CHAPTER 32 CONSTRUCTION IMPACTS

32.1 Introduction

The DSNY is planning to restore and modify solid waste transfer operations at their Converted MTS facilities. The new operations, which will containerize MSW for barge transport, are planned for the City's Converted MTSs and will require varying degrees of over-water and on-shore construction. Construction and operation of the Converted MTSs in the Proposed Plan will have short- and long-term impacts on the surrounding marine environment and ambient natural resources. Since construction of the MTSs will be less than 3 years in duration, a detailed construction related impact analysis was not required. In this section, two types of impacts will be discussed: short-term or construction impacts, and long-term or operational impacts.

32.2 Construction Impacts

Construction impacts to the marine environment result from both the demolition of existing structures and the fabrication of new facilities. Construction impacts are limited temporally to the span of the activities, typically a few years. On a generic basis, these impacts include, but are not limited to, loss of benthic habitat due to dredging, turbidity and siltation from piling removal or installation, loss of encrusting organism habitat from piling removal, and general disruption due to human and mechanical activity. Minor water quality impacts, such as localized anoxia, may result if newly exposed reduced sediments draw down dissolved oxygen on contact. A list of the potential impacts at the Converted MTSs is presented in Table 32.2-1. The proposed construction plans call for some activity at each of the eight Converted MTSs, but the extent varies, with some sites being totally rebuilt and others having relatively minor alterations.

32.2.1 Benthic Communities

Benthic organisms, being immobile (at least in the adult stages), are subject to impacts of construction activities that have the potential for disruption or even obliteration of the populations in the impact zone. The benthic species found at each Converted MTS are listed in Table 32.2-2. If benthic species diversity is the accepted indicator for overall "health" of the communities around each Converted MTS, it follows that the Converted MTS zones with the highest diversities are likely to be more greatly impacted than those with lower diversities. While species diversity is an accepted indicator, caution must be used in interpreting the data because certain specific monocultures can also be considered highly valuable systems. Nonetheless, lower diversity benthic communities are usually opportunistic species with high abundances and toleration for more degraded environments. The most abundant species observed at these Converted MTSs were those species tolerant of degraded environments: *Streblospio benedict*, *Capitella capitata*, polychaetes and oligochaetes. With these caveats in mind, benthic species diversity will be used in this impact analysis to determine probable impacts to the benthic communities.

Table 32.2-1
Potential Impacts to Marine Communities at Converted MTSs

Chemical
Heavy metals released from sediment during dredging
Heavy metals and polycyclic aromatic hydrocarbons (PAHs) introduced to sediment and water from treated lumber used in construction
Suspended particles from marine construction and dredging
Anoxia from release of reduced sediments during dredging
Biological
Disrupted communities
Removal of food sources
Physical
Channel dredging
Dredged material disposal
Dredging and filling
Habitat degradation

Table 32.2-2
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

South Bronx					
Species	**Total Number**	**Species**	**Total Number**	**Species**	**Total Number**
Streblospio benedicti	6,497	Caprellidae	11	*Crangon septemspinosa*	2
Oligochaeta	2,861	Actinaria	10	*Heteromysis formosa*	2
Cirratulidae	1,025	Polynoidae	10	*Crepidula fornicata*	2
Haploscoloplos sp.	678	*Edotea triloba*	8	*Eumida sanguinea*	2
Hypaniola grayi	321	Atherinidae	8	Nudibranchia	2
Eteone sp.	224	*Molgula manhattensis*	7	*Lysianopsis alba*	2
Nereis sp.	205	Ampharetidae	7	*Lepidonotus* sp.	2
Polydora sp.	105	*Corophium* sp.	6	*Cirratulis grandis*	2
Mulinea lateralis	100	*Sigambra* sp.	6	*Parapholis spinosus*	2
Pectinaria gouldii	98	Platyhelminthes	6	*Neomysis americana*	1
Nereis succinea	77	Anemone	5	*Leucon americanus*	1
Capitellidae	66	Amphithoidae	5	*Edotea* sp.	1
Parametopella cypris	66	*Yolida* sp.	5	*Acteocina canaliculata*	1
Phyllodocidae	61	Bivalvia	4	*Erichthonius* sp.	1
Elasmopus levis	59	*Ampelisca* sp.	4	*Spio* sp.	1
Spionidae	50	*Gammurus* sp.	4	*Glycera americana*	1
Xanthidae	48	Hesionidae	4	Syllidae	1
Melitidae	46	*Sabelleria vulgaris*	4	*Hyatella* sp.	1
Mya arenaria	30	Polychaeta	3	*Cassura longicirrata*	1
Amphipoda	27	Corophidae	3	*Ampharete artila*	1
Capitella capitata	21	Pysnogonidae	3	*Asabellides* sp.	1
Podarke obscura	21	Decapoda	3	*Crepidula plana*	1
Glycera sp.	18	Aoridae	3	*Dyspanopeus sayi*	1
Melita nitida	17	*Cerepus tubularis*	3	*Sabella microphthalmus*	1
Gasrtopoda	15	*Panopeus herbstii*	3	*Schistomeringos* sp.	1
Tellina agilis	11	*Podarke* sp.	3	*Tellina* sp.	1
Sabellidae	11	*Polydora ligni*	2		
Total					**12,933**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

Southwest Brooklyn			
Species	**Total Number**	**Species**	**Total Number**
Streblospio benedicti	4,058	*Mya arenaria*	5
Oligochaeta	991	*Pagurus* sp.	5
Haploscoloplos sp.	477	*Hypaniola grayi*	4
Annelida	336	Bivalvia	4
Capitellidae	162	*Eumida sanguinea*	4
Nereis sp.	159	*Gammurus* sp.	3
Gasrtopoda	104	Hesionidae	3
Phyllodocidae	75	Atherinidae	3
Heteromysis formosa	72	*Palaeomonetes vulgaris*	3
Eteone sp.	62	Isopoda	3
Acteocina canaliculata	54	*Paranaitis speciosa*	3
Cirratulidae	51	*Cirratulus* sp.	3
Capitella capitata	45	*Polydora* sp.	2
Ilyanassa sp.	45	*Polydora ligni*	2
Crepidula fornicata	42	*Podarke obscura*	2
Pectinaria gouldii	35	*Edotea triloba*	2
Ampelisca sp.	34	*Sabelleria vulgaris*	2
Erichthonius sp.	34	*Nephtys* sp.	2
Amphipoda	22	*Pagurus longicarpus*	2
Melita nitida	20	*Leucon americanus*	1
Glycera sp.	19	*Corophium* sp.	1
Eulalia viridis	17	*Scolocolepides viridis*	1
Nereis succinea	15	Polychaeta	1
Tellina agilis	15	Caprellidae	1
Elasmopus levis	13	Syllidae	1
Rictaxis punctostriatus	13	Nudibranchia	1
Glycera americana	12	*Lysianopsis alba*	1
Mytillidae	12	*Mytilus edulis*	1
Xanthidae	10	*Lepidonotus* sp.	1
Paranatus sp.	10	*Oxyurustylis smithi*	1
Notoacmea testudinalis	9	*Clymenella* sp.	1
Neomysis americana	8	*Idotea metallica*	1
Ampelisca venili	8	*Microphthalmus aberrans*	1
Crangon septemspinosa	7	*Phyllodoce* sp.	1
Ilyanassa obsoleta	7	*Polinices duplicata*	1
Mulinea lateralis	5	*Sigalionidae* sp.	1
Spionidae	5		
Total			**7,137**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

Greenpoint			
Species	**Total Number**	**Species**	**Total Number**
Streblospio benedicti	23,169	*Corophium* sp.	5
Capitella capitata	1,338	*Sigambra* sp.	3
Oligochaeta	1,071	*Mya arenaria*	3
Eteone sp.	958	Anemone	2
Annelida	497	*Scolocolepides viridis*	2
Polydora sp.	248	*Glycera* sp.	2
Haploscoloplos sp.	113	*Podarke obscura*	2
Polydora ligni	112	*Melita nitida*	2
Capitellidae	58	*Unciola* sp.	2
Nereis sp.	55	*Ilyanassa* sp.	1
Cirratulidae	36	Bivalvia	1
Phyllodocidae	26	Amphipoda	1
Neomysis americana	23	*Elasmopus levis*	1
Mulinea lateralis	17	*Ampelisca* sp.	1
Spionidae	16	*Edotea triloba*	1
Ilyanassa obsoleta	16	*Pagurus* sp.	1
Crangon septemspinosa	15	Syllidae	1
Hypaniola grayi	9	*Gammarus mucronatus*	1
Nereis virens	7	*Palaemonetes* sp.	1
Nereis succinea	6		
Total			**27,823**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

Hamilton Avenue			
Species	**Total Number**	**Species**	**Total Number**
Capitella capitata	4,746	Nematoda	6
Streblospio benedicti	1,702	*Ilyanassa* sp.	5
Oligochaeta	1,196	*Corophium* sp.	5
Polydora sp.	462	*Nereis succinea*	4
Annelida	210	*Palaeomonetes vulgaris*	4
Nereis sp.	126	*Leucon americanus*	3
Edotea sp.	115	*Ampelisca* sp.	3
Platyhelminthes	54	*Glycera* sp.	3
Haploscoloplos sp.	29	*Mulinea lateralis*	2
Neomysis americana	26	*Mya arenaria*	2
Phyllodocidae	24	Polychaeta	2
Polydora ligni	22	*Balanus* sp.	2
Podarke obscura	22	*Phyllodoce arenae*	2
Crangon septemspinosa	20	*Schistomeringos rudolphi*	2
Spionidae	13	Amphipoda	1
Capitellidae	12	Sabellidae	1
Cirratulidae	10	*Monoculodes edwardsi*	1
Eumida sanguinea	9	*Nephtys* sp.	1
Scolocolepides viridis	7	*Nereis virens*	1
Hesionidae	7	Decapoda	1
Molgula manhattensis	6	*Fabrica sabella*	1
Syllidae	6	*Hippolyte* sp.	1
Total			**8,877**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

West 135th Street			
Species	**Total Number**	**Species**	**Total Number**
Oligochaeta	2,866	Leptosynapta	8
Streblospio benedicti	1,095	*Crangon septemspinosa*	7
Annelida	992	*Edotea triloba*	6
Mulinea lateralis	381	*Monoculodes edwardsi*	6
Neomysis americana	379	*Corophium* sp.	5
Haploscoloplos sp.	361	*Hyatella* sp.	5
Eteone sp.	164	*Podarke obscura*	4
Phyllodocidae	147	*Cyathura polita*	4
Leucon americanus	106	*Glycera* sp.	3
Bivalvia	66	*Gammurus* sp.	3
Scolocolepides viridis	65	Gasrtopoda	2
Nereis sp.	61	*Ampelisca* sp.	2
Capitella capitata	40	Isopoda	2
Spio sp.	28	Cumacea	2
Spionidae	25	*Molgula manhattensis*	1
Notomastus sp.	21	*Sabelleria vulgaris*	1
Polychaeta	18	Pysnogonidae	1
Mulinea sp.	17	*Gammarus mucronatus*	1
Amphipoda	16	*Callinectes sapidus*	1
Ilyanassa sp.	14	*Gammarus* sp.	1
Capitellidae	13	*Macoma* sp.	1
Nereis succinea	9	*Portunus* sp.	1
Mya arenaria	8		
Total			**6,959**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

West 59th Street			
Species	**Total Number**	**Species**	**Total Number**
Oligochaeta	2,486	*Sabelleria vulgaris*	3
Streblospio benedicti	1,220	*Nereis succinea*	2
Polydora sp.	122	*Corophium* sp.	2
Eteone sp.	74	*Scolocolepides viridis*	2
Haploscoloplos sp.	68	*Podarke obscura*	2
Leucon americanus	57	*Melita nitida*	2
Capitella capitata	35	*Monoculodes edwardsi*	2
Annelida	31	Orbiniidae	2
Nereis sp.	31	Anemone	1
Crangon septemspinosa	27	Phyllodocidae	1
Ampelisca sp.	14	*Ilyanassa* sp.	1
Cirratulidae	12	*Sigambra* sp.	1
Neomysis americana	10	*Glycera* sp.	1
Mulinea lateralis	8	Xanthidae	1
Edotea triloba	7	*Mulinea* sp.	1
Pectinaria gouldii	6	*Palaeomonetes vulgaris*	1
Capitellidae	5	Pysnogonidae	1
Stenopleustes gracilis	5	*Mytilus edulis*	1
Bivalvia	4	*Lepidonotus* sp.	1
Spionidae	3	Cumacea	1
Amphipoda	3	*Oxyurustylis smithi*	1
Gammurus sp.	3		
Total			**4,261**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

East 91st Street			
Species	**Total Number**	**Species**	**Total Number**
Streblospio benedicti	16,952	*Ilyanassa obsoleta*	5
Oligochaeta	1,738	*Neomysis americana*	4
Annelida	1,637	*Gammurus* sp.	4
Haploscoloplos sp.	569	Amphithoidae	4
Hypaniola grayi	401	*Tharyx* sp.	4
Eteone sp.	393	*Nereis succinea*	3
Spionidae	324	*Parametopella cypris*	3
Cirratulidae	151	Xanthidae	3
Mulinea lateralis	136	*Acteocina canaliculata*	3
Nereis sp.	79	Caprellidae	3
Polydora sp.	65	Actinaria	3
Pectinaria gouldii	55	Corophidae	3
Phyllodocidae	35	*Sigambra* sp.	2
Capitella capitata	25	Polychaeta	2
Ilyanassa sp.	20	*Tellina agilis*	2
Glycera sp.	19	Nudibranchia	2
Bivalvia	17	*Lysianopsis alba*	2
Corophium sp.	13	Decapoda	2
Amphipoda	13	*Fabrica sabella*	2
Rictaxis punctostriatus	13	*Leucon americanus*	1
Mya arenaria	12	*Polydora ligni*	1
Edotea triloba	10	*Scolocolepides viridis*	1
Anemone	8	*Crepidula fornicata*	1
Sabellidae	8	*Erichthonius* sp.	1
Podarke obscura	7	*Glycera americana*	1
Crangon septemspinosa	6	Isopoda	1
Elasmopus levis	6	*Mytilus edulis*	1
Molgula manhattensis	6	*Idotea balthica*	1
Ampharetidae	6	*Ovatella myosotis*	1
Gasrtopoda	5	*Pinnixa* sp.	1
Ampelisca sp.	5		
Total			**22,801**

Table 32.2-2 (Continued)
Organisms Collected in Benthic Grabs at Each Converted MTS
January – October 2003

North Shore			
Species	**Total Number**	**Species**	**Total Number**
Streblospio benedicti	4,751	*Nephtys* sp.	5
Oligochaeta	1,459	Capitellidae	4
Haploscoloplos sp.	1,457	Hesionidae	4
Eteone sp.	192	*Cassura longicirrata*	4
Annelida	150	Gasrtopoda	3
Corophium sp.	83	*Edotea triloba*	3
Mulinea lateralis	68	Nudibranchia	3
Sigambra sp.	59	*Mya arenaria*	2
Nereis sp.	45	*Tellina agilis*	2
Ilyanassa sp.	36	Sabellidae	2
Cirratulidae	29	*Mytilus edulis*	2
Phyllodocidae	25	*Cirratulus cirratus*	2
Neomysis americana	23	*Cossura longocirrata*	2
Pagurus sp.	22	*Molgula* sp.	2
Polydora sp.	19	*Glycera* sp.	1
Capitella capitata	15	*Melita nitida*	1
Bivalvia	15	*Rictaxis punctostriatus*	1
Amphipoda	13	*Molgula manhattensis*	1
Polychaeta	13	*Gammurus* sp.	1
Leucon americanus	12	*Ilyanassa obsoleta*	1
Polydora ligni	12	Caprellidae	1
Pectinaria gouldii	10	Atherinidae	1
Hypaniola grayi	9	Pysnogonidae	1
Ampelisca sp.	8	*Tharyx* sp.	1
Nereis succinea	7	*Paranaitis speciosa*	1
Crangon septemspinosa	7	*Jassa falcata*	1
Anemone	5	*Limulus polyphemus*	1
Spionidae	5	Sipunculid	1
Total			**8,603**

The Shannon-Weaver Index for benthic organisms was computed for all Converted MTSs.[1] This index is used as a measure of community diversity, but also accounts for numbers of individual organisms. Table 32.2-3 lists the stations and their respective indices. In a rank of the indices from the highest to the lowest, a high index indicates a high species diversity.

Table 32.2-3
Shannon-Weaver Index and Rank of Benthic Impact at Converted MTSs

Converted MTS	Shannon-Weaver Index	Rank
West 135th Street	2.014	High
South Bronx	1.921	High
Southwest Brooklyn	1.815	High
Hamilton Avenue	1.509	Medium
North Shore	1.487	Medium
West 59th Street	1.286	Medium
East 91st Street	1.116	Medium
Greenpoint	0.780	Low
Mean (all MTSs)	**1.700**	

The ranking of high, medium and low are somewhat arbitrary; however, this ranking can be used as a general grouping of the respective MTS indices to determine impacts. A Shannon-Weaver Index above 1.8 was given a high rank, an index between 1.0 and 1.8 was assigned a medium rank and an index below 1.0 was given a low rank.

At present, the plan is for the degrees of activity and consequent potential for benthic impacts shown in Table 32.2-4. The Converted MTSs that will have construction of new platforms, causing turbidity and siltation, were assigned a high impact rank. Those with minimal or no construction were assigned a low or no impact rank.

[1] New York City Department of Sanitation, March 2004. Marine Biological Studies of the Marine Transfer Stations Operated by the New York City Department of Sanitation. Prepared by EEA, Inc.

Table 32.2-4
Construction Activity and Potential Impacts

Converted MTS	Construction Activity	Marine Resource Impacts	Degree of Impact
West 135th Street	New, larger platform	Turbidity, siltation	(high)
South Bronx	New, larger platform	Turbidity, siltation	(high)
Southwest Brooklyn	Existing platform to remain	None	(none)
Hamilton Avenue	Existing platform removed	Minimal	(low)
North Shore	New, larger platform	Turbidity, siltation	(high)
West 59th Street	New, larger platform	Turbidity, siltation	(high)
East 91st Street	New, larger platform	Turbidity, siltation	(high)
Greenpoint	New, smaller platform	Turbidity, siltation	(high)

If the two above tables are combined, the matrix shown in Table 32.2-5 can be constructed. In order to determine the expected impacts, turbidity and siltation received a high rank, while the removal of platforms with no new construction received a low rank. If two high ranks were compared, the expected impact was high. If a high and medium rank were compared, the expected impact was moderate. If the Shannon-Weaver Index or construction activity had a low rank, the expected impact was ranked as minimal or none.

Table 32.2-5
Degree of Expected Benthic Impacts

Converted MTS	Degree of Expected Impacts
West 135th Street	High
South Bronx	High
Southwest Brooklyn	None
Hamilton Avenue	Minimal
North Shore	Moderate
West 59th Street	Moderate
East 91st Street	Moderate
Greenpoint	Minimal

The needs of the project require that the old platforms be removed and new ones constructed. Southwest Brooklyn is an exception; the existing platform will remain in place. The construction of new platforms will cause turbidity and siltation, which could smother benthic communities. Impacts will be greatest to the benthic communities at the Converted MTSs that have the most diverse benthic communities. The above ranking of expected benthic impacts from construction appears logical as West 135th Street and South Bronx had the highest Shannon-Weaver indices and significant construction activities. Conversely, Southwest Brooklyn, Greenpoint and Hamilton Avenue ranked low on impacts. No impacts are expected at Southwest Brooklyn, as no over-water platform construction is slated. No new over-water construction is planned at Hamilton Avenue and the benthic community at Greenpoint is not very diverse, so the limited construction should not result in drastic impacts.

32.2.2 Epibenthic Communities

Examination of the colonization plates revealed that most of the Converted MTSs had extensive macrofaunal communities within a single growing season. Most growth was observed in the spring and summer months. The most abundant species were those that are tolerant of degraded environments, such as the amphipod *Corophium insidiosum*, the polychaete worm, *Polydora sp*. and the tunicate *Molgula manhattensis*. All species found on the colonization arrays at each Converted MTS are listed in Table 32.2-6. Removal of the existing structures will temporarily eliminate these communities and cause a localized loss of food sources for fish species (e.g., tautog) that prey on them. At the Hamilton Avenue Converted MTS, this impact will be the most pronounced compared to the others because substrate for growth will be permanently removed. Greenpoint will also have a loss of macrofauna due to a reduction in platform size. The other Converted MTSs will have as much or more new hard surface available for colonization so this initial habitat loss will not be significant. The epibenthic community is expected to remain at Southwest Brooklyn, as no pier removal or construction is planned at this Converted MTS.

It is important to note that colonization was observed during one sampling season and therefore the new structures are expected to be colonized fairly quickly. However, colonization may be delayed if treated lumber is used in construction. Treated lumber prevents marine growth until enough of the treatment has leached out of the lumber to allow a suitable environment for growth. Two widely used treatments for marine construction are creosote and chromated copper arsenate (CCA). Although both are used to deter marine growth, studies have suggested that they do not pose a significant risk to aquatic life.[2] Creosote releases PAHs and CCA releases copper, chromium and arsenic; however, the most leaching occurs with the initial introduction to the water and leaching decreases with time.[3] The leachate from both types of treated lumber is absorbed by the sediment and is either metabolized by microorganisms or becomes biologically unavailable.[4] Because leaching decreases with time, both benthic and epibenthic organisms are expected to recolonize the sediment and reclaim the submerged structures. It must also be noted that many of the benthic and epibenthic organisms found around the Converted MTSs were those tolerant of degraded environments and would generally be the first to be found again.

[2] Sinnott, T.J., 2000. Assessment of the Risks to Aquatic Life from the Use of Pressure Treated Wood in Water. New York State Department of Environmental Conservation.
[3] Ibid.
[4] Ibid.

Table 32.2-6
Epibenthic Organisms Collected at Each Converted MTS
April 2003 – February 2004

Converted MTS	Epibenthic Organism	
South Bronx	*Ampellisca* sp.	*Molgula manhattensis*
	Antinoella sarsi	*Mytilus edulis*
	Balanus sp.	*Nereis succinea*
	Caprella sp.	*Paracaprella tenuis*
	Corophium insidiosum	*Phyllodoce arenae*
	Crustacea	*Pleusymtes glaber*
	Elasmopus levis	*Polydora* sp.
	Eumida sanguinea	*Sabella microphthalma*
	Hydrozoa, Mud, & Algal Film	*Scoloplos* sp.
	Isopoda	Sipunculoidea
	Jassa falcata	Stenothoidae
	Melita nitida	*Tharyx* sp.
	Microdeutopus sp.	
Southwest Brooklyn	Actinaria	*Gammarus oceanicus*
	Ampellisca sp.	Hydrozoa, Mud, & Algal Film
	Ampithoe valida	Isopoda
	Antinoella sarsi	*Jassa falcata*
	Aoridae	*Lepidonotus squamatus*
	Balanus sp.	*Lyonsia* sp.
	Caprella penantis	*Melita nitida*
	Caprella sp.	Melitidae
	Corophium insidiosum	*Microdeutopus* sp.
	Corophium sp.	*Molgula manhattensis*
	Crepidula fornicata	*Mytilus edulis*
	Crepidula plana	*Nereis* sp.
	Elasmopus levis	*Nereis succinea*
	Enrichthonius sp.	*Paracaprella* sp.
	Eumida sanguinea	*Paracaprella tenuis*

Table 32.2-6 (Continued)
Epibenthic Organisms Collected at Each Converted MTS
April 2003 – February 2004

Converted MTS	Epibenthic Organism	
Greenpoint	*Ampellisca* sp.	*Molgula manhattensis*
	Balanus sp.	*Mytilus edulis*
	Corophium insidiosum	*Nereis succinea*
	Corophium sp.	*Pleusymtes glaber*
	Eumida sanguinea	Polydora sp.
	Gammarus mucronatus	*Sabella microphthalma*
	Hydrozoa, Mud, & Algal Film	Spionidae
	Melita nitida	Stenothoidae
	Microdeutopus sp.	Syllidae
Hamilton Avenue	*Ampellisca* sp.	*Molgula manhattensis*
	Balanus sp.	*Mytilus edulis*
	Copepoda	Nereidae
	Corophium insidiosum	*Nereis* sp.
	Corophium sp.	*Nereis succinea*
	Eumida sanguinea	Phyllodocidae
	Gammarus mucronatus	*Pleusymtes glaber*
	Hydrozoa, Mud, & Algal Film	*Polydora* sp.
	Isopoda	*Sabella microphthalma*
	Jassa falcata	*Sabellaria vulgaris*
	Lepidonotus squamatus	Sabellidae
	Lysonia sp.	Stenothoidae
	Melita nitida	Syllidae
	Microdeutopus sp.	
West 135th Street	*Ampellisca* sp.	*Melita nitida*
	Ampithoe valida	*Nereis* sp.
	Balanus sp.	*Nereis succinea*
	Corophium insidiosum	*Pleusymtes glaber*
	Corophium sp.	*Polydora* sp.
	Hydrozoa, Mud, & Algal Film	*Sabella microphthalma*
	Isopoda	Spionidae
	Jassa falcata	Stenothoidae
	Lyonsia sp.	*Melita nitida*

Table 32.2-6 (Continued)
Epibenthic Organisms Collected at Each Converted MTS
April 2003 – February 2004

Converted MTS	Epibenthic Organism	
West 59th Street	*Ampellisca* sp.	Isopoda
	Ampithoe valida	*Lyonsia* sp.
	Balanus sp.	*Melita nitida*
	Corophium insidiosum	*Molgula manhattensis*
	Corophium sp.	*Nereis succinea*
	Eumida sanguinea	*Phyllodoce arenea*
	Gammarus sp.	*Pleusymtes glaber*
	Hydrozoa, Mud, & Algal Film	*Polydora* sp.
	Ampellisca sp.	Spionidae
East 91st Street	*Ampellisca* sp.	*Molgula manhettansis*
	Antinoella sarsi	*Mytilus edulis*
	Balanus sp.	*Nereis succinea*
	Brania wellfleetensis	*Paracaprella tenuis*
	Caprella penantis	*Phyllodoce arenae*
	Corophium insidiosum	*Phyllodoce* sp.
	Corophium sp.	*Pleusymtes glaber*
	Elasmopus levis	*Polydora* sp.
	Erichthonius brasiliensis	Polynoidae
	Eumida sanguinea	*Sabella microphthalma*
	Exogone dispar	*Sabellaria vulgaris*
	Hydrozoa, Mud, & Algal Film	Sabellidae
	Jassa falcata	Spionidae
	Lyonsia sp.	Stenothoidae
	Melita nitida	Xanthidae
	Microdeutopus sp.	*Molgula manhettansis*
North Shore	*Ampellisca* sp.	*Microdeutopus* sp.
	Antinoella sarsi	*Molgula manhattensis*
	Balanus sp.	*Nereis succinea*
	Copepoda	*Phyllodoce arenea*
	Corophium insidiosum	Phyllodocidae
	Corophium sp.	*Pleusymtes glaber*
	Elasmopus levis	*Polydora* sp.
	Gammarus mucronatus	*Sabella microphthalma*
	Hydrozoa, Mud, & Algal Film	Spionidae
	Jassa falcata	Stenothoidae
	Melita nitida	

32.2.3 Adult Finfish

Construction impacts such as turbidity and siltation will be limited spatially to the immediate area of the transfer station. These impacts will also be restricted temporally to the time of construction, approximately one to one-and-one-half years. Adult finfish impacts are not expected because motile organisms will avoid construction activities that produce less than optimal environmental conditions. Fish generally display avoidance behavior of areas that have one milligram per liter or more of suspended sediment.[5] Some fish are more tolerant of suspended sediment than others. For example, bottom dwellers, such as flounders, are more tolerant of suspended particles than pelagic species, and clupeids (herring) are most sensitive to suspended sediment as it easily clogs their gills.[6] Table 32.2-7 shows the relative sensitivity of the finfish collected at the Converted MTSs to suspended particles in the water column.

The pile-driving activity associated with pier construction may also cause fish to avoid the construction sites. Relative finfish sensitivity to noise is listed in Table 32.2-7. Studies on the effects of offshore pile-driving on finfish, which may be more intense than the type used in this project, have indicated that, in general, bottom dwelling fish (flatfish, etc.) are less sensitive to pile-driving than pelagic fish (whose swim bladders are sensitive to pressure changes, which in turn affects the ear).[7] Herring have been documented to show escape responses to pile-driving.[8] Avoidance response of juvenile salmonids to pile-driving activity in harbors has also been documented.[9] Although there were no salmonids at any of the MTSs studied, this study may be extrapolated to suggest that finfish would probably avoid the areas where marine construction is occurring.

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[5] Bio/consultant as. Evaluation of the Effect of Sediment Spill from Offshore Wind Farm Construction on Marine Fish.
[6] Ibid.
[7] Bio/consultant as. Evaluation of the Effect of Noise from Offshore Pile-Driving on Marine Fish.
[8] Ibid.
[9] Feist, B.E., Anderson, J.J., and Miyamoto, R., 1992. Potential Impacts of Pile Driving on Juvenile Pink (*Oncorhynchus gorbuscha*) and Chum (*O. keta*) Salmon Behavior and Distribution.

Table 32.2-7
Adult Finfish Sensitivity to Suspended Particles and Noise Associated with Marine Construction[1]

Common Name	Suspended Particles	Noise
Alewife	High	High
American Eel	Moderate	Moderate
American Shad	High	High
Atlantic Butterfish	Moderate	Moderate
Atlantic Croaker	Moderate	Moderate
Atlantic Herring	High	High
Atlantic Menhaden	High	High
Atlantic Silverside	Moderate	Moderate
Atlantic Tomcod	Moderate	Moderate
Bay Anchovy	Moderate	Moderate
Black Sea Bass	Moderate	Moderate
Blueback Herring	High	High
Bluefish	Moderate	Moderate
Cunner	Moderate	Moderate
Gizzard Shad	High	High
Grubby Sculpin	Moderate	Moderate
Hickory Shad	High	High
Hogchoker	Low	Low
Lined Sea Horse	Moderate	Moderate
Little Skate	Low	Low
Naked Goby	Moderate	Low
Northern Pipefish	Moderate	Moderate
Oyster Toadfish	Low	Low
Scup	Moderate	Moderate
Smallmouth Flounder	Low	Low
Smooth Dogfish	Moderate	Low
Spotted Hake	Moderate	Moderate
Striped Bass	Moderate	Moderate
Striped Searobin	Moderate	Moderate
Summer Flounder	Low	Low
Tautog	Moderate	Moderate
Weakfish	Moderate	Moderate
White Perch	Moderate	Moderate
Windowpane	Low	Low
Winter Flounder	Low	Low
Winter Skate	Low	Low

Note for Table 32.2-7:
(1) This table uses information from European sources to show a relative sensitivity of the fish collected at the MTSs to activities associated with marine construction. Both studies were conducted in Europe and discuss European species. The families of the fish studied were used to determine a general impact on the local finfish families collected at the Converted MTSs.

Table 32.2-8 lists the adult finfish species collected at each Converted MTS. It must be noted that only six of the eight MTSs were sampled for adult finfish due to physical restraints of two of the sites. The two MTSs that were not sampled for adult finfish were East 91st Street and Hamilton Avenue. The flatfishes (flounders) and clupeids were totaled for each Converted MTS. Four of the six Converted MTSs that were trawled (South Bronx, Southwest Brooklyn, West 135th Street and West 59th Street) had substantially more flatfish than herrings. The finfish communities at the above-mentioned Converted MTSs indicate that there may possibly be a less drastic community shift at those Converted MTSs during platform modification than Converted MTSs with a high clupeid population. North Shore and Greenpoint had more herrings surrounding the Converted MTS, and may experience more finfish avoidance behavior that the other Converted MTSs. General avoidance behavior of the finfish that live near the Converted MTSs was observed during the summer months when the dissolved oxygen levels decreased in the water, resulting in the movement of fish away from the affected areas. A similar response would occur if marine construction released anoxic sediment that absorbed the oxygen from the water, causing a temporary drop in dissolved oxygen levels.

32.2.4 Ichthyoplankton

Ichthyoplankton are more sensitive to construction impacts than adult finfish. This is due to high mortality experienced in egg and larval stages. The lethal concentration of suspended sediment for finfish eggs and larvae is generally one milligram per liter of water.[10] For demersal fish eggs (those that lay on the substratum), the impacts are similar to those of the benthic invertebrates. These eggs could be smothered by sediment during construction. Pelagic eggs are free-floating and could be carried or swept through an impact zone, but given the current velocities in most of the Converted MTS areas, are unlikely to stay for any extended period. Table 32.2-9 indicates

[10] Bio/consultant as. Evaluation of the Effect of Sediment Spill from Offshore Wind Farm Construction on Marine Fish.

Table 32.2-8
Number of Adult Finfish Collected at Each Converted MTS
JANUARY – DECEMBER 2003

	Species	Total Number	EFH Listed
South Bronx	Bay Anchovy	25	
	Atlantic Butterfish	16	*
	Atlantic Croaker	9	
	Striped Bass	8	
	Summer Flounder	6	*
	Winter Flounder	5	*
	Atlantic Tomcod	4	
	Spotted Hake	4	
	Tautog	4	
	Grubby Sculpin	3	
	Atlantic Herring	2	*
	Bluefish	2	*
	Windowpane	2	*
	Atlantic Menhaden	1	
	Cunner	1	
	Hickory Shad	1	
	Northern Pipefish	1	
	Smallmouth Flounder	1	
	Total	**95**	**6**

Table 32.2-8 (continued)
Number of Adult Finfish Collected at Each Converted MTS
JANUARY – DECEMBER 2003

	Species	Total Number	EFH Listed
Southwest Brooklyn	Bay Anchovy	898	
	Weakfish	69	
	Scup	68	*
	Little Skate	39	
	Windowpane	38	*
	Summer Flounder	35	*
	Atlantic Croaker	24	
	Atlantic Herring	20	*
	Atlantic Silverside	18	
	Striped Bass	15	
	Striped Searobin	14	
	Winter Flounder	10	*
	Spotted Hake	9	
	Atlantic Butterfish	8	*
	Atlantic Menhaden	6	
	Atlantic Tomcod	4	
	Bluefish	4	*
	Smooth Dogfish	3	
	Black Sea Bass	2	*
	Northern Pipefish	2	
	Winter Skate	2	
	Alewife	1	
	Grubby Sculpin	1	
	Lined Sea Horse	1	
	Oyster Toadfish	1	
	Smallmouth Flounder	1	
	Total	**1,293**	**8**

Table 32.2-8 (continued)
Number of Adult Finfish Collected at Each Converted MTS
January – December 2003

	Species	Total Number	EFH Listed
Greenpoint	Striped Bass	35	
	Atlantic Menhaden	10	
	Atlantic Tomcod	10	
	Atlantic Silverside	8	
	Atlantic Herring	5	*
	Bluefish	5	*
	Naked Goby	5	
	Winter Flounder	5	*
	American Shad	4	
	Spotted Hake	3	
	White Perch	3	
	American Eel	1	
	Bay Anchovy	1	
	Striped Searobin	1	
	Summer Flounder	1	*
	Tautog	1	
	Total	**98**	**4**

	Species	Total Number	EFH Listed
West 135th Street	Atlantic Croaker	881	
	Striped Bass	23	
	Winter Flounder	17	*
	Hogchoker	5	
	White Perch	5	
	Atlantic Menhaden	3	
	Bluefish	3	*
	Atlantic Butterfish	2	*
	Hickory Shad	2	
	Windowpane	2	*
	American Eel	1	
	Atlantic Tomcod	1	
	Bay Anchovy	1	
	Gizzard Shad	1	
	Summer Flounder	1	*
	Total	**948**	**5**

Table 32.2-8 (continued)
Number of Adult Finfish Collected at Each Converted MTS
January – December 2003

	Species	Total Number	EFH Listed
West 59th Street	Striped Bass	356	
	Hogchoker	282	
	Atlantic Tomcod	174	
	Weakfish	119	
	Bay Anchovy	104	
	Spotted Hake	85	
	Atlantic Croaker	79	
	White Perch	67	
	Windowpane	30	*
	Atlantic Butterfish	19	*
	Winter Flounder	16	*
	Summer Flounder	13	*
	Grubby Sculpin	8	
	Hickory Shad	7	
	Atlantic Herring	5	*
	American Eel	4	
	Northern Pipefish	4	
	Striped Searobin	4	
	Atlantic Menhaden	3	
	Blueback Herring	3	
	Smallmouth Flounder	3	
	Atlantic Silverside	2	
	Bluefish	1	*
	Cunner	1	
	Gizzard Shad	1	
	Total	**1,390**	**6**

Table 32.2-8 (continued)
Number of Adult Finfish Collected at Each Converted MTS
January – December 2003

	Species	Total Number	EFH Listed
North Shore	Atlantic Silverside	44	
	Atlantic Herring	40	*
	Atlantic Menhaden	21	
	Striped Bass	15	
	Bay Anchovy	2	
	Winter Flounder	2	*
	Grubby Sculpin	1	
	Northern Pipefish	1	
	Total	**126**	**2**

Table 32.2-9
Life History Characteristics of Finfish Found in the Central Part of the Mid-Atlantic Bight

Scientific Name	Common Name	Spawning Time	Spawning Location	Egg Type	Habitat	
					Summer	Winter
Mustelus canis	Smooth Dogfish	March - May	Estuary / Mid-Atlantic Bight	Live	Estuary	Ocean
Anguilla rostrata	American Eel	March - May	Sargasso Sea	◆	Estuary	Estuary
Conger oceanicus	Conger Eel	June - February	Sargasso Sea	◆	Estuary	◆
Alosa aestivalis	Blueback Herring	March - May	Fresh Water	Pelagic	Estuary	Ocean
Alosa mediocris	Hickory Shad	March - May	Fresh Water	Demersal / Pelagic	◆	◆
Alosa pseudoharengus	Alewife	March - May	Fresh Water	Pelagic	Estuary	Ocean
Alosa sapidissima	American Shad	March - May	Fresh Water	Demersal / Pelagic	Fresh Water / Estuary	Ocean
Brevoortia tyrannus	Atlantic Menhaden	Sept.-Nov. & March - May	Mid and South Atlantic Bight	Pelagic	Estuary	Ocean
Clupea harengus	Atlantic Herring	March - May	Mid-Atlantic Bight	Demersal	◆	◆
Anchoa hepsetus	Striped Anchovy	June - August	Mid-Atlantic Bight	Pelagic	Estuary / Ocean	Estuary / Ocean
Anchoa mitchilli	Bay Anchovy	June - August	Estuary / Mid-Atlantic Bight	Pelagic	Estuary	Ocean
Osmerus mordax	Rainbow Smelt	March - May	Fresh Water	Demersal	Brackish	Estuary
Synodus foetens	Inshore Lizardfish	◆	South Atlantic Bight	◆	◆	Ocean
Microgadus tomcod	Atlantic Tomcod	December - February	Fresh Water	Demersal	Estuary / Fresh Water	Fresh Water
Pollachius virens	Pollock	September - February	Mid-Atlantic Bight	Pelagic	Estuary	Ocean
Urophycis chuss	Red Hake	June - August	Mid-Atlantic Bight	Pelagic	Ocean	Ocean
Urophycis regia	Spotted Hake	June - Nov. & March - May	Mid-Atlantic Bight	Pelagic	Ocean	Ocean
Urophycis tenuis	White Hake	March - May	Mid-Atlantic Bight	Pelagic	Ocean	Ocean

Table 32.2-9 (Continued)
Life History Characteristics of Finfish Found in the Central Part of the Mid-Atlantic Bight

Scientific Name	Common Name	Spawning Time	Spawning Location	Egg Type	Habitat	
					Summer	Winter
Ophidion marginatum	Striped Cusk-Eel	June - November	Mid-Atlantic Bight	Pelagic	Estuary / Ocean	Ocean
Opsanus tau	Oyster Toadfish	March - August	Estuary	Demersal	Estuary	Estuary
Strongylura marina	Atlantic Needlefish	March - May	Estuary	Demersal	Estuary	◆
Cyprinodon variegatus	Sheepshaed minnow	March - August	Estuary	Demersal	Marsh	Estuary
Fundulus heteroclitus	Mummichog	March - August	Estuary	Demersal	Marsh	Estuary
Fundulus luciae	Spotfin Killifish	March - August	Estuary	Demersal	Marsh	Estuary
Fundulus majalis	Striped Killifish	March - August	Estuary	Demersal	Creeks / Shores	Estuary
Lucania parva	Rainwater Killifish	March - August	Estuary	Demersal	Marsh	Estuary
Gambusia holbrooki	Eastern Mosquitofish	June - August	Fresh Water	Live	Fresh Water / Estuary	Fresh Water / Estuary
Menidia beryllina	Inland Silverside	March - August	Estuary	Demersal	Marsh	Estuary
Menidia menidia	Atlantic Silverside	March - August	Estuary	Demersal	Estuary	Ocean
Apeltes quadracus	Fourspine Stickleback	March - May	Estuary	Demersal	Eelgrass	Estuary
Gasterosteus aculeatus	Threespine Stickleback	March - May	Estuary	Demersal	Marsh	Ocean
Hippocampus erectus	Lined Seahorse	March - August	Estuary / Mid-Atlantic Bight	Live	Estuary	Ocean
Syngnathus fuscus	Northern Pipefish	June - August	Estuary	Live	Estuary	Ocean
Prionotus carolinus	Northern Searobin	June - November	Mid-Atlantic Bight (Estuary◆)	Pelagic	Estuary / Ocean	Ocean
Prionotus evolans	Striped Searobin	June - November	Mid-Atlantic Bight (Estuary◆)	Pelagic	Estuary / Ocean	Ocean
Myoxocephalus aenaeus	Grubby	December - February	Estuary / Mid-Atlantic Bight	Demersal	Estuary / Ocean◆	Estuary / Ocean◆

Table 32.2-9 (Continued)
Life History Characteristics of Finfish Found in the Central Part of the Mid-Atlantic Bight

Scientific Name	Common Name	Spawning Time	Spawning Location	Egg Type	Habitat	
					Summer	Winter
Morone americana	White Perch	March - May	Fresh Water	Demersal / Pelagic	Estuary / Fresh Water	Estuary
Morone saxatilus	Striped Bass	March - May	Fresh Water	Pelagic	Estuary / Fresh Water	Estuary
Centropristis striata	Black Sea Bass	March - November	Mid-Atlantic Bight	Pelagic	Estuary / Ocean	Ocean
Pomatomus saltatrix	Bluefish	March - August	Mid and South Atlantic Bight	Pelagic	Estuary	Ocean
Caranx hippos	Crevalle Jack	◆	South Atlantic Bight	Pelagic	Estuary	◆
Lutjanus griseus	Gray Snapper	June - August	South Atlantic Bight	Pelagic	◆	◆
Stenotomus chrysops	Scup	March - August	Estuaries, Bays, Cont Shelf	Pelagic	Estuary	Ocean
Bairdiella chrysoura	Silver Perch	June - August	◆	Pelagic	Estuary	◆
Cynoscion regalis	Weakfish	March - August	Estuary / Mid-Atlantic Bight	Pelagic	Estuary	Ocean
Leiostomus xanthurus	Spot	December - February	Southern Mid-Atlantic Bight	Pelagic	Estuary	Ocean
Menticirrhus saxatilis	Northern Kingfish	June - August	Mid-Atlantic Bight	Pelagic	Ocean / Estuary	Ocean
Micropogonias undulatus	Atlantic Croaker	June - November	Southern Mid-Atlantic Bight	Pelagic	Estuary	Estuary
Pogonias cromis	Black Drum	June - August	Mid-Atlantic Night	Pelagic	Estuary	Ocean
Chaetodon ocellatus	Spotfin Butterflyfish	◆	South Atlantic Bight	Pelagic	Estuary	◆
Mugil cephalus	Striped Mullet	December - February	South Atlantic Bight	Pelagic	Estuary / Fresh Water	Ocean
Mugil curema	White Mullet	March - May	South Atlantic Bight	Pelagic	Estuary	Ocean
Sphyraena borealis	Northern Sennet	March - May	South Atlantic Bight	Pelagic	Estuary	◆

Table 32.2-9 (Continued)
Life History Characteristics of Finfish Found in the Central Part of the Mid-Atlantic Bight

Scientific Name	Common Name	Spawning Time	Spawning Location	Egg Type	Habitat	
					Summer	Winter
Tautoga onitis	Tautog	March - November	Estuary / Mid-Atlantic Bight	Pelagic	Estuary	Estuary
Tautogolabrus adspersus	Cunner	March - November	Mid-Atlantic Bight	Pelagic	Estuary	Estuary /Ocean
Pholis gunnellus	Rock Gunnel	December - February	Estuary / Mid-Atlantic Bight	Demersal	Estuary	Ocean
Astroscopus guttatus	Northern Stargazer	June - August	Estuary / Mid-Atlantic Bight	◆	Estuary / Ocean	◆
Hypsoblennius hentz	Feather Blenny	June - August	Estuary	Demersal	Estuary	Estuary
Ammodytes americanus	American Sand Lance	December - February	◆	Demersal	Estuary	Estuary
Gobionellus boleosoma	Darter Goby	June - August	Estuary	Demersal	Estuary	Estuary
Gobiosoma bosc	Naked Goby	March - August	Estuary	Demersal	Estuary	Estuary
Gobiosoma ginsburgi	Seaboard Goby	June - August	Estuary	Demersal	Estuary / Ocean	◆
Peprilus triacanthus	Butterfish	June - August	Estuary / Mid-Atlantic Bight	Pelagic	Estuary / Ocean	Ocean
Scophthalmus aquosus	Windowpane	March - May & Sept. - November	Estuary / Mid-Atlantic Bight	Pelagic	Estuary / Ocean	Ocean
Eutropus microstomus	Smallmouth Flounder	March - November	Mid-Atlantic Bight	Pelagic	Estuary / Ocean	Ocean
Paralichthys dentatus	Summer Flounder	September - February	Mid-Atlantic Bight	Pelagic	Estuary	Estuary
Pseudopleuronectes americanus	Winter Flounder	December - February	Estuary / Mid-Atlantic Bight	Demersal	Estuary	Estuary /Ocean◆
Trinectes maculatus	Hogchoker	March - November	Estuary	Pelagic	Estuary	Estuary
Sphoeroides maculatus	Northern Puffer	March - August	Estuary	Demersal	Estuary	Ocean

Source : Able, K.W. & Fahay, M.P., 1998 The First Year in the Life of Estuarine Fishes in the Middle Atlantic Bight. Rutgers University Press. New Brunswick, NJ.
◆ = Unknown.

the time of year and egg type of the more abundant species located in the central part of the Mid-Atlantic Bight.[11] This table may be used as an indicator of those species more at risk to impacts from construction.

Larval forms that have motility (i.e., can swim) will behave like the adult finfish and avoid areas where the environmental conditions are unfavorable. As with the eggs, any that are swept through the construction sites by currents would not be exposed to suspended sediments for extended periods of time due to current velocities in the areas.

Currents may play an important factor in reducing impacts to non-motile finfish eggs and larvae. Most of the Converted MTSs have slated construction that would cause siltation; however, any egg or larvae swept into the construction zone should be swept out of the zone fairly quickly due to strong currents experienced at Converted MTS sites. The two Converted MTSs that are on restricted water bodies with less strong current regimes, Greenpoint and Hamilton Avenue, are places where eggs and larvae may have a greater residence time and exposure to suspended sediment. However, these Converted MTSs have a lesser degree of over-water construction planned than most other Converted MTSs and had among the lowest concentrations of finfish eggs and larvae, so impacts should be minimal.

The finfish eggs and larvae collected at each Converted MTS are presented in Tables 32.2-10 and 32.2-11. Winter flounder is the only species collected at the Converted MTSs that lays demersal eggs. Because of its recreational importance and declining numbers, winter flounder is of concern to fisheries biologists and regulatory scientists. Winter flounder eggs were collected at three of the Converted MTSs – South Bronx, East 91st Street and West 59th Street. Winter flounder larvae were collected at all eight Converted MTSs. Construction impacts are expected to be negligible to winter flounder or other ichthyoplankton species.

[11] Able, K.W. and Fahay, M.P., 1998. The First Year in the Life of Estuarine Fishes in the Middle Atlantic Bight. Rutgers University Press. New Brunswick, NJ.

Table 32.2-10
Finfish Eggs Collected at Each Converted MTS
January – September 2003

South Bronx	EFH Listed	Southwest Brooklyn	EFH Listed	Greenpoint	EFH Listed	Hamilton Avenue	EFH Listed
Atlantic Menhaden		Atlantic Menhaden		Bay Anchovy		Cunner	
Cunner		Bay Anchovy		Cunner		Bay Anchovy	
Fourbeard Rockling		Cunner		Labridae		Tautog	
Labridae		Tautog		Tautog		Atlantic Menhaden	
Tautog		Searobin spp.		Atlantic Menhaden		Windowpane	*
Searobin spp.		Windowpane	*	Fourbeard Rockling		Labridae	
Bay Anchovy		Labridae				Searobin spp.	
Winter Flounder	*	Smallmouth Flounder				Fourbeard Rockling	
Windowpane	*	Fourbeard Rockling				Smallmouth Flounder	
Hogchoker							

West 135th Street	EFH Listed	West 59th Street	EFH Listed	East 91st Street	EFH Listed	North Shore	EFH Listed
Bay Anchovy		Bay Anchovy		Cunner		Cunner	
Labridae		Atlantic Menhaden		Bay Anchovy		Atlantic Menhaden	
Atlantic Menhaden		Labridae		Atlantic Menhaden		Labridae	
Cunner		Cunner		Labridae		Tautog	
Tautog		Fourbeard Rockling		Tautog		Fourbeard Rockling	
Anchovy spp.		Tautog		Fourbeard Rockling		Bay Anchovy	
Searobin spp.		Hogchoker		Hogchoker		Windowpane	*
Northern Pipefish		Winter Flounder	*	Searobin ssp.		Searobin spp.	
		Windowpane	*	Windowpane	*	Smallmouth Flounder	
				Winter Flounder	*		

Table 32.2-11
FINFISH LARVAE COLLECTED AT EACH CONVERTED MTS
January – September 2003

South Bronx	EFH Listed	Southwest Brooklyn	EFH Listed	Greenpoint	EFH Listed	Hamilton Avenue	EFH Listed
Atlantic Menhaden		Winter Flounder	*	Anchovy spp.		Winter Flounder	*
Winter Flounder	*	Anchovy spp.		Goby spp.		Anchovy spp.	
Goby spp.		Goby spp.		Atlantic Menhaden		Atlantic Mehnaden	
Anchovy spp.		Atlantic Menhaden		Winter Flounder	*	Goby spp.	
Sculpin spp.		Windowpane	*	Herring spp.		Sculpin spp.	
Herring spp.		Herring spp.		Sculpin spp.		Tautog	
Rock Gunnel		Sculpin spp.		Labridae		Windowpane	*
Tautog		Northern Pipefish		Fourbeard Rockling		Weakfish	
Northern Pipefish		Weakfish		Rock Gunnel		Herring spp.	
Weakfish		American Sand Lance		American Sand Lance		Rock Gunnel	
Atlantic Silverside		Tautog		American Eel		Northern Pipefish	
Windowpane	*	Threespine Stickleback		Banded Killifish		Alewife	
Cunner		Fourbeard Rockling		Windowpane	*	American Sand Lance	
		Smallmouth Flounder				Atlantic Herring	*
		Labridae				Labridae	
		Searobin spp.				Fourbeard Rockling	
		Rock Gunnel				Feather Blenny	
		Scup	*			Striped Bass	
		Cunner				Cunner	
		Fourspot Flounder					
		Atlantic Butterfish	*				
		Striped Searobin					

Table 32.2-11 (Continued)
FINFISH LARVAE COLLECTED AT EACH CONVERTED MTS
January – September 2003

West 135th Street	EFH Listed	West 59th Street	EFH Listed	East 91st Street	EFH Listed	North Shore	EFH Listed
Winter Flounder	*	Anchovy spp.		Winter Flounder	*	Herring spp.	
Anchovy spp.		Winter Flounder	*	Anchovy spp.		Atlantic Menhaden	
Goby spp.		Goby spp.		Goby spp.		Anchovy spp.	
Atlantic Menhaden		Atlantic Menhaden		Atlantic Menhaden		Winter Flounder	*
Weakfish		Weakfish		Herring spp.		Goby spp.	
Sculpin spp.		Atlantic Herring	*	Sculpin spp.		Atlantic Menhaden	
American Sand Lance		Threespine Stickleback		Fourbeard Rockling		Sculpin spp.	
Herring spp.		Windowpane	*	Northern Pipefish		Tautog	
Atlantic Tomcod		Herring spp.		Weakfish		Cunner	
Hogchoker		Sculpin spp.		Windowpane	*	Northern Pipefish	
Atlantic Silverside		Tautog		Rock Gunnel		Rock Gunnel	
Rock Gunnel		Rock Gunnel		Tautog			
Windowpane	*	American Sand Lance		Threespine Stickleback			
		American Eel		Summer Flounder	*		
		Labridae					
		Northern Pipefish					
		Hogchoker					

32.3 Operational Impacts

While the construction impacts are limited to the duration of the activities, the operational impacts will persist for the duration of the facilities' life span, a time span measured in decades. For the purpose of this DEIS section, the major operational impact will be the footprint of the structures over water. While the littoral zone covered by the structures will not be devoid of invertebrate and finfish resources, the coverage will block sunlight and hinder primary production. Each of the Converted MTSs has differing amounts of existing and proposed coverage; the differences are listed in Table 32.3-1.

Table 32.3-1
Existing and Proposed
Platform Coverage at Each Converted MTS

Converted MTS	Existing Square Feet	Proposed Square Feet	Difference
South Bronx	42,610	67,647	25,037
Southwest Brooklyn	23,855	23,855	0
Greenpoint	34,695	13,048	(21,647)
Hamilton Avenue	34,905	0	(34,905)
West 135th Street	52,905	88,994	36,089
West 59th Street	65,275	90,906	25,631
East 91st Street	34,717	78,374	43,657
North Shore	40,747	87,149	46,402
Total	329,709	449,973	120,264

Inspection of the above table reveals that the Greenpoint, Hamilton Avenue and Southwest Brooklyn Converted MTSs can be eliminated from the long-term impact discussion since they are either remaining in place or are being replaced with facilities that have substantially smaller footprints.

It is safe to say that the impacts of large platforms on the harbor estuary ecology are controversial. Studies conducted by EEA in the late 1980s showed similar finfish and benthic communities in the interpier and underpier environments in two large-scale programs on the

Hudson and East Rivers, respectively.[11,12,13] Other studies, primarily by Able *et., al*., have shown that caged winter flounder failed to thrive underneath large platforms.[14,15] Able's studies are controversial, however, because the fish were caged, and this may impact the results of the study. Some fish are even known to associate with submerged structures, as it provides shelter and surfaces for food to grow. While the field tests appear to be contradictory for finfish, there is no doubt that fish do indeed inhabit at least the interface of platforms, and the benthic invertebrate communities are virtually identical in the underpier and interpier zones.

From a regulatory perspective, there is acceptance that platforms do not necessarily cause the underpier zones to be devoid of life, but they are still considered to be a taking of marine environmental resources and the procedural, if not environmental, equivalent of fill.

32.3.1 Benthic Communities

The studies done by EEA and published in the late 1980s and early 1990s were conclusive regarding the benthic organism communities under large platforms in the Hudson and East Rivers. A comparison involving hundreds of grab samples from the inter and underpier zones indicated there was no statistically significant difference in species composition and abundance.[16,17,18] Based largely upon these published studies, it appears unlikely that the reconstruction, or even enlargement, of the present platforms will materially alter the benthic

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[11] New York City Public Development Corporation, 1991. East River Landing Aquatic Environmental Study. Final Report. Prepared by EEA, Inc.

[12] New York City Public Development Corporation, 1988. Hudson River Center Aquatic Environmental Study. Draft Interim Report. Prepared by EEA, Inc.

[13] Stoecker, Roy R., J. Collura and P.J. Fallon., 1992. Aquatic Studies at the Hudson River Center Site, pp. 407-427 In: Estuarine Research in the 1980s. The Hudson River Environmental Society Seventh Symposium on Hudson River Ecology (C. Lavett Smith ed.). State University of New York Press. Albany.

[14] Able, K.W., Manderson, J.P., and Studholme, A.L., 1998. The Distribution of Shallow Water Juvenile Fishes in an Urban Estuary: The Effects of Manmade Structures in the Lower Hudson River. Estuaries. Vol. 21, No. 4B, pp. 731-744.

[15] Duffy-Anderson, J.T. and Able, K.W., 1999. Effects of Municipal Piers on the Growth of Juvenile Fishes in the Hudson River Estuary: A Study Across a Pier Edge. Marine Biology. 133: 409-418.

[16] New York City Public Development Corporation, 1991. East River Landing Aquatic Environmental Study. Final Report. Prepared by EEA, Inc.

[17] New York City Public Development Corporation, 1988. Hudson River Center Aquatic Environmental Study. Draft Interim Report. Prepared by EEA, Inc.

[18] Stoecker, Roy R., J. Collura and P.J. Fallon., 1992. Aquatic Studies at the Hudson River Center Site pp. 407-427 In: Estuarine Research in the 1980s. The Hudson River Environmental Society Seventh Symposium on Hudson River Ecology (C. Lavett Smith ed.). State University of New York Press. Albany.

meiofauna communities over the long term. Benthic communities that may have experienced toxicity due to leachate from treated lumber used to build the piers would quickly be rebuilt as the leaching decreases and the pollution tolerant organisms, that had dominated the benthic communities before construction started, would come back. Those communities displaced by construction would begin reclaiming the sediment soon after construction was completed.[19,20] The opportunistic species would appear first, followed by longer-lived species.[21,22]

32.3.2 Epibenthic Communities

The long-term impact to epibenthic communities will be beneficial. The planned enlargement of the platforms will provide significantly more hard surface for macrofauna and the finfish that use them as a food source. The five Converted MTSs that will have increased platforms, and therefore increased areas for epibenthic growth once the treated lumber has lost its toxicity, are West 135th Street, West 59th Street, East 91st Street, South Bronx and North Shore. The increase in epibenthic colonizers should lead to an increase in finfish species that feed on these organisms (e.g., cunner and tautog).

32.3.3 Adult Finfish

The EEA studies on the East River showed altered finfish communities in the under- and interpier zones. Abundances of fish under South Street Seaport Pier 17, which was used as a model, did show moderately lower numbers under piers and different types of finfish in the two zones.[23] It is possible, even likely, that construction of larger platforms at East 91st Street and South Bronx, located on the East River, and possibly North Shore, located in Flushing Bay off

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[19] U.S. Department of the Interior. Minerals Management Service, 2000. Environmental Survey of Potential Sand Resource Sites: Offshore New Jersey. Prepared by Applied Coastal Research and Engineering, Inc., Continental Shelf Associates, Inc., Barry A. Vittor & Associates, Inc., and Aubrey Consulting, Inc.

[20] U.S. Army Corps of Engineers, 1999. The New York District's Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project. Draft. Phase II-III. During Construction and 1st Year Post-Construction Studies.

[21] U.S. Department of the Interior. Minerals Management Service, 2000. Environmental Survey of Potential Sand Resource Sites: Offshore New Jersey. Prepared by Applied Coastal Research and Engineering, Inc., Continental Shelf Associates, Inc., Barry A. Vittor & Associates, Inc., and Aubrey Consulting, Inc.

[22] U.S. Army Corps of Engineers, 1999. The New York District's Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project. Draft. Phase II-III. During Construction and 1st Year Post-Construction Studies.

[23] New York City Public Development Corporation, 1991. East River Landing Aquatic Environmental Study. Final Report. Prepared by EEA, Inc.

the East River, will cause population declines and shifts in finfish species composition underneath these platforms. Interpier-underpier studies on the Hudson River also showed slightly different finfish densities for several species beneath piers as opposed to in open water.[24,25] Using this study as a model, there is a possibility of a shift in the finfish communities at the West 59th and West 135th Street Converted MTSs with the expansion of piers. Conversely, Converted MTSs that have a reduction in pier coverage, Greenpoint and Hamilton Avenue, may also see a small shift in local finfish communities. Because finfish for the most part are transient, these shifts cannot be quantified absent a future monitoring program. Regardless, a conservative approach would be to allow for some reduction, measurable or not, in local fish stocks due to construction of the enlarged platforms.

The present plan is to construct 120,264 square feet (approximately 2.8 acres) of new platforms in the harbor estuary should full build-out be accomplished. Based upon existing data and previous studies, the Converted MTSs which will experience a net gain in pier coverage will be the most likely finfish impact receptors.

32.3.4 Ichthyoplankton

Aside from the possible population shifts at the Converted MTSs with increased pier structures, there is little likelihood that the enlarged Converted MTSs would have any significant or even measurable impacts on ichthyoplankton communities.

[24] New York City Public Development Corporation, 1988. Hudson River Center Aquatic Environmental Study. Draft Interim Report. Prepared by EEA, Inc.
[25] Stoecker, Roy R., J. Collura and P.J. Fallon., 1992. Aquatic Studies at the Hudson River Center Site pp. 407-427 In: Estuarine Research in the 1980s. The Hudson River Environmental Society Seventh Symposium on Hudson River Ecology (C. Lavett Smith ed.). State University of New York Press. Albany.

32.4 Overview of Marine Environmental Impacts

Construction, or short-term impacts resulting from the project, will be limited both spatially and temporally. The greatest impacts will be temporary destruction of benthic and epibenthic communities and avoidance by finfish due to suspended particles and food source reduction. While they may not be amenable to avoidance or reduction, these impacts will be limited and will not last beyond one seasonal cycle for invertebrates. Construction impacts on finfish will not be quantifiable.

Full build-out of the project will result in an additional 2.8 acres of new platform in the harbor marine environment. From a regulatory perspective, this impact may be significant due to the timeframe of the project – decades. If the judgment of the agencies is a finding of significant negative impact, then mitigation programs may need to be devised, assuming that no landside alternative is possible.