

Deepening the Delaware: Persistence Pays Off

Delaware River Main Channel Deepening

WESTERN DREDGING ASSOCIATION CONFERENCE

TORONTO, CANADA

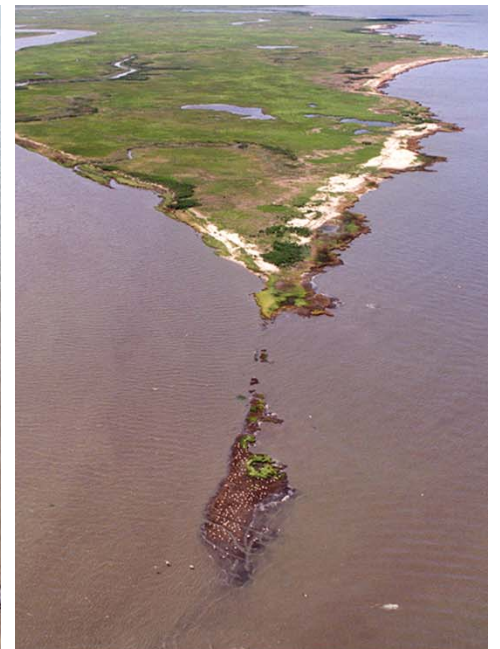
JUNE 17, 2014

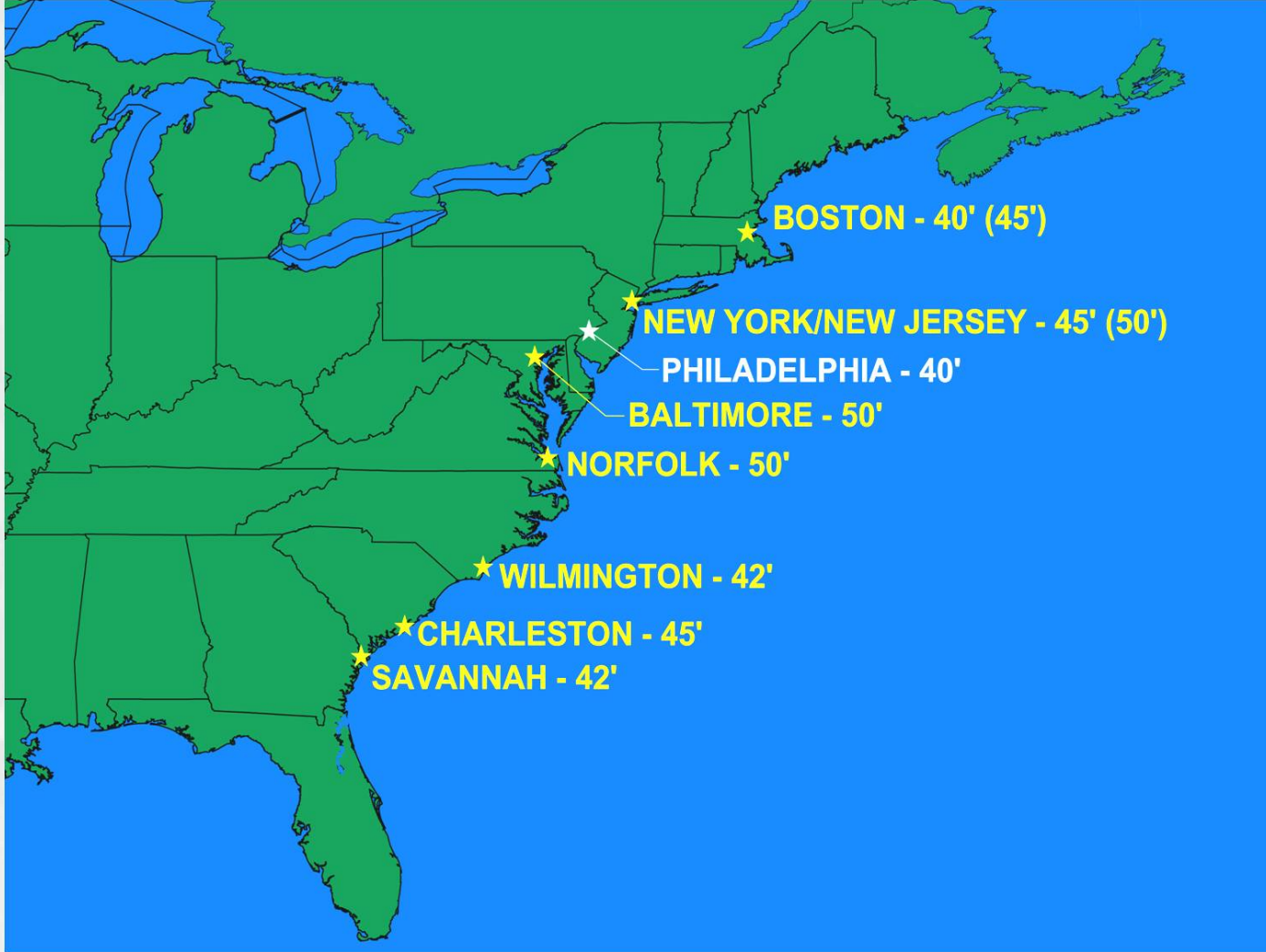
Anthony DePasquale, P.E.
Chief, Operations Division

USACE/Philadelphia District



US Army Corps of Engineers
BUILDING STRONG





Delaware River Ports

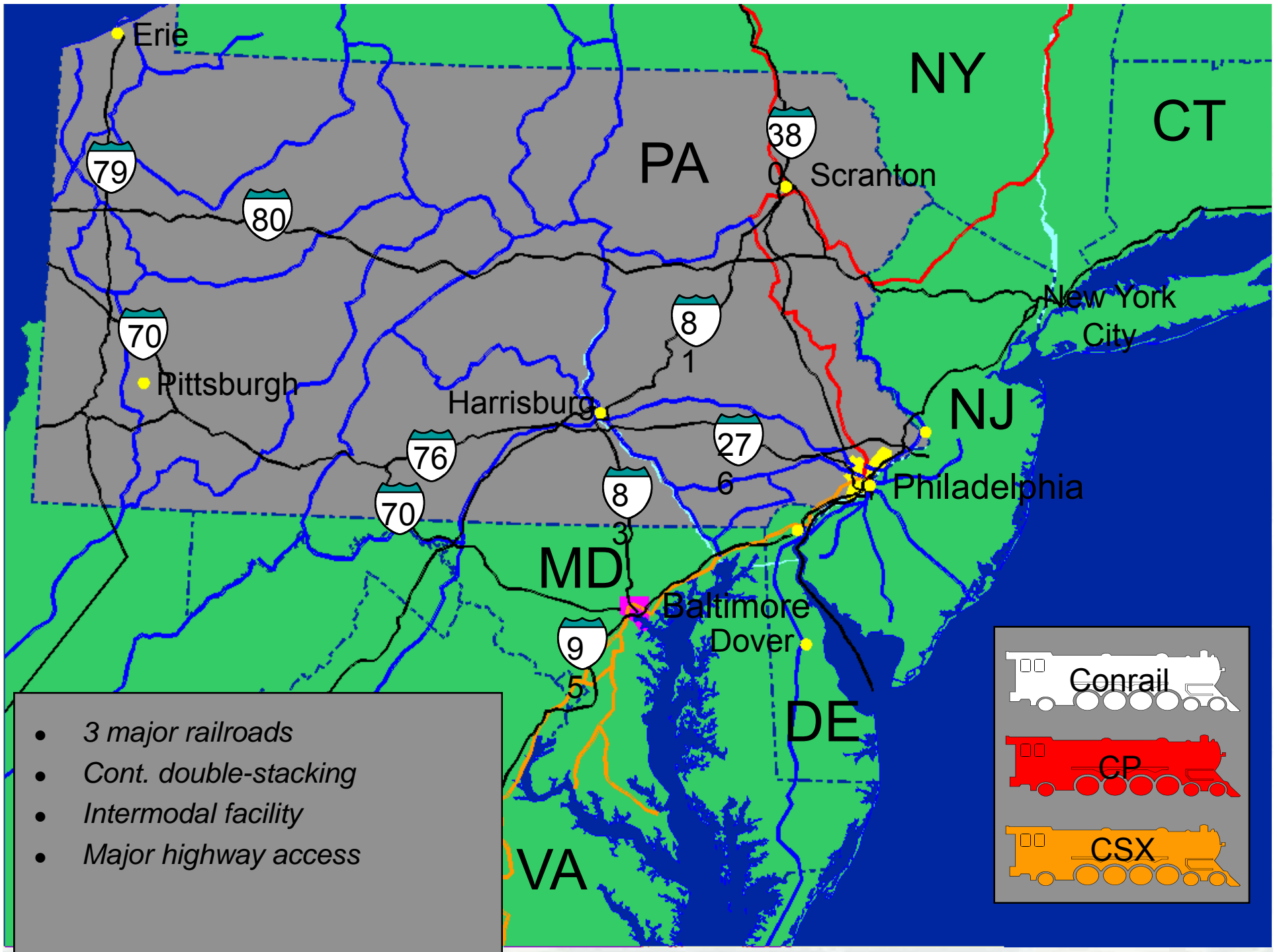
- Largest freshwater Port Complex in the World
- Fifth Largest Complex in the United States
- Handle over 70 million tons of cargo annually



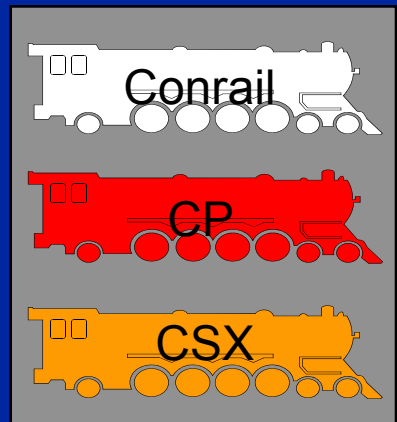
Types of Commodities

- Crude Oil
- Containers
- Coal, Scrap Metal
- Iron Ore, Steel
- Petroleum Products
- Fruit, Meat, Lumber
- Cocoa Products, Paper





- 3 major railroads
- Cont. double-stacking
- Intermodal facility
- Major highway access



Project Timeline

Congress directs Corps to study improving 40' channel	1983
Feasibility Study report recommends 45' channel	1992
Congress authorizes construction	
Final Design, Supplemental EIS complete	1997
Corps recommends construction	1998
GAO audit, Corps response	2002
Economic reanalysis complete	2004
Sponsor changes from DRPA to PRPA	2007
Signing of Project Partnership Agreement w/ PRPA	2008
First deepening contract	2010
Estimated completion of 45' channel	2017



Project Economics

- As of 2011
 - ▶ Average Annual Benefits: \$35,167,000
 - ▶ Average Annual Costs: \$21,502,000
 - ▶ Average Annual Net Benefits: \$13,665,000
 - ▶ Benefit-Cost Ratio: 1.64
- Port beneficiaries
 - ▶ 80% Container & Dry Bulk Cargo
 - ▶ 20% Crude Oil & Petroleum Products
- Primary sources of benefits
 - ▶ Larger and more fully loaded containerships and dry bulk (steel and slag) vessels
 - ▶ Reduced lightering of tankers
- Conservative analysis
 - ▶ Counts only national benefits (excludes competitive advantages)
 - ▶ Counts only direct benefits (excludes jobs created/saved, tax revenues)
 - ▶ Based on existing tonnage, commodities, origins, destinations



Prior Channel Deepenings

Delaware River, Philadelphia to the Sea			
Authorization	Depth	Width	Complete
NATURAL CONDITIONS (pre-1885)	17'-24'	175'-600'	n/a
January 1885 Board of Engineers recommendation	26'	600'	1898
March 1899 improvement plan	30'	600'	1905
June 1910 River and Harbor Act	35'	800'	1934
June 1938 River and Harbor Act	40'	800'-1000'	1942
Water Resources Development Act 1992	45'	400'-1000'	est. 2017



Judge Robinson's Ruling

- Corps clear to proceed with Reach C
- Rest of the project subject to her jurisdiction
- Anticipates Corps/DNREC cooperation
- Her expectations going forward are in line with the Corps had already expressed
- Also in line with our own regulatory philosophy ("How can we both accomplish our goals?")
- Upheld by Third Circuit Court of Appeals



Judge Robinson's Ruling

*"Just to be clear, the **Deepening Project** is one that **should be completed**, consistent with Congressional intent. The court does not equate **administrative obstacles** with **proof of insurmountable environmental risks**. For those who oppose the Project in the first instance, the time for that fight has long passed. The decision to allow deepening in Reach C, therefore, is not 'a bridge to nowhere,' it is a first step in a regulatory process that has worked in the past, and should work here, **to accomplish Congress' goals without causing environmental harm as defined by statute.**"*



BUILDING STRONG®

SETTING THE
RECORD
STRAIGHT:

1) Is this project a sound use of taxpayer dollars?

? *"But a GAO study showed this project would return only 50 cents on the dollar, and a second study confirmed the project is still a loser"*

! **This project represents a positive investment, and the GAO never claimed otherwise -- they offered questions, not answers**

GAO Study #1 (2002)

- An audit , not an alternative reanalysis -- no BCR, no 0.50
- GAO found problems, called for full independent reanalysis
- Corps complied, project put on hold 1 year pending reanalysis
- BCR went from 1.40 to 1.15 (now back up to 1.35)

GAO Study #2 (2010)

- Confirms we took care of problems from Study #1
- Raises new concerns about economic uncertainty, benefits
- Recommendations much less in scope and magnitude
- Corps will again comply, but project will continue



Project Economics

- Corps analysis very conservative
 - ▶ Counts only national benefits (no competitive advantages)
 - ▶ Counts only direct benefits (no jobs or tax revenues)
 - ▶ Counts only existing tonnage, commodities, origins, destinations
- Sources of benefits
 - ▶ More efficient vessel loading
 - ▶ Reduced lightering
 - ▶ Attraction of more efficient container and dry bulk vessels
- Port beneficiaries
 - ▶ 50% Container & Dry Bulk Cargo
 - ▶ 50% Crude Oil & Petroleum Products



SETTING THE
RECORD
STRAIGHT:

2) Hasn't the project or the environment changed?

? *"The Corps has ignored significant changes to the project since the Environmental Impact Statement was completed in 1997"*

! **The project itself has not changed -- but only half as much dredging is now needed to get it done**

- Still deepening the same channel from 40 to 45 feet
- But estimates are down from 33 to 16 million cubic yards
- Main contributor is improved sonar technology
- Average deepening less than maintenance during initial construction
- Less material to be dredged also means less to be placed
- No new disposal areas needed now, one less beneficial re-use site
- So the only project changes are in terms of less impact
- Environmental changes negligible (Athos) or already addressed (sturgeon)



SETTING THE
RECORD
STRAIGHT:

3) What kind of stuff will the Corps be dredging up?

? *"Muck...Sludge...Toxins..."*

! **Varying combinations of silt, clay, sand and gravel -- that's what's at 40 and at 45**

- The channel is only ~2% of the Delaware River and Bay below Philadelphia
- And about half that area is already deeper than 45'
- Almost 70 years of maintenance have kept the channel clean
- NJ issued a 5-year WQC for maintenance as recently as 2007
- More than \$8M in tests by certified labs confirm no significant impact
- Monitoring also shows no groundwater contamination
- Disposal areas are just mud, dirt and natural vegetation



BUILDING STRONG®

SETTING THE
RECORD
STRAIGHT:

4) Where will the Corps put all this dredged material?

? *"The Corps is failing to account for the additional cost of moving material up to abandoned mines in Pennsylvania"*

! **This project is limited to dredging the channel and placing the material nearby -- any rehandling is taken care of by others**

- All river material to 7 existing, active federal sites in NJ & DE
- Nor will any of these sites will end up any higher than they would have without the deepening project (maintenance dredging only)
- Bay sand to go for beneficial use at 2 DE sites (30% of total cost)
- No Corps project for moving the material a second time
- But beneficial reuse is always an option for others
- No conflict between project and Pennsylvania's goals



BUILDING STRONG®

Dredged Material Disposal Plan

Rock Blasting

- 77K CY near Marcus Hook
- Crushed rock to Fort Mifflin CDF

River Material

- 12M CY
 - Sand, clay, silt
- ### All Federally Owned Sites
- Confined Disposal Facilities
 - 5 in NJ, 1 in DE, 1 in DE & NJ

TOTAL Dredged Material

- 16M CY over 5 years
- (Less per year than avg. maintenance of ~5M CY)

Bay Material

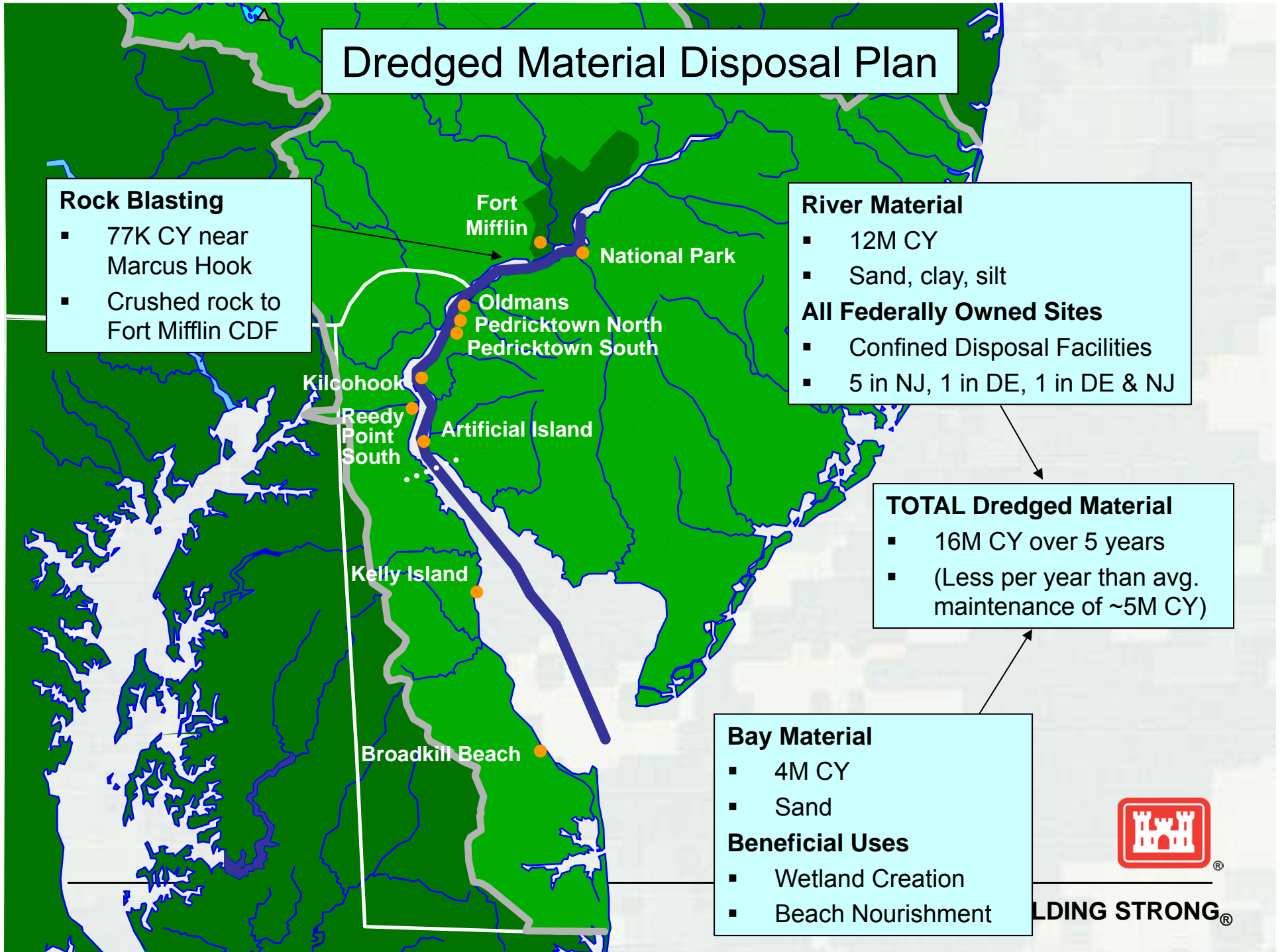
- 4M CY
- Sand

Beneficial Uses

- Wetland Creation
- Beach Nourishment



UILDING STRONG®



SETTING THE
RECORD
STRAIGHT:

5) Why didn't the Corps follow its NY-NJ model?

? *"The Corps brought in the environmental groups early for its NY-NJ project and satisfied their concerns; why not for the Delaware?"*

! **The differences between the two projects defy simple side-by-side comparison -- except it's the same agency managing both**

New York-New Jersey Harbor

- Pre-existing environmental issues, interest groups already engaged
- Some material known to be contaminated, must be treated
- No permanent disposal areas; contractor must decide each time

Delaware River Main Channel

- No pre-existing (or current) issues with 40' channel, minimal interest
- No contaminated material per federal or state standards
- Confined disposal facilities; Corps owned, operated & monitored

- Corps followed federal process, but also turned no one away
- Corps modified project in response to public concerns
- Project re-uses dredged material for environmental benefit



BUILDING STRONG®

Upland (Riverside) Disposal Areas



National Park



Killcohook



Pedricktown North & Oldmans



Reedy Point South

BUILDING STRONG®



Environmental Studies

- >\$10 million since 1992 ...
- ... in biological and chemical testing ...
- ... using independent, certified labs
- ... in coordination with:
 - ▶ EPA
 - ▶ USFWS
 - ▶ NMFS (NOAA)
 - ▶ USGS
 - ▶ DNREC
 - ▶ NJDEP
 - ▶ PADEP



Environmental Studies

- Salinity
 - ▶ USGS studies
 - ▶ Corps 3-D hydrodynamic and salinity modeling
- Shellfish
 - ▶ Benthic evaluations of aquatic beneficial use areas
 - ▶ Including sediment circulation studies
- Sediment
 - ▶ Bulk sediment analysis
 - ▶ High-resolution PCB analysis
 - ▶ EPA "Green Book" tiered testing
- Groundwater
 - ▶ Expanded groundwater data collection by USGS
- Oil Spills
 - ▶ Oil spill contingency planning
- Artifacts
 - ▶ Cultural resource investigations of channel, upland and aquatic beneficial use sites
- Endangered Species
 - ▶ Endangered species coordination with USFWS, NMFS



Agency Comments

- EPA:
 - ▶ “... continues to believe that there will be no adverse impacts associated with the disposal of sediments generated by the project.”
- USFWS:
 - ▶ “Results of chemical analyses provided within the biological assessment indicated that contaminant loads in the sediments tested are low.”
- USGS:
 - ▶ “... the concerns about increasing the potential for saltwater from the river to infiltrate into the adjacent aquifers, either as a result of dredging through a confining unit or as a result of the upstream movement of saltwater in the deepened channel, can be set aside. No significant confining units will be breached and the saltwater will not significantly move upstream to increase the threat of saltwater intrusion.”
- DNREC:
 - ▶ “..our evaluation indicates a low potential for water quality impacts associated with toxics released as a result of deepening the main channel within Delaware waters. “



Your Local Project Team

For the Corps' own engineers, scientists and other professionals who've worked long and hard on this project, there is the satisfaction familiar to anyone who's seen years of labor finally come to fruition. As we begin the actual deepening, we also look forward to working with all three states in following it through to completion.

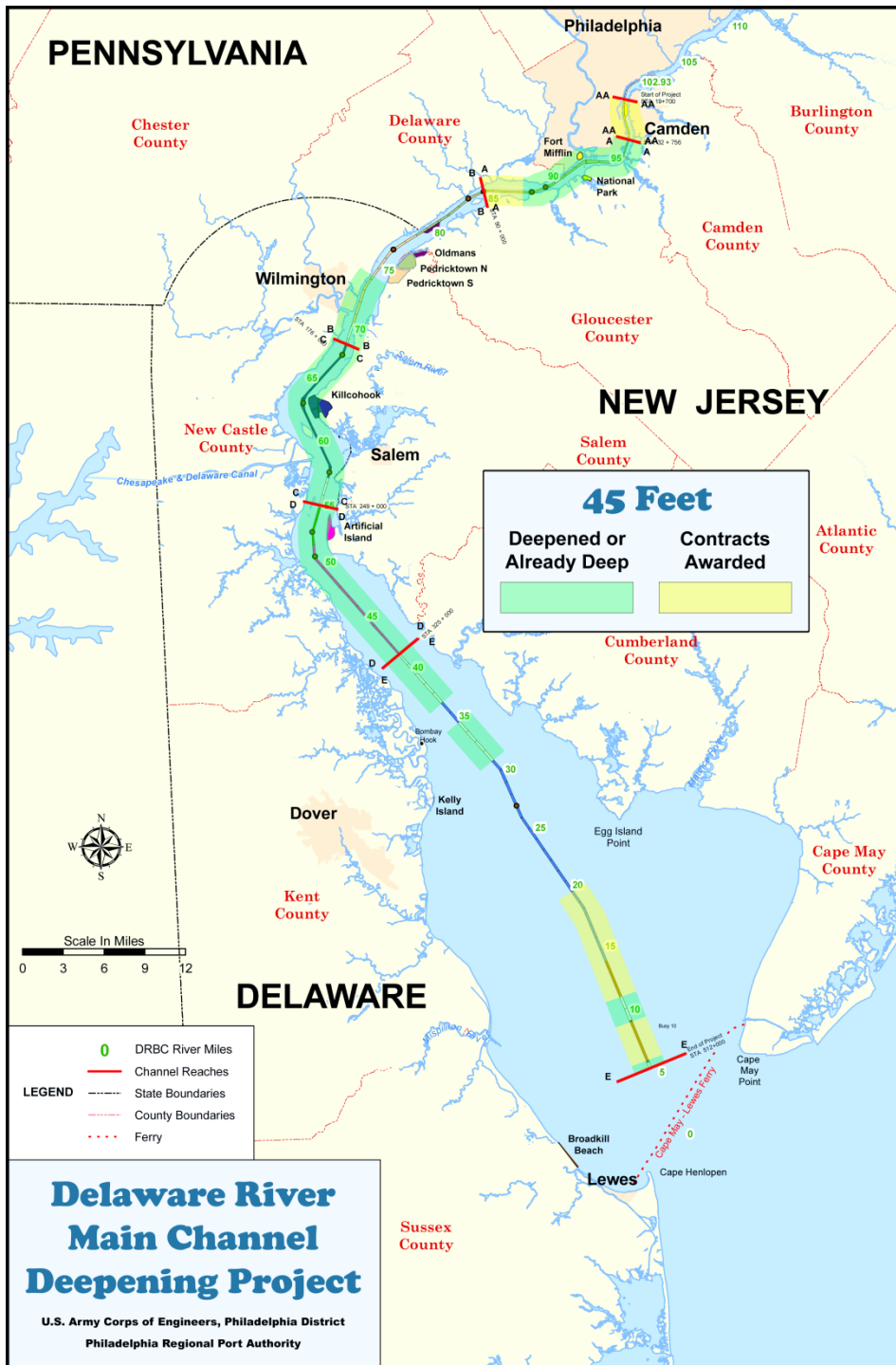
*~ LTC Tom Tickner
Commander, Philadelphia District*



BUILDING STRONG®



Delaware River
Main
Channel Deepening
45 Foot Project

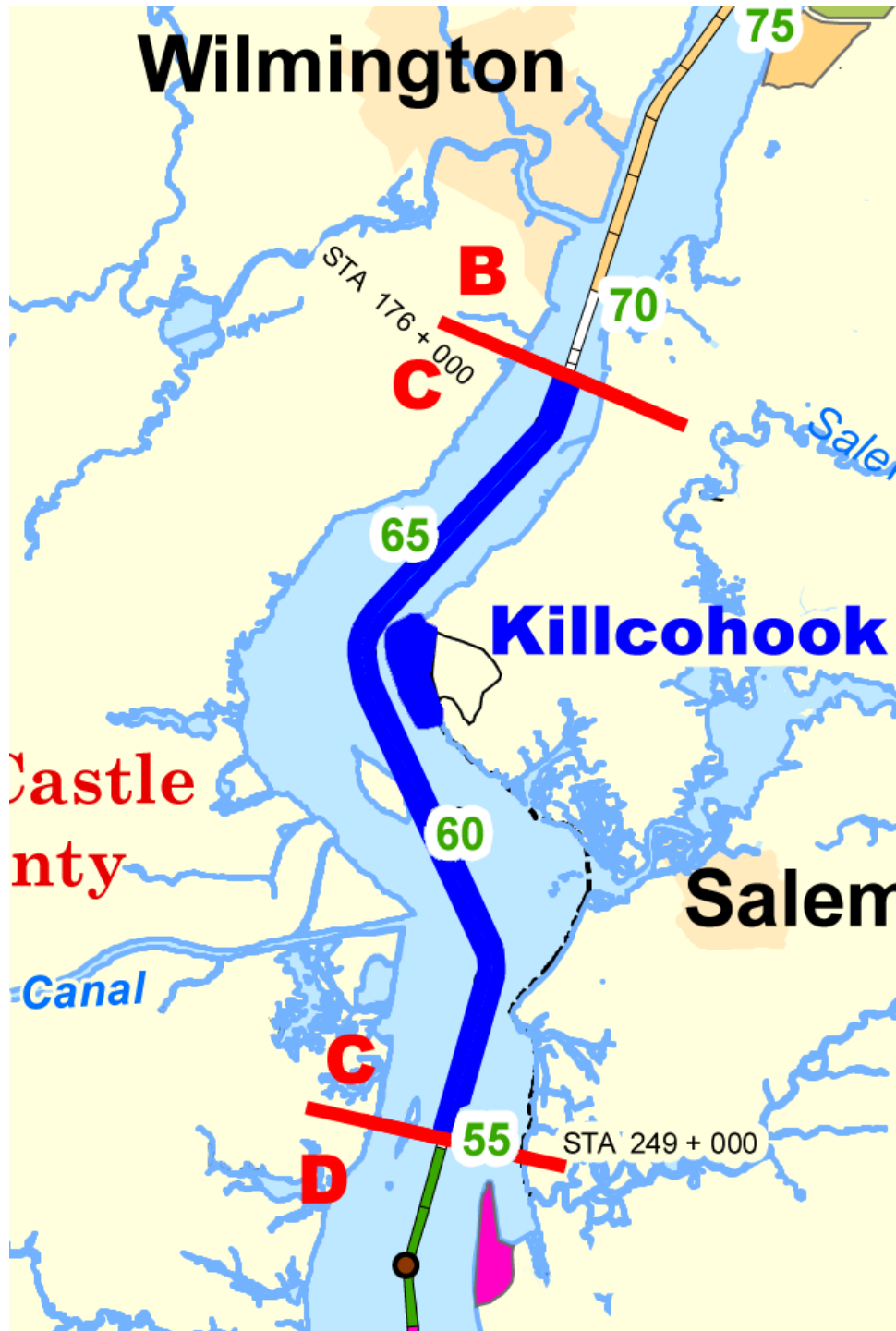


The 45-foot Project

- Increase authorized depth of Delaware River federal navigation channel by 5 feet
- Follow 40-foot channel alignment 102.5 miles from Philadelphia/Camden to deepwater in Delaware Bay
- Widen 12 of 16 channel bends for safer navigation
- Deepen Marcus Hook Anchorage to 45 feet also
- No change in channel widths (ranging 400 to 1,000 feet)
- Channel was already deep enough in about 50% of its area pre-construction and thus requires no dredging
- Initial construction cost: approximately \$300 million
- Nonfederal sponsor (35% cost share): Philadelphia Regional Port Authority
- Total estimated dredging volume: 16 million cubic yards
- River Portion (Reaches AA thru D): 12 million cubic yards of silt, clay, sand and gravel to be placed in 5 federal confined disposal facilities (CDFs)
- Bay Portion (Reach E): 4 million cubic yards of sand to be placed ashore at two sites for ecosystem restoration, storm risk reduction
- Rock Removal (Marcus Hook vicinity): 200,000 cubic yards to be blasted in place, removed by bucket dredge, and placed in federal CDF at Fort Mifflin



BUILDING STRONG®



Contract #1 (complete)

- Reach C
 - ▶ Constructed March to September 2010
 - ▶ Delaware Memorial Bridge to Port Penn/Reedy Island (~12 miles)
 - ▶ Quantity: 3.6 million cubic yards
 - ▶ Placement: Killcohook CDF
 - ▶ Method: pipeline cutter suction dredge
 - ▶ Contractor: Norfolk Dredging Co.
 - ▶ Cost: \$30.1 million



BUILDING STRONG®



Deepening Begins



Contractor

- Norfolk Dredging Co.

Base Contract

- 40' Channel Maintenance
- Reaches B & C
- \$10.5 million
- 1.7 million CY
- Started November 2009

Option 1

- 45' Channel Deepening
- Reach C
- \$32 million
- 2.6 million CY
- Started March 2010
- Est. Complete July 2010

Dredging Equipment

- Cutterhead Dredges
PULLEN & CHARLESTON

Dredging Method

- Pipeline Dredging

Disposal Area

- Killcohook CDF

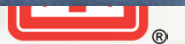


BUILDING STRONG®



BUILDING STRONG®





BUILDING STRONG®



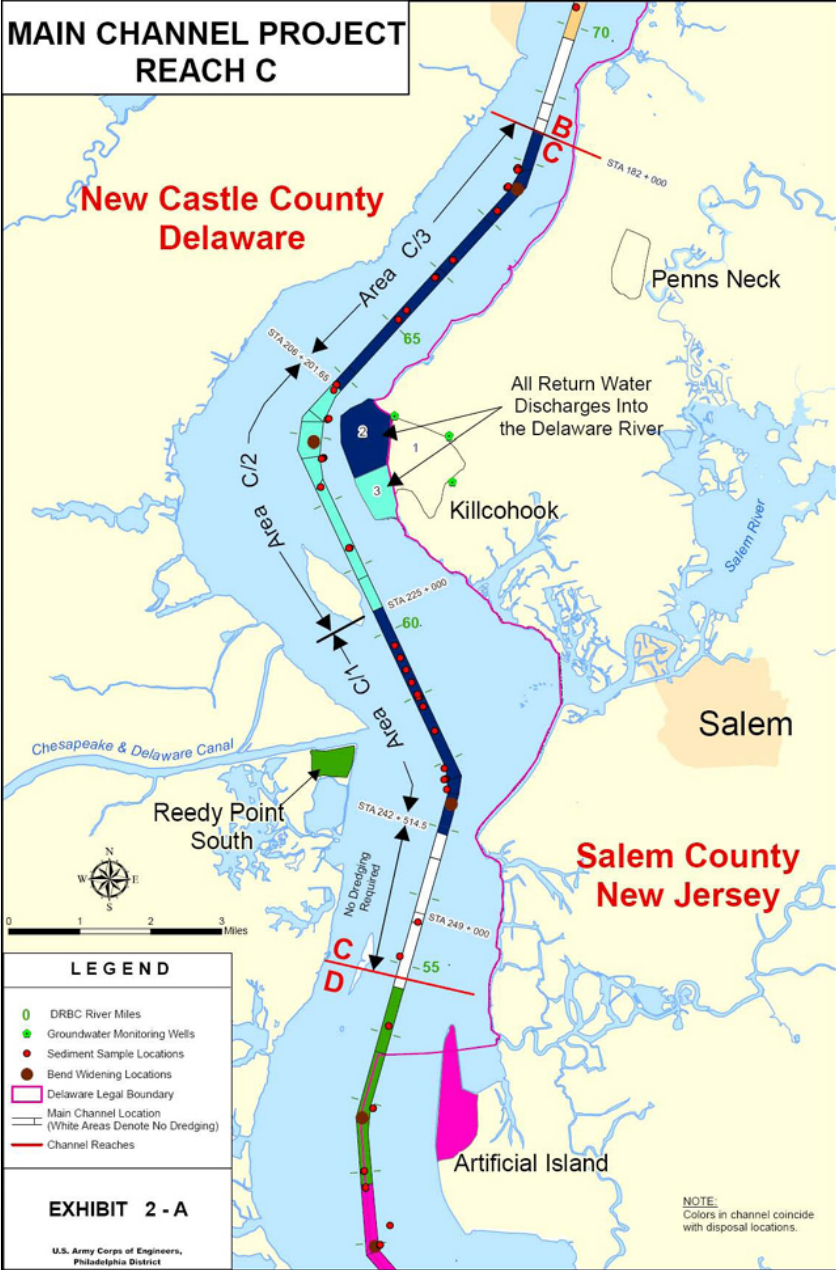
BUILDING STRONG®











BUILDING STRONG®

Killcohook CDF



DING STRONG®



BUILDING STRONG®



BUILDING STRONG®



BUILDING STRONG®

Contract #2 (complete)



- Lower Portion of Reach B
 - ▶ Constructed November 2011 to January 2012
 - ▶ North of Wilmington to Delaware Memorial Bridge (~4 miles)
 - ▶ Quantity: 0.9 million cubic yards
 - ▶ Placement: Pedricktown South CDF
 - ▶ Method: pipeline cutter suction dredge
 - ▶ Contractor: Norfolk Dredging Co.
 - ▶ Cost: \$7.6 million



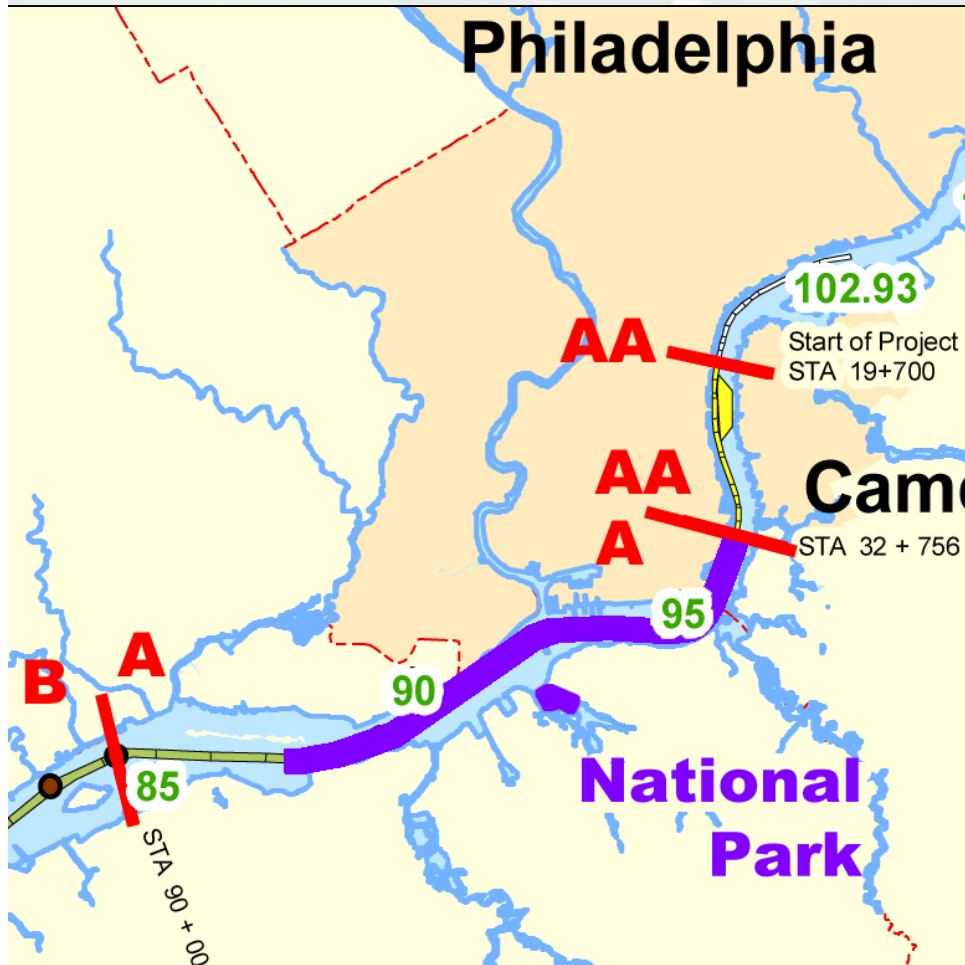
BUILDING STRONG®



BUILDING STRONG®



Contract #3 (complete)



- Upper Reach A
 - ▶ Constructed September 2012 to February 2013
 - ▶ Walt Whitman Bridge to SW of Philadelphia Airport (~11 miles)
 - ▶ Quantity:
1.2 million cubic yards
 - ▶ Placement:
National Park CDF
 - ▶ Method:
pipeline cutter suction dredge
 - ▶ Contractor:
Great Lakes Dredge & Dock Co.
 - ▶ Cost: \$14.5 million



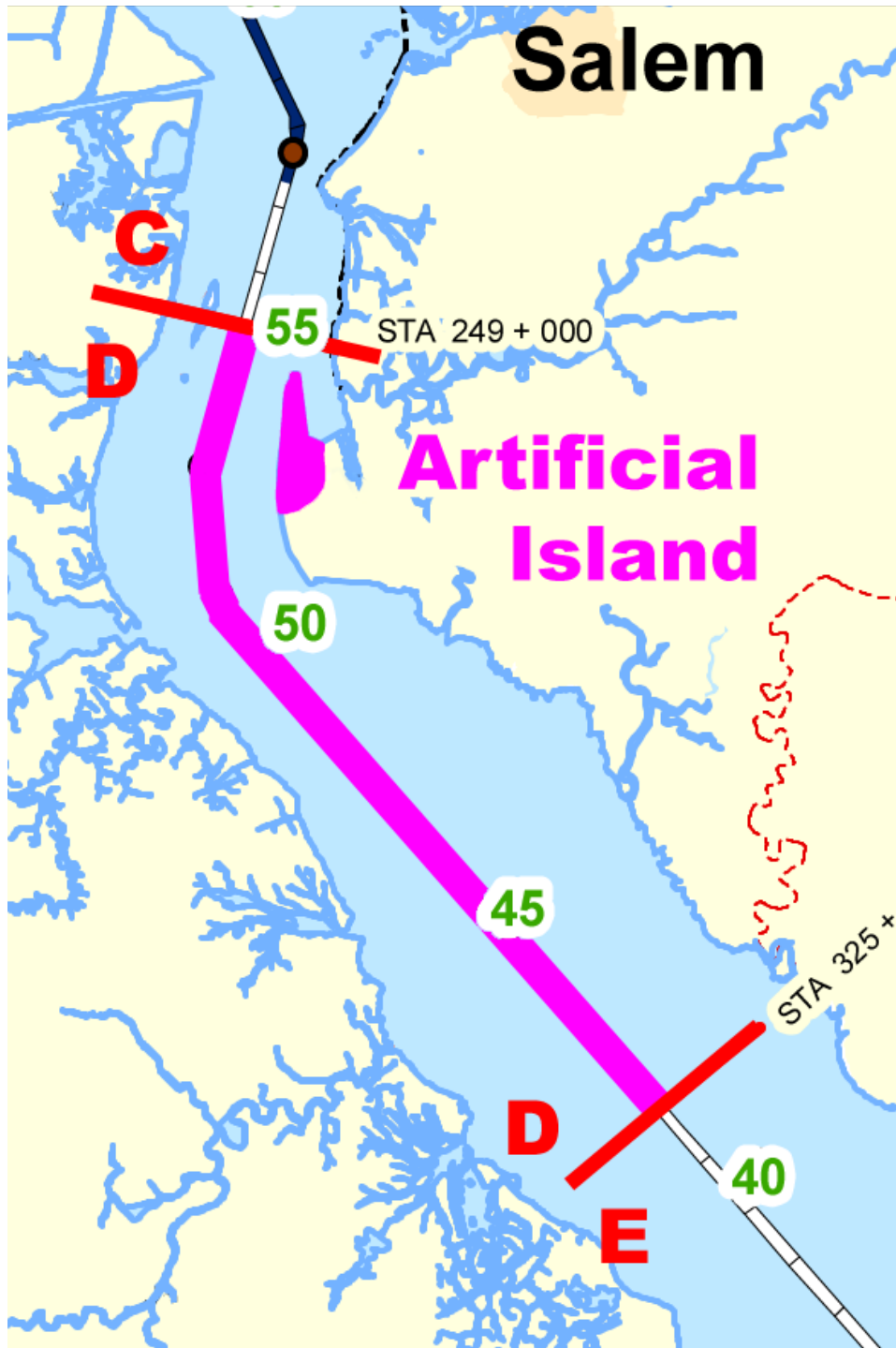
BUILDING STRONG®



BUILDING STRONG®



BUILDING STRONG®



Contract #4 (complete)

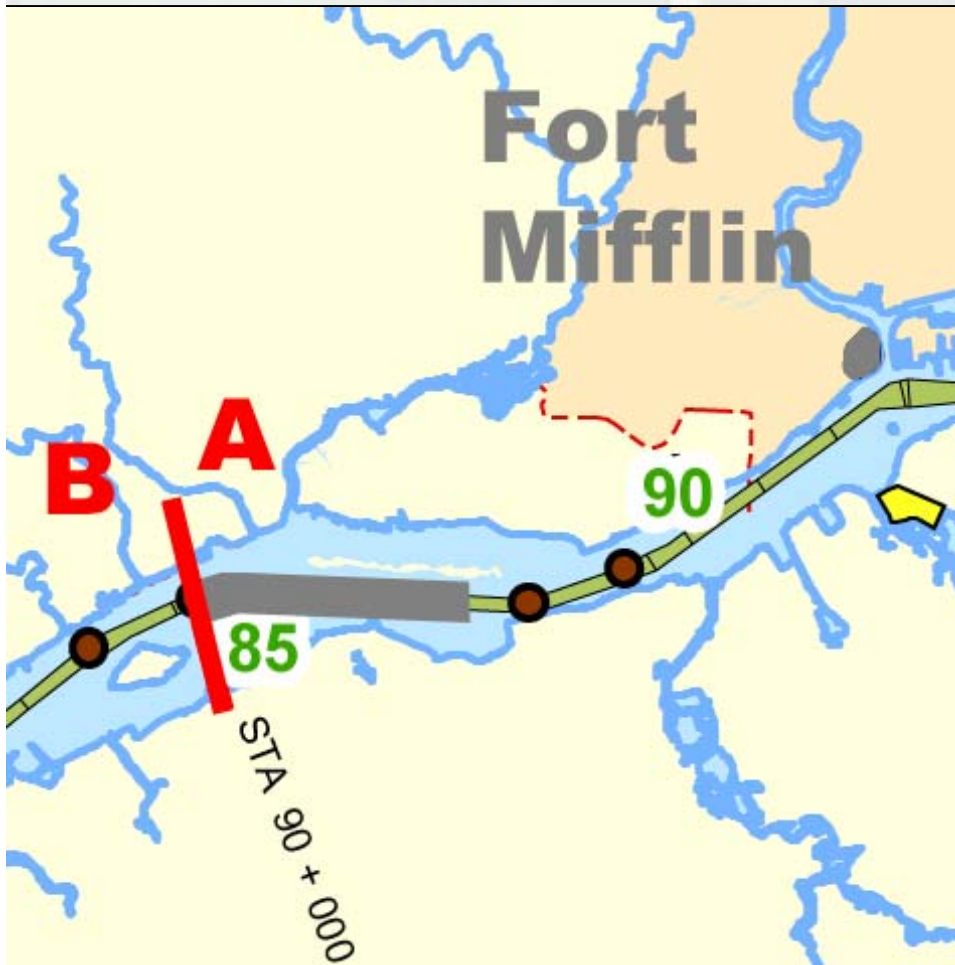
- Reach D
 - ▶ Constructed February to November 2013
 - ▶ Port Penn/Reedy Island to Woodland Beach (~14 miles)
 - ▶ Quantity:
1.3 million cubic yards
 - ▶ Placement:
Artificial Island CDF
 - ▶ Method: hopper dredge
 - ▶ Contractor:
Dutra Dredging Co.
 - ▶ Cost: \$23 million



BUILDING STRONG®



Contract #5 (awarded)

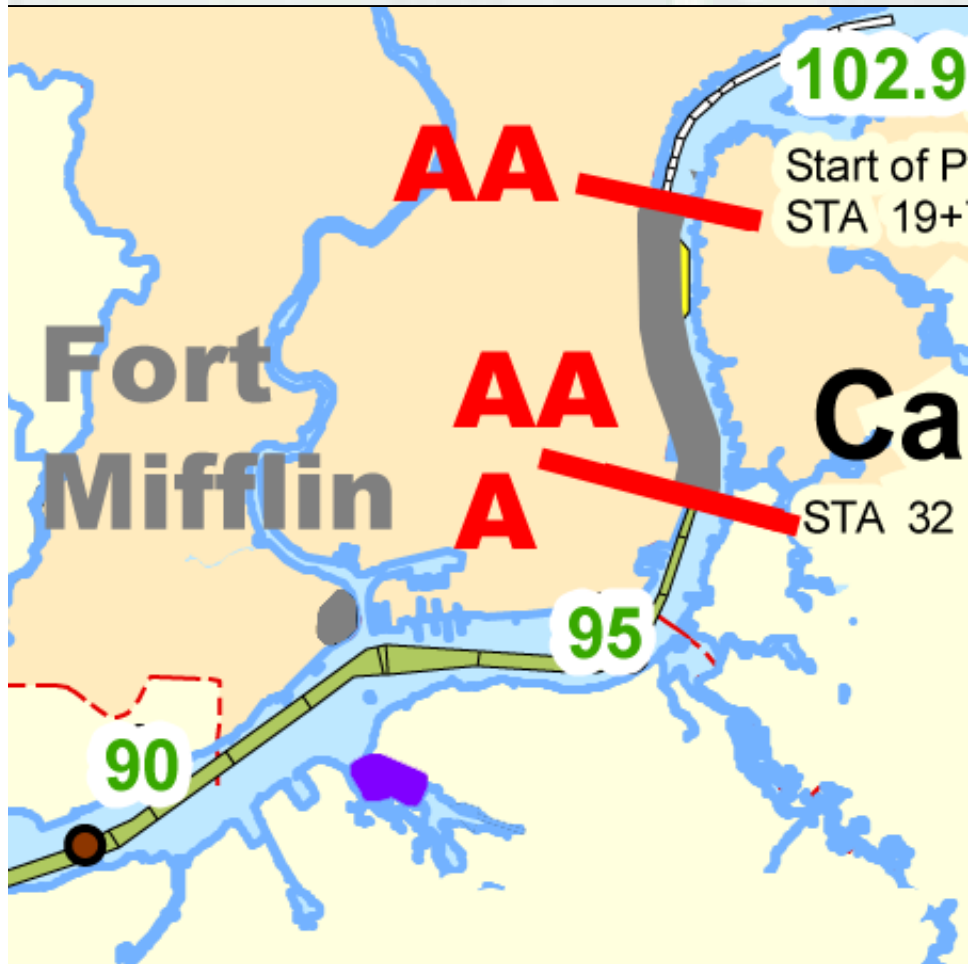


- Lower Reach A
 - ▶ Awarded January 2014
 - ▶ Construction to start July 2014
 - ▶ SW of Philadelphia Airport to Chester (~3 miles)
 - ▶ Estimated quantity: 0.4 million cubic yards
 - ▶ Placement: Fort Mifflin CDF
 - ▶ Method: bucket and hopper dredge
 - ▶ Contractor: Great Lakes Dredge & Dock Co.
 - ▶ Cost: \$14.1 million



BUILDING STRONG®

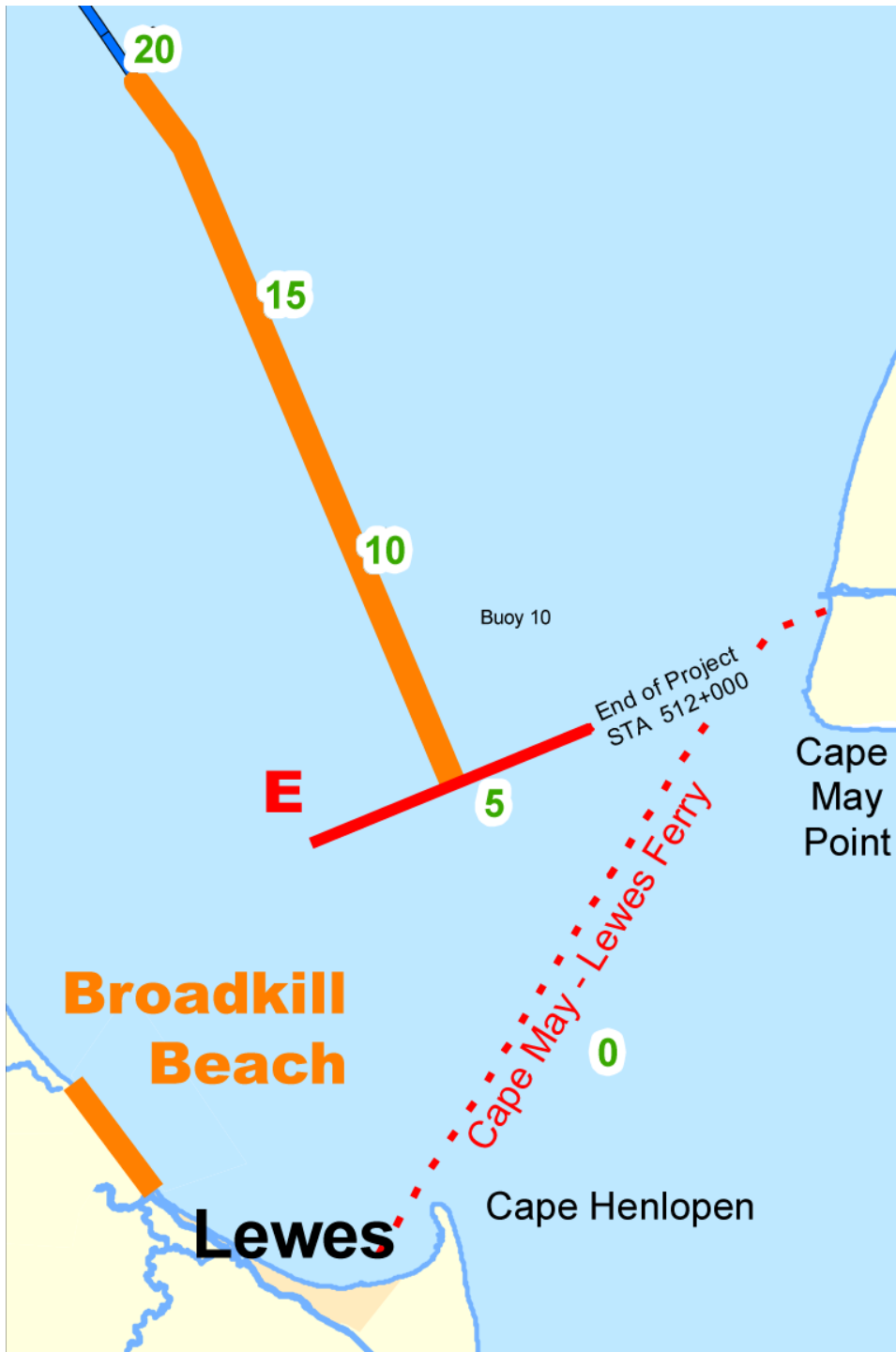
Contract #6 (awarded)



- Reach AA
 - ▶ Awarded May 2014
 - ▶ Construction to start September 2014
 - ▶ Ben Franklin Bridge to Walt Whitman Bridge (~2.5 miles)
 - ▶ Estimated quantity: 0.7 million cubic yards
 - ▶ Placement: Fort Mifflin CDF
 - ▶ Method: bucket and hopper dredge
 - ▶ Contractor: Great Lakes Dredge & Dock Co.
 - ▶ Cost: \$25.4 million



BUILDING STRONG®



Contract #7 (awarded)

- Lower Reach E
 - ▶ Awarded June 2014
 - ▶ Construction to start September 2014
 - ▶ South end of project (~15 miles)
 - ▶ Estimated quantity: 1.9 million cubic yards
 - ▶ Placement/Beneficial Use: Broadkill Beach Coastal Storm Damage Reduction (beachfill + dune) (initial construction)
 - ▶ Method: hopper dredge
 - ▶ Contractor: Weeks Marine Inc.
 - ▶ Cost: \$63 million



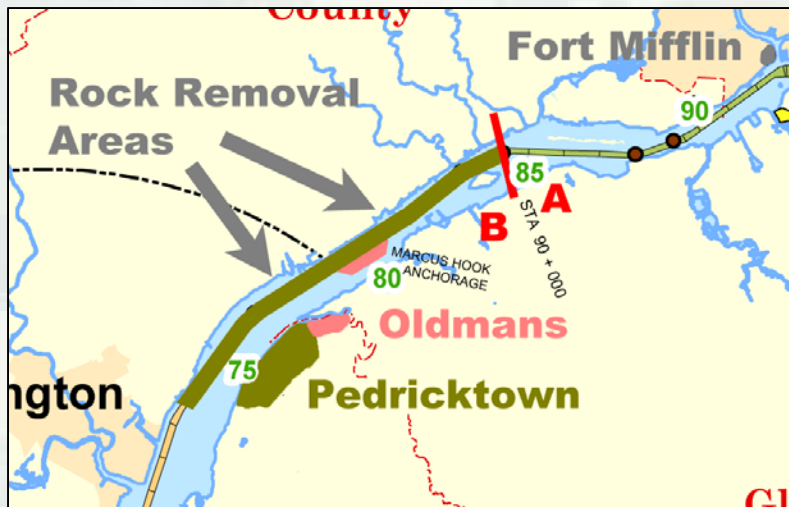
BUILDING STRONG®

Delaware River Deepening Contract Summary

Date	Contract	Contractor / plant	Cubic meters	\$/ cu m	Cubic yards	\$/ cu yd	Total cost
2010	Reach C	Norfolk / pipeline (2)	2,765,900	\$12.02	3,617,600	\$9.19	\$30,100,000
2011	Lower Reach B	Norfolk / pipeline	688,100	\$8.89	900,000	\$6.80	\$7,600,000
2012	Upper Reach A	GLDD / pipeline, hopper	1,456,700	\$12.29	1,905,300	\$9.40	\$14,500,000
2013	Reach D	Dutra /DonJon hopper, excavator	829,900	\$12.75	1,085,500	\$9.75	\$18,500,000
2014	Lower Reach A	GLDD / bucket	336,400	\$35.32	440,000	\$27.00	\$14,800,000
2014	Reach AA	GLDD / bucket	529,800	\$48.40	693,000	\$37.00	\$25,400,000
2014	Lower Reach E	Weeks Marine/hopper	1,452,700	\$42.23	1,800,000	\$33.00	\$63,300,000
2015	Rock Removal	TBD	TBD	TBD	TBD	TBD	TBD
2016	Upper Reach E	TBD	TBD	TBD	TBD	TBD	TBD
2017	Upper Reach B	TBD	TBD	TBD	TBD	TBD	TBD



BUILDING STRONG®



The Rest of the Work

- 2015 to completion
(currently on track for 2017)
 - ▶ Upper Reach B and Marcus Hook Anchorage
 - ▶ Rock Removal
 - ▶ Upper Reach E (beneficial use – ecosystem restoration)
- Channel maintenance
(after initial construction)
 - ▶ Expected annual volume: 4.3 million cubic yards
 - ▶ Increase of about 20% over 40-foot channel maintenance (3.5 million cubic yards)



For more information...

Visit the Delaware River Deepening website
<http://bit.ly/deldeep>

Contact the
Philadelphia District Public Affairs Office
edward.c.voigt@usace.army.mil
215-656-6515
Or
anthony.j.depasquale@usace.army.mil



US Army Corps of Engineers
BUILDING STRONG[®]

