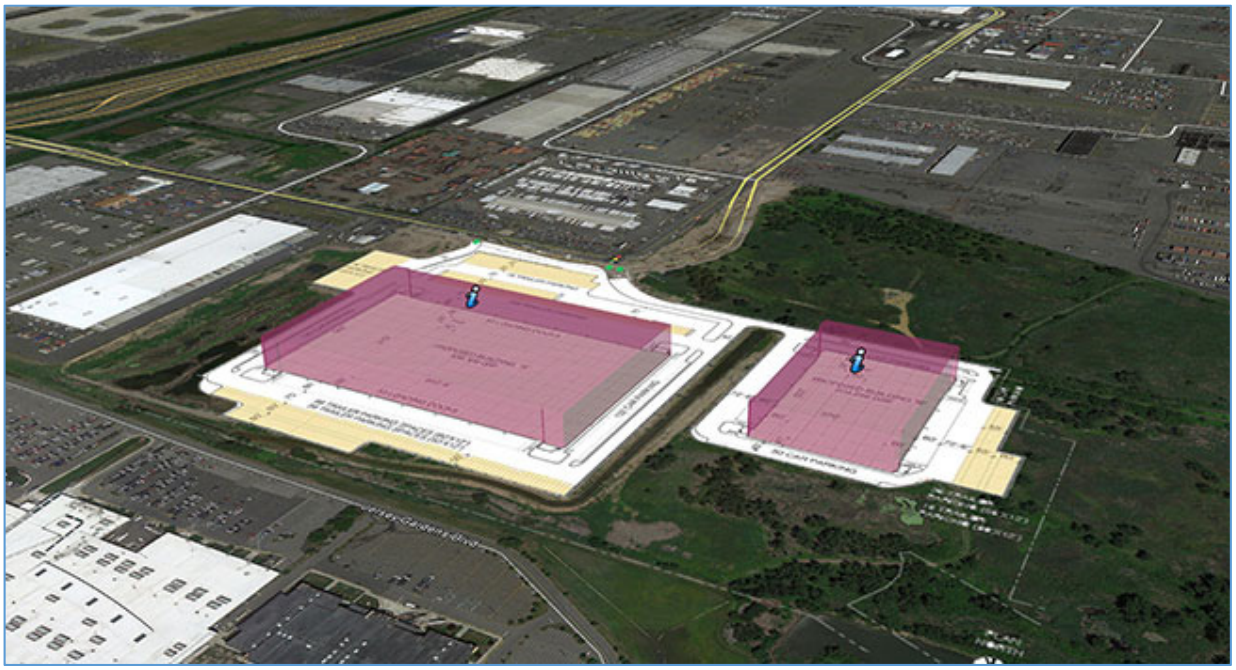
Site Location and Context

Elizabeth Waterfront Site – Image from Google Maps



The site (5A) is located on the southernmost portion of Newark Bay, just north of the confluence of the Arthur Kill and Kill van Kull. It formerly hosted Allied Signal, and has been through several owners since. Adjacent development has been intense, with: the massive Elizabeth Terminal complex to the north; the Jersey Gardens Mall to the south; the Norfolk Southern Express Rail (E-Rail) terminal to the south; and major warehouse/distribution uses (FedEx Ground, et al) to the west. Over the years, there have been proposals or suggestions, both formal and informal, for both passenger and freight-oriented waterborne services on the site. The current owner, Prologis, has branded the site "ProLogis Elizabeth Seaport" and is developing 72 acres of the site with two new buildings totaling over 742,000 sf of warehouse/DC space.[8] Fedway Associates, a wine and spirits distributor, will occupy the 539,000 SF larger building on the site.[9] The developer's plans for the remainder of the site, and for the possible inclusion or accommodation of waterborne freight or passenger uses, are not known at the time this project concluded in 2016.

ProLogis Elizabeth Seaport Development Concept (see http://elizabethseaport.com)



Marine Conditions

The site is along the main 50' channel serving Port Newark and Elizabeth Terminal but water depths at the site itself are extremely shallow. Waterside inspections were performed at the northern portion of the site, (5A), in front of the Prologis development area and the southern portion of the site (in front of the Jersey Gardens Mall).

The northern portion is comprised of a narrow timber pier extending from an undeveloped shoreline and heavily wooded upland. The remains of a timber fender system (see area "A" below) are located on each side of the pier and mooring hardware is in place along each upper edge. Two timber dolphins (pilings) are

[8] http://elizabethseaport.com
[9] http://www.njbiz.com/article/20160412/NJBIZ01/160419960/prologis-unveils-plans-for-new-fedway-distribution-center-in-elizabeth

located at each offshore corners. Water depths around the pier and along the undeveloped shoreline (see area "B" below) range from 6' to mud flats. No additional structures exist along the waterfront.

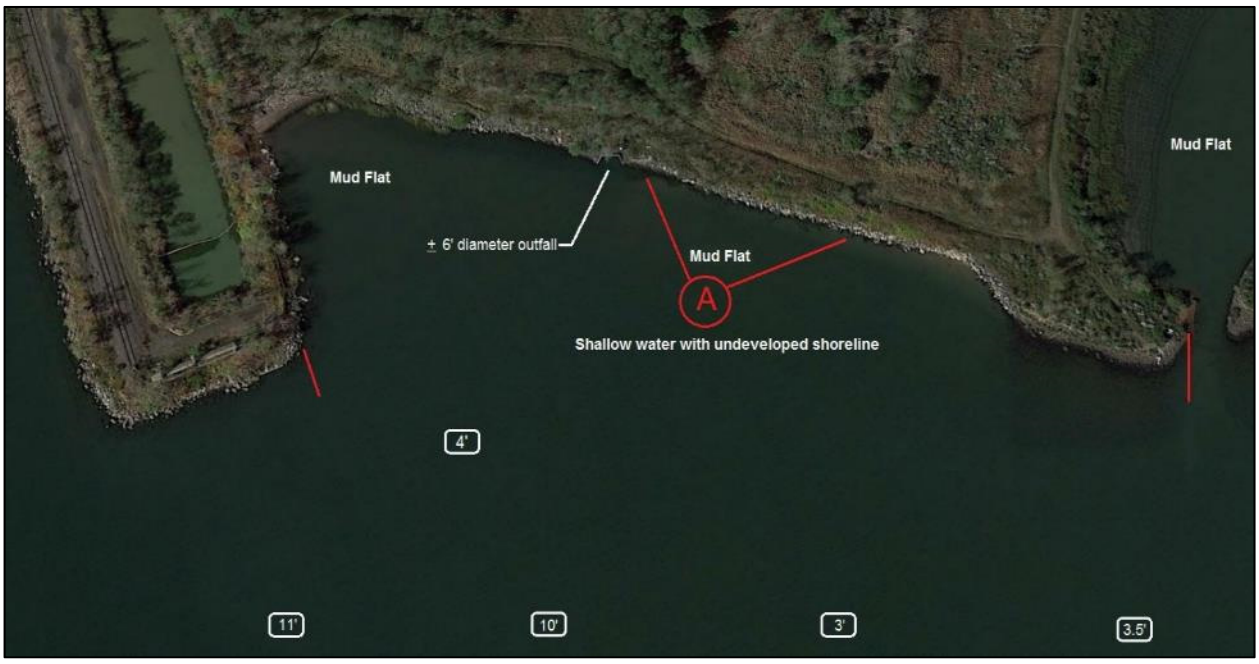
Elizabeth Waterfront Site, Northern Portion – Inspections and Depth Soundings

Elizabeth Waterfront – Timber Pier at North End of Site

Elizabeth Waterfront – Undeveloped Upland and Shoreline with Shallow Water on Northern Portion of Site

The southern portion of the site (5B), in front of Jersey Gardens Mall, is an undeveloped shoreline with erosion protection provided by riprap (crushed) stone. The upland is undeveloped and heavily wooded. A large diameter concrete outfall structure is located at the midpoint of the shoreline. No other structures exist at the site. At low water conditions, a mud flat is exposed along the shoreline to approximately one hundred feet offshore. Beyond the mud flats, offshore water depths are shallow through the north and midpoints of the site, but begin to drop off sharply toward the south approaching the navigation channel of the Arthur Kill.

Elizabeth Waterfront Site, Northern Portion – Inspections and Depth Soundings



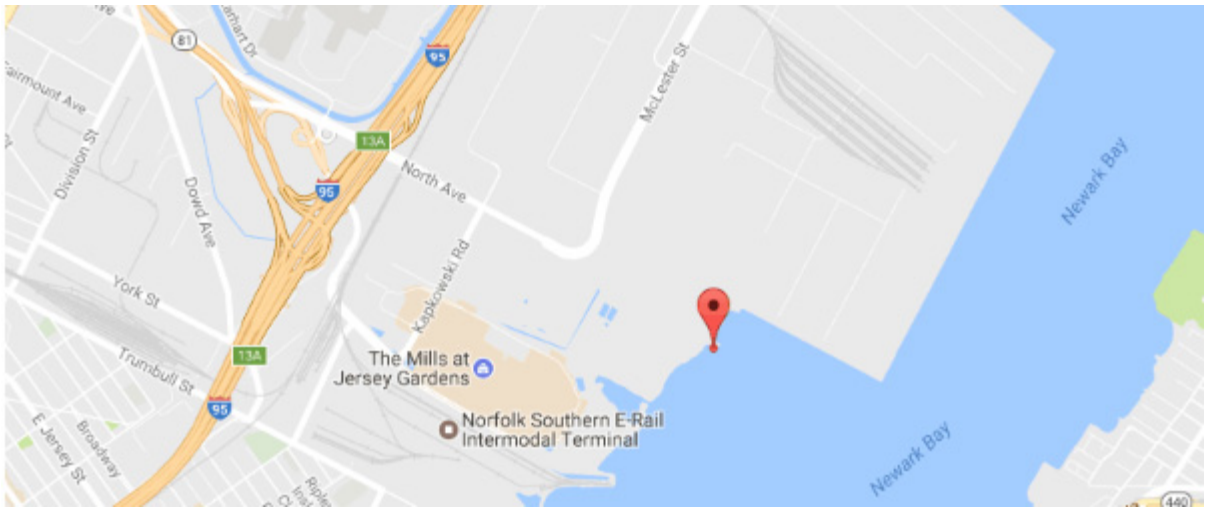
Elizabeth Waterfront – Undeveloped Upland and Shoreline at Southern Portion of Site

Elizabeth Waterfront – Large Diameter Outfall Located Along Shoreline of Southern Portion of Site

Landside Access

The site has direct vehicle access, just off the New Jersey Turnpike via North Avenue and McLester Street, though its capacity to support growth forecast for port activity and other existing and new developments is a perennial concern. It offers poor pedestrian and bicycle conditions to the surrounding area due to the high concentration of truck traffic in the area; however, there is considerable pedestrian activity at Jersey Gardens Mall, adjacent to the waterfront.

Highway Access – Map Image from Google Maps



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that freight or passenger vessel operations could be a moderate concern, due to the number of very large ships utilizing the channel in front of the site, but this can be addressed with proper operational practices.

This site offers many opportunities. It could host freight operations (container barge, project cargo, or even a truck-on-barge ferry) at the north end; it could host freight operations (rail-on-barge ferry) or passenger operations (ferry to Jersey Gardens) at the south end. But it also has significant questions – is the undeveloped portion of the site easily developable based on dredging or other environmental considerations? Is there sufficient demand to support or warrant any of these service opportunities? Does waterborne service fit with the owners' future development plans? All of these issues warrant further exploration.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #6 – TREMLEY POINT

Facts at a Glance

Location	City of Linden, Union County, on the Arthur Kill
Land Use	Three large development sites (GAF/ISP, Cytek, and DuPont/Grasselli Point Industries) adjoining active petrochemical facilities and utilities
Marine Conditions	35' maintained channel on the Arthur Kill (Cytek and Grasselli); measured berth depths 18 to 30' at Cytek; estimated berth depth 9' at Grasselli; 9' measured channel on the Rahway River (Cytek and GAF/ISP)
Access	The sites are physically close to the Turnpike but access is very circuitous. This will be remedied with construction of Tremley Point Connector Road. The Connector Road will provide access from Turnpike Interchange 12 through Carteret, over the Rahway River, and into Tremley Point. The project will reduce impacts on local neighborhoods and should encourage a wide range of freight development on Tremley Point. Project planning is well underway and has been transferred from the NJ Turnpike Authority to NJDOT, which has the funding for construction.
Future Plans	Major warehouse/distribution development planned at GAF/ISP with marketing underway; Grasselli being actively marketed for sale and development

Site Location and Context

Tremley Point is the area bounded by the Arthur Kill to the east and the Rahway River to the south, between the Goethals Bridge and the Outerbridge Crossing. There are many industrial properties concentrated in this area, including the former GAF/ISP, Cytek Industries, and DuPont/Grasselli Point Industries sites.

- The Cytek site (6A) is directly east of GAF and has frontage on both the Arthur Kill and the Rahway River, including historic marine structures. The upland and waterfront structures are inactive and are no longer maintained. The waterfront is comprised of a variety of collapsing, pile supported concrete structures and failing bulkheads. Security fencing has been installed along the waterfront.
- The DuPont/Grasselli Point Industries site (6B) is located approximately one mile north of the Cytek site, along the Arthur Kill. The site has been cleared and extensively remediated; the shoreline is in largely unimproved condition, apart from a small berthing platform and an abandoned liquid bulk vessel tie-up. The site is being actively marketed for sale, and offers 106 usable acres from a total area of 210 acres.[10] The ultimate buildout potential of the site is unknown.
- The GAF/ISP site (6C) is located at the southern portion of Tremley Point. It abuts unimproved water frontage along the Rahway River, with no structures for marine transportation. In 2014, Goodman Development received approval to construct five new buildings totaling more than 2.8 million square feet on the site. The properties are currently being advertised for lease.[11]

[10] http://nj.gov/state/planning/docs/21_Linden-DuPont.pdf

[11] http://www.nj.com/union/index.ssf/2014/06/international_developer_planning_huge_linden_warehouse_complex.html; http://www.loopnet.com/xNet/LoopLink/Profile/Profile.aspx?LID=19625022&STID=cassidyturley/newjersey

Locations of GAF/ISP, Cytek, and Grasselli Point Development Areas – Image from Google Maps

Detail of Grasselli Point Development Area (Source: CBRE)

Marine Conditions

Cytek and Grasselli are both on the Arthur Kill, a heavily-used shipping channel authorized and maintained at 35 feet. The Grasselli site was not inspected, but NOAA charts suggest the depth near the shoreline to be around 9 feet. The water frontage appears to be primarily unimproved rubble, save for a small berthing platform (in apparent disrepair) and one liquid bulk vessel loading berth. The Cytek site

was inspected. Water depths alongside are berthing areas are good, at 16 to 30 feet. The site has one large timber pile and two pile supported berthing platforms, and various smaller platforms, all in poor condition. The southern exposure of the site, along the Rahway River, is comprised of a collapsed concrete platform and failing bulkheads.

Cytek Industries Site – Inspections and Depth Soundings

Cytek Industries Site – Pipe Pile Supported Concrete Platform and Timber Dolphins at Southeast Corner of Property

Cytek Industries Site – Pipe Pile Supported Wharf with Timber Piling Fender and Mooring fixtures

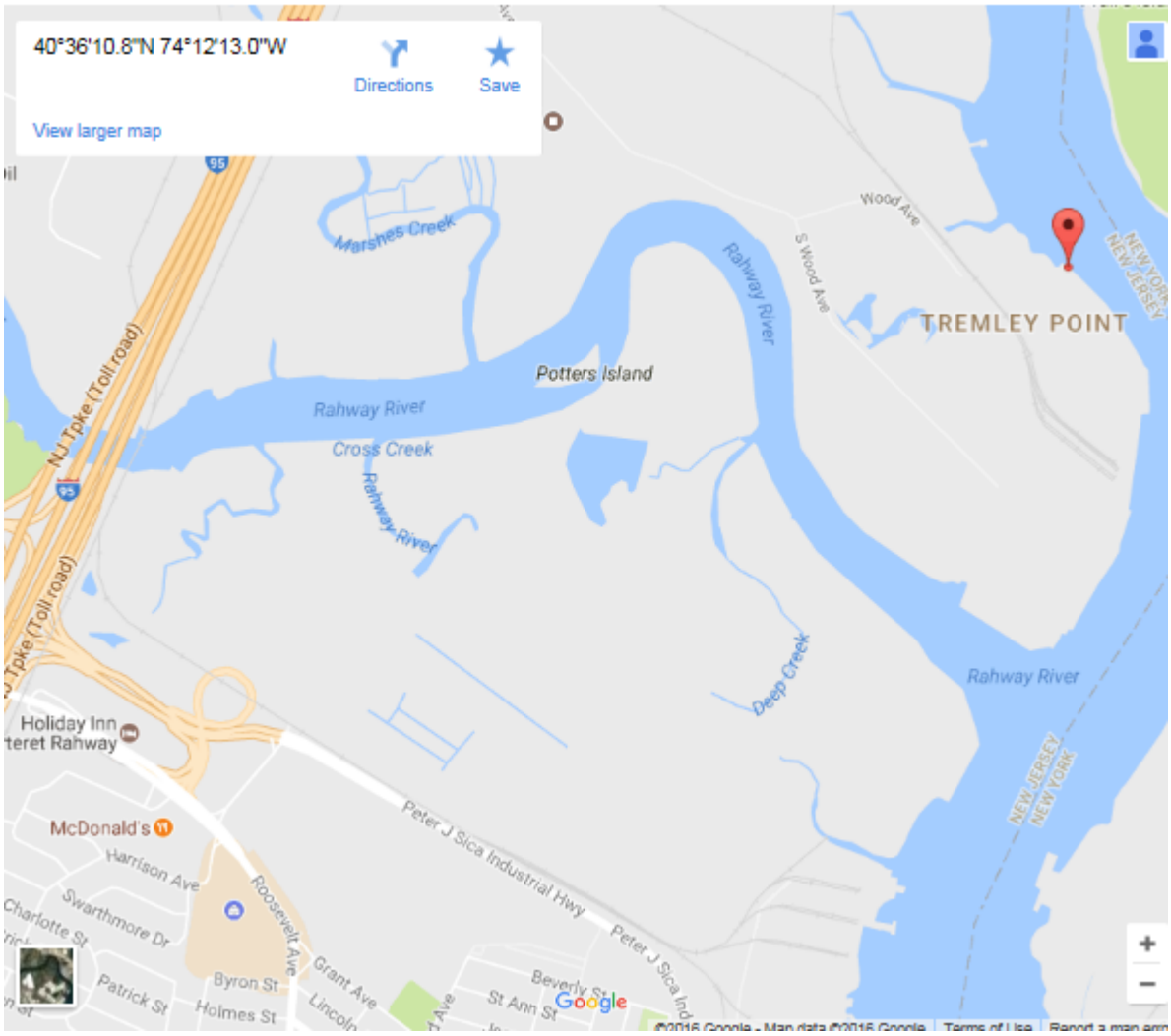
Cytek also has waterfrontage on the Rahway River, as does the GAF/ISP site. CH2m Inc. measured current channel depths in the Rahway River at 7 to 9 feet, with depths at potential berthing areas of generally between 0 and 4 feet.

Landside Access

The three sites are each less than 1.5 miles from the New Jersey Turnpike, but can only access the Turnpike indirectly via US 1 & 9 and (primarily) Wood Avenue, which traverses residential areas of Linden. To address this condition, the NJDOT is advancing development of a four-lane, 1.1 mile connector road and bridge from the Peter J. Sica Industrial Highway (off Exit 12 in Carteret, south of the Rahway River), running north across the Rahway River, and connecting to Tremley Point Road.[12] This will substantially improve highway access for all three sites, while reducing trucking impacts in neighborhoods.

[12] http://www.nj.gov/turnpike/our-projects-tremley-point.html

Tremley Point in Relation to Exit 12 and Peter J. Sica Industrial Highway –– Map Image from Google Maps



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that on this reach of the Arthur Kill, there is typically a high need for berth maintenance dredging. In the case of Cytek this is fortunately not an issue, although further investigations would be required at Grasselli Point. Vessel operations in the Arthur Kill can be challenging due to high volumes of barge and tanker traffic, so appropriate cautions must be taken, but navigation occurs routinely in these waters and the procedures for safe operation are well-established. Given their size and position on the Arthur Kill, along with the prospect of substantially improved highway access, both Cytek and Grasselli Point appear very well-suited to accommodate marine freight barge activity. To the best of our knowledge, development plans for these sites have not been finalized, so the integration of marine activities remains possible.

If the GAF/ISP and Cytek sites are jointly developed, the GAF/ISP site could utilize the Cytek Arthur Kill water frontage; if not, it could utilize its own Rahway River frontage. The Rahway River is not deep, but was recently measured at up to 9 feet in depth, which is sufficient for bulk barges; some channel deepening

would likely be required, and berth deepening would definitely be required, along with the construction of new berthing structures. Development plans are in place for this site and do not currently include marine activity, but it is physically possible to provide it, if desired.

Overall, Tremley Point offers appears to offer an attractive combination of large development parcels, excellent truck access (with the Connector Road), rail access, and waterfront access. Further discussions with property owners and developers appear warranted to explore marine freight service and multimodal development opportunities, including the strong potential for "freight village" type projects integrating water, rail, truck, warehouse-distribution, and other value-added freight and industrial activities.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #7 – CARTERET WATERFRONT PARK

Facts at a Glance

Location	Borough of Carteret, Middlesex County, on Arthur Kill
Land Use	Waterfront Park and Marina Adjacent to developed industrial waterfront and undeveloped waterfront, near residential and commercial areas of Carteret
Marine Conditions	35' authorized channel, 24' current berth depths
Access	Access via Waterfront Access Road, connecting to Peter J. Sica Highway, which connects to Roosevelt Ave. (for local access) and the New Jersey Turnpike (for regional access). Accessible by pedestrians and bicycles, and within 1 mile of bus transit, but not walkable to rail transit.
Future Plans	Carteret is planning a passenger ferry terminal and service at the site. Design engineering and NEPA investigations are underway.

Site Location and Context

Carteret Waterfront Park Ferry Site – Image from Google Maps

The Carteret Waterfront Park Site (7) is located on the west bank of the Arthur Kill on the eastern edge of Carteret. It is bounded by developed industrial shoreline to the south, undeveloped shoreline to the north, and residential and commercial users to the west. The site supports a newly completed public park, pier and promenade, municipal boat launch and parking plaza. Four breasting panels and two steel mono-piles fitted with mooring hardware have been installed on the offshore face of the pier in preparation of receiving mid-sized vessels. A steel H pile supported trestle extends from the south end of the pier, forming the offshore border for a natural, undeveloped cove. Two parallel rows of timber piles border the south side of the cove. A municipal boat launch and landing are located at the north end of the pier, with vehicle and boat trailer parking provided upland. The site has parking, a fishing pier, a fitness trail, and other amenities.

Carteret Waterfront Park Ferry Site – Image from Google Maps

Carteret has been planning a passenger ferry service to run north through the Arthur Kill, then east through the Kill Van Kull, then through New York Harbor to Lower Manhattan. The trip is estimated to take 25 minutes. Ferry terminal development is intended to support residential/mixed use development of available waterfront and surrounding areas. Carteret has retained a consultant for design engineering. The development program includes marine facilities for docking and passenger loading/unloading, a ticketing building, and a 350-car parking lot,[13]

[13] http://www.ci.carteret.nj.us/content/2861/3563/3571.aspx. Accessed 12/18/2016.

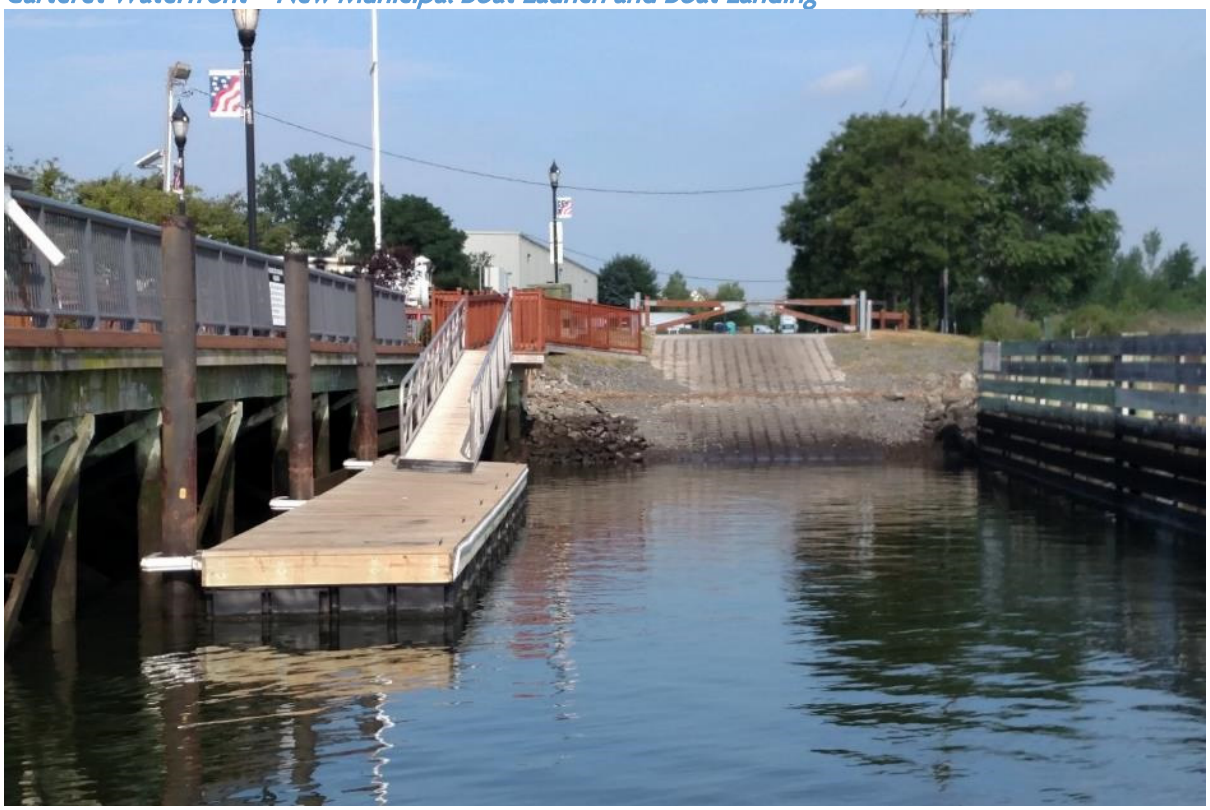
Marine Conditions

A waterside inspection was performed at the Carteret Waterfront Park site. Reference area "A" below is municipal boat launch and small boat landing; area "B" is a free standing timber pier with berthing capabilities; and area "C" is a steel pile trestle and promenade. All are in new condition. The site adjoins the Arthur Kill, a federally-authorized channel maintained at 35 feet. Depths at the site are between 17' and 19' feet, which is more than sufficient for passenger ferry vessels.

Carteret Waterfront Park Ferry Site – Inspections and Depth Soundings

Carteret Waterfront – New Timber Pier with Breasting Panels and Hardware for Mid-Sized Vessel Berthing Capabilities

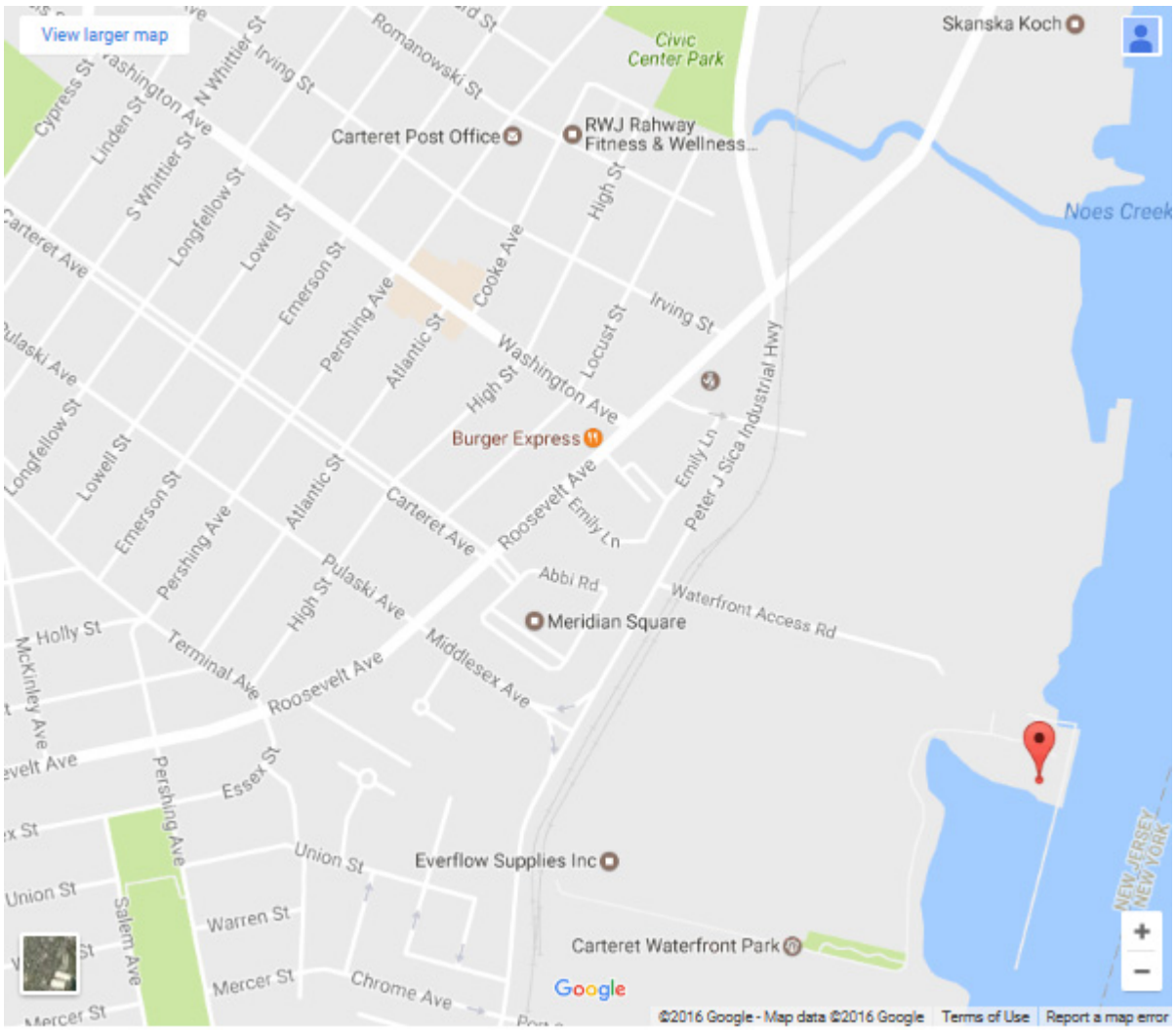
Carteret Waterfront – New Municipal Boat Launch and Boat Landing



Landside Access

The Carteret Waterfront Park Site is served by Waterfront Access Road, just off Peter J. Sica Highway, which connects to Roosevelt Ave. for local access and the New Jersey Turnpike for regional access. The site has existing parking and more is planned; it is within one mile of passenger bus service; and it is accessible to pedestrians and bicycles. There is no nearby rail transit service.

Access to Carteret Waterfront Park – Map Image from Google Maps



Peter J. Sica Highway at Waterfront Access Road -- Image from Google Maps

Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee suggest several areas of attention. While the Arthur Kill is a deep and well-maintained channel, many of the sites adjoining require significant berth dredging; however, as inspections show, this site offers good water depths. The remaining issues involve the operation of passenger vessels within the Arthur Kill and Kill van Kull, constricted waterways that are heavily used by some of the largest marine cargo vessels on the US East Coast. Containerships accessing Port Newark and Elizabeth Terminal must traverse the Kill van Kull, while the Arthur Kill is heavily used by petroleum tankers, fuel barges, and other bulk vessels. Carteret is aware of these issues and has plans to address them.

The consultant team performed a very high-level analysis of potential demand for a passenger ferry service to lower Manhattan, based entirely on existing commute patterns reported in US Census Journey to Work data. At market capture rates of 7.5% to 15.0% of daily commuters, this ferry might expect to see between 520 and 1,039 riders per day. These numbers could be higher or lower depending on the price per ride and the price of parking. These numbers do not include the effect of potential additional new development within walking distance of the terminal, which could be a substantial market capture opportunity for the service.

Assuming that vessels can be operated safely and reliably on the planned route, the consultant team has concluded that no apparent impediments to development of a passenger ferry terminal and service exist at this site. The land is available; highway access has been provided for; pedestrian, bicycle, and bus transit connections exist, a base of provable demand exists; vessel operation seems viable; and planning to implement the service is underway.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #8 – TUFTS POINT / PORT READING

Facts at a Glance

Location	Carteret, Middlesex County, on the Arthur Kill (Tufts Point), Woodbridge Township, Middlesex County, on the Arthur Kill (Port Reading)
Land Use	Sites within well-developed industrial areas where "marine freight infill" uses could potentially be introduced
Marine Conditions	35' maintained channel; berth depths unknown
Access	Excellent vehicle access via New Jersey Turnpike Exit 12
Future Plans	Not known

Site Location and Context

Tufts Point and Port Reading – Image from Google Maps

There are two sites of potential interest located south of the Carteret Waterfront Park.

- One site is Port Reading (8A). Port Reading is an active Conrail railyard on property leased from Prologis. Given its location on the water, it could potentially provide rail "car float" service for New Jersey, as a supplement to the existing car float operation at Greenville Yard in Bayonne. The concept of adding a water connection to the existing rail service has not been discussed with Norfolk Southern.

- The other site is Tufts Point (8B). Tufts Point is at a bend in the Arthur Kill. In 2015, Amazon opened a massive new fulfillment center on the site, but development left an area of approximately 20 acres undeveloped next to the waterfront. The owner/developer plans for this "leftover" site are not known, but it could be an excellent size and configuration for a marine freight barge operation.

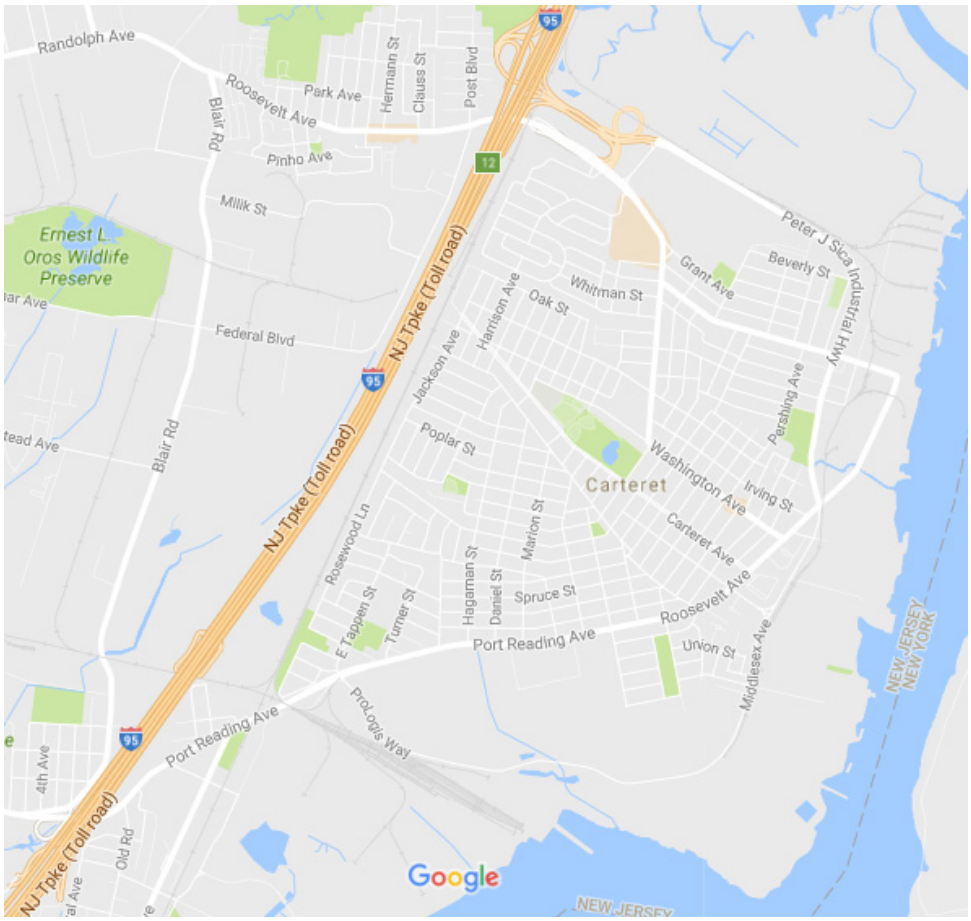
Marine Conditions

The Arthur Kill is a heavily used main shipping channel maintained at 35'. Depths alongside Tufts Point and Port Reading have not been determined through investigation,

Landside Access

The two sites are extremely well-located for vehicle access via the New Jersey Turnpike Exit 12, connecting to the Peter J. Sica Industrial Highway, from which both sites can be reached via Port Reading Avenue and ProLogis Way or Port Reading Road.

Highway Access – Map Image from Google Maps



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that on this reach of the Arthur Kill, there is typically a high need for berth dredging. Dredging investigations have not been performed for either site. Vessel operations in the Arthur Kill can be challenging due to high volumes of barge and tanker traffic, so appropriate cautions must be taken, but navigation occurs routinely in these waters and the procedures for safe operation are well-established.

The potential opportunities identified in this Profile are: a marine freight barge at Tufts Point; and a rail car float connection at Port Reading. At this time, neither site owner has been contacted to discuss the concepts, but that could be a next step if there is interest in pursuing the opportunities further.

Whether or not these concepts advance, they are useful illustrations of opportunities for "marine freight infill" development – finding "leftover" space and "missing" connections in established, highly developed areas, and then matching them with potentially suitable marine freight uses.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #9 – BAYSHORE RECYCLING CORPORATION

Facts at a Glance

Location	Keasbey (unincorporated), Middlesex County, on the Raritan River
Land Use	Recycling and project cargo handling terminal with extensive marine cargo use, located between major highways and other industrial properties
Marine Conditions	25' authorized channel currently at 17'
Access	Excellent vehicle access via NJ Turnpike, I-287/NJ440, and (for workforce) the Garden State Parkway; less amenable for pedestrian and bicycle access
Future Plans	Owner plans to expand marine cargo handling

Site Location and Context

Bayshore Recycling Center Site – Image from Google Maps

Bayshore Recycling Corporation (9) is a diversified handler of construction materials, soils, and other recyclables, with an emphasis on environmental sensitivity. It is located on the Raritan River, just west of the Garden State Parkway Driscoll Bridge, about 1.5 miles north and east of Raritan Center. Bayshore uses truck, barge, and rail services to move materials inbound and outbound. For barge shipments, there is a T-shaped pier approximately 625 feet in length.

Bayshore Recycling Center Site Detail with "T" Pier – Image from Google Earth

Bayshore is also performing construction activities on site, including the fabrication of building modules. These modules will be moved -- via barge -- to the New York City waterfront for final assembly.

Building Module under Construction

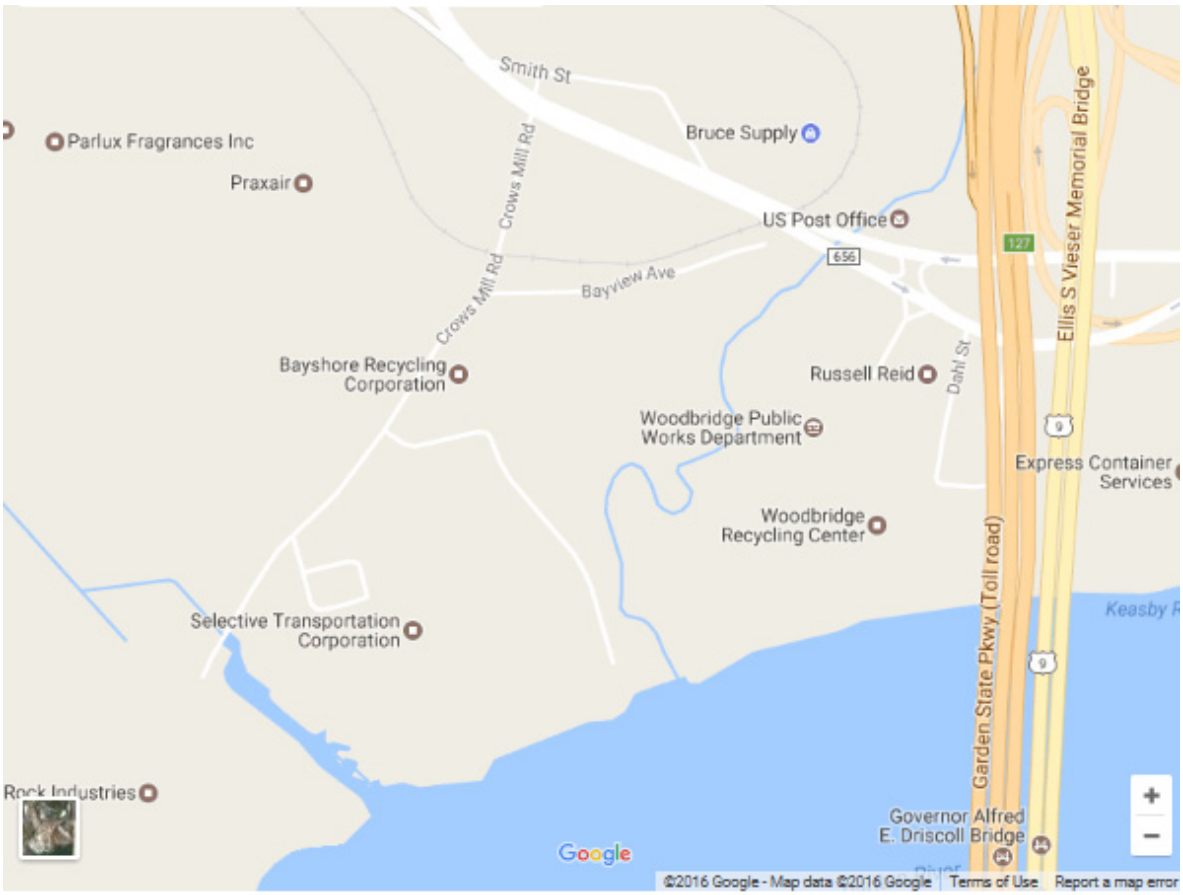
Marine Conditions

This reach of the Raritan River is authorized to 25' but currently offer 17'. Berth depths at Bayshore Recycling are not known, but appear adequate for present operations.

Landside Access

The site is extremely well-located for vehicle access via the New Jersey Turnpike, I-287/NJ 440, and (for passenger vehicles) the Garden State Parkway. It offers generally poor pedestrian and bicycle access conditions due to the scale of development and the distance to the waterfront from major roads.

Highway Access – Map Image from Google Maps



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that freight vessel accessibility could be a moderate concern due to the horizontal and vertical bridge clearances in the Raritan River. The vessel path to the Raritan Center wharf passes under several bridges, including an NJ TRAINSIT rail lift bridge known as River Draw. River Draw is planned for replacement and will provide 110' of vertical clearance in the "up" position – similar to the Edison Bridge (US 9) and Victory Bridge (NJ 35).

Bayshore Recycling is a current user of freight barge and freight rail services, and would like to increase its use of these modes as alternatives to trucking. As its business grows and evolves, it may look to implement transportation infrastructure improvements, which could represent public-private investment opportunities.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

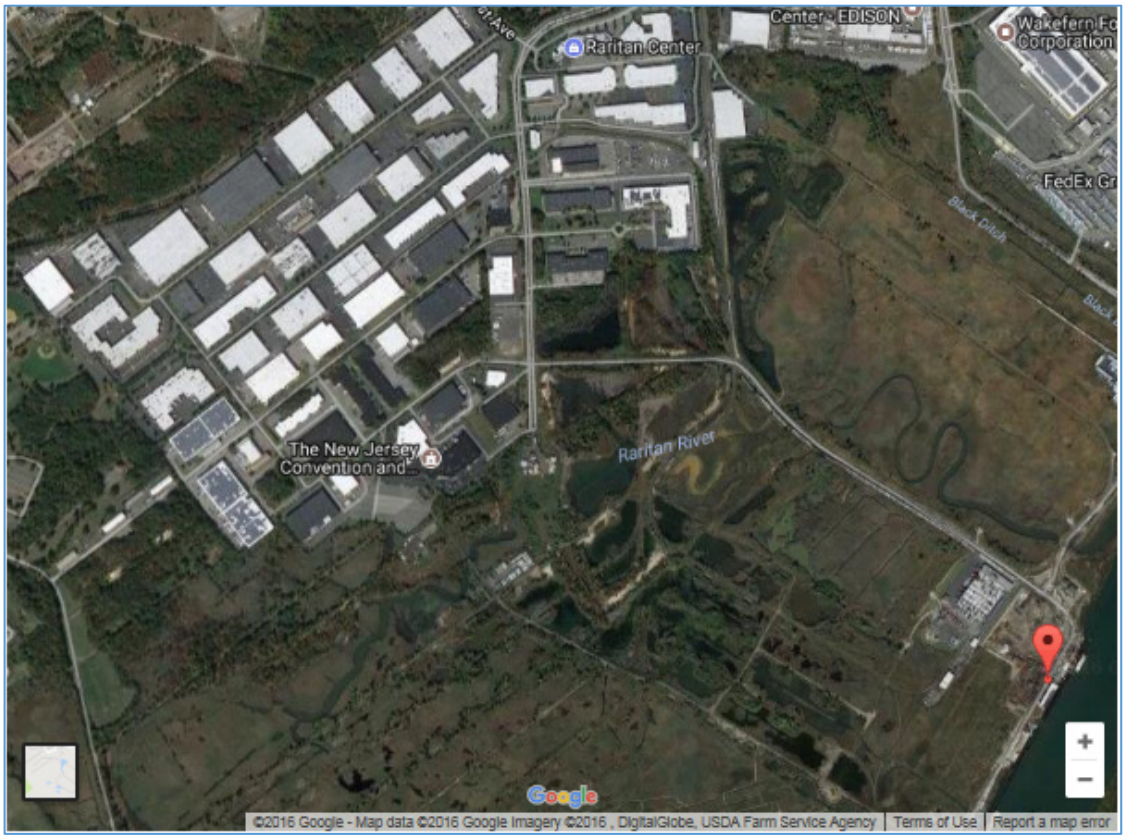
PROFILE #10 – RARITAN CENTER (FEDERAL BUSINESS CENTERS)

Facts at a Glance

Location	Township of Edison, Middlesex County, on the Raritan River
Land Use	Master-planned industrial developed property focusing on truck-oriented tenants, adjoining similar uses and undeveloped wetlands
Marine Conditions	Historic 2,200' timber pile wharf; 25' authorized channel currently at 17', with 16' to 22' measured depth along wharf face. Removal of unexploded munitions has taken place and certified ordinance free by the USACE.
Access	Excellent vehicle access via NJ Turnpike, I-287/NJ440, and (for workforce) the Garden State Parkway. Port Newark Marine Terminal is within 20 miles of Raritan Center via Turnpike. The site is less amenable for pedestrian and bicycle access.
Future Plans	Owner plans to accommodate a current maritime user and indicates it will consider future maritime users if opportunities arise.

Site Location and Context

Raritan Center Site – Image from Google Maps



Federal Business Centers' Raritan Center Business Park (10) includes 2,350 acres with nearly 15 million square feet of office, warehouse/distribution, other business space, and amenity uses such as hotels, banks, and restaurants. Most of the developable land within the overall property is located well back from the Raritan River frontage, but a small portion of the site (around 12 acres) is located next to the river and currently handles marine cargo. Federal Business Centers plans to accommodate the existing maritime tenant (a barge contractor), and does not currently have plans to expand the use of waterborne freight at the site, but is open to such opportunities if they arise.[14]

Federal Business Centers is a designated Free Trade Zone, meaning that companies that import goods or raw materials to buildings on the property can (a) defer import tariffs on the goods until such time as finished products are sold within the United States and (b) avoid import tariffs altogether on finished goods that are re-exported to countries outside of the United States.

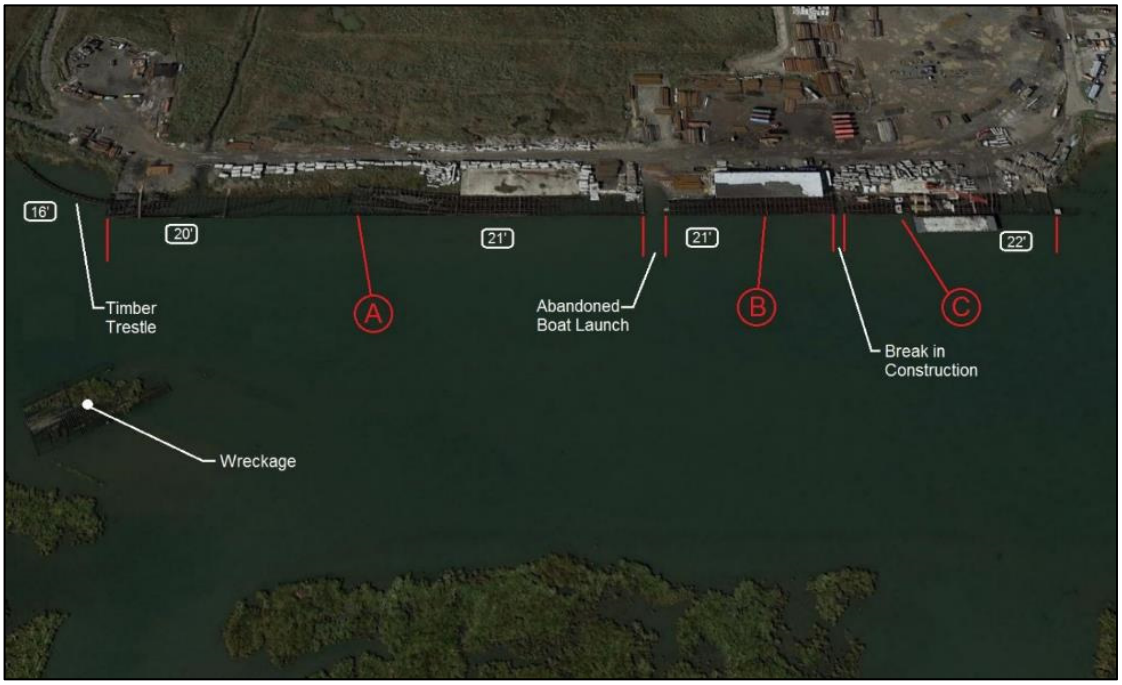
Raritan Center Site, Marine Cargo Handling Area and Historic Wharf – Image from Google Earth

Marine Conditions

The marine cargo-handling portion of the site is located on the north bank of Raritan River, approximately 1.8 miles west of New Jersey State Parkway Driscoll Bridge. This reach of the Raritan River has an authorized channel depth of 25' but currently provides only 17', which is adequate for barge traffic. Along the wharf face, the site offers good berth depths of 16 to 22 feet. The site is primarily comprised of a high level timber wharf, approximately 2,200 feet long, constructed along the shoreline. A bulkhead that once retained upland fill has failed along the entire length of the structure and the wharf now stands independent of a naturally sloping shoreline. The deck of the wharf no longer exists, resulting in a field of the timber piles, pile caps and bracing. Multiple areas of fire damage are apparent throughout the remaining structure. Barges currently moor outboard of the timber piles, and shore cranes transfer cargo over them.

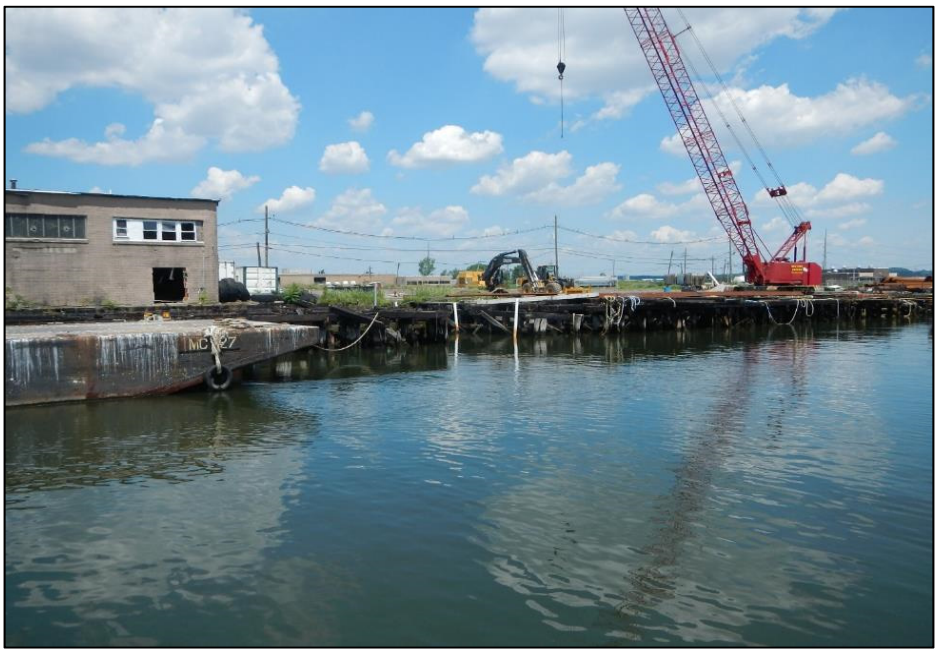
[14] http://federalbusinesscenters.com/ and personal communications with Federal Business Centers management

Raritan Center – Inspections and Depth Soundings



Raritan Center – West End of Abandoned Wharf Structure

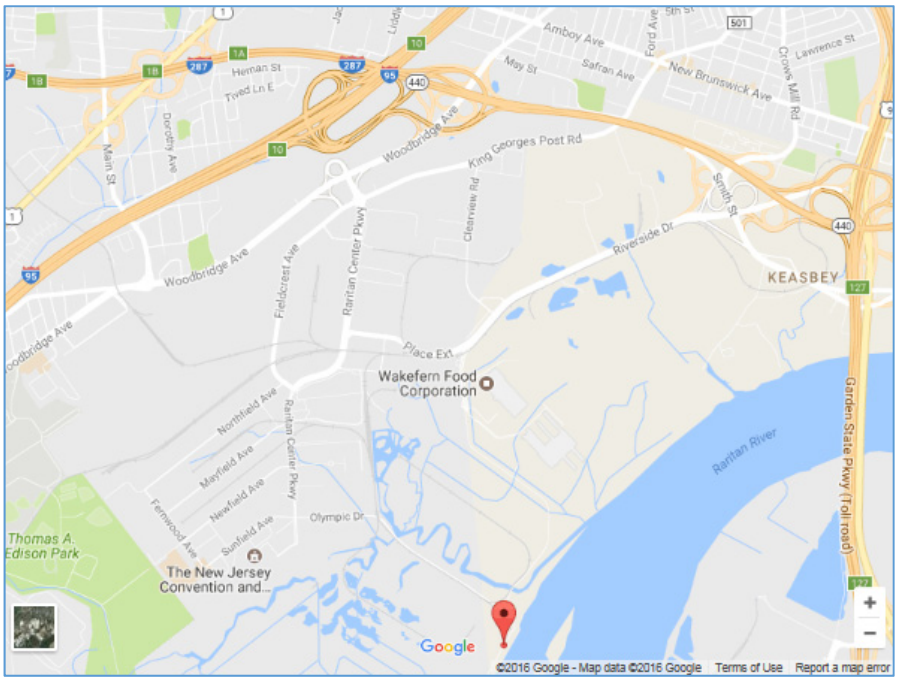
Raritan Center – East End of Abandoned Wharf Structure with Active Marine Operations



Landside Access

The site is extremely well-located for vehicle access via the New Jersey Turnpike, I-287/NJ 440, and (for passenger vehicles) the Garden State Parkway. It offers generally poor pedestrian and bicycle access conditions due to the scale of development and the distance to the waterfront from major roads.

Highway Access – Map Image from Google Maps



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that freight vessel accessibility could be a moderate concern due to the horizontal and vertical bridge clearances in the Raritan River. The vessel path to the Raritan Center wharf passes under several bridges, including an NJ TRANSIT rail lift bridge known as River Draw. River Draw is planned for replacement and will provide 110' of vertical clearance in the "up" position – similar to the Edison Bridge (US 9) and Victory Bridge (NJ 35). Another development factor is the history of the site. It was formerly the Raritan Arsenal, and there was a period of concern regarding the potential impacts of unexploded ordnance on marine cargo operations. The Federal Business Centers managers indicate that this issue has been investigated and the Army Corps of Engineers has deemed the berth length and its approaches safe.

The site has strong maritime freight possibilities. Some or all of historic 2,220 foot timber pile wharf could be reconstructed without a lengthy permit process, since it is an existing structure; the site requires no dredging; and at least 12 and perhaps as much as 20 acres could be available for continued or expanded maritime freight uses, should a suitable opportunity arise.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

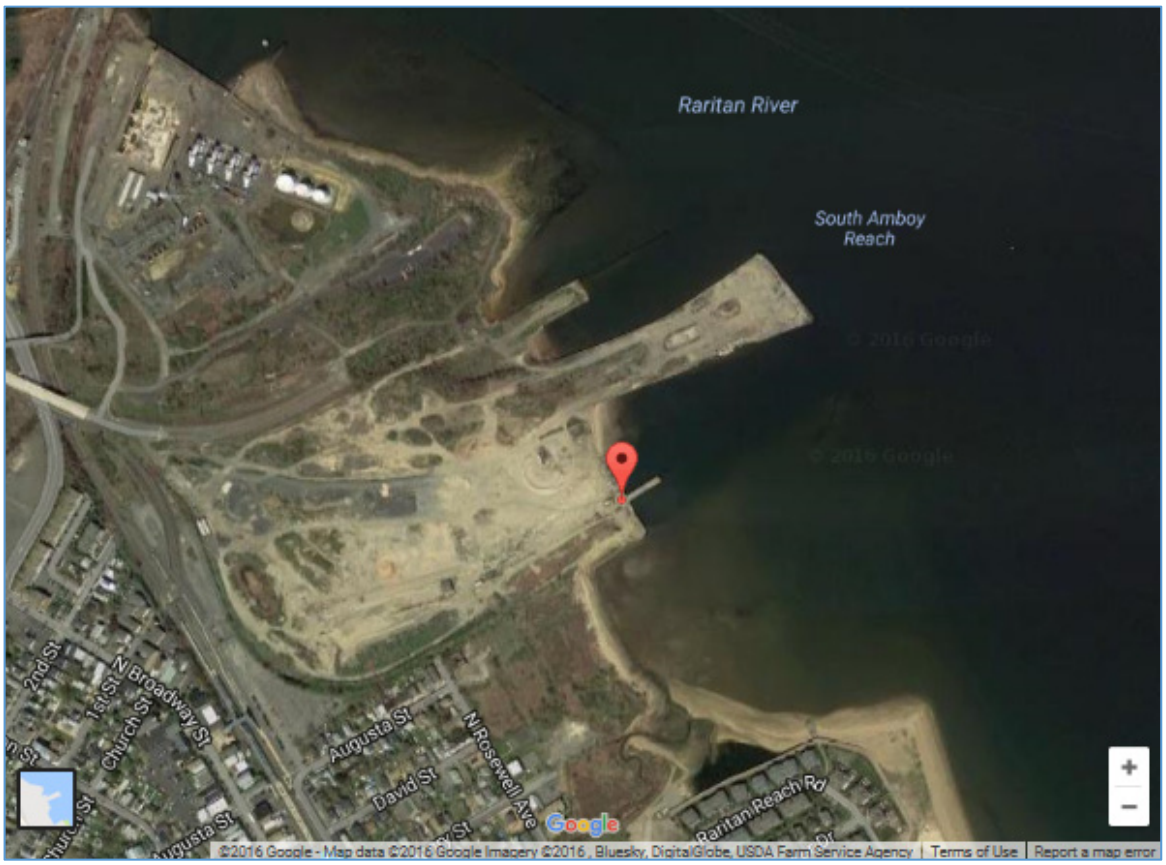
PROFILE #11 – SOUTH AMBOY SITE

Facts at a Glance

Location	City of South Amboy, Middlesex County, on Raritan Bay
Land Use	Vacant property close to downtown South Amboy Adjacent to undeveloped waterfront, near residential and commercial uses
Marine Conditions	25' authorized channel, 11' current berth depths, no developed berths
Access	New connecting road from Main Street recently built Potential for site improvements to provide 1 mile walking distance to NJ TRANSIT, Bus Routes, and Downtown South Amboy
Future Plans	City of South Amboy is developing a passenger ferry terminal and service at the site. Phase I Federal funding is secured. Site development will also include major residential development. No obvious challenges to implementation.

Site Location and Context

South Amboy Ferry Site – Image from Google Maps



The South Amboy Ferry Site (11) is located on the south bank of Raritan Bay, approximately .8 miles east of the NJ TRANSIT railroad bridge. The upland area at the site is undeveloped and overgrown. The shoreline throughout the site is a mix of sand and mud that form a natural cove that has silted in. A concrete seawall defines the east border of the site, and protects against erosion of upland residential properties. The west end of the site returns offshore at a revetment of concrete rubble and sheet pile. During low water conditions, a sand bar is exposed at the east end of the cove. The sand bar forms a tidal pool and encompasses over half the shoreline of site.

The site is located north and west of downtown South Amboy. It is bounded by undeveloped shoreline and backland along the immediate waterfront, and residential development further west and south. Historically, the site was used for handling sand by barge. Today, the site is cleared and ready for development.

According to South Amboy officials, the necessary permits for development of a passenger ferry terminal and service have been secured, and planning studies necessary to advance development are imminent. FHWA has authorized more than $2 million in funding for Phase I construction of the Ferry Terminal, including Licensed Site Remediation Services. The ferry service is planned to run to Lower Manhattan in around 40 minutes, and the site is expected to provide a minimum of 500 parking spaces for commuters, although the exact number is to be determined. Additionally, approximately 1,700 new residential units are also planned on the site, with the possibility of more units in the future. New York Waterway has provided a letter of commitment to operate the service, but an operator has not yet been formally designated. [15]

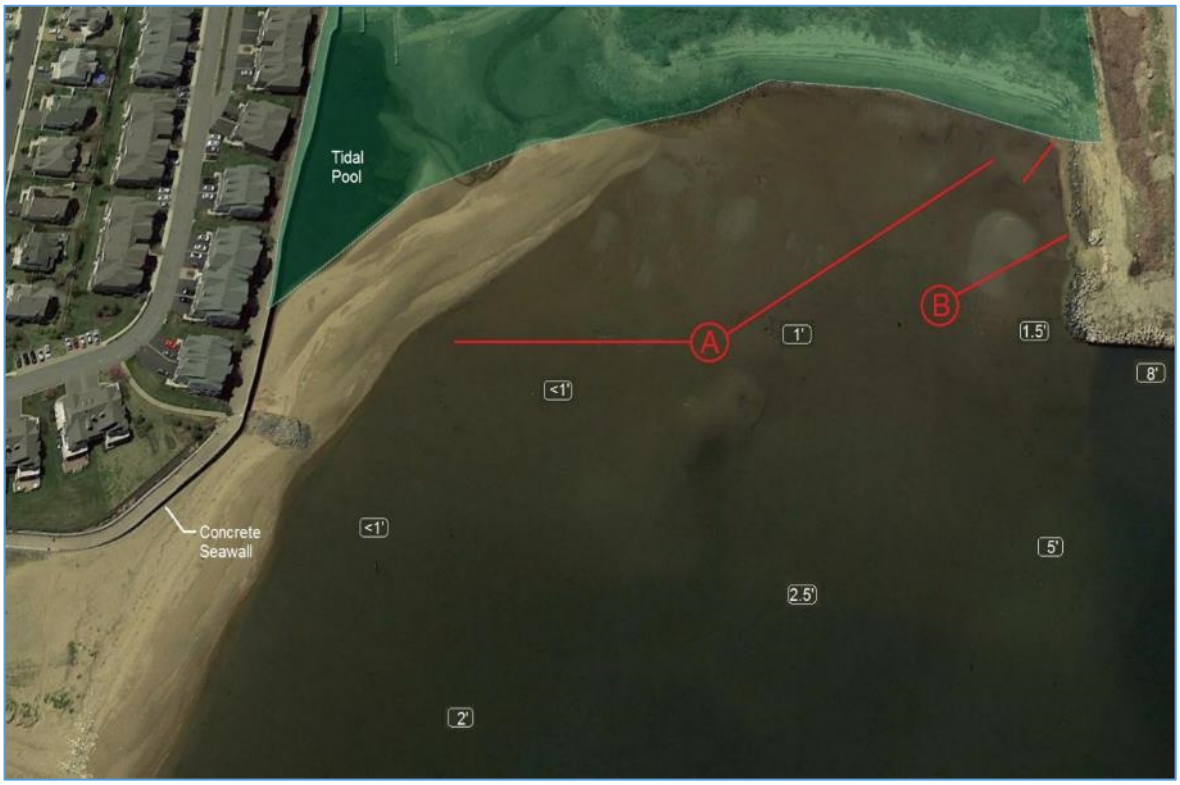
Marine Conditions

A waterside inspection was performed at the South Amboy Ferry site. As shown in the aerial photograph, there are many possible locations for a ferry landing, and the inspection team did not have information on the planned or preferred design location. They therefore investigated probably the most challenging area of the site – the cove area closest to downtown South Amboy. Depths in these areas are extremely shallow. Reference area "A" below is natural beach shoreline; reference area "B" below is concrete rubble and sheet pile in "end of life" condition.

Marine access to other parts of the site is better, The USACE reports historic berth depths of approximately 18 feet, serving two berths of 235 feet each. The site is served by a channel authorized to a depth of 25 feet, which is currently operating at 24 feet. NOAA charts indicate shoaling near the berthing areas, with current depths around 11 feet. This suggests some localized dredging may be required, but if so it should be fairly limited in scope.

[15] http://www.gmnews.com/2016/06/21/federal-funding-launches-construction-on-south-amboy-ferry/; http://www.southamboynj.gov/news/city-receives-go-ahead-start-ferry-terminal-site-construction; and consultant team site visit with Mayor Fred Henry, autumn 2016

South Amboy Ferry Site – Inspections and Depth Soundings



South Amboy – North End of Site

South Amboy -- Residential Community at South end of Site, with Undeveloped Upland and Shoreline

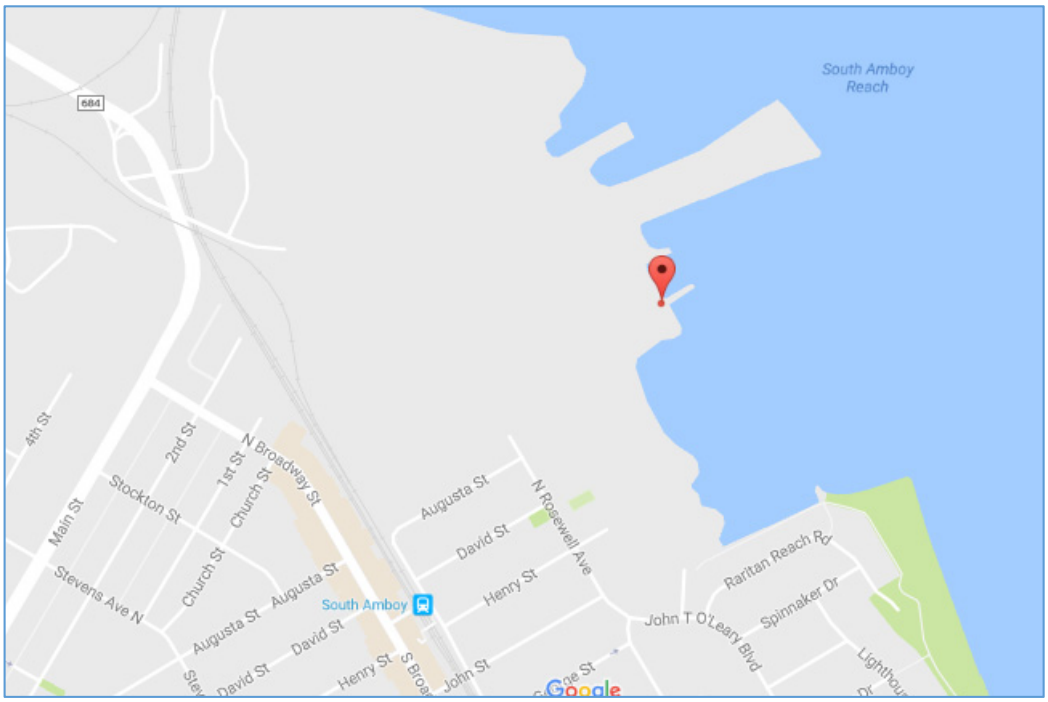
Landside Access

The South Amboy Ferry Site is well-located with respect to existing and potential future landside access. It is served by the newly-reconstructed Radford Ferry Road, which provides highway access from Main Street, crossing over the NJ TRANSIT line.

Radford Ferry Road -– Image from Google Maps

Currently, the site is not easily accessible by pedestrians or bicyclists, but if suitable connections were built, the distance between the ferry site, the NJ TRANSIT rail station, and bus transit stops serving South Amboy would be less than one mile. The site's potential accessibility should be graded as excellent.

Proximity to Rail Transit – Map Image from Google Map Link



Site and Service Development Factors

The "Level of Action" analysis undertaken for this study by the New York/New Jersey Harbor Operations Committee Steering Committee indicates that channel dredging, berth dredging, vessel navigation, vessel accessibility, and vessel operability should require a low level of action to address.

The consultant team performed a very high-level analysis of potential demand for a passenger ferry service to lower Manhattan, based entirely on existing commute patterns reported in US Census Journey to Work data. At market capture rates of 7.5% to 15.0% of daily commuters, this ferry might expect to see between 562 and 1,123 riders per day. These numbers could be higher or lower depending on the price per ride and the price of parking. These numbers do not include the effect of nearby planned development, which could be a substantial market capture opportunity for the service.

Overall, there are no obvious impediments to development of a passenger ferry terminal and service at this site. The land is available and under remediation; highway access has been provided for; while pedestrian, bicycle, and transit connections do not yet exist, it appears they can be provided; initial funding has been authorized; a base of provable demand exists; vessel operation seems viable; and planning to implement the service is underway.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

PROFILE #12 – BELFORD / ATLANTIC HIGHLANDS / HIGHLANDS FERRY TERMINALS

Facts at a Glance

Location	Borough of Highlands, Monmouth County (Highlands Ferry); Borough of Atlantic Highlands, Monmouth County (Atlantic Highlands Ferry); Belford, (unincorporated), Monmouth County (Belford Ferry); all on Sandy Hook Bay
Land Use	Existing passenger ferry terminals with on-site auto parking
Marine Conditions	Water depths typically 8' or more
Access	Auto oriented terminals, generally accessible from NJ 36 and local roads
Future Plans	Public planners are interested in ways to reduce parking pressures

Site Location and Context

Currently, there are three passenger ferry services linking Monmouth County with Manhattan: NY Waterway operating from Belford (12A); Seastreak operating from Atlantic Highlands (12B); and Seastreak operating from Highlands (12C).

Ferry Service Locations, Monmouth County to Manhattan – Annotated Map Image from Google Maps

Marine Conditions

Berth depths are generally believed to be 8 feet or more and are sufficient for existing services.

Landside Access

All three of these ferry terminals are auto-oriented – their demand depends on commuters who park at the facilities. Belford currently offers 1,000 parking spaces in one large modern parking lot and does not appear, from a high-level review, to be parking constrained. Parking at Atlantic Highlands is divided among four irregularly shaped but contiguous parking lots, and appears more constrained. Parking at Highlands is divided between the "Shore" lot at the terminal and a satellite lot offsite and to the west, with shuttle service, and also appears more constrained.

Belford Ferry Landing and Parking -- Image from Google Maps

Atlantic Highlands Ferry Landing and Parking (https://seastreak.com)

Highlands Ferry Landing and Parking (https://seastreak.com)

Site and Service Development Factors

Decreasing pressures on constrained parking facilities was identified by public sector planners as an important goal. There are several potential strategies for accomplishing this: increasing the density or size of existing parking lots; increasing the use of off-site parking and shuttle buses; and/or seeking additional ferry terminals to reduce the concentration of demand. Each of these could be pursued by the terminal operators and/or responsible local and regional planning agencies.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

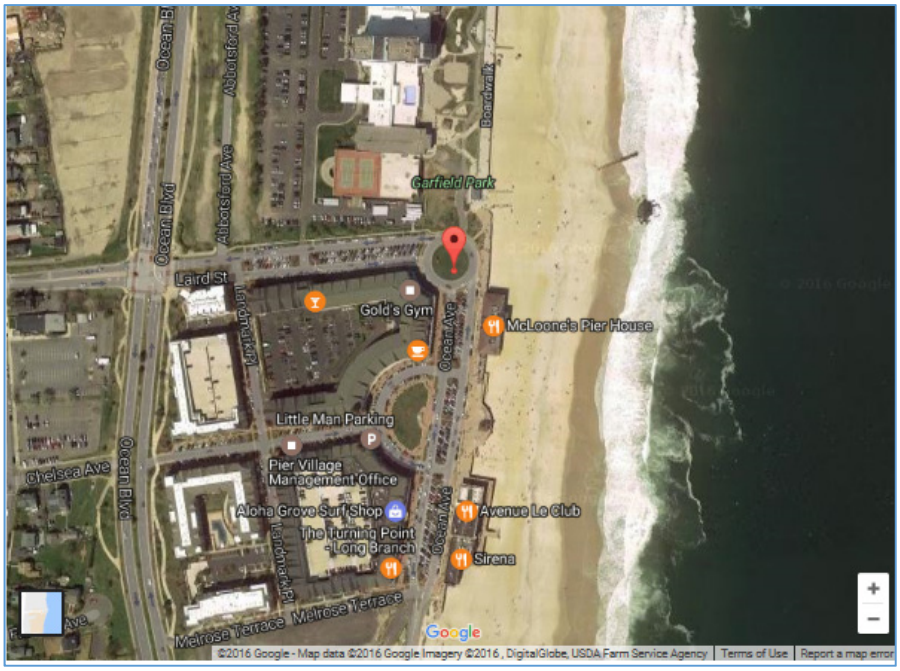
PROFILE #13 – LONG BRANCH FERRY SITE

Facts at a Glance

Location	City of Long Branch, Monmouth County, on the Atlantic Ocean
Land Use	Beachfront and boardwalk
Marine Conditions	Open ocean; no structures or berthing
Access	Primary access via Ocean Boulevard and Laird Street. Excellent pedestrian and bi-cycle access on Boardwalk. Located less than 1 mile from NJ Transit Rail station.
Future Plans	Long Branch is planning to reconstruct its historic pier (damaged then demolished in 2001) and institute a commuter ferry service to Lower Manhattan.

Site Location and Context

Long Branch Ferry Site – Image from Google Maps



The City of Long Branch hosted an amusement pier until it was damaged by fire in 1987 and ultimately demolished in 2001. The City now plans to rebuild the pier, close to its historic location at the foot of Laird Street, just north of McLoone's Pier House (13). The concept calls for the pier to host a passnger ferry to Manhattan, along with the development of retail/commercial space and off-pier structured parking. High-speed ferry service is expected to provide a 40-minute trip to Lower Manhattan. A contract for pier and ferry engineering was awarded in March 2016, but funding for the project has not yet been secured; Long Branch anticipates that a mix of public and private funding will be needed.[16]

[16] https://www.gmnews.com/2016/03/29/city-awards-contract-pier-ferry-engineering/

Former Long Branch Pier (source: Asbury Park Press[17])

Marine Conditions

The pier would be constructed into open ocean water and would presumably be designed to reach appropriate depths, with suitable protection for vessel berthing and operation.

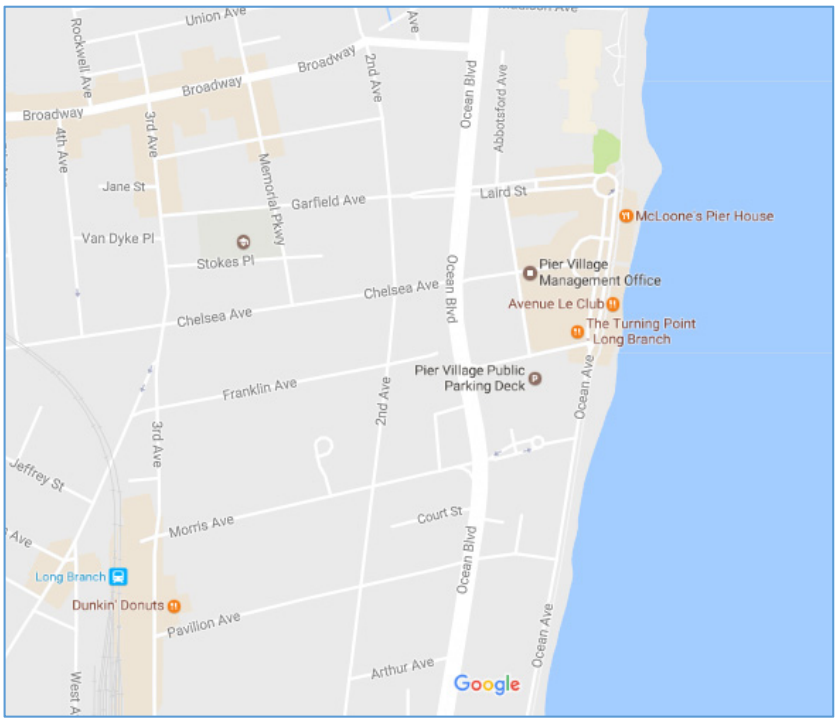
Landside Access

The pier will be reconstructed at the foot of Laird Street. Primary auto access would be from Ocean Boulevard and Laird Street although the location of future structured parking to serve the ferry has not yet been determined. Pedestrian and bicycle access should be excellent, given the central location along the Long Branch boardwalk. Additionally the site is located within one mile of the NJ TRANSIT Rail station.

Foot of Laird Street and Surrounding Uses – Image from Google Maps

[17] Image accessed at: http://www.bing.com/images/search?q=long+branch+commuter+ferry+pier&view=detailv2&&id=84E1CEA5C3511DDD262B5DEB72AB9A4846DA9D76&selectedIndex=0&ccid=nlvKkXjX&simid=608017085193191883&thid=OIP.M9e5bca9178d7eb91c7de5ddd253d519do0&ajaxhist=0

Access to Long Branch Pier Site -- Map Image from Google Maps



Site and Service Development Factors

The consultant team performed a very high-level analysis of potential demand for a passenger ferry service to lower Manhattan, based entirely on existing commute patterns reported in US Census Journey to Work data. At market capture rates of 7.5% to 15.0% of daily commuters, this ferry might expect to see between 393 and 787 riders per day. These numbers could be higher or lower depending on the price per ride and the price of parking. These numbers do not include the effect of potential additional new development within walking distance of the terminal, which could be a substantial market capture opportunity.

Assuming that vessels can be operated safely and reliably on the planned route, the consultant team has concluded that no obvious impediments to development of a passenger ferry terminal and service exist at this site. The main challenge may be finding the right mix of uses and development partners to successfully fund the project.

This Opportunity Site Profile was developed as part of the NJTPA's Inventory and Assessment of Waterborne Transportation Resources Project. For further details, please contact NJTPA or visit www.njtpa.org.

APPENDIX H

GLOSSARY OF KEY TERMS

Bridge Air Draft (clearance) – the vertical distance between the waterline and the underside of the center span at MHHW. This information appears on nautical charts.

Bureau of Transportation Statistics (BTS) – A Federal agency which, among other activities, maintains the nation's key transportation data metrics. BTS offers an excellent and comprehensive on-line glossary of general freight and passenger transportation terms at https://www.rita.dot.gov/bts/dictionary/list.xml.

Mean High Water (MHW) -- the mean height of all high waters above the sea bottom over a given period of time.

Mean Higher High Water (MHHW) -- the highest waters in a given day, averaged over a longer period of time.

Mean Low Water (MLW) -- the mean height of all low waters above the sea bottom over a given period of time.

Mean Higher High Water (MHHW) -- the lowest waters in a given day, averaged over a longer period of time.

National Ocean and Atmospheric Administration (NOAA) – A Federal agency which, among other activities, maintains the nation's nautical charts and publications for U.S. coasts and the Great Lakes.

Vessel Air Draft -- the vertical distance from the waterline to the highest "permanent" structure on a vessel.

Vessel Beam -- the maximum width of a vessel measured on the main deck.

Vessel Deadweight -- the cargo carrying capacity of a vessel, in tons, excluding the weight of the ship itself.

Vessel Displacement -- the weight of the vessel itself plus the deadweight.

Vessel Draft -- the depth below the water line of any vessel. It will vary with "Deadweight" – the cargo or passenger weight on board. The depth can be found by reading draft marks on a larger vessel. Large ships are regulated as to maximum draft for their size and underwater configuration. Draft marks for safe carriage is assigned by the builder under international convention and these cannot be exceeded under international law. .

Vessel LOA (length overall) – the vessel length measured from bow to stern plus any underwater length of propellers.

Ton (short) – 2,000 pounds.

Ton (metric) -- 2,204.6 pounds

Twenty-foot equivalent unit (TEU) – the number of 20-foot long container equivalents in a single container. One 20-foot container is one TEU; one 40-foot container is two TEUs.

Water Taxi -- A smaller version of a passenger ferry designed to operate in places with shallow draft and/or to supplement the use of larger ferries.

Wharf -- A mooring place for vessels placed either alongside or at an angle to the shoreline.