GATEWAY DEVELOPMENT COMMISSION

HUDSON TUNNEL PROJECT

2024 PRE-CONSTRUCTION MONITORING REPORT HUDSON RIVER LOW COVER AREA HUDSON RIVER GROUND STABILIZATION

Gateway Development Commission

For
United States Army Corps of Engineers
New York State Department of Environmental Conservation

DECEMBER 2024
Version 1.0

TABLE OF CONTENTS

VERSION CONTROL

Version	Date	Changes	Created By	Approved By
0.1	December 2024	Version 1		

Table 1: Version Control

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACRONYMS

%	Percent
ASTM	American Society for Testing and Materials
°C	Degrees Celsius
DO	Dissolved Oxygen
°F	Degrees Fahrenheit
FTA	Federal Transit Administration
FEIS	Final Environmental Impact Statement
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GDC	Gateway Development Commission
HTP	Hudson Tunnel Project
HRGS	Hudson River Ground Stabilization
mg/L	milligrams per liter
mL	milliliters
NEC	Northeast Corridor
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRT	North River Tunnel
NTU	Nephelometric Turbidity Units
NYSDEC	New York State Department of Environmental Conservation
ORP	Oxidative Reduction Potential
PANYNJ	Port Authority of New York and New Jersey
ROD	Record of Decision
USACE	United States Army Corps of Engineers

1 INTRODUCTION

The Gateway Development Commission ("GDC") has prepared this report for the Hudson Tunnel Project ("HTP" or "Project") to document the pre-construction aquatic habitat conditions and ecological communities present within the Low Cover Area[1] and to summarize the biological monitoring observations conducted during in-water construction activities in 2024 associated with the development of a new rail tunnel under the Hudson River and the rehabilitation of the North River Tunnel ("NRT"). The monitoring activities were conducted in accordance with the modified Five-Year Monitoring Plan for Hudson River Low Cover Area ("Monitoring Plan") (GDC 2024a) which was approved by the National Oceanic Atmospheric Administration ("NOAA")/ National Marine Fisheries Service ("NMFS"), New York State Department of Environmental Conservation ("NYSDEC"), and United States Army Corps of Engineers ("USACE"). The Monitoring Plan was prepared to describe and fulfill monitoring requirements for environmental permits (NYSDEC Permit No. 2-6205-01829/00005 and USACE Permit No. NAN-2020-00835) issued for construction activities related to the deep soil hardening and mixing processes implemented in the Low Cover Area (Appendix A).

1.1 Purpose

The purpose of this report is to provide a summary of the pre-construction ecological community and habitat data collected in 2024 under the approved Monitoring Plan. This data represents the baseline monitoring collected to document pre-construction conditions which will be compared to post-construction results in future years.

The report includes the following elements:

- Project description and environmental permitting requirements
- A summary of the Monitoring Plan development and modifications
- Regulatory background for the overall HTP construction activities requiring review under National Environmental Policy Act ("NEPA") and consultation with federal and state agencies
- Methods used to characterize the pre-construction habitat and ecological communities in the Project area and reference areas
- Results of the 2024 sampling performed to document baseline conditions.

2 PROJECT REGULATORY BACKGROUND

The purpose of the HTP is to preserve the current functionality of Amtrak's Northeast Corridor ("NEC") service and NJ TRANSIT's commuter passenger rail service between New Jersey and Pennsylvania Station New York ("PSNY") by repairing the deteriorating NRT, and to strengthen the NEC's resiliency to support reliable service by providing redundant capability under the Hudson River for Amtrak and NJ TRANSIT NEC trains between New Jersey and PSNY.

The HTP consists of a new two-track tunnel together with rehabilitation of the existing NRT. The new tunnel would have two new tracks extending from the NEC in Secaucus, New Jersey, beneath the Palisades (North Bergen and Union City, New Jersey) and the Hoboken/Weehawken, New Jersey waterfront area, and beneath the Hudson River to connect to the existing tracks in PSNY. Upon completion of the HTP, the NEC would have four tracks (two in the new Hudson

[1] The FEIS/ROD refers to this area as the "low-cover area." However, as part of the HTP's procurement and contracting processes, the low-cover area is also referred to as the "Hudson River Ground Stabilization ("HRGS")."

River Tunnel and two in the North River Tunnel) between New Jersey and New York under the Hudson River, which would provide operational flexibility and redundancy for Amtrak and NJ TRANSIT rail operations.

The Federal Railroad Administration ("FRA") was the lead federal agency for the HTP's environmental review, in accordance with the NEPA. The Federal Transit Administration ("FTA") was a Cooperating Agency for the Final Environmental Impact Statement ("FEIS")/Record of Decision ("ROD") and as such, FTA issued the ROD jointly with the FRA in May 2021. The Port Authority of New York and New Jersey ("PANYNJ") was the Project Sponsor at the time the FEIS/ROD was issued on May 28, 2021. On October 21, 2022, PANYNJ and the GDC formally notified FRA and FTA that GDC was assuming the role of NEPA Project Sponsor. FRA coordinated compliance with Section 106 of the National Historic Preservation Act (Section 106) with the NEPA process.

The NYSDEC issued Permit No. 2-6205-01829 to Amtrak on October 1, 2021. The USACE issued Permit No. NAN-2020-00835 to Amtrak and NJ TRANSIT, as joint co-permittees, on November 17, 2021.

2.1 Project Description

The construction activities within the Low Cover Area will impact 3.03 acres of the Hudson River where deep soil mixing is required to strengthen the river substrate to minimize risk during tunnel boring operations (Figure 1). Deep soil mixing is a ground improvement method where in-place native soils are mixed or blended with cement. This technique creates columns of soil-cement with increased strength and reduced compressibility. Deep soil mixing involves the introduction of large diameter augers or paddles which are advanced to a maximum design coverage depth. As the augers or paddles turn, cement or cement grout is introduced and is mixed with the native soils to create a "soilcrete." The result is a series of overlapping soilcrete columns that together create a hardened volume of soil.

2.2 NEPA Compliance

As the NEPA Project Sponsor, GDC is responsible for ensuring the Project meets all federal and state requirements. GDC has prepared this report to comply with the following requirements and environmental commitments specified in the FEIS/ROD.

- FEIS/ROD Section 11.7.3.1.3 *Aquatic Biota.* The Project Sponsor will also monitor the recovery of the remaining 2.3 acres of soilcrete for five years post-construction.
- FEIS/ROD Section 11.7.3.1.3 A*quatic Biota.* As compensation for the change in the nature and elevation of bottom habitat within the 0.7 acres, the Project Sponsor will monitor this area, in coordination with the USACE, NMFS and NYSDEC, for five years to assess its recovery as fish foraging habitat and will include the submittal of regular monitoring reports.
- FEIS/ROD Section 11.7.3.2 *Essential Fish Habitat* As compensation for the change in the nature and elevation of bottom habitat within the 0.7 acres, the Project Sponsor will monitor this area, in coordination with the USACE, NMFS and NYSDEC, for five years to assess its recovery as fish foraging habitat. The Project Sponsor will also monitor the recovery of the remaining 2.3 acres of soilcrete for five years post-construction.
- FEIS/ROD Section 11.7.3.4 *Threatened, Endangered or Special Concern Species.* After construction is complete, the Project Sponsor will monitor the recovery of the 0.7 acres of elevated soilcrete and the remaining 2.3 acres of soilcrete for five years as foraging

habitat. Monitoring of this area will be conducted in consultation with the USACE, NMFS, and NYSDEC and will include the submittal of regular monitoring reports.

- FEIS/ROD Section 11.7.3.5 *Significant Coastal Fish and Wildlife Habitat.* After construction is complete, the Project Sponsor will monitor the recovery of the 0.7 acres of elevated soilcrete and the remaining 2.3 acres of soilcrete for five years to assess the habitat use and re-sedimentation of the modified river bottom. Monitoring of this area will be conducted in consultation with the USACE, NMFS, and NYSDEC and will include the submittal of regular monitoring reports. With implementation of measures recommended through these consultations, the permanent operation of the Preferred Alternative would not adversely affect the designation of this portion of the Hudson River as a Significant Coastal Fish and Wildlife Habitat.
- FEIS/ROD Attachment A: Mitigation Commitments (Natural Resources): Monitoring of the recovery of the 0.7 acres of affected river bottom, as well as the remaining 2.3 acres of ground improvement, for five years, in consultation with the USACE, NMFS, and the NYSDEC, to assess the recovery of the area as foraging habitat. Monitoring reports will be available on the Project website.

- FEIS/ROD Attachment A: Mitigation Commitments (Natural Resources): In the 0.7-acre area of the river bottom where the soilcrete would extend above the existing mudline, the Project Sponsor will implement a five-year monitoring program following completion of construction, in consultation with the USACE, NMFS, and the NYSDEC, to assess the recovery of the area as fish foraging habitat. The Project Sponsor will also monitor the recovery of the remaining 2.3 acres of soilcrete for five years post-construction. Regular monitoring reports will be submitted to the USACE, NMFS, and NYSDEC and will be made available on the Project website.

2.3 Permit Compliance

GDC has prepared this report to comply with requirements specified in the following federal and state permit conditions.

NYSDEC Natural Resources Permit Condition No. 8

On October 1, 2021, the NYSDEC authorized the proposed work in the low cover area through the issuance of NYSDEC Permit No. 2-6205-01829/00005 (Appendix A). The NYSDEC Natural Resources Permit Condition No. 8 identified that within ninety (90) days of issuance, the Permittee must submit a low cover section Monitoring Plan to the NYSDEC for review and approval prior to commencing work and within one year prior to commencement of work conduct pre-construction survey data to include, at a minimum, physical monitoring bathymetry, water quality, and sediment characteristics), benthic invertebrate monitoring, and fish community monitoring.

USACE Special Permit Condition (D)

On November 15, 2021, the USACE authorized the work in the low cover area through the issuance of USACE Permit No. NAN-2020-00835 (Appendix A). The USACE Special Permit Condition (D) included a stipulation that a river-bottom Monitoring Plan needed to be approved prior to commencing any in-water or in-wetlands work and submit a Monitoring Plan to assess the on-going recovery of fish foraging habitat of the 3.1-acre ground treatment in the Hudson River. A Monitoring Plan was to be developed in concert with the NOAA NFMS and the NYSDEC and incorporates up to five (5) years of post-construction surveys after the removal of the last of the two cofferdams. An annual report must be submitted in triplicate no than December 31 of each year.

2.4 Monitoring Plan Development and Revisions

A Five-Year Monitoring Plan for Hudson River Low Cover Area was prepared and submitted to NOAA/NMFS, USACE, and NYSDEC for review and approval. The Monitoring Plan was prepared to monitor Project impacts on the fish and macroinvertebrate communities as well as the physical habitat within the Low Cover Area. The Monitoring Plan was approved by USACE on September 8, 2022, NOAA/NMFS on September 9, 2022, and NYSDEC on September 12, 2022. The Monitoring Plan was revised on November 8, 2022, to address regulatory agency comments and resubmitted on November 9, 2022.

On May 22, 2024, a request to modify the Monitoring Plan was made prior to in-water construction, to meet the state and federal agencies permit conditions and to more effectively monitor the ecological communities and physical habitat conditions within the Low Cover Area and reference areas to assess potential impacts from the Project. These modifications to the Monitoring Plan were submitted to the agencies on May 22, 2024, via email (GDC 2024b) and were approved by the agencies on May 31, 2024. Associated correspondence and approvals for the modified Monitoring Plan are provided in Appendix B.

3 MONITORING PLAN SURVEYS AND FIELD METHODS

The modified Monitoring Plan (GDC 2024b) details the collection of pre-construction baseline aquatic community and habitat data within the Low Cover Area and associated reference areas (Figure 2). In accordance with the agency modified Monitoring Plan (GDC 2024b), pre-construction baseline aquatic community and habitat data collection included the collection of benthic invertebrate community data and sediment grain size data using a petite Ponar dredge, water quality parameter data collection using a multiparameter sonde and bottom trawl surveys to assess the fish community. Additionally, bathymetry surveys were conducted as part of pre-construction activities within the Low Cover Area to document pre-construction bottom contours.

In addition to the field data collection, during the in-water construction activities (i.e. pile driving and sheeting installation) agency approved biological monitors were present to document and report any potential incidental take of listed species, specifically Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*.

3.1 Benthic Macroinvertebrate Community Surveys

Prior to the start of construction at the Low Cover Area, baseline macroinvertebrate community surveys were conducted on June 18, 2024, at each of the 10 (ten) monitoring locations (site and reference) identified in Figure 2. Monitoring locations were selected to get spatial coverage of both the Low Cover Area as well as upstream and downstream reference areas.

At each of the monitoring locations, three replicate grab samples were collected using a petite Ponar dredge to characterize the benthic macroinvertebrate community. Each dredge was brought to the surface, the volume of the recovered sediment in each grab was noted, and the sediment composition was visually estimated. The three (3) benthic community grabs were combined, rinsed through a 500-micron sieve and placed in a labelled sample jar and preserved with 91 percent (%) isopropanol for a single sample per location. Since benthic organisms can be patchily distributed, combining three replicates into a single sample allows for better data comparability between locations. Samples were sent to Normandeau Associates, Inc.'s laboratory in Bedford, New Hampshire where organisms were identified to the lowest practical taxonomic level and enumerated.

3.2 Grain Size

Sediment grabs were collected as part of the pre-construction survey at both the site and

reference monitoring locations to document grain size and habitat conditions in the Low Cover Area prior to construction. Following the collection of the benthic macroinvertebrate community samples, a single petite Ponar grab was taken at each location for grain size analysis. The sediment from each grab was placed in a labelled, sealable plastic bag, allowed to settle, and the overlying water was decanted prior to shipping samples to Eurofins in South Burlington, Vermont for grain size analysis using gravimetric processes following the American Society for Testing and Materials method (ASTM) D422.

3.3 Water Quality Monitoring

During the benthic invertebrate and sediment sampling, water quality monitoring was also conducted using a multiparameter sonde at two depth intervals at each monitoring location. Water quality parameters including temperature, pH, Oxidative Reduction Potential ("ORP"), Dissolved Oxygen ("DO"), turbidity, and conductivity were collected from the middle of the water column and approximately one meter above the river bottom at each monitoring location.

3.4 Fish Community Surveys

The pre-construction fish community surveys were performed on June 19, 2024, using a 20-foot otter trawl that was towed parallel to the river flow adjacent to the monitoring locations as shown on Figure 2. A total of three representative otter trawl tows were performed within the Low Cover Area and two otter trawl tows within both the upstream and downstream reference area for a total of seven total trawls (3 site, 4 reference).

At each of the target monitoring locations, the otter trawl was deployed and allowed to settle to the river bottom. Tows were conducted into the current and were timed to allow a uniform collection effort between locations. After completion of the tow, the trawl was hoisted back to the boat using an onboard winch system and the net contents were poured into a large collection container for processing. Fish collected during the survey were identified to the lowest taxonomic level possible, enumerated, measured, and a representative photo was taken of each species. All fish collected during the surveys were released after processing. Other benthic fauna that was collected in the trawls such as shrimp and crabs were also identified, counted and released.

3.5 Bathymetry

Bathymetry was conducted as part of the pre-construction survey at both the sampling and reference locations prior to construction activities. The Project utilized Multibeam Bathymetry to obtain a geophysical survey that includes a swath bathymetric survey providing high-resolution multibeam data to develop contours of the water depths and the general shape of the river bottom. Horizontal accuracy of the multibeam bathymetry was approximately 0.2 feet and vertical accuracy will be approximately 0.2 feet. Survey lines had a minimum of 50% overlap to ensure 200% coverage. In addition, digital side-scan sonar survey was provided to obtain more detailed information on the character of the riverbed. The side-scan sonar supplemented the multibeam bathymetry data in locating and identifying debris on the river bottom as well as scars, old pilings, and areas of scour due to past storm surges. The side-scan ortho sonograph accuracy is approximately 6.0 feet horizontally.

In the fall of each year of the 5-year monitoring event, the bathymetry of the Low Cover Area will be mapped to identify changes in river bottom from the previous year. Within the Low Cover Area, the mapping will occur from the pier headline to the boundaries of State water in the middle of the Hudson River. Bathymetric mapping will utilize high resolution side-scan sonar to allow for the analysis of annual variation of the sea floor.

4 PRE-CONSTRUCTION MONITORING RESULTS

The benthic macroinvertebrate community results are presented in Table 2, results of the sediment grain size analysis are presented in Table 3, the water quality monitoring results are presented in Table 4, and the fish community results are presented in Table 5 and. A photolog of the otter trawl results and invertebrate sampling are presented in Appendix C.

4.1 Benthic Macroinvertebrate Survey Results

Benthic invertebrate community samples were collected at four reference locations (BC-R-01 to BC-R-04 and four site locations within the Low Cover Area (BC-S-01 to BC-S-04), and two near-shore locations near the bulkhead of the West 30th Street Heliport Pier on June 18, 2024. The results of the benthic invertebrate community surveys are presented in Table 2.

Across all ten monitoring locations, the number of taxa per sample ranged from 13 to 39, with a total of 77 different invertebrate taxa observed. Total abundance ranged from 105 individuals at MBH-01(bulkhead) to 1,349 individuals at BC-S-02 (site). Blue mussel (*Mytilus edulis*) was the most abundant species, collected at seven out of ten locations with a total of 1,767 individuals. The second most abundant species was a sand-builder worm (*Sabellaria vulgaris)* which was collected at seven locations with 929 total individuals. The third most abundant taxa were oligochaetes (o*ligochaeta*) which were collected at 9 locations with 425 total individuals. These three taxa accounted for 76% of the total number of individuals collected during the baseline monitoring. The most widespread taxa were the polychaeta (*Mediomastus ambiseta)* and mud worm *(Streblospio benedicti)* which were collected at all ten locations.

The four (4) site locations had a mean abundance of 802 individuals per sample, while the four reference locations had a mean abundance of 170 individuals. The variance in mean abundance between the site and reference locations was due to the high counts of blue mussels found at two of the site locations (BC-S-01 and BC-S-02). Species richness was higher at the site monitoring locations than the Reference monitoring locations with a mean of 32 and 21 taxa, respectively. Mean density was also higher at the site locations (34,870 organisms per meter squared (m^2) than at the reference monitoring locations (7,370 organisms/m^2). Similarly, the elevated mean density at the Project locations was due to the high abundance of mussels at the two (2) site locations. The Shannon-Weiner Diversity Index is a commonly used metric to assess invertebrate populations where higher scores equal a more diverse community. Diversity scores overall were relatively low, ranging from 1.05 at BC-R-04 to 2.22 at MBH-01. The mean diversity index was slightly higher at the Reference locations (1.82) compared to the site locations (1.52). Evenness was also higher at the Reference locations than the site with scores of 0.596 and 0.450 respectively.

Invertebrate species collected during the baseline monitoring are typical of the soft sediment habitat found in the Hudson River estuary and consisted primarily of bivalves, amphipods, polychaetas and various types of worms adapted to burrowing into the sediment. Abundance varied greatly between monitoring locations, but this is not unusual of benthic invertebrate organisms which are often patchily distributed (Bascompte, et al. 2002). Diversity and species richness were relatively low with many samples dominated by one or a few taxa.

4.2 Grain Size Results

Co-located sediment grain size data was collected to evaluate substrate conditions associated with the benthic community. Table 3 presents the results of the grain size collected at each sample location.

The substrate throughout the Project area was predominantly fine grained. Silt was the dominant grain size class observed across most benthic locations, except for BC-R-02 and BC-S-02 where sand was dominant. Of the grain sizes measured, gravel and coarse sands were observed the least, occurring at only three locations (BC-R-02, BC-S-01, BC-S-02). The substrate within the Low Cover Area was predominantly fines with three locations (BC-S-01, -03, and -04) consisting predominantly of silt/clay and only one location (BC-S-02) having more than 30% gravel and sands present in addition to fines. The reference locations were also primarily fines, but there was some spatial variation with more coarse grain sizes present at the upstream reference locations, especially BC-R- 2, and no gravel or coarse sand observed at the downstream reference locations (BC-R-3 and 4). The grain sizes classified as gravel appeared to be cinders, likely from historic anthropogenic activity on the river, and did not appear to be native material such as stone.

4.3 Water Quality Results

The water quality results are presented in Table 4.

The sampling locations on the lower Hudson River fall within the jurisdiction of both New York and New Jersey. On the New Jersey side of the river, water is classified as saline estuarine waters that support aquatic life and recreation activities ("SE2"). The water quality standards for SE2 waters are as follows:

- Dissolved Oxygen (DO): must be at least 5.0 milligrams/liter (mg/L)
- Turbidity: may not exceed 10 Nephelometric Turbidity Units (NTU)
- Temperature: should not exceed 89.6 degrees Fahrenheit (°F) or 32 degrees Celsius (°C)
- pH: should be withing the range of 6.5 to 8.5

The Project area is located between the Battery and the Bronx in New York which falls under Class I water quality criteria. Class I waters in New York are designated for secondary contact recreation such as boating or fishing. The water quality standards for Class I Waters are as follows:

- Fecal coliform monthly geometric mean should not exceed 200 CFU/100 milliliters (mL) and total coliform should not exceed 2,400 CFU/ 100 mL
- The DO concentration must be at least 4.0 mg/L at any time
- The temperature should not exceed 83 °F or 28.3 °C at any time
- pH should be within the range of 6.5 to 8.5
- Turbidity may not exceed 5 NTU.

As shown in Table 4, turbidity, dissolved oxygen, pH and temperature at the 10 monitoring locations are generally within the parameters set for Class I waters, with some exceptions. During the pre-construction baseline monitoring, waterbodies were not monitored for bacteria; therefore, a comparison to these water quality standards cannot be made. Deviations in pH and turbidity were observed at several locations.

Exceedances (above the 8.5 threshold for SE2 and Class I) for pH were observed at the following locations:

- BC-R-01 Bottom Depth
- BC-R-03 Bottom Depth

- BC-R-04 both Bottom and Mid-Column Depths
- BC-MBH-02 Bottom Depth

Exceedances (above 5 NTU for Class I) for turbidity were observed at the following locations:

- BC-R-04 Bottom Depth
- BC-MBH-01 Mid-Column Depth
- BC-MBH-02 both Bottom and Mid-Column Depths

Turbidity at BC-R-04 within the mid-column depth was 13.45 NTU which is also above the SE2 threshold of 10 NTU.

Water temperatures observed during the survey ranged from 18.0 to 22.8°C and did not exceed the 28.3°C Class I threshold or 32°C SE2 threshold. At all locations, the DO levels were above 8 mg/L (ranging from 8.00 to 9.25 mg/L) and above the minimum 4 mg/L threshold value for Class I waters and minimum 5 mg/L threshold for SE2 waters. Water quality parameters were generally similar between the Low Cover Area and reference locations and were suitable of supporting aquatic life.

4.4 Fish Community Survey Results

The results of the otter trawl surveys are presented in Table 5. Representative photographs of the marine life observed within the trawl surveys are presented in Appendix C.

Fish species, along with crustaceans, cephalopods, and ctenophores were collected during the trawl surveys performed on June 19, 2024. Across all seven locations, the number of fish species per tow ranged from 3 to 8, with a total of 11 different fish species observed. Tomcod (*Microgadus proximus*) was the most abundant species, collected at all seven locations with a total of 171 individuals followed in abundance by hogchoker (*Trinectes maculatus*) which was collected at five locations (18 total individuals). Although most of the fish collected were bottom dwelling species, some sportfish including striped bass (*Morone saxatilis*) and weakfish (*Cynoscion regalis)* were also collected.

Across all seven fish community survey locations, the number of invertebrate taxa per tow ranged from 2 to 4, with a total of 6 invertebrate taxa observed during the trawl surveys. Sand shrimp (*Crangon septemspinosa*) and jellyfish (*Ctenophora)* were the most abundant invertebrate taxa observed and were collected at all locations with a total of 223 individual shrimp (jellyfish were not individually counted). Overall, 17 different taxa were collected in the trawl surveys.

The community observed during the otter trawls was relatively similar between the site and Reference locations. The total number of organisms (fish and invertebrates) was similar with an average of 75 individuals at the site and 73 individuals at Reference. The total number of combined taxa was slightly lower at the site with an average of 6.7 taxa per location compared to 8.5 at the Reference but the number of fish per location was greater at the site with an average of 39 compared to 27 at the Reference.

4.5 Bathymetry Results

Results of the bathymetry performed within the Low Cover Area are provided in Appendix D.

5 DISCUSSION

Pre-construction environmental monitoring was completed in 2024 in accordance with the modified Monitoring Plan (GDC 2024b) to collect data on ecological communities and habitat present within the Low Cover Area and appropriate reference locations. The monitoring included

macroinvertebrate grab sampling and fish community trawl surveys which documented a fish and invertebrate community typical of the lower Hudson River. The abundance and diversity varied between samples, but results were generally similar between site and Reference locations. The sediment grain size sampling showed the physical habitat in the Low Cover Area was primarily fine-grained substrate consisting of silt and clay and generally consistent with the surrounding reference areas within the Lower Hudson. The water quality monitoring identified a few parameters which were outside the regional water quality standards which is not surprising given the site's location within a very developed and urban area, but overall water quality was generally consistent with state standards and suitable for supporting aquatic life.

FEIS/ROD Section 3.3.5.7 explains installation and removal of cofferdams ("HRGS In-Water Work") would occur only within an authorized work window from July 1 to January 20. As such, HRGS in-water work including the installation and removal of the cofferdams is strictly prohibited between January 21 and June 30 of each calendar year.

The HRGS In-Water Work within the Low Cover Area is strictly prohibited between January 21 and June 30 of each calendar year. To adhere to the seasonal restrictions identified in the FEIS/ROD, HRGS In-Water work within the Low Cover Area is planned to occur in three (3) seasons:

1. Season 1: July 1, 2024, to January 20, 2025
2. Season 2: July 1, 2025, to January 20, 2026
3. Season 3: July 1, 2026, to January 20, 2027

This 2024 data will serve as the baseline dataset describing pre-construction conditions within the Low Cover Area to which future data will be compared to assess potential Project impacts. Five (5) years of post-construction surveys including physical monitoring bathymetry, water quality, and sediment characteristics, benthic invertebrate monitoring, and fish community monitoring after the removal of the last of the two cofferdams will be conducted. An annual report will be submitted in triplicate no than December 31 of each year.

6 REFERENCES

Bascompte, Jordi, et al. "Patchy Populations in Stochastic Environments: Critical Number of Patches for Persistence." *The American Naturalist*, vol. 159, no. 2, 2002, pp. 128–37. *JSTOR*, https://doi.org/10.1086/324793. Accessed 19 Dec. 2024.

GDC 2024a. Gateway Development Commission (GDC) *Five Year Monitoring Plan for Hudson River Low Cover Area (Monitoring Plan)* Submitted electronically, 2024

GDC 2024b. Gateway Development Commission (GDC) *Modifications of Five-Year Monitoring Plan for Hudson River Low Cover Area (Revised)* Submitted electronically, June 2024.

TABLES

Table 2. Benthic Community Survey Results
Hudson Tunnel Project
Low Cover Area Pre-Construction Monitoring Report
Gateway Development Commission

Taxon Classification				Common Name	Site Locations				Reference Locations			
Class	Order	Family	Lowest Practical Taxon Level		BC-S-01	BC-S-02	BC-S03	BC-S-04	BC-R-01	BC-R-02	BC-R-03	BC-R-04
Ascidiacea												
	Pleurogona											
		Molgulidae										
			Molgula manhattensis	Sea grapes	6	8	2	--	--	1	--	--
Bacillariophycae												
	Centrohelida											
		Carinomidae										
			Carinoma tremaphoros	Protist	--	--	--	--	1	--	1	--
Bivalva												
	Arcida											
		Arcidae										
			Anadara transversa	Transverse ark clam	1	3	--	--	--	--	--	--
	Cardiida											
		Tellinidae										
			Macoma petalum	Atlantic macoma	--	--	--	--	--	--	--	--
			Macoploma tenta	Elongated macoma	--	--	--	--	1	--	2	--
			Tellinidae	Tellin clam	--	2	3	1	--	3	4	2
	Chaetocerotales											
		Lyonsiidae										
			Lyonsia hyalina	Glassy lyonsia	9	--	--	--	--	--	--	--
	Grammysioidea											
		Myidae										
			Mya arenaria	Soft-shell clam	1	4	--	--	--	--	--	--
		Mytilidae										
			Mytilidae	Mussel	--	--	--	--	--	--	--	1
			Mytilus edulis	Blue mussel	962	611	100	1	5	36	52	--
	Nuculida											
		Nuculidae										
			Nucula proxima	Atlantic nut clam	1	--	--	--	1	--	--	--
	Venerida											
		Mactridae										
			Mulinia lateralis	Dwarf surf clam	--	--	--	--	--	--	--	--
		Petricolidae										
			Petricolaria pholadiformis	False angelwing	5	40	8	--	1	52	1	--
				Unknown bivalva species	1	8	--	--	1	--	--	--
Gastropoda												
	Neogastropoda											
		Muricidae										
			Urosalpinx cinerea	Eastern oyster drill	1	1	1	--	--	--	--	--
		Nassariidae										
			Ilyanassa obsoleta	Eastern mud snail	--	--	--	--	--	--	1	--
			Ilyanassa trivittata	Three line mud snail	--	--	--	--	--	--	--	--

Table 2. Benthic Community Survey Results
Hudson Tunnel Project
Low Cover Area Pre-Construction Monitoring Report
Gateway Development Commission

Taxon Classification				Common Name	Site Locations				Reference Locations			
Class	Order	Family	Lowest Practical Taxon Level		BC-S-01	BC-S-02	BC-S03	BC-S-04	BC-R-01	BC-R-02	BC-R-03	BC-R-04
Gastropoda (continued)												
	Pylopulmonata											
		Pyramidalidae										
			Odostomia eburnea	Sea snail	5	4	2	--	--	3	--	--
			Turbonilla interrupta	Interrupted turbonille	--	1	--	--	1	1	--	--
				Unknown gastropoda species	--	--	--	--	--	--	1	1
Malacostraca												
	Amphipoda											
		Oedicerotidae										
			Ameroculodes edwardsi	Scud	--	--	--	--	--	--	--	--
		Ampeliscidae										
			Ampelisca abdita	Amphipod	--	3	1	--	--	--	--	--
			Ampelisca vadorum	Amphipod	1	1	1					
		Aoridae										
			Grandidierella japonica	Japanese skeleton shrimp	1	2	1	--	1	2	--	--
		Caprellidae										
			Caprella penantis	Skeleton shrimp	--	--	--	--	--	--	--	1
		Corophiidae										
			Monocorophium acherusicum	Tube-building amphipod	4	--	--	--	--	--	--	--
		Ischyroceridae										
			Jassa marmorata	Marbled scud	--	--	--	--	--	1	--	--
		Leuconidae										
			Leucon americanus	Scud	--	--	--	--	--	--	--	5
		Melitidae										
			Melita nitida	Striped amphipod	--	--	1	--	--	--	--	--
		Pleustidae										
			Incisocalliope aestuarius	Estuarine amphipod	8	9	3	--	--	1	--	--
		Unciolidae										
			Unciola irrorata	Scud	--	--	1	--	--	--	--	--
			Unciola serrata	Scud	--	2	2	--	2	--	--	--
	Cumacea											
		Diastylidae										
			Oxyurostylis smithi	Sharp-tailed cumacean	--	1	--	--	1	--	--	1
	Decapoda											
		Crangonidae										
			Crangon septemspinosa	Sand shrimp	--	1	1	1	2	--	--	--
		Paguridae										
			Pagurus sp.	Hermit crab	--	--	--	--	--	1	--	--
		Panopeidae										
			Dyspanopeus sayi	Say mud crab	1	--	1	--	--	--	--	--
	Isopoda											
		Anthuridae										
			Cyathura burbancki	Isopod	3	2	--	--	--	1	--	--

Table 2. Benthic Community Survey Results
Hudson Tunnel Project
Low Cover Area Pre-Construction Monitoring Report
Gateway Development Commission

Taxon Classification				Common Name	Site Locations				Reference Locations			
Class	Order	Family	Lowest Practical Taxon Level		BC-S-01	BC-S-02	BC-S03	BC-S-04	BC-R-01	BC-R-02	BC-R-03	BC-R-04
Malacostraca (continued)												
		Idoteidae										
			Edotia triloba	Isopod	--	--	1	--	--	--	1	1
			Synidotea laevidorsalis	Asian isopod	2	1	--	--	1	2	2	--
	Mysida											
		Mysidae										
			Neomysis americana	Oppossum shrimp	--	--	--	--	--	--	3	--
Palaeonemertea												
	Tubulaniformes											
		Tubulanidae										
			Tubulanus sp.	Nemertean worm	2	--	3	1	--	--	1	--
Oligochaeta												
				Unknown oligochaeta species	1	--	52	76	49	7	97	106
Polychaeta												
	Achnanthales											
		Orbiniidae										
			Leitoscoloplos fragilis	Diatom	--	--	--	--	--	--	--	--
			Leitoscoloplos robustus	Diatom	--	--	--	--	--	--	--	--
	Capitellida											
		Capitellidae										
			Heteromastus filiformis	Polychaete worm	--	2	1	1	--	--	3	3
			Mediomastus ambiseta	Polychaete worm	1	3	4	17	3	1	20	13
Crassiclitellata												
		Maldanidae										
			Euclymene collaris	Polychaete worm	10	5	5	1	1	1	--	--
Eunicida												
		Dorvilleidae										
			Schistomeringos rudolphi	Four-eyed dorvillea	--	1	1	--	--	--	--	--
		Eunicidae										
			Lysidice unicornis	Polychaete worm	1	--	--	--	--	--	--	--
			Marphysa sanguinea	Blood worm	--	6	--	--	--	--	--	--
Phyllodocida												
		Goniadidae										
			Glycinde multidens	Polychaete worm	--	--	--	--	--	--	--	--
		Hesionidae										
			Oxydromus obscurus	Polychaete worm	8	--	2	--	--	--	--	--
			Podarkeopsis levifuscina	Polychaete worm	--	--	6	--	2	1	1	--
		Nereididae										
			Alitta succinea	Clam worm	4	4	3	1	--	--	--	--
		Phyllodocidae										
			Eumida sanguinea	Bristle worm	1	2	--	--	--	1	--	--
			Hypereteone heteropoda	Polychaete worm	11	4	18	3	9	3	8	--
			Paranaitis speciosa	Polychaete worm	--	--	--	--	--	--	2	--

Table 2. Benthic Community Survey Results
Hudson Tunnel Project
Low Cover Area Pre-Construction Monitoring Report
Gateway Development Commission

Taxon Classification				Common Name	Site Locations				Reference Locations			
Class	Order	Family	Lowest Practical Taxon Level		BC-S-01	BC-S-02	BC-S03	BC-S-04	BC-R-01	BC-R-02	BC-R-03	BC-R-04
Polychaeta (continued)												
		Polynoidae										
			Eunoe oerstedi	Multi-pronged scaleworm	2	3	--	--	--	--	--	--
			Lepidonotus sp.	Scale worm	--	--	--	1	1	--	5	--
		Syllidae										
			Myrianida prolifera	Polychaete worm	1	--	2	--	--	--	--	--
			Streptosyllis verrilli	Polychaete worm	--	--	--	--	--	--	2	--
			Syllidae	Necklace worm	--	--	1	--	--	2	--	--
			Syllis gracilis	Polychaete worm	2	--	--	--	--	--	--	--
	Spionida											
		Sabellidae										
			Parasabella microphthalma	Polychaete worm	1	3	--	--	--	--	--	--
			Sabellaria vulgaris	Sand builder worm	137	578	162	1	37	12	2	--
		Spionidae										
			Dipolydora socialis	Polychaete worm	1	--	--	--	--	--	--	--
			Marenzelleria viridis	Red-gilled mudworm	--	--	--	--	--	--	--	--
			Polydora cornuta	Whip mudworm	12	--	8	2	2	5	1	--
			Pygospio elegans	Bristle worm	--	3	--	--	--	--	--	--
			Spionidae	Mud worm	--	--	1	--	--	--	--	--
			Streblospio benedicti	Bar-gilled mudworm	4	3	10	22	3	3	36	3
	Terebellida											
		Ampharetidae										
			Ampharete oculata	Polychaete worm	5	2	4	1	--	1	2	2
		Cirratulidae										
			Cirratulidae	Hair worm	3	4	1	2	1	--	5	1
			Cirriformia grandis	Polychaete worm	--	1	--	--	--	--	--	--
		Terebelidae										
			Polycirrus eximius	Polychaete worm	6	--	--	--	--	--	--	--
			Polycirrus phosphoreus	Polychaete worm	1	--	--	--	--	--	--	--
			Polycirrus sp.	Polychaete worm	83	21	4	1	13	5	--	--
				Abundance (N)	1309	1349	417	133	139	146	253	140
				Species Richness (S)	39	36	35	17	23	24	24	13
				Density (organisms/m^2)	56,913	58,652	18,130	5,783	6,043	6,348	11,000	6,087
				Diversity (H')	1.18	1.32	2.07	1.50	2.07	2.17	2.01	1.05
				Evenness (J')	0.321	0.369	0.581	0.528	0.661	0.682	0.633	0.409

Notes:

1. Benthic community samples collected on June 18, 2024 using a petite ponar dredge.
2. Benthic taxonomy identification performed by Normandeau Associates, Inc. in Bedford, New Hampshire.
3. Diversity calculated using Shannon-Weiner index using base e method as:

$$H' = -\sigma\, p_i \ln(p_i)$$

4. Evenness calculated using Pielou's index as:

$$J' = \frac{H'}{\ln(S)}$$

Table 3. Sediment Grain Size Results

Hudson Tunnel Project

Low Cover Area Pre-Construction Monitoring Report

Gateway Development Commission

Location	BC-R-01	BC-R-02	BC-R-03	BC-R-04	BC-S-01	BC-S-02	BC-S-03	BC-S-04
Particle Size Category Classification								
Gravel	--	14.1	--	--	15.8	37.0	--	--
Sand	21.0	57.7	23.3	27.6	12.3	49.7	18.8	29.0
Coarse Sand	--	14.7	--	--	0.8	12.1	--	--
Medium Sand	6.9	13.2	5.9	7.7	4.3	13.1	7.1	9.4
Fine Sand	14.1	29.8	17.4	19.9	7.2	24.5	11.7	19.6
Silt	55.0	19.3	55.4	49.2	66.1	8.2	59.2	46.9
Clay	24.0	8.9	21.3	23.2	5.8	5.1	22.0	24.1
Individual Sieve Size - Incremental Percentages								
Sieve 3 inch	--	--	--	--	--	--	--	--
Sieve 2 inch	--	--	--	--	--	--	--	--
Sieve 1.5 inch	--	--	--	--	--	--	--	--
Sieve 1 inch	--	--	--	--	--	--	--	--
Sieve .75 inch	--	--	--	--	--	--	--	--
Sieve .375 inch	--	6.7	--	--	12.5	28.5	--	--
Sieve #4	--	7.4	--	--	3.3	8.5	--	--
Sieve#10	--	14.7	--	--	0.8	12.1	--	--
Sieve #20	3.1	6.4	3.4	4.6	2.2	3.6	3.8	3.0
Sieve #40	3.8	6.8	2.5	3.1	2.1	9.5	3.3	6.4
Sieve #60	2.7	5.9	3.0	3.8	2.4	12.5	3.7	5.8
Sieve #80	2.7	4.0	1.8	2.4	1.1	3.9	1.9	4.8
Sieve #100	2.2	3.3	1.7	2.0	0.9	2.1	1.6	3.3
Sieve #200	6.5	16.6	10.9	11.7	2.8	6.0	4.5	5.7
Hydrometer 1	20.3	3.8	22.8	22.6	59.4	1.9	30.2	16.8
Hydrometer 2	10	2.5	4.2	5.0	1.9	1.9	7.3	10.0
Hydrometer 3	13.2	5.6	14.2	11.6	1.2	1.9	8.9	6.1
Hydrometer 4	8.2	3.3	7.1	3.3	1.8	1.3	5.5	6.0
Hydrometer 5	3.3	4.1	7.1	6.7	1.9	1.3	7.3	8.0
Hydrometer 6	3.8	1.6	4.3	4.9	--	0.6	1.8	2.0
Hydrometer 7	4.9	2.6	7.3	8.6	2.1	2.6	9.5	12.4

Notes:

1. Sediment grain size samples collected with a petite ponar grab sampler at each benthic community location on June 18, 2024.

Table 4. Water Quality Parameters
Hudson Tunnel Project
Low Cover Area Pre-Construction Monitoring Report
Gateway Development Commission

Sample Location	Water Column Depth	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Temperature (°C)
BC-R-01	Bottom	21.57	3.40	9.44	8.66	433	22.7
	Mid-Column	31.15	2.52	8.49	8.15	445	19.1
BC-R-02	Bottom	21.22	2.87	8.28	8.28	416	22.8
	Mid-Column	32.62	2.30	8.72	8.08	432	18.8
BC-R-03	Bottom	21.35	2.51	9.37	8.76	436	22.6
	Mid-Column	34.09	2.58	8.30	8.18	452	18.4
BC-R-04	Bottom	23.26	3.83	9.17	9.25	456	22.4
	Mid-Column	28.66	13.45	8.84	8.63	461	20.7
BC-S-01	Bottom	27.50	2.32	8.75	7.95	158	20.8
	Mid-Column	35.27	1.87	8.14	7.90	194	18.5
BC-S-02	Bottom	27.94	2.72	8.92	7.95	153	20.6
	Mid-Column	36.78	2.06	8.24	7.90	191	18.2
BC-S-03	Bottom	26.74	2.23	9.01	8.06	197	21.1
	Mid-Column	37.02	1.64	8.32	7.93	218	18.1
BC-S-04	Bottom	25.42	1.81	9.10	8.00	216	21.3
	Mid-Column	36.04	4.67	8.18	7.86	239	18.0

Notes:

1. Water quality data collected during aquatic surveys performed on June 18, 2024.

Acronyms:

°C = degrees Celsius
BC = benthic community
MBH = Middle Bulkhead
mg/L = milligrams per liter
mS/cm = milliSiemens per centimeter
mV = millivolts
NTU = Nephlometric Turbidity Units
ORP = Oxidative Reduction Potential
R = Reference Location
S = Site Location

Table 5. Otter Trawl Survey Results

Hudson Tunnel Project

Low Cover Area Pre-Construction Monitoring Report

Gateway Development Commission

Location (Area):	Site (Between 1 & 2)	Site (Between 2 & 3)	Site (Between 3 & 4)	Upstream Reference (Inside)	Upstream Reference (Outside)	Downstream Reference (Inside)	Downstream Reference (Outside)	All Locations
Marine Life Species: Common Name (Scientific Name)	**Count**	**Count**	**Count**	**Count**	**Count**	**Count**	**Count**	**Count**
Bay anchovy (*Anchoa mitchilli)*	1	--	6	--	1	1	--	9
Black sea bass (*Centropristis striata)*	1	--	--	--	--	--	--	1
Clearnose skate (*Raja eglanteria*)	1	--	--	--	1	--	--	2
Hogchoker (*Trinectes maculatus)*	1	1	--	--	3	2	11	18
Northern sea robin (*Prionotus carolinus)*	--	--	--	1	1	--	1	3
Oyster toadfish (*Opsanus tau)*	--	--	5	1	4	--	2	12
Spotted hake (*Urophycis regia)*	--	1	--	1	1	--	1	4
Striped bass (*Morone saxatilis)*	--	--	--	--	1	--	--	1
Tomcod (*Microgadus proximus)*	35	54	11	5	1	2	63	171
Weakfish (*Cynoscion regalis)*	--	--	--	--	--	1	--	1
White perch (*Morone americana)*	--	--	--	1	--	--	--	1
Blue crab (*Callinectes sapidus)*	--	1	--	--	1	--	1	3
Jellyfish[2] (*Ctenophora*)	Many	Many	Many	Many	Many	Many	Many	Many
Sand shrimp (*Crangon septemspinosa)*	28	55	24	28	74	29	49	287
Hermit crab (*Pagurus bernhardus)*	--	1	--	--	1	--	--	2
Longfin squid (*Pandalus borealis)*	1	--	--	--	--	--	--	1
Oyster crab (*Zaops ostreus)*	--	--	--	--	--	--	1	1
Total Count of Fish	39	56	22	9	13	6	78	223
Total Fish Taxa	5	3	3	5	8	4	5	11
Total Count of Invertebrates	29	57	24	28	76	29	51	294
Total Invertebrate Taxa	3	4	2	2	4	2	4	6
Total Organisms	68	113	46	37	89	35	129	517
Total Taxa	8	7	5	7	12	6	9	17

Notes:

1. Otter trawl surveys performed on June 19, 2024.

2. Jellyfish were not indivudally counted

FIGURES

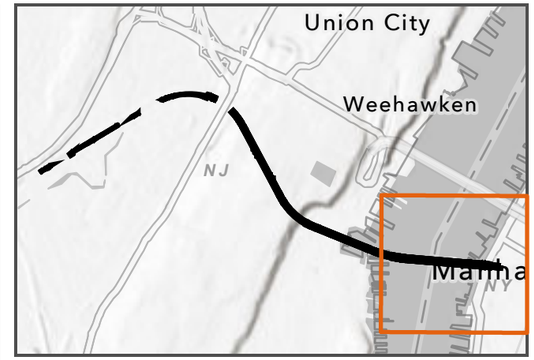


FIGURE 1
LOW COVER AREA
Gateway Development Commission
New York County, NY

Legend
- Federal Navigation Channel
- HTP Alignment
- 12th Avenue Shaft
- Low Cover Area

0 250 500 1,000 ft
0 75 150 300 m

GATEWAY DEVELOPMENT COMMISSION

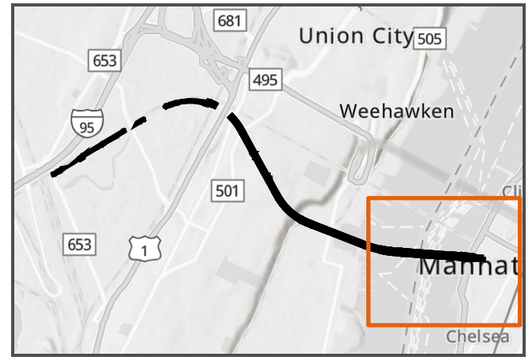


FIGURE 2

RIVER MONITORING LOCATIONS

Gateway Development Commission
New York County, NY

Legend

- Benthic Macroinvertebrate Monitoring Location
- Approximate Fish Trawling Location

0 250 500 1,000 ft
0 75 150 300 m

GATEWAY DEVELOPMENT COMMISSION

Creator: NCochran Last Saved: 1/13/2026 2:36 PM
Coordinate System: NAD 1983 BLM Zone 18N
Location: T:_EPP\Gateway\Hudson_Tunnel\New_York_Side\MXD_Pro\In_Water_Eco_Survey.aprx\Figure 2 - River Monitoring Locations
Disclaimer: the information shown in this map was assembled from GIS data created and/or acquired by Arcadis. The data is not to survey accuracy and is meant for planning and visualization purposes only.

Appendix A: Approved Environmental Permits

NYSDEC Permit: Tidal Wetlands, Excavation and Fill in Navigable Waters, Water Quality Certification

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 2
47-40 21st Street, Long Island City, NY 11101
P: (718) 482-4997 | F: (718) 482-4975
www.dec.ny.gov

October 1, 2021

David R. Pittman P.E.
Engineering Director
AMTRAK – National Railroad Passenger Corp
Box 41 30th Street Station, 4S067
Philadelphia, PA 19104

Re: NYSDEC Permit No. 2-6205-01829/00005
Facility: Amtrak Hudson Tunnel Project
Btwn W 29th and W 33rd St and Hudson River
New York, NY 10001
ECL Article 25 - Tidal Wetlands
ECL Article 15 – Protection of Waters
6 NYCRR Part 608 – Water Quality Certification
NOTICE OF PERMIT ISSUANCE

Dear Mr. Pittman,

Enclosed is your permit. Please read it carefully. You are required to comply with all conditions of the permit.

Please note that Natural Resources Condition 3 of the permit requires submittal of the attached "Notice of Intent to Commence Work" at least 5 days prior to the start of the permitted activity, and Natural Resources Condition 4 of the permit requires submittal of the attached “Notice of Completion of Work” no later than 10 days following completion.

If you have any technical questions, please contact Joanna Field in the Division of Marine Resources at (718) 482-6464 or via email at: r2.naturalresources@dec.ny.gov. If you have any administrative questions, please contact me via email at: caitlyn.nichols@dec.ny.gov.

Sincerely,

Caitlyn P. Nichols
Environmental Analyst 2

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

PERMIT

Under the Environmental Conservation Law (ECL)

Permittee and Facility Information

Permit Issued To:
AMTRAK - NATIONAL RAILROAD PASSENGER CORP
60 MASSACHUSETTS AVE NE
WASHINGTON, DC 20002

Facility:
Amtrak Hudson Tunnel Project

Btwn W 29th and W 33rd St and Hudson River
New York, NY 10001

Facility Location: in NEW YORK COUNTY **Village:** Manhattan
Facility Principal Reference Point: NYTM-E: 583.822 NYTM-N: 4512.056
Latitude: 40°45'18.7" Longitude: 74°00'25.2"
Project Location: W 29th and W 33rd St and Hudson River
Authorized Activity: This permit authorizes boring and construction of the Hudson Tunnel in the New York portion of the Hudson River including ground improvement activities to harden the soil around and above the tunnel and establish the 11-foot minimum cover over the tunnel. Work includes:

- Construction of a two-tube railway tunnel beneath the Hudson River
- Conversion of approximately 3.03 acres of soft substrate to artificial hard bottom within the Hudson River
- Permanent placement of approximately 2,200 cubic yards of fill in the water column
- Temporary installation of a 1200′ x 110′ sheetpile and king pile cofferdam
- Demolition, excavation, and construction work activities involving the Hudson River Park bulkhead

The Permittee will purchase credits from the NYCEDC's Saw Mill Creek Mitigation Bank as mitigation for unavoidable impacts associated with work activities within regulated jurisdictional areas of New York State.

Permit Authorizations

Tidal Wetlands - Under Article 25
Permit ID 2-6205-01829/00005
New Permit Effective Date: 10/1/2021 Expiration Date: 9/30/2031
Excavation & Fill in Navigable Waters - Under Article 15, Title 5
Permit ID 2-6205-01829/00006
New Permit Effective Date: 10/1/2021 Expiration Date: 9/30/2031
Water Quality Certification - Under Section 401 - Clean Water Act
Permit ID 2-6205-01829/00004
New Permit Effective Date: 10/1/2021 Expiration Date: 9/30/2031

NYSDEC Approval

By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this permit.

Permit Administrator: STEPHEN A WATTS, Regional Permit Administrator
Address: NYSDEC Region 2 Headquarters
47-40 21st St
Long Island City, NY 11101 -5401

Authorized Signature: _____ Date _10_/_01_/_2021__

Permit Components

NATURAL RESOURCE PERMIT CONDITIONS

WATER QUALITY CERTIFICATION SPECIFIC CONDITION

GENERAL CONDITIONS, APPLY TO ALL AUTHORIZED PERMITS

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

NATURAL RESOURCE PERMIT CONDITIONS - Apply to the Following Permits: TIDAL WETLANDS; EXCAVATION & FILL IN NAVIGABLE WATERS; WATER QUALITY CERTIFICATION

1. **Conformance With Plans** All activities authorized by this permit must be in strict conformance with the approved plans submitted by the applicant or applicant's agent as part of the permit application. Such approved plans were prepared by the entities described and cited in Natural Resources permit condition 2.

2. **Conformance with Plans – Addenda** In addition to plans reference in the Condition titled "Conformance with Plans," the activities authorized by this permit must be in strict conformance with the following approved plans and/or submissions made as part of the permit application:

Permit Application package submitted by the Gateway Trans-Hudson Partnership on behalf of Amtrak National Railroad Passenger Corp. and NJ Transit, titled "The Hudson Tunnel Project," dated July 15, 2021 and received electronically by NYSDEC on July 19, 2021 and addenda submitted and received electronically by NYSDEC on September 1, 2021, September 1, 2021, September 7, 2021, and September 23, 2021.

3. **Notice of Intent to Commence Work** At least five (5) days prior to the start of work, Permittee must complete and submit the attached "Notice of Intent to Commence Work" form to NYSDEC Division of Marine Resources, 47-40 21st Street, Long Island City, New York 11101 and via email to: r2.naturalresources@dec.ny.gov (Attention: Joanna Field and Habitat Supervisor).

4. **Notice of Completion of Work** Within ten (10) days of the completion of work, Permittee must complete and submit the attached Notice of Completion of Work form to NYSDEC Division of Marine Resources, 47-40 21st Street, Long Island City, New York 11101 and via email to: r2.naturalresources@dec.ny.gov (Attention: Joanna Field and Habitat Supervisor).

5. **Post Sign and Permit** The attached NYSDEC permit and permit sign must be conspicuously posted in a publicly accessible location at the project site. They must be visible, legible, and protected from the elements at all times for the duration of work authorized by this permit.

6. **Design Plans and Contract Specifications** No less than sixty (60) days prior to commencing any construction or site preparation work occurring in New York State lands under water, waters, or wetlands, Permittee shall submit design plans and a specification package, at a minimum of 60% complete, for review and approval to: NYSDEC Division of Environmental Permits, 47-40 21st Street, Long Island City, NY 11101 and via email to DEP.R2@dec.ny.gov (Attention: Hudson Tunnel Project Manager). Such documents shall include the items specified in Attachment A

The Permittee shall respond to and address any NYSDEC comments no later than 30 days prior to the start of work. Permittee shall not undertake construction or site preparation work in the field on any contract or phase of the project until the final design plans and specification package has been submitted to NYSDEC and NYSDEC grants written approval.

7. **Mitigation Requirements** To mitigate for the loss of habitat resulting from the conversion of approximately 3.03 acres of soft substrate to artificial hard bottom, including the addition of 0.68 acres of hardened soil placed one to two feet above the mudline totaling 2,200 cubic yards, Permittee has proposed a purchase of 3.03 credits from NYCEDC's Sawmill Creek Mitigation Bank.

No later than ninety (90) days prior to the start of work, the Permittee must submit verifying documentation that the impacts will be offset through the purchase (or contract to purchase) of 3.03 credits from the NYCEDC's Sawmill Creek Mitigation Bank. Documentation should be submitted to NYSDEC Division of Marine Resources 47-40 21st Street, Long Island City, New York 11101 (Attention: Habitat Supervisor) and via email to: r2.naturalresources@dec.ny.gov.

If the Permittee is unable to acquire the above-referenced credits, the Permittee must notify NYSDEC immediately and submit a traditional mitigation plan to NYSDEC for review and approval prior to the start of work. All correspondence must be submitted to NYSDEC Division of Marine Resources 47-40 21st Street, Long Island City, New York 11101 (Attention: Habitat Supervisor) and via email to: r2.naturalresources@dec.ny.gov.

8. **Post-Construction Monitoring Requirements** Within ninety (90) days of permit issuance, the permittee must submit a monitoring plan for the low cover section to the Department for review and approval. Any changes requested by the Department must be incorporated into the monitoring plan and resubmitted to the Department within fourteen (14) days for approval. The Department must approve the plan prior to the Permittee commencing work.

Within one year of completion of the authorized activity in the low cover area, and again annually for a minimum of four years thereafter, a survey must be conducted, and a report and data must be submitted to the Department. The purpose of the monitoring plan is to assess the recovery of the area as fish foraging habitat. For comparison purposes a pre-construction survey of the target and a control area must be provided with the first post-construction survey. Survey data should include, at a minimum, physical monitoring (bathymetry, water quality, and sediment characteristics), benthic invertebrate monitoring, and fish community monitoring. All documentation must be submitted in writing to: NYSDEC Division of Marine Resources 47-40 21st Street, Long Island City, New York 11101 (Attention: Habitat Supervisor) and via email to: r2.naturalresources@dec.ny.gov.

9. **Endangered Species Monitoring Requirements** The permittee shall employ appropriate monitoring procedures for Atlantic sturgeon on any and all equipment used to conduct the work authorized in this permit and shall submit incident reports of any Atlantic sturgeon take to: NYSDEC Division of Marine Resources, 47-40 21st Street, Long Island City, NY, NY 11101 (Attention: Marine Habitat Supervisor) and via email to: r2.naturalresources@dec.ny.gov.

10. **Environmental Monitor Qualifications** The Permittee's environmental monitor must be a qualified field biologist experienced with endangered species identification, specifically Atlantic sturgeon, and reporting protocols. His/her/their qualifications shall be submitted to: NYSDEC Division of Marine Resources, 47-40 21st Street, Long Island City, NY, NY 11101 (Attention: Marine Habitat Supervisor) and via email to: r2.naturalresources@dec.ny.gov; and must be approved by the Department prior to the commencement of any regulated activity of any calendar year.

11. **Dewatering Discharge** Cofferdam dewatering shall cause no visible contrast to the surrounding waters. Discharge(s) may not cause a violation of the water quality standards of the receiving waters. Dewatering shall cease if at any time any of the following conditions are observed: (1) the discharge causes a substantial visible contrast to the natural conditions of the receiving waters; and/or (2) the discharge causes or contains discernable odors, a visible oil sheen, foam, or floating solids. The Permittee must contact the Division of Environmental Permits, Hudson River Tunnel project manager (718-482-4997) immediately to report the event, and the problem shall be corrected before resuming discharge.

12. **Vibratory Pile Drivers** Vibratory pile drivers shall be used to the maximum extent practicable in the construction of the cofferdams.

13. **Concrete or Leachate Must Not Escape** Wet concrete is highly toxic to fish and other aquatic organisms. During construction, concrete or leachate will not escape or be discharged from any floating concrete batch plant, not will washings from transit mix trucks, mixers, or other devices enter any water body, including wetlands and protected buffer areas.

14. **Materials Disposed at Upland Site** Any demolition debris, excess construction materials, and/or excess excavated materials shall be immediately and completely disposed of on an approved upland site more than 100 feet from any regulated wetland or water body. These materials shall be suitably stabilized so as not to re-enter any water body, wetland, or wetland adjacent area.

15. **Minimize Adverse Impacts to Wetlands, Wildlife, Water** All work must be performed in a manner which minimizes adverse impacts to wetlands, wildlife, water quality and natural resources.

16. Removal of Temporary Features All items placed or constructed as temporary features for the purposes of construction and demolition, including cofferdams, landings, piers, docks, platforms and catwalks, must be completely removed at the conclusion of construction.

17. Fill Material All fill will consist of "clean" sand, gravel, or soil. The use of material such as asphalt, slag, fly-ash, recycled concrete aggregate (RCA), broken concrete, or demolition debris is strictly prohibited.

18. Best Management Practices Best management practices will be employed to prevent the loss of construction materials, debris, and sediments from entering the wetlands or waterways. Such practices may include, but are not limited to, cofferdams, turbidity curtains, construction fencing, staked hay bales, silt fencing, floating platforms, netting, and containment booms.

19. Storage of Equipment, Materials The storage of construction equipment and materials shall be confined to the upland area landward of the bulkhead or on a barge, except as authorized by this permit.

20. Authorization of Property Owners and Certification of Access Permissions, authorizations, easements from all property owners must be obtained for any work conducted on property not owned by the the Permittee. Prior to the start of work authorized under this permit, certification of access must be submitted via email to NYSDEC Region 2 Division of Environmental Permits (Attention: Hudson Tunnel Project Manager; DEP.R2@dec.ny.gov).

21. No Interference With Navigation There shall be no unreasonable interference with navigation by the work herein authorized.

22. State Not Liable for Damage The State of New York shall in no case be liable for any damage or injury to the structure or work herein authorized which may be caused by or result from future operations undertaken by the State for the conservation or improvement of navigation, or for other purposes, and no claim or right to compensation shall accrue from any such damage.

23. State May Order Removal or Alteration of Work If future operations by the State of New York require an alteration in the position of the structure or work herein authorized, or if, in the opinion of the Department of Environmental Conservation it shall cause unreasonable obstruction to the free navigation of said waters or flood flows or endanger the health, safety or welfare of the people of the State, or cause loss or destruction of the natural resources of the State, the owner may be ordered by the Department to remove or alter the structural work, obstructions, or hazards caused thereby without expense to the State, and if, upon the expiration or revocation of this permit, the structure, fill, excavation, or other modification of the watercourse hereby authorized shall not be completed, the owners, shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may require, remove all or any portion of the uncompleted structure or fill and restore to its former condition the navigable and flood capacity of the watercourse. No claim shall be made against the State of New York on account of any such removal or alteration.

24. State May Require Site Restoration If upon the expiration or revocation of this permit, the project hereby authorized has not been completed, the applicant shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may lawfully require, remove all or any portion of the uncompleted structure or fill and restore the site to its former condition. No claim shall be made against the State of New York on account of any such removal or alteration.

25. Precautions Against Contamination of Waters All necessary precautions shall be taken to preclude contamination of any wetland or waterway by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate or any other environmentally deleterious materials associated with the project.

26. In-water Work Moratorium To protect migrating anadromous fish, including Atlantic sturgeon, overwintering striped bass, and winter flounder, and other threatened and/or endangered species, in-water work is prohibited from January 21 to June 30 of each year during construction.

WATER QUALITY CERTIFICATION SPECIFIC CONDITIONS

1. Water Quality Certification The authorized project, as conditioned pursuant to the Certificate, complies with Section 301, 302, 303, 306, and 307 of the Federal Water Pollution Control Act, as amended and as implemented by the limitations, standards, and criteria of state statutory and regulatory requirements set forth in 6 NYCRR Section 608.9(a). The authorized project, as conditioned, will also comply with applicable New York State water quality standards, including but not limited to effluent limitations, best usages and thermal discharge criteria, as applicable, as set forth in 6 NYCRR Parts 701, 702, 703, and 704.

GENERAL CONDITIONS - Apply to ALL Authorized Permits:

1. Facility Inspection by The Department The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71- 0301 and SAPA 401(3).

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

2. Relationship of this Permit to Other Department Orders and Determinations Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

3. Applications For Permit Renewals, Modifications or Transfers The permittee must submit a separate written application to the Department for permit renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing. Submission of applications for permit renewal, modification or transfer are to be submitted to:

Regional Permit Administrator
NYSDEC Region 2 Headquarters
47-40 21st St
Long Island City, NY11101 -5401

4. Submission of Renewal Application The permittee must submit a renewal application at least 30 days before permit expiration for the following permit authorizations: Excavation & Fill in Navigable Waters, Tidal Wetlands, Water Quality Certification.

5. Permit Modifications, Suspensions and Revocations by the Department The Department reserves the right to exercise all available authority to modify, suspend or revoke this permit. The grounds for modification, suspension or revocation include:

a. materially false or inaccurate statements in the permit application or supporting papers;

b. failure by the permittee to comply with any terms or conditions of the permit;

c. exceeding the scope of the project as described in the permit application;

d. newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;

e. noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

6. Permit Transfer Permits are transferrable unless specifically prohibited by statute, regulation or another permit condition. Applications for permit transfer should be submitted prior to actual transfer of ownership.

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification
The permittee, excepting state or federal agencies, expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees, and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under Article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits
The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights
This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

Design Plans and Contract Specifications (Continued)

1. complete plan drawings, including site plan, cross-sections and profile view drawings, to scale, showing proposed site conditions;
2. north arrow, scale, name of preparer, and date prepared;
3. survey of existing conditions, including bathymetric elevations;
4. in-water and upland erosion controls/erosion control methods;
5. staging locations;
6. access route for construction equipment and vessels;
7. contract requirements, including types and dimensions of material proposed;
8. discussion of seasonal/activity work windows and endangered species monitoring protocols;
9. construction schedules, including coffer dam installation and removal and deep mixing activities;
10. geotechnical data collection;
11. site-specific borings; and
12. demolition, construction, and/or excavation activities in the Hudson River Bulkhead Impact Area.

95-20-1 (8/87)—9d

New York State
Department of Environmental Conservation

NOTICE

The Department of Environmental Conservation (DEC) has issued permit(s) pursuant to the Environmental Conservation Law for work being conducted at this site. For further information regarding the nature and extent of work approved and any Departmental conditions on it, contact the Regional Permit Administrator listed below. Please refer to the permit number shown when contacting the DEC.

Regional Permit Administrator

Permit Number 2-6205-01829/00005

Expiration Date 09/30/31

NOTE: This notice is **NOT** a permit

Stephen A Watts III
47-40 21st Street
LIC, NY 11101
(718) 482-4997

NOTICE OF INTENT TO COMMENCE WORK

Date: 5-10-24

NYSDEC Natural Resources
Attn. Natural Resources Supervisor
NYSDEC Region 2 Office
47-40 21st Street
Long Island City, N.Y. 11101

Re: NYSDEC Permit No. 2-6205-01829/00005
Facility: Amtrak Hudson Tunnel Project
Btwn W 29th and W 33rd St and Hudson River
New York, NY

Dear NYSDEC Natural Resources Supervisor:

In accordance with Natural Resource Condition 3 of the referenced permit, I hereby serve notice to commence work on Hudson River in-water work July 1 **, 20** 24 **.**

This is also to certify that, having read this entire permit, I am fully aware of and understand the general and natural resource conditions therein, and agree to comply with all such conditions further understand that prior to undertaking any modification to the subject work, I must seek and receive written approval of the NYSDEC Regional Permit Administrator.

John Geitner Digitally signed by John Geitner Date: 2024.05.10 12:28:06 -04'00'

Signature of Permittee

Name of Permittee (please print)

DocuSigned by:
T. Roberson Edwards, P.E.
04B1C483849B4CC...

Signature of Permittee

T. Roberson Edwards, P.E.

Name of Permittee (please print)

Signature of Contractor

Weeks Marine, Inc. | Adam D. Wallach, PE

Name of Contractor (please print)

4 Commerce Drive

Street Address of Contractor

Cranford, NJ 07016

City, State, & Zip Code of Contractor

(908) 272 4010

Telephone Number of Contractor

WARNING

The permittee and his contractor (if any) are required to follow all permit conditions. Violations of the permit may lead to legal action, including the imposition of substantial monetary fines and corrective work.

cc: Environmental Permits
Marine Resources

NOTICE OF COMPLETION OF WORK

Date: _____

NYSDEC Natural Resources
Attn. Natural Resources Supervisor
NYSDEC Region 2 Office
47-40 21st Street
Long Island City, N.Y. 11101

Re: NYSDEC Permit No. 2-6205-01829/00005
Facility: Amtrak Hudson Tunnel Project
Btwn W 29th and W 33rd St and Hudson River
New York, NY

Dear NYSDEC Natural Resources Supervisor:

In accordance with Natural Resource Condition 4 of the referenced permit, I hereby serve notice that the work allowed by the above referenced permit has been completed as of _____, 20____, consistent with the requirements of the above referenced permit.

_____
Signature of Permittee

_____
Name of Permittee (please print)

_____
Signature of Contractor

_____
Name of Contractor (please print)

_____
Street Address of Contractor

_____
City, State, & Zip Code of Contractor

_____
Telephone Number of Contractor

cc: Environmental Permits
Marine Resources

Department of the Army Permit NAN-2020-00835

DEPARTMENT OF THE ARMY PERMIT

JOINT CO-PERMITTEES

Amtrak
c/o David R. Pittman, Engineering Director
2955 Market Street – 4S-067
Philadelphia, Pennsylvania 19104
(267-761-0220)

New Jersey Transit Corporation
c/o Robert Palladino, Senior Director
One Penn Plaza East – 8th Floor
Newark, New Jersey 07105
(973-491-7791)

Permit Number: NAN-2020-00835

Date Issued: NOV 15 2021

Issuing Office: U.S. Army Engineer District - New York

NOTE: The term "you" and its derivatives, as used in this permit, means the joint co-permittees individually and together. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Work Description:

Discharge below the plane of Spring High Tide in regulated wetlands and waters up to 25,000 cubic yards of construction-grade fill material to create new upland retained-fill and construct a viaduct structure both creating a new two-rail Northeast Corridor railway main line element and parallel vehicle access service approximately 6,200 feet long, on average 150 feet wide, as well as all ancillary storm water management structures and drainage ways, culverts, and temporary access and construction fills within approximately 4.5 acres of regulated wetlands and waters the Hackensack River's Meadowlands as shown on attached dated today permit drawings.

Construct and remove sequentially, two 600-foot-long by 110-foot-wide temporary construction steel cofferdams to dewater approximately 3.1 acres of the Hudson River as shown on attached dated today permit drawings to harden the subaqueous river bottom soil by auger soil mixing soilcrete injection methods so the tunnel boring machine (TBM) can safely bore through harden material. Within the dewatered eastern cofferdam discharge up to 25,000 cubic yards of harden soil to provide a minimum eleven (11) feet of earthen cover over each tunnel tube.

Construct by tunnel boring machine (TBM) two twin single-rail subaqueous railway tunnel tubes (each a maximum 35-foot outside diameter) under the Hudson River at a minimum depth of 56 feet below the plane of Mean Lower Low Water measured to the outside top of each tunnel's concrete lining as shown on attached dated today permit drawings to sustain a minimum of eleven (11) feet of earthen cover.

All regulated work shall be performed in accordance with the attached dated today permit drawings and the Special Conditions (A) through (O) listed below which are hereby made part of this permit, as well as the attached New Jersey Department of Environmental Protection Clean Water Act Water Quality Certification and Federal Coastal Zone Act Coastal Zone Management Concurrence Permit Number 0909-17-0001.1 CDT 170001 dated 30 June 2017, State of New York Department of State issued

PERMITTEE: Amtrak and New Jersey Transit
PERMIT NUMBER: NAN-2020-00835

NOV 15 2021

Federal Coastal Zone Act Coastal Zone Management Concurrence Certification dated 01 January 2019; and New York State Department of Environmnetal Conservation issued Clean Water Act Water Quality Certification Permit numbered 2-6205-01829/00004 dated 01 October 2021.

Work Location: IN: Penhorn Creek (Hackensack River Watershed) and the Hudson River

AT: Secaucus, North Bergen, Union City, Weehawken, and Between Hoboken, Hudson County, New Jersey and Manhattan, New York County, New York

General Permit Conditions:

1. The 5-year time limit for completing the here in work authorized ends on NOV 15 2026. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity. Should you wish to cease to maintain the authorized activity or should you desire to abandon it, you must obtain a modification of this permit from this office, which may require restoration.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

5. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of this permit.

6. You understand and agree that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Special Permit Conditions:

(A) The joint co-permittees shall provide required timely verifications of requirements of these Special Conditions to this office at the following address:

U.S. Army Engineer District - New York

Chief, Regulatory Functions Branch
26 Federal Plaza, Room 16-406
New York, New York 10278-0090
EMAIL: Permit-Compliance-Submittals@usace.army.mil

(B) The joint co-permittees shall comply with all conditions and stipulations contained within "Programmatic Agreement Among the Federal Railroad Administration, the New Jersey Historic Preservation Officer, the New York Historic Preservation Officer, the Advisory Council on Historic Preservation, the Federal Transit Administration, the New Jersey Transit Corporation, and the National Railroad Passenger Corporation Regarding the Hudson Tunnel Project in Hudson County, New Jersey and New York County, New York, dated May 17 2021.

(C) The joint co-permittees shall prior to commencing any in-water or in-wetlands work obtain 4.5 mitigation credits from an existing federally approved transportation wetland mitigation bank within the Hackensack River Basin Meadowlands District to compensate for 4.5 acres of permanent loss and temporary impacts to regulated waters and vegetated of the United States, and provide written verification to this office of the accomplishment of this condition.

(D) The joint co-permittees shall prior to commencing any in-water or in-wetlands work obtain, this office's approval of a river-bottom monitoring plan to assess the ongoing recovery as fish foraging habitat of the 3.1-acre ground treatment in the Hudson River. The monitoring plan shall be developed in concert with the NOAA National Marine Fisheries Service and the New York State Department of Environmental Conservation and be for a minimum of five calendar years after the removal of the last of the two cofferdams. Annual reports shall be submitted in triplicate not later than December 31st of each year.

(E) The joint co-permittees shall assure that all your contractors and sub-contractors shall comply with this permit and all personnel performing the permitted work are fully aware of all the permit's stipulations, general conditions, and special conditions of this permit

(F) The joint co-permittees shall maintain at each work site whenever work is being performed, including aboard main work vessels; a complete current copy of this permit, including its dated permit drawings, special conditions, and any future modifications / amendments.

(G) The joint co-permittees when working in the Hackensack River Meadowlands shall not stockpile fill or other materials in a manner conducive to erosion, or in areas likely to cause high turbidity runoff during storm events. The joint co-permittees shall use all practicable measures during construction (e.g. silt fences, hay bales, erosion control netting, vegetative stabilization) to stabilize all exposed soils immediately upon the completion of each grading activity, and appropriate temporary fencing shall be installed around all adjacent wetlands and waters not authorized herein to be impacted and any other adjacent sensitive ecological areas during construction periods, to prevent entering these areas.

(H) As a result of consultation with NMFS, FRA would not conduct in-water construction activities, such as installation and removal of cofferdam structures, from January 21 through June 30 to minimize potential Impacts to overwintering and migrating striped bass and to migrating anadromous species such as alewife and blueback herring.

(I) The joint co-permittees shall avoid installing or removing the temporary construction cofferdams' sheet piles from March 1st through June 30th to minimize impacts to migrating anadromous fish species and their habitat in the Hudson River.

(J) The joint co-permittees shall submit the following listed items, numbered 1 through 12, to the United States Coast Guard's First Coast Guard District for publication in the United States Coast Guard's Local Notice to Mariners at LNM@uscg.mil or faxed to (617) 223-8291, a minimum of fourteen calendar days before implementing any in-water activities authorized by this permit in the Hackensack or Hudson Rivers:

1. Date of Notice to Mariners Submission.
2. Name, Phone Number, and Email Address of Project's Point of Contact.
3. Construction Company Name.
4. Type of Marine Work.
5. Waterway and Location Where Work Will Be Done.
6. Latitude & Longitude of Work Area (Degrees, Minutes, Thousandths of Seconds).
7. Work Start & Stop Dates and Hours of Operations.
8. Equipment on Site.
9. Name, Phone Number, and Email Address of On-Site Point of Contact.
10. Passing Arrangements / Time to Move Vessels to Not Impede Navigation.
11. VHF Marine Radio Channel Monitored.
12. Aquatic Disposal Site (if used).
13. NOAA Nautical Chart Number for the Work Area.

(K) The joint co-permittees shall assure that excess river bottom soil displaced by the deep soil mixing / soilcrete soil harden work and any and all waste products shall be contained within the cofferdam for subsequent contained removal and transport to State-approved upland disposal sites.

(L) The joint co-permittees shall completely remove all elements of the two temporary construction cofferdams from the Hudson River bottom leaving no cofferdam element in or on the river bottom, including equipment, parts, and tools used within the cofferdam areas.

(M) The joint co-permittees shall within 60 calendar days of removal of the final elements of the second temporary construction cofferdam provide this office engineering size, certified and sealed copies and one electronic file copy of the river bottom of the 3.1-acre area containing digital data in State Plane coordinates (NAD83/feet [MAW]).

(N) The joint co-permittees shall provide to this office within 60 calendar days of completion of the TBM(s)' work, four engineering-sized signed and sealed paper copies and one electronic file copy [digital data in State Plane coordinates (NAD83/feet [MAW])] of "As-Built" drawing(s) depicting the location length and depth to the top of each tunnel tube beneath the Hudson River.

(O) The joint co-permittees shall notify the National Oceanic and Atmospheric Administration (NOAA) of the project's marine construction completion and provide NOAA-requested specifications so NOAA may initiate the appropriate corrections and updates to navigation nautical chart(s) and The Coast Pilot.

PERMITTEE: Amtrak and New Jersey Transit Corporation NOV 15 2021
PERMIT NUMBER: NAN-2020-00835

This must be submitted online at: http://ocsdata.ncd.noaa.gov/idrs/discrepancy.aspx

Further Information and Stipulations:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. Code 403).

(X) Section 404 of the Clean Water Act (33 U.S. Code 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization:

a. This permit does not obviate the need to obtain required Federal, state, or local authorizations.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability: In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Joint Co-Applicants' Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision: This office may reevaluate its decision at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

NOV 15 2021

a. Either of your agencies fail to comply with the terms and conditions of this permit.

b. The information provided by your agencies in support of your joint permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions: General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signatures below, as joint co-permittees, indicates that your agencies accept and agree to comply with the terms and conditions of this permit.

November 15, 2021

(JOINT CO-PERMITTEE) (DATE)
Amtrak - Scot L. Naparstek, EVP Chief Operations Officer

November 15, 2021

(JOINT CO-PERMITTEE) (DATE)
New Jersey Transit Corporation - Kevin S. Corbett, President & CEO

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

NOV 15 2021

(DISTRICT ENGINEER) (DATE)
Matthew W. Luzzatto
Colonel, U.S. Army
District Engineer

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278-0090

CENAN-OP-RW

IMPORTANT

This letter must be completed and mailed to the Regulatory Branch at the above address prior to commencement of any work authorized under the permit.

Permittee: Amtrak and New Jersey Transit Corporation Permit No. NAN-2020-00835-WCO

Date Permit Issued: 15 November 2021 Expiration Date: 15 November 2026

Waterway: Hudson River

Project Location: Hudson County, New Jersey and Manhattan, New York County, New York

Work will commence on or about: 01 July 2024 Hudson River in-water work July 1, 2024

Name, Address & Telephone Number of Contractor:

Weeks Marine, Inc., 4 Commerce Drive, Cranford, NJ 07016, (908) 463-4032

John Geitner Digitally signed by John Geitner Date: 2024.05.10 12:27:31 -04'00'

Signature of Permittee Date

DocuSigned by: T. Roberson Edwards, P.E. 5/10/2024

Signature of Permittee Date

Fold this form into thirds, with the bottom third facing outward. Tape it together and mail to the address below **or FAX to (212) 264-4260.**

Place Stamp Here

USACE Operations/Regulatory 16-406
c/o PSC Mail Center
26 Federal Plaza
New York, New York 10278

NYSDEC License to Collect or Possess: Scientific #1535

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Marine Resources
123 Kings Park Blvd. (Nissequogue River State Park), Kings Park, NY 11754
P: (631) 444-0430 | F: (631) 444-0434 | FW.Marine@dec.ny.gov
www.dec.ny.gov

License to Collect or Possess: Scientific 1535

LICENSE

Under the Environmental Conservation Law (ECL)

Licensee Information

License Issued To:

Matthew Frackelton
6588 River Road
Jordan, NY 13080

Phone: (315) 671-9687
Email: matthew.frackelton@arcadis.com

Region: 2

DEC Contact Information

Marine Permit Office
NYSDEC Division of Marine Resources
123 Kings Park Blvd
Nissequogue River State Park
Kings Park, NY 11754

Phone: (631) 444-0470
Email: marine.lcp@dec.ny.gov

License Authorizations

License to Collect or Possess: Scientific
License #: 1535
Effective Date: 05/30/2024
Expiration Date: 05/29/2025

NYSDEC Approval

By acceptance of this license, the licensee agrees that the license is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this license.

License Regulations

6 NYCRR Part 39
ECL 11-0515 (1)

License to Collect or Possess: Scientific – License Conditions

1. **Authorized Species - The licensee is authorized to collect and possess the following marine species:** marine fish species (super class Pisces), marine invertebrate species (New York indigenous).
2. **Authorized Activities - The licensee is authorized to possess collected species for the following activities:** a study to monitor the impacts of the Hudson Tunnel Project on benthic invertebrates and fish in the project area.
3. **Location of Collection - The licensee will collect specimens from the following locations:** the lower Hudson River (Lat: 40.715, Lon: -74.019) in the project's low cover area, figure attached.
4. **Authorized Collection Gear - The licensee is authorized to collect these specimens utilizing:** a ponar or Van Veen grab sampler and rock baskets for benthic invertebrates and an otter trawl for fish species.
5. **Gear Marking and Monitoring:** The licensee shall mark all gear deployed with the licensee's name, resident address and license type and number. All traps and nets shall be checked no less than once every twenty-four (24) hours. Rock baskets shall be checked no less than once every twelve (12) weeks.
6. **No Endangered or Threatened Species:** No endangered or threatened species may be collected or possessed pursuant to this license.
7. **Incidental Collection of Endangered or Threatened Species – Mandatory Release:** If any endangered or threatened species are incidentally collected, the licensee shall immediately release such species unharmed at the point of collection.
8. **Incidental Mortality of Endangered or Threatened Species – Mandatory Reporting:** If any endangered or threatened species are incidentally killed, the licensee shall contact the Marine Permit Office to arrange for delivery of the specimen.
9. **Federal and Local Licensing Requirements:** The licensee shall determine if a corresponding Federal or local Permit is required to exercise the authority granted in this license. If a corresponding Federal or local permit is required, the licensee shall obtain a valid Federal or local permit before conducting any activity pursuant to this license.
10. **Conservation Officer Notification - Marine and Coastal District:** The licensee shall notify the appropriate Regional Environmental Conservation Officer prior to all collection activities. The name, registration number and a description of the vessel must be provided in the notification. Regional law enforcement telephone numbers are: Long Island, Region 1, 631-444-0250; New York City, Region 2, 718-482-4885; and, Hudson River, Region 3: 845-256-3013**.**

11. **Authority to Designate Agents**: The licensee is authorized to designate agents to assist the licensee with the activities authorized pursuant to this license provided that:
    a) The licensee submits a written request to the Marine Permit Office containing: name, address, age, and phone number of the person he or she is nominating as a designated agent, and;
    b) The licensee receives an amended license from the Marine Permit Office listing the designated agents he or she has nominated before that person can conduct activities authorized by this license.
12. **Authorized Designated Agents - The following Designated Agents are authorized:** Nick Firman, Jason Vogel, Nathan Peo, Gina Quinones, Anna Shaheen.
13. **Final Disposition of Collected Fish and Wildlife Specimens collected pursuant to this license will be:** released unharmed at the point of original capture following the collection of biological data for species sampled via trawl. Invertebrate species sampled via benthic grab sampler may be retained for further study in a laboratory setting and disposed of in a land-based facility. Organisms may not be returned to the wild if they have been removed from the site for over 24 hours.
13. **Reporting Requirement Prior to Expiration:** The licensee shall email an annual report, prior to the expiration date listed on the license, to the Marine Permit Office at the following address: marine.lcp@dec.ny.gov.

    This report shall contain:
    a. Name of the licensee
    b. License number
    c. Common name of listed animals collected
    d. Location of collection
    e. Dates of collection
    f. Biological data collected
    g. Final disposition of collected animals

General Conditions – Apply to ALL Authorized Licenses

1. **Licensee Shall Read All Conditions** The licensee shall read all license conditions prior to conducting any activities authorized pursuant to this license.
2. **License is Not Transferrable** This license is not transferrable and is valid only for the person identified as the licensee.
3. **Licensee Responsible for Federal, State or Local Permits/Licenses** The licensee is responsible for obtaining any and all necessary, corresponding Federal, State or local permits or licenses prior to conducting any activity authorized pursuant to this license.
4. **Reasons for Revocation** This license may be revoked for any of the following reasons:

a. Licensee provided materially false or inaccurate statements in his or her application, supporting documentation or on required reports;
b. Failure by the licensee to comply with any terms or conditions of this license;
c. Licensee exceeds the scope of the purpose or activities described in his or her application for this license;
d. Licensee fails to comply with any provisions of the NYS Environmental Conservation Law, any other State or Federal laws or regulations of the department directly related to the licensed activity;
e. Licensee submits a check, money order or voucher for this license or application for this license that is subsequently returned to the department for insufficient funds or nonpayment after the license has been issued.

5. **Licensee Shall Carry Copy of License** The licensee and any designated agents shall carry a copy of this license and their permit card when conducting activities pursuant to this license.
6. **Licensee Shall Notify of Change of Address** The licensee shall notify the Marine Permit Office in writing, by mail or email, within five (5) days of the official change or residence.
7. **Licensee is Liable for Designated Agents** If designated agents are authorized pursuant to this license, the licensee shall be liable and responsible for any activities conducted by designated agents pursuant to this license or any actions by designated agents resulting from activities authorized by this license.
8. **License Renewal** The licensee shall submit an electronic request for the renewal of this license prior to the expiration date listed on the license. The licensee shall include accurate and complete copies of any required reports with their renewal request. The renewal paperwork shall be submitted to: https://on.ny.gov/marinelcp.
9. **Licensee is Liable** The licensee shall be liable and responsible for any activities conducted under the authority of this license or any actions resulting from activities authorized by the license.
10. **Access by Law Enforcement** The licensee shall allow representatives of the NYSDEC Division of Law Enforcement to enter the licensed premises to inspect his or her operations and records for compliance with license conditions.
11. **Trespassing Prohibited** This license is not a license to trespass. The licensee shall obtain permission from the appropriate landowner/land manager prior to conducting activities authorized pursuant to this license.

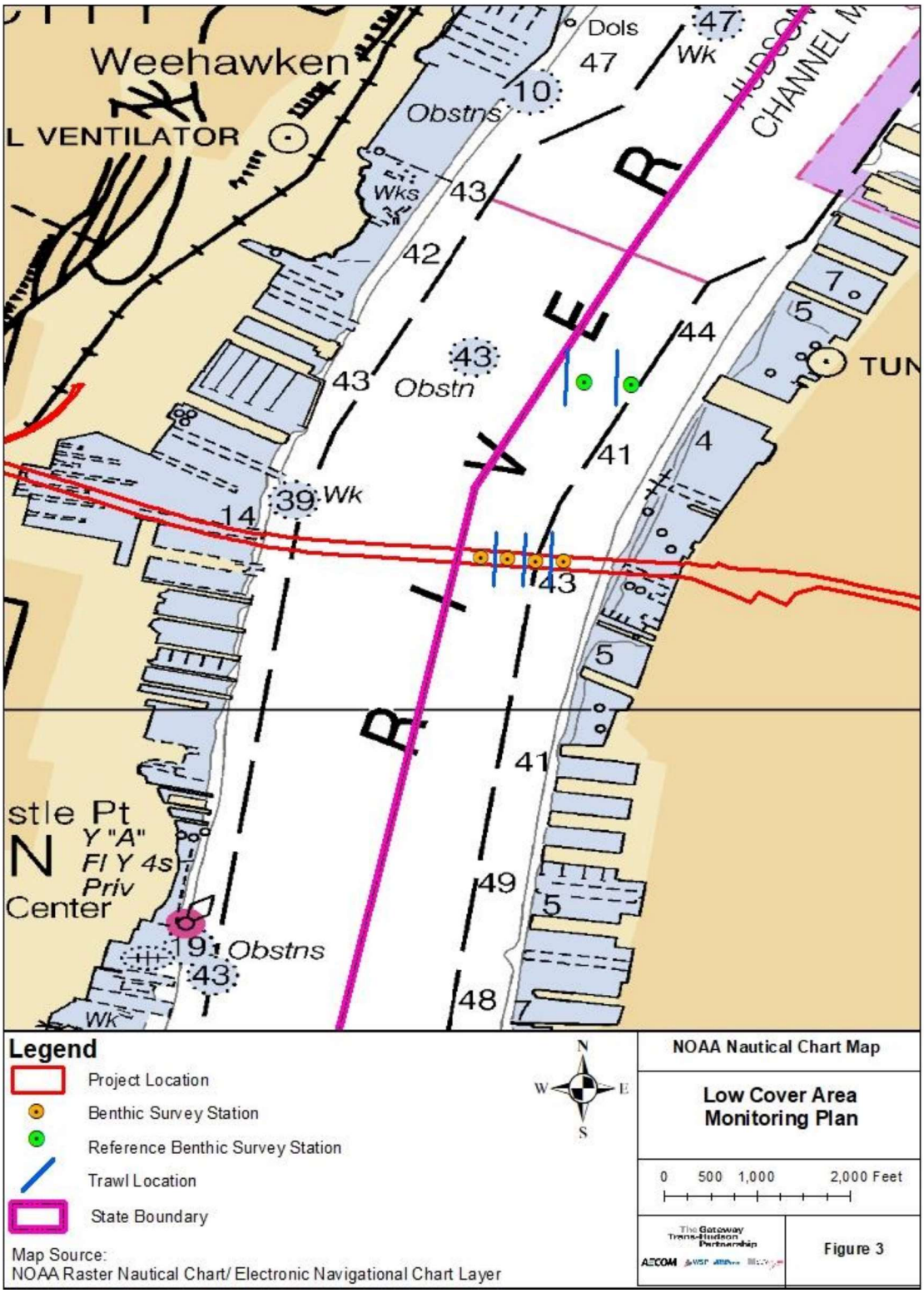


Figure 3: Proposed Sampling Locations

Appendix B: Modifications and Approved Monitoring Plan

GATEWAY DEVELOPMENT COMMISSION

May 22, 2024

VIA E-MAIL

Rosita Miranda, United States Army Corps of Engineers (USACE)
rosita.miranda@usace.army.mil

Jessie Murray, National Oceanic Atmospheric Administration (NOAA), National Marine Fisheries Service NMFS)
Marine Habitat Resource Specialist
jessie.murray@noaa.gov

Matthew James, New York State Department of Environmental Conservation (NYSDEC)
Regional Marine Resources Manager
matthew.james@dec.ny.gov

RE: Hudson Tunnel Project – Hudson River Low Cover Area Monitoring Plan, November 9, 2022, Modifications

Requesting Concurrence on the Proposed Modifications to the Monitoring Plan by June 3, 2024

Dear Ms. Miranda, Ms. Murray, and Mr. James:

The Gateway Development Commission (GDC) appreciates continued support and attention while we are executing the Hudson Tunnel Project (HTP). GDC is hereby providing proposed modifications to the approved Five-Year Monitoring Plan for Hudson River Low Cover Area Monitoring Plan (Monitoring Plan) proposed to streamline and improve the monitoring associated with the Hudson River Ground Stabilization Project (Project) to assess potential impacts on invertebrates and fish habitat. The proposed modifications to the Monitoring Plan will allow a comparison of pre- and post-construction physical habitat and ecological communities within the Project area compared to nearby reference locations to meet the monitoring goals identified during the permitting process.

Regulatory Background and Approvals

On October 1, 2021, the NYSDEC authorized the work in the low cover area through the issuance of NYSDEC Permit No. 2-6205-01829/00005. The permit identified that within ninety (90) days of issuance, the Permittee must submit a low cover section Monitoring Plan to the NYSDEC for review and approval. The NYSDEC must approve the Monitoring Plan prior to the Permittee commencing work.

The purpose of the Monitoring Plan is to assess the recovery of the area as fish foraging habitat. For comparison purposes, a pre-construction survey of the target and a control area must be provided with the first post-construction survey. Survey data should include, at a minimum, physical monitoring (bathymetry, water quality, and sediment characteristics), benthic invertebrate community monitoring, and fish community monitoring. All documentation must be submitted in writing to: NYSDEC Division of Marine Resources 47-40 21st Street, Long Island City, NY 11101 (Attention: Habitat Supervisor) and via email to: r2.naturalresources@dec.ny.gov.

On November 15, 2021, the USACE authorized the work in the low cover area through the issuance of USACE Permit No. NAN-2020- 00835 and identified that the Project shall, prior to commencing any in-water or in-wetlands work, obtain approval from the USACE of a river-bottom Monitoring Plan to assess the on-going recovery as fish foraging habitat of the 3.1-acre ground treatment in the Hudson River. The Monitoring Plan shall be developed in concert with the NOAA NFMS and the NYSDEC and be for a minimum of five (5) calendar years after the removal of the last of the two (2) cofferdams. Annual reports shall be submitted in triplicate no later than December 31st of each year.

A Five-Year Monitoring Plan for Hudson River Low Cover Area (Monitoring Plan) was prepared and submitted to USACE, NMFS, and NYSDEC for review and approval. The Monitoring Plan was approved by USACE on September 8, 2022, NMFS on September 9, 2022, and NYSDEC on September 12, 2022.

Schedule and Implementation

Implementation of the Monitoring Plan requires pre-construction survey activities to establish baseline conditions prior to the planned and authorized in-river work activities that are anticipated to begin in July 2024. The Monitoring Plan includes physical monitoring (bathymetry, water quality, and sediment characteristics), benthic invertebrate community monitoring, and fish community monitoring. The frequency of monitoring is outlined in Table 1 of the Monitoring Plan to assess conditions both in advance of the in-water work and for a five (5) year monitoring interval following Project completion (i.e., after cofferdam removal). Annual monitoring reports will be completed that compare annual data collection to baseline conditions to assess river bottom habitat recovery.

Baseline data collection is currently targeted for June 17 to June 21, 2024, for invertebrates, substrate characterization and water quality to collect baseline data prior to construction scheduled for July 1, 2024. As detailed below, a single monitoring effort prior to initiation of construction in July 2024 will accurately establish baseline conditions to support the Monitoring Plan. Fish community baseline surveys are planned for either the late summer/fall of 2024 consistent with the timeframe in the original Monitoring Plan, or to be done concurrently in June with benthic sampling if practicable[1]. GDC is requesting feedback from USACE, NMFS, and NYSDEC if there is a concern for completion of baseline fish data collection occurring in June concurrent with benthic sampling.

Proposed Modifications to the Monitoring Plan

The following section discusses proposed modifications to four (4) tasks as identified in the original Monitoring Plan. These modifications were previously discussed with both NMFS and NYSDEC via telephone conversations. Overall, modifications are proposed based upon the following considerations:

- Modifications will increase the likelihood of collecting more appropriate data to better understand potential Project impacts;
- Modifications will better meet the stated objectives of Monitoring Plan and effectively evaluate the response of the aquatic community within the Project area; and
- Modifications will address health and safety considerations, and anticipated difficulties implementing proposed monitoring based on current site conditions.

[1] June surveys may not be available based upon scheduling appropriate equipment to safely implement.

Proposed modifications to the Monitoring Plan are described after each task below.

Task 1: Benthic Invertebrate Community Sediment Sampling

The original Monitoring Plan calls for collecting three (3) replicate sediment grabs at each of the six (6) locations identified in the Monitoring Plan (4 site, 2 reference) during three (3) sample periods for a total of 18 sediment grab samples per year.

Proposed Modification

The Project team proposes benthic invertebrate sampling once per year (i.e., June 2024-2029) at four (4) sites within the Project area and four (4) reference sites for a total of eight (8) sediment grab samples per year. Each grab sample will include three (3) replicate sediment grabs consistent with original Monitoring Plan.

In addition to the visual estimation of grain size and sediment characteristics during invertebrate sampling, sediment samples may also be submitted for grain size analysis at a laboratory to identify more precisely the physical habitat across locations.

Proposed modifications are based on the following considerations:

- Benthic invertebrate communities are not expected to differ significantly from June to October. Most invertebrate monitoring protocols such as the USEPA Rapid bioassessment protocols and many state protocols use a single collection event during an index period or season (Barbour et al. 1999). State agencies including the NYSDEC typically have a single sample collection event per year or index period as well (Duffy 2021).
- Benthic macroinvertebrates are patchily distributed across the substrate so adding additional reference locations will help to better characterize the potential natural variability in the community.
- Additional reference locations will help bracket the Project site and allow a better understanding of what potential changes, if any, in the macroinvertebrate community may be related to the Project versus natural variability.

Final reference locations will be determined in the field by experienced scientists using best professional judgement to try to match the conditions most closely at the site locations. Additional locations may be added in the field based on professional judgement or scope changes.

Task 2: Benthic Invertebrate Hard Substrate Sampling

The Monitoring Plan calls for deploying four (4) replicate rock basket artificial substrate samplers at each of the six (6) locations (four (4) site and two (2) reference locations) identified in the Monitoring Plan bi-annually for a total of 12 rock basket samples per year.

Proposed Modification

The Project team recommends not deploying rock baskets at this time.

The proposed exclusion of rock baskets from future monitoring is based on the following considerations:

- Data collection in Task 1 is anticipated to be sufficient to meet objectives of the original Monitoring Plan.

- The protocol referenced in the Monitoring Plan (Chapman, 2013) is intended for sampling shallow riffles in wadable, freshwater streams in New Hampshire. The protocol is not intended to be used in deeper marine conditions with high flow.
- The Project team anticipates difficulty in retrieving the rock baskets without significant sample washout due to water depths (i.e., 20 to 40 feet) and significant water energies associated with current and tides. The retrieval method in the referenced protocol is for shallow, wadeable areas where the rock basket is placed in a 5-gallon bucket prior to removal to avoid invertebrates being washed out of the substrate during retrieval. However, containerizing the sampler prior to retrieval at these water depths would not be possible and there would be a risk of sample washout compromising the sample while it was being brought back to the surface.
- Leaving buoys/lines in the river over the identified eight-week deployment period could also be a navigation/health and safety hazard for boaters and the public. Based on the Project teams experience at nearby sites in the lower Hudson River, the current and debris accumulation on the sampler/line and floats for even a short period (24 hours) can be significant and could move the sampler or remove them entirely which would make finding the samplers difficult or impossible.

Task 3: Water Quality Monitoring

The Monitoring Plan calls for the collection of in-situ water quality parameters including temperature, pH, salinity, dissolved oxygen, turbidity, and conductivity at two (2) depth ranges within the water column at each of the six (6) locations identified in the Monitoring Plan during each of the three (3) sample periods.

Proposed Modification

The Project team recommends collecting water quality at all benthic and fish sampling locations concurrent with those tasks. This includes eight (8) sampling locations. The Project team will not mobilize only to collect water quality samples.

Task 4: Fish Sampling

The Monitoring Plan calls for conducting river bottom sampling using an otter trawl twice a year at the five (5) locations identified in the Monitoring Plan. Up to two (2) trawls would occur at each of the five (5) locations during each sample event.

Proposed Modification

The Project team recommends reducing the frequency of trawling to once per year and adding an additional trawl location based on the new invertebrate reference location (outlined in Task 1).

The Project location is in a heavily developed area so there may be significant debris which could make bottom trawling difficult or unsafe. If suitable conditions for safe sampling do not exist, the Project team will submit a written request that trawling may be discontinued as part of annual monitoring reports.

Proposed modifications are based on the following considerations:

- One (1) round of trawl data would be sufficient for identifying benthic species utilizing the area and comparing the Project area to reference locations.

- Trawling can be disruptive to benthic habitat. Reducing the sample frequency to once per year would allow sufficient data to meet the Monitoring Plan objectives while minimizing impacts to benthic habitat and species.

Task 5: Bathymetry Survey

This Monitoring Plan calls for annual bathymetric surveys to identify changes in the river bottom. The bathymetry surveys will be used to map the various depth of the Hudson River near the Project and will help determine the river bottom's topography within the Project area. Comparing the pre-construction bathymetry to post-construction would help assess potential changes in the river bottom and habitat following the Project, and document recovery.

Proposed Modification

If significant changes are not observed based on year one (1) of post construction bathymetric data, or subsequent years show recovery to baseline conditions, then the Project team may recommend reducing the frequency of bathymetric surveys as part of an annual monitoring report.

Five Year Monitoring Interval (Post-Construction)

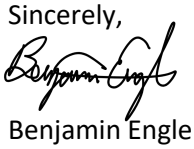
As part of annual monitoring reports, GDC may recommend discontinuing a portion or all the monitoring before the conclusion of the five (5) years monitoring interval if the results of the monitoring indicate conditions have returned to pre-construction conditions. If the data analysis indicates the Project did not significantly alter the benthic invertebrate community or fish habitat in the Project area or that it recovered quickly after completion of the Project, then additional monitoring would be unnecessary as the goals of the Monitoring Plan would have been accomplished.

Conclusions

GDC is hereby requesting concurrence on the proposed modifications to the Monitoring Plan by June 3, 2024, as GDC will be performing surveys from June 17 – June 21, 2024. We trust that the proposed modifications to the Monitoring Plan are consistent with previous discussions with NMFS and NYSDEC and meet the objectives for the original Monitoring Plan. The proposed modifications herein were developed by both Mr. Douglas Partridge, PWS and Mr. Matthew Frackelton, both with over twenty (20) years in data collection and ecological monitoring and assessment in New York and across North America.

If you have any questions regarding this modification of the Monitoring Plan in advance of in-water work for the HTP's Hudson Tunnel Ground Stabilization Project, please do not hesitate to contact me at BEngle@gatewayprogram.org.

Sincerely,



Benjamin Engle
Senior Program Manager, Program Planning
Gateway Development Commission

Enclosure
Five-Year Monitoring Plan for Hudson River Low Cover Area, November 9, 2022

cc: GDC, Eric Daleo
GDC, Jim Morrison
GDC, Cesar Silva
GTHP, Mary Ann Mason
MPA, Joanne Iwaskiw
MPA, Douglas Partridge
NYSDEC, Stephen Watts
NMFS, Karen Greene

References

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish*, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C

Chapman, A. 2013. *Protocols for Macroinvertebrate Collection, Identification and Enumeration* (pp. 1-16).: New Hampshire Department of Environmental Services (NHDES). Concord, New Hampshire.

Duffy, B. (2021). *Standard Operating Procedure: Biological Monitoring of Surface Waters in New York State*. In A. J. Smith (Ed.).: New York State Department of Environmental Conservation Division of Water.

From:	Iwaskiw, Joanne (mPa)
To:	James, Matthew M (DEC); jessie.murray; Ben Engle
Cc:	rosita.miranda@usace.army.mil; karen.greene@noaa.gov; Eric Daleo; Morrison, James; Silva, Cesar (Aecom); Mason, Mary Ann; Partridge, Doug (mPa); Nichols, Caitlyn P (DEC); Matthew.Frackelton@arcadis.com; Partridge, Doug; Watts, Stephen (DEC)
Subject:	Re: Hudson Tunnel Project - 5-Year Monitoring Plan for Hudson River Low Cover Area - Proposed Modifications
Date:	Friday, May 31, 2024 1:46:27 PM
Attachments:	image001.png image002.png Outlook-c2jz3wtq.png

Thank you for your review and approval of the modification to the Monitoring Plan and concurrence on post monitoring survey.

Joanne Iwaskiw
Environmental | Permit Compliance Manager
joanne.iwaskiw@gatewayprogram.org
201-238-3006
100 Broadway - 20th Floor
New York, New York 10005

GATEWAY DEVELOPMENT COMMISSION

From: James, Matthew M (DEC) <matthew.james@dec.ny.gov>
Sent: Friday, May 31, 2024 1:20 PM
To: Iwaskiw, Joanne (mPa) <Joanne.Iwaskiw@gatewayprogram.org>; jessie.murray <jessie.murray@noaa.gov>; Ben Engle <BEngle@gatewayprogram.org>
Cc: rosita.miranda@usace.army.mil <rosita.miranda@usace.army.mil>; karen.greene@noaa.gov <karen.greene@noaa.gov>; Eric Daleo <edaleo@gatewayprogram.org>; Morrison, James <JMorrison@gatewayprogram.org>; Silva, Cesar (Aecom) <Cesar.Silva@gatewayprogram.org>; Mason, Mary Ann <MaryAnn.Mason@stvinc.com>; Partridge, Doug (mPa) <Doug.Partridge@gatewayprogram.org>; Nichols, Caitlyn P (DEC) <Caitlyn.Nichols@dec.ny.gov>; Matthew.Frackelton@arcadis.com <Matthew.Frackelton@arcadis.com>; Partridge, Doug <Doug.Partridge@arcadis.com>; Watts, Stephen (DEC) <stephen.watts@dec.ny.gov>
Subject: RE: Hudson Tunnel Project - 5-Year Monitoring Plan for Hudson River Low Cover Area - Proposed Modifications

Good afternoon,
NYSDEC is also amenable to the proposed modifications to the Monitoring Plan and agrees with the recommendation that post-monitoring surveys be conducted at a minimum of year 5 post construction. If you have any questions or concerns please let me know.

Thank you,

Matthew James
He/Him/His
Regional Marine Resources Manager | Division Marine Resources
New York State Department of Environmental Conservation
47-40 21st Street Long Island City, NY 11101
Phone: (718) 482-6593 | **Fax**: (718) 482-4502 | matthew.james@dec.ny.gov
www.dec.ny.gov | Region 2 Office Directions | facebook | twitter

---

From: Iwaskiw, Joanne (mPa) <Joanne.Iwaskiw@gatewayprogram.org>
Sent: Friday, May 31, 2024 9:45 AM
To: jessie.murray <jessie.murray@noaa.gov>; Ben Engle <BEngle@gatewayprogram.org>
Cc: rosita.miranda@usace.army.mil; James, Matthew M (DEC) <matthew.james@dec.ny.gov>; karen.greene@noaa.gov; Eric Daleo <edaleo@gatewayprogram.org>; Morrison, James <JMorrison@gatewayprogram.org>; Silva, Cesar (Aecom) <Cesar.Silva@gatewayprogram.org>; Mason, Mary Ann <MaryAnn.Mason@stvinc.com>; Partridge, Doug (mPa) <Doug.Partridge@gatewayprogram.org>; Nichols, Caitlyn P (DEC) <Caitlyn.Nichols@dec.ny.gov>; Matthew.Frackelton@arcadis.com; Partridge, Doug <Doug.Partridge@arcadis.com>; Watts, Stephen (DEC) <stephen.watts@dec.ny.gov>
Subject: Re: Hudson Tunnel Project - 5-Year Monitoring Plan for Hudson River Low Cover Area - Proposed Modifications

Thank you again - *resending with corrected email*.

Joanne Iwaskiw
Environmental | Permit Compliance Manager
joanne.iwaskiw@gatewayprogram.org
201-238-3006
100 Broadway - 20th Floor
New York, New York 10005

GATEWAY DEVELOPMENT COMMISSION

From: Iwaskiw, Joanne (mPa) <Joanne.Iwaskiw@gatewayprogram.org>
Sent: Friday, May 31, 2024 9:32 AM
To: Jessie Murray - NOAA Federal <jessie.murray@noaa.gov>; Ben Engle <BEngle@gatewayprogram.org>
Cc: rosita.miranda@usace.army.mil <rosita.miranda@usace.army.mil>; matthew.james@dec.ny.gov <matthew.james@dec.ny.gov>; steven.watts@dec.ny.gov <steven.watts@dec.ny.gov>;

karen.greene@noaa.gov <karen.greene@noaa.gov>; Eric Daleo <edaleo@gatewayprogram.org>; Morrison, James <JMorrison@gatewayprogram.org>; Silva, Cesar (Aecom) <Cesar.Silva@gatewayprogram.org>; Mason, Mary Ann <MaryAnn.Mason@stvinc.com>; Partridge, Doug (mPa) <Doug.Partridge@gatewayprogram.org>; caitlyn.nichols@dec.ny.gov <caitlyn.nichols@dec.ny.gov>; Matthew.Frackelton@arcadis.com <Matthew.Frackelton@arcadis.com>; Partridge, Douglas <Doug.Partridge@arcadis.com>
Subject: Re: Hudson Tunnel Project - 5-Year Monitoring Plan for Hudson River Low Cover Area - Proposed Modifications

Thank you for your review and approval of the modification to the Monitoring Plan and recommendation on post monitoring survey.

Joanne Iwaskiw
Environmental | Permit Compliance Manager
joanne.iwaskiw@gatewayprogram.org
201-238-3006
100 Broadway - 20th Floor
New York, New York 10005

GATEWAY DEVELOPMENT COMMISSION

From: Jessie Murray - NOAA Federal <jessie.murray@noaa.gov>
Sent: Friday, May 31, 2024 9:10 AM
To: Ben Engle <BEngle@gatewayprogram.org>
Cc: rosita.miranda@usace.army.mil <rosita.miranda@usace.army.mil>; matthew.james@dec.ny.gov <matthew.james@dec.ny.gov>; steven.watts@dec.ny.gov <steven.watts@dec.ny.gov>; karen.greene@noaa.gov <karen.greene@noaa.gov>; Eric Daleo <edaleo@gatewayprogram.org>; Morrison, James <JMorrison@gatewayprogram.org>; Silva, Cesar (Aecom) <Cesar.Silva@gatewayprogram.org>; Mason, Mary Ann <MaryAnn.Mason@stvinc.com>; Iwaskiw, Joanne (mPa) <Joanne.Iwaskiw@gatewayprogram.org>; Partridge, Doug (mPa) <Doug.Partridge@gatewayprogram.org>
Subject: Re: Hudson Tunnel Project - 5-Year Monitoring Plan for Hudson River Low Cover Area - Proposed Modifications

Good Morning -

We have reviewed the modifications to the proposed monitoring plan for the Hudson Tunnel Project and are amenable to the proposed modifications. However, we recommend that should the post monitoring survey interval be reduced, surveys should be conducted at a minimum during year 5 post construction. From our perspective, monitoring was recommended to understand how the bottom recovers from the deep soil mixing proposed. Pre- and post sampling should be done at the same time of year for the best possible comparison.

If you have any questions or would like to discuss further, please don't hesitate to reach out.

Thank you
Jessie

On Wed, May 22, 2024 at 9:09 PM Ben Engle <BEngle@gatewayprogram.org> wrote:

> Good Evening,
>
> The Gateway Development Commission (GDC) appreciates continued support and attention while we are executing the Hudson Tunnel Project (HTP).
>
> On October 1, 2021, the NYSDEC authorized the work in the low cover area through the issuance of NYSDEC Permit No. 2-6205-01829/00005. On November 15, 2021, the USACE authorized the work in the low cover area through the issuance of USACE Permit No. NAN-2020- 00835. As stipulated by the issued permits, the attached Five-Year Monitoring Plan for Hudson River Low Cover Area Monitoring Plan (Monitoring Plan) was submitted for agency review and approval. The goal of Monitoring Plan is to assess the on-going recovery as fish foraging habitat of the 3.1-acre low cover area that requires ground treatment in the Hudson River that will be performed by the Hudson River Ground Stabilization Project commencing July 1, 2024.
>
> GDC is hereby providing proposed modifications to the approved Monitoring Plan to streamline and improve the monitoring associated with the Hudson River Ground Stabilization Project to assess potential impacts on invertebrates and fish habitat. These modifications were previously discussed with both NMFS and NYSDEC via telephone conversations. Overall, modifications are proposed based upon the following considerations:
>
> - Modifications will increase the likelihood of collecting more appropriate data to better understand potential Project impacts;
> - Modifications will better meet the stated objectives of Monitoring Plan and effectively evaluate the response of the aquatic community within the Project area; and
> - Modifications will address health and safety considerations, and anticipated difficulties implementing proposed monitoring based on current site conditions.
>
> **GDC is hereby requesting concurrence on the proposed modifications to the Monitoring Plan by June 3, 2024**, as GDC will be performing surveys from June 17 – June 21, 2024, in advance of the in-water work associated with the Hudson River Ground Stabilization Project commencing July 1, 2024.
>
> If you have any questions regarding this modification of the Monitoring Plan in advance of in-water work for the HTP's Hudson Tunnel Ground Stabilization Project, please do not hesitate to contact me.
>
> Thank you,
> Benjamin Engle

Benjamin S. Engle, ENV SP (he/him)
Senior Program Manager, Program Planning
Gateway Development Commission
(646) 565-0523
bengle@gatewayprogram.org
GATEWAY PROGRAM

--

Jessie Murray
Marine Habitat Resource Specialist
Habitat and Ecosystems Services Division
Greater Atlantic Regional Fisheries Office
James J. Howard Marine Sciences Laboratory, Highlands, NJ
NOAA Fisheries | U.S. Department of Commerce
(732) 872-3116

***NOTE: Please send files and correspondence electronically instead of through the mail to ensure we get your requests in a timely manner.*

Appendix C: Otter Trawl Survey Marine Species Photograph Log

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 1

Date: 6/19/2024

Location: Hudson River

Description: Tomcod *(Microgadus tomcod).*

Photo: 2

Date: 6/19/2024

Location: Hudson River

Description: Sand shrimp *(Crangon septemspinosa).*

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 3

Date: 6/19/2024

Location: Hudson River

Description: Two bay anchovies *(Anchoa mitchilli).*

Photo: 4

Date: 6/19/2024

Location: Hudson River

Description: Tomcod (*Microgadus tomcod).*

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 5

Date: 6/19/2024

Location: Hudson River

Description: Hogchoker *(Trinectes maculatus)*.

Photo: 6

Date: 6/19/2024

Location: Hudson River

Description: Spotted hake *(Urophycis regia).*

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 7

Date: 6/19/2024

Location: Hudson River

Description: Blue crab (*Callinectes sapidus)*.

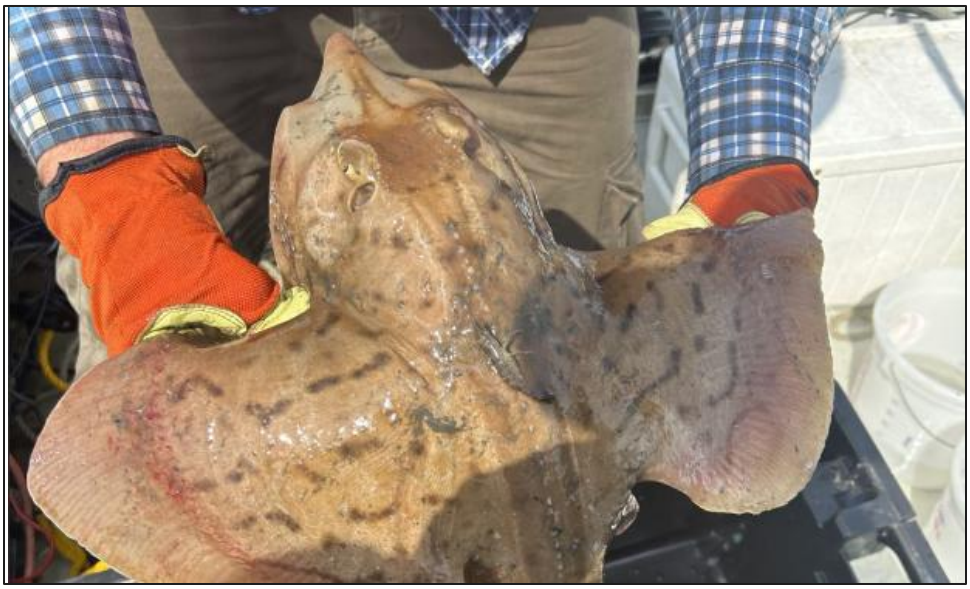


Photo: 8

Date: 6/19/2024

Location: Hudson River

Description: Clear nose skate *(Raja eglanteria).*

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 9

Date: 6/19/2024

Location: Hudson River

Description: Underside of clear nose skate (*Raja eglanteria)*.

Photo: 10

Date: 6/19/2024

Location: Hudson River

Description: Clear nose skate (*Raja eglanteria)* being measured.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 11

Date: 6/19/2024

Location: Hudson River

Description: Juvenile black sea bass (*Centropristis striata).*

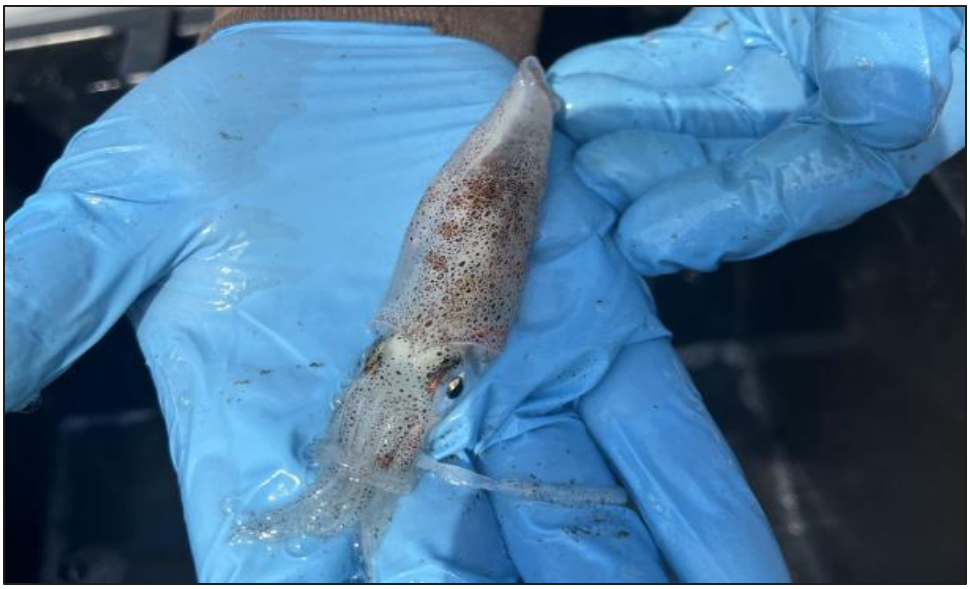


Photo: 12

Date: 6/19/2024

Location: Hudson River

Description: Longfin inshore **s**quid *(Loligo pealei)*.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 13

Date: 6/19/2024

Location: Hudson River

Description: White perch *(Morone americana)*.

Photo: 14

Date: 6/19/2024

Location: Hudson River

Description: Large piece of driftwood debris.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 15

Date: 6/19/2024

Location: Hudson River

Description: Striped bass *(Morone saxatilis)*.

Photo: 16

Date: 6/19/2024

Location: Hudson River

Description: Northern sea robin *(Prionotus carolinus).*

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 17

Date: 6/19/2024

Location: Hudson River

Description: Lady crab *(Ovalipes ocellatus).*

Photo: 18

Date: 6/19/2024

Location: Hudson River Estuary

Description: Long-wristed hermit crab (*Pagurus longicarpus).*

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 19

Date: 6/19/2024

Location: Hudson River
Description: Weakfish *(Cynoscion regalis).*

Photo: 20

Date: 6/19/2024

Location: Hudson River
Description: Crab spp.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 21

Date: 6/19/2024

Location: Hudson River

Description: BC-S-02 ponar sediment grab pre-sieve.

Photo: 22

Date: 6/19/2024

Location: Hudson River

Description: BC-S-02 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 23

Date: 6/19/2024

Location: Hudson River

Description: BC-S-03 ponar sediment grab pre-sieve.

Photo: 24

Date: 6/19/2024

Location: BC-S-03 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 25

Date: 6/19/2024

Location: Hudson River

Description: BC-S-04 ponar sediment grab pre-sieve.

Photo: 26

Date: 6/19/2024

Location: BC-S-04 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 27

Date: 6/19/2024

Location: Hudson River

Description: BC-MHB-01 ponar sediment grab pre-sieve.

Photo: 28

Date: 6/19/2024

Location: BC-MHB-01 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 29

Date: 6/19/2024

Location: Hudson River

Description: BC-MHB-02 ponar sediment grab pre-sieve.

Photo: 30

Date: 6/19/2024

Location: BC-MHB-02 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 31

Date: 6/19/2024

Location: Hudson River

Description: BC-R-02 ponar sediment grab pre-sieve.

Photo: 32

Date: 6/19/2024

Location: BC-R-02 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 33

Date: 6/19/2024

Location: Hudson River

Description: BC-R-03 ponar sediment grab pre-sieve.

Photo: 34

Date: 6/19/2024

Location: BC-R-03 ponar sediment grab post-sieve.

Project Photographs

Baseline Biota Survey
Hudson Tunnel Project
New York, New York

Photo: 35

Date: 6/19/2024

Location: Hudson River

Description: BC-R-01 ponar sediment grab pre-sieve.

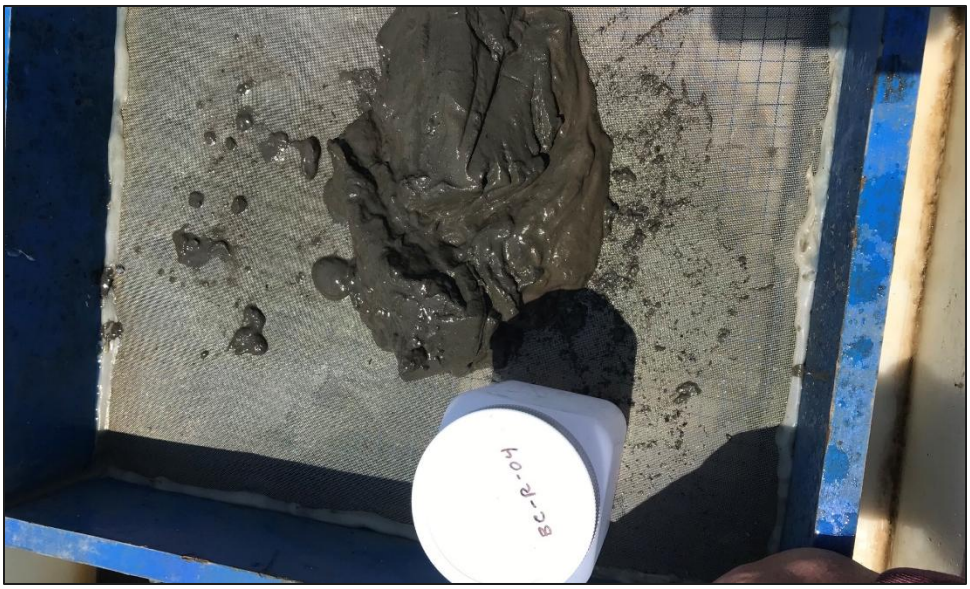
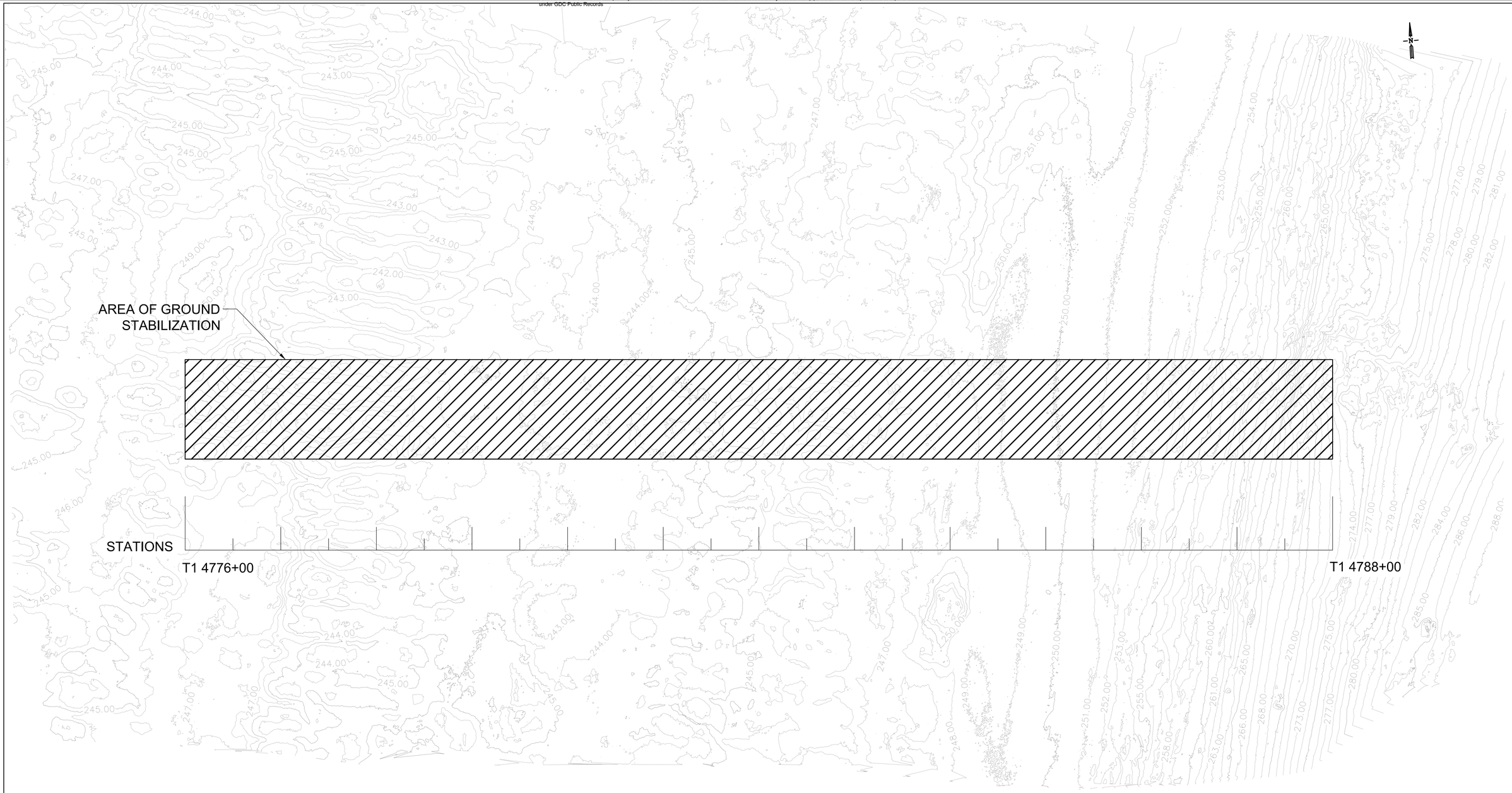


Photo: 36

Date: 6/19/2024

Location: BC-R-04 ponar sediment grab pre-sieve.

Appendix D: Bathymetric Survey



EXISTING SITE BATHYMETRY (1 / G-110)

1" = 50'-0"

No.	Revisions	Date	By
0	RFC SUBMISSION	07/16/2024	MKOS

Amtrak®

Office of Deputy Chief Engineer
STRUCTURES
National Railroad Passenger Corporation
30th Street Station, Philadelphia, Pennsylvania 19104

Approved	Date

WEEKS COWI GATEWAY PROGRAM

HUDSON TUNNEL PROJECT

HUDSON RIVER GROUND STABILIZATION

EXISTING SITE BATHYMETRY

RFC DESIGN

Designed: AAWG | Drawn: MMSS | Checked: MKOS | Date: 07/16/2024

Contract No. GDC23-003

Sheet No. 06 OF 28

Dwg. No. G-110

11-04-2024 19:37:31