Reasons for the New Jersey Department of Environmental Protection (NJDEP) to Deny Permits for the Northeast Supply Enhancement (NESE) Project

APPLICATIONS FOR NESE DO NOT ADHERE TO REGULATIONS' REQUIREMENTS TO PROTECT THREATENED & ENDANGERED SPECIES AND THE BAYSHORE ECONOMY

According to the **Coastal Zone Management Rules** in N.J.A.C. 7:7-9.39(b), "Development of endangered or threatened wildlife or plant species habitat is prohibited unless it can be demonstrated, through an endangered or threatened wildlife or plant species impact assessment as described at N.J.A.C. 7:7-11, that endangered or threatened wildlife or plant species habitat would not directly or through secondary impacts on the relevant site or in the surrounding area be adversely affected."

Construction of the Raritan Bay Loop, with its newly proposed shorter schedule, threatens the health of marine life, habitats, benthic and shellfish communities, and the economy of the region due to suspension and spreading of toxins from beneath the seafloor, noise from construction, and limited access to construction space in the Bay for commercial and recreational activities.

Marine life that lives and feeds on the seafloor - clams, oysters and other mollusks, crabs and horseshoe crabs - are particularly vulnerable to the disruptions that the construction of the Williams/Transco NESE pipeline would entail. These species have both ecological and commercial value.

FERC estimates it would take these bottom-dwelling species, like clams and crustaceans, 1 to 3 years to recover after construction of the Raritan Bay Loop, but it could be longer factoring in weather, currents and the overall disruption caused by trenching the pipeline.

Currently, NOAA's National Marine Fisheries Service (NMFS) determined that the NESE Pipeline may affect, and is likely to adversely affect the right whale, fin whale, and Atlantic sturgeon. Therefore, formal consultation pursuant to the Endangered Species Act has been requested. Until consultation is finalized, the impacts to these species are unknown. [NOAA National Marine Fisheries Service. Revised Determination of Effect and Request for Consultation. Feb. 7, 2019.]

In their 9/9/19 response to concern #46 that was submitted to NJDEP, Williams/Transco noted that consultation for offshore species is ongoing. Without any evidence, they asserted that the habitat will see long-term benefit from replacement of contaminated sediment with clean fill and that threatened & endangered species would not have their population negatively impacted. NOTE: The contaminated sediment referenced will be unearthed from beneath the seafloor and resuspended into a wider area.

1. Impact from Shortened Construction Schedule

Williams/Transco has shortened their proposed construction schedule for the Raritan Bay Loop by several months, but they still needed permission to conduct construction activities during times that have been designated as prohibited for construction to protect the migration, breeding and spawning periods of threatened and endangered marine life such as Atlantic flounder.

This shortened construction timeframe raises concerns about more concentrated noise that affects marine life, and Williams/Transco's latest request for Incidental Harassment Authorization (May 2019) of marine life now includes anticipated permanent harm to the hearing of 7 gray seals and 16 harbor seals (Level A Harassment). This is in addition to the Level B Harassment requests that include disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering for 826 gray seals, 1,780 harbor seals, 4 harp seals, 5 fin whales (**endangered**), 30 humpback whales **(endangered),** 1 minke whale, 2 North Atlantic right whales (**endangered**), 6,331 bottlenose dolphins, and 95 common dolphins, and 11 harbor porpoises (**species of concern**) from the noise of construction.

A shortened timeline increases the intensity of work, so the overall impacts will be magnified.

More construction vessels in different parts of the Raritan Bay Loop construction at the same time means more intense construction noise and vessel traffic, all of which threaten aquatic life.

- Williams/Transco has said it will compress its construction time frame by using even more vessels. Williams/Transco always had planned to use many types of vessels to do this work: barges fitted with a number of different mechanisms such as clamshell dredges, pipelay equipment, and cranes; supply vessels and barges; and a variety of support vessels such as tugs, personnel transport, and security boats. To allow for the compression of the construction schedule into seven months, Williams now plans to hire many more of them. For example, three clamshell dredging barges will now work in different portions of the proposed pipeline path simultaneously.
- More vessels mean more noise, and noise damages marine life. Thirty-two species of fish inhabit Raritan Bay and New York's Lower Harbor. Fish are very sensitive to noise and to the vibrations caused by vessel engines. Such disturbances interfere with the ability of fish to feed, spawn, and migrate. Marine mammals and sea turtles are similarly affected.
- More vessels also mean more traffic, and vessel traffic threatens marine mammals. Whales, seals, and dolphins have returned to these waters in significant numbers in recent years. For example, 212 distinct individual whales were spotted swimming and feeding in these waters in 2018. Indeed, on May 27, 2019, a group of New Jersey boaters caught two humpback whales on video in Raritan Bay. All marine mammals are protected from harm by the Federal Marine Mammal Protection Act.
- Williams/Transco has proposed protecting marine mammals by training vessel operators and crews to recognize them in the water and then take avoidance measures like slowing a vessel down or maneuvering it away. But this won't work at night or in bad weather. Moreover, whales in particular swim for long distances underwater, and the kinds of vessels used to construct a pipeline are not agile or easy to maneuver.
- In addition to fish and marine mammals, the increased density of vessels threatens sea turtles. Four species of sea turtle are found in the region where the pipeline would be built: Loggerhead, Green, Leatherback, and Kemp's ridley sea turtle. In July 2018, a Kemp's ridley sea turtle - the world's most endangered species of sea turtle- laid her eggs on a beach on the western end of the Rockaway Peninsula, which is within close proximity to this pipeline's path.
- All of these species are listed as endangered or threatened. The intense, low frequency noise generated by vessel motors threaten sea turtles, as does the risk of vessel strikes. Turtles enter and circulate through the waters through which the proposed NESE pipeline would pass between early May and mid-November, the period in which most of the construction would occur.

Whales: Williams/Transco's construction schedule calls for trench work below the seafloor in the fall and early winter months, a period when whales are particularly active in the area. Additionally, the survival of these whales in our waters depends on menhaden, a filter feeder, which will not be able to filter the plankton they feed on because they will be covered with sediment during and after construction.

Sea Turtles: Sea turtles depend on vision to locate prey, and construction's increase in turbidity and suspended sediments could impede their search for food. Additionally, mortality to benthic prey may force them away from their preferred foraging areas, and observers might not see them in waters with increased turbidity. Thus, risks to them from vessel strikes and other impacts would be increased by the NESE Project, and the plan for using observers is not adequate to avoid this.

2. Impacts from Unearthing and Spreading Toxics that are currently beneath the surface of Raritan Bay's seabed

- Construction of NESE's Raritan Bay Loop will impact the endangered Atlantic sturgeon's migratory pathway, and harm to Atlantic sturgeon, which is a benthic feeder, includes exposure to re-suspended contaminants, bioaccumulation of toxins from contamination of benthic invertebrates, seafloor and benthic habitat disturbances, noise, and vessel strikes.
- Disturbing, spreading and re-suspending toxins like arsenic, lead, dioxin, PCBs, and other elements with dredging and other construction of the Raritan Bay Loop would, in effect, place these toxins back on the seabed surface. There, bottom-dwelling creatures would again be poisoned, and the endangered Atlantic sturgeon, which feeds on bottom-dwelling species (benthic invertebrates such as crustaceans, worms, and mollusks, marine worms, and bivalve shellfish), would also be adversely affected.
- The construction of the Raritan Bay Loop would threaten to harm marine mammals' communication, navigation, travel, feeding and breeding with noise from construction as well as increased turbidity in the water, and it would kill (smother and poison) benthic communities from dredging and backfilling activities.
- **Benthic communities** will be killed by dredging, anchoring & redistribution of dredged seafloor sediment. Williams/Transco has proposed to pay 25 cents per clam to New York for destroying these populations, at a total of 3.4 million dollars, to be used for an oyster project at the other end of Long Island rather than something that would improve the water quality in Raritan Bay & Lower New York Harbor.
- **Atlantic sturgeon (endangered):** Raritan Bay is a major habitat for Atlantic sturgeon. Atlantic sturgeon feed on bottom-dwelling invertebrates. Williams/Transco acknowledges that those species -- clams, crustaceans, etc. -- would be the most directly and adversely impacted by construction. Williams/Transco estimates that it would take 1-3 years for these species to recuperate. The impacts of the 3-12 hours per day of construction activity on the sturgeon's habitat will not only expose them to plumes of toxic sediments (given that sturgeon consume large amounts of mud and sand as they feed) but also reduce and poison their prey. Additionally, it is possible that the Atlantic sturgeon could be attracted to the construction area when their prey is stirred-up. Williams/Transco does not adequately address the long-term implications of any of this, especially considering that sturgeon are slow to mature and reproduce - males take at least 12 years to mature and females reach maturity at 18 years.
- **Horseshoe crabs (threatened):** The construction schedule of Williams/Transco includes May to September, disrupting the horseshoe crab in the crucial months when they come ashore to lay eggs on beaches and then when larvae are hatching. **Impact has not been identified, and avoidance / mitigation plans haven't been published even though comments of NJ's Endangered and Nongame Species Program experts (ENSP) noted a preference for no near-shore activity between April 15 and September 15.**
  - Horseshoe crabs are recognized as a "keystone" species because its eggs and larvae are an essential food source for other marine wildlife as well as for migrating birds, including the federally listed threatened and state-listed **endangered red knot**. It is acknowledged that the State has said that the red knot would not be affected by NESE.
  - During May and June, horseshoe crabs come ashore to lay eggs on beaches. Since horseshoe crabs do not stray far from their place of birth, disruption to their onshore migration could lead to long-term diminution of this critical ecological agent. At this point, Williams/Transco is choosing to forego avoidance measures during a critical time of year for this species and also not proposing any mitigation measures. It seems that there is no adherence at all to the "avoid, minimize, mitigate" practice relative to the horseshoe crab whatsoever. The encroachment of the TOYR on the horseshoe crab mating and nesting period makes it more likely that there will be an adverse impact on an endangered species' population.

- Threats to the dwindling horseshoe crab population's reproduction and survival are posed from such spreading of contaminants. Horseshoe crab eggs provide a food source to migratory birds including the threatened red knot.
- The horseshoe crab population has substantially declined in recent decades. The FEIS states that "The most recent stock assessment report for horseshoe crab concluded that, since the ASMFC's initial horseshoe crab stock assessment in 1998, declining abundance in the New York region is evident, and the trend has not reversed (ASMFC, 2013a) … In the 9 years of monitoring conducted by BRWC, there has been no sign of sustained recovery, and the population remains at about 25 percent of its carrying capacity (Reynolds, 2017)." {BRWC = Bayshore Regional Watershed Council}
- This is likely due to diminished water quality, lack of spawning habitat, and constant disturbance; and any action construction by Williams/Transco - especially during spawning season - will further disrupt important ecological processes relating to the horseshoe crab (*Limulus polyphemus*) and eliminate any possibility of potential recovery, particularly in New Jersey where there are spawning populations. Several studies (including those done by the National Park Service) document small but viable breeding populations in portions of New York and along the southern coast of Raritan Bay in New Jersey; all of these areas would be impacted by the NESE project. Due to the nature of the size of the *Limulus* populations that occupy Raritan Bay and nest on the surrounding shorelines, any impact to the benthic environment would have significant and potentially irreversible impacts on habitat, food resources, and recruitment.

- **Oysters:** As a species that filters seawater, the oyster is essential to the health of the waters in the New York Bight (which includes Raritan Bay). Oyster reefs can also reduce the impact of storms like Superstorm Sandy.
  - Efforts to establish 100 acres of oyster reefs are underway through the Billion Oyster Project, begun in 2014. The Billion Oyster Project has reinstituted oysters and reefs along the waters of Staten Island in the area of the proposed pipeline.
  - Oysters are a filter feeder of plankton, and they will be affected by the construction of NESE's pipeline in the New York Bight. The debris from digging will smother oysters.

Dredging up toxics has not been avoided by construction of the Raritan Bay Loop, and this will likely cause long-term harm that was not accounted for in the applications.

For decades, industrial pollution nearly choked the life out of Raritan Bay and the New York Harbor, but because of strong environmental protections, all that is changing. Once a dumping ground for 275 million gallons of industrial waste per day, these areas have made a miraculous recovery over the last 50 years. Whale and dolphin sightings have skyrocketed - 272 whales were spotted in New York Harbor last year - and water quality has improved tremendously, largely because of the presence of shellfish.

Dredging and vessel traffic to construct the NESE pipeline in waters off our shore will have major impacts to habitats due to the disturbance of shellfish beds and other benthic resources as well as unearthing, suspending and redistributing toxins currently buried beneath the seabed.

As stated in NESE's 1/25/19 FEIS by FERC (page ES-11), "Sediments within Raritan and Lower New York Bays contain contaminants from historical and ongoing anthropogenic sources. Seafloor-disturbing construction could resuspend sediment-bound contaminants into the water column, which could expose biota to contaminants and result in adverse effects. Transco's sediment chemical analysis found that most of the sample sites had at least one contaminant that exceeded upper-level effects thresholds. Concentrations of organic contaminants were greater than upper-level effects thresholds at approximately 33 percent of the sample sites. Approximately 83 percent of the sample sites had at least one exceedance of an inorganic (metal) threshold."

Seabed disturbance from construction of this project would have direct impacts that include mortality, injury, or temporary displacement of the organisms living on, in, or near the 87.8 acres of seafloor directly affected by the Project and indirect impacts that include redistribution of sediments that fall out of suspension, which would bury benthic and demersal (bottom dwelling) species, resulting in mortality of eggs and other life stages.

Williams/Transco assumes that 947.4 acres of the seabed will be smothered with unearthed and redistributed toxic sediments at a depth of at least 0.12 inches.

The **sediment modeling** does not address the effects of the different toxins in the contaminated sediments to any of the marine species (benthic or pelagic, migratory or otherwise) that may be exposed to those chemicals (including sediment used in backfill), and there is minimal evaluation of the effects otherwise. Such an oversight underscores Williams/Transco's intentional focus on sediment transport and misdirection away from what is actually in the sediment.

There was no analysis provided to document anticipated **synergistic effects of exposure to a combination of toxins** to any marine species (benthic or pelagic, migratory or otherwise).

Furthermore, part of the Raritan Bay Loop would go through the **Raritan Bay Slag Superfund Site**. Lead, arsenic, antimony, copper, iron and chromium, are the primary contaminants contained in slag. Other metal contaminants include manganese, vanadium and zinc. Areas 7 & 11 of the Raritan Bay Slag Superfund Site are part of the NESE construction workspace, and toxic levels of lead, arsenic and other heavy metals have been found by the EPA and NJDEP in soils, sediments and surface waters here. The complex currents, eroded slag particles, and dissolved metals from the jetty have not been adequately accounted for in avoidance plans by Williams/Transco. **EPA recommended continued consultation about construction here.**

The **impact on human health** of these substances is well known. Arsenic, for example, causes a variety of cancers in humans. Lead causes neurologic impairment, especially in children. PCBs enter the food chain. More than 90% of human exposure to PCBs is through food, including fish and shellfish.

While the environmental impacts related to pipelines begin at the construction phase (i.e., removal of seafloor, increases in turbidity and sedimentation), they can persist for years after its completion with detrimental consequences on the stability of aquatic habitats. (Henley et al., 2000; Doyle and Smart, 2001; Kjelland et al., 2015)

Sources:

Henley, W.F., Patterson, M.A., Neves, R.J. and Lemly, A.D. (2000). Effects of sedimentation and turbidity on lotic food webs: a concise review for natural resource managers. Reviews in Fisheries Science, 8(2), pp.125-139.

Doyle, R.D. and Smart, R.M. (2001). Impacts of water column turbidity on the survival and growth of Vallisneria americana winterbuds and seedlings. Lake and Reservoir Management, 17(1), pp.17-28.

Kjelland, M.E., Woodley, C.M., Swannack, T.M. and Smith, D.L. (2015). A review of the potential effects of suspended sediment on fishes: potential dredging-related physiological, behavioral, and transgenerational implications. Environment Systems and Decisions, 35(3), pp.334-350.

As stated in NESE's 1/25/19 FEIS (page ES-11), "Direct impacts on offshore resources due to seafloor disturbance would include mortality, injury, or temporary displacement of the organisms living on, in, or near the 87.8 acres of seafloor directly affected by the Project. Indirect impacts would include suspension of sediments in the water column, which could clog fish gills and obscure visual stimuli, and the redistribution of sediments that fall out of suspension, which could bury benthic and demersal species, resulting in mortality of eggs and other life stages. Benthic invertebrates and demersal (bottom-dwelling) fish species in or near areas directly impacted by construction would be most affected. Pelagic fish, sea turtles, and marine mammals could also be affected but would likely temporarily vacate the area to avoid the disturbance." These particular impacts would severely affect not only fish that are present but also impact recruitment and future fisheries either directly (by destroying eggs and spawning habitat) or indirectly (by completely deterring fish from inhabiting and spawning in the area).

Although shellfish (clams and oysters) are capable of filtering sediments and commonly occur in naturally turbid habitats, high sediment loads can negatively affect natural populations and different life-stages (Wilber & Clarke, 2010).

- For example, larval oysters require a clean hard bottom for attachment; therefore, sediment deposited on oyster reefs in layers as little as 1 or 2 mm thick may inhibit its settlement.
- Juvenile and adult oysters and clams experience physiological impacts such as reductions in respiration and feeding rates when growing in areas of high sediment loads.
- Heavy sedimentation on oyster reefs can cause mortality of oysters as well as the loss of the foraging and shelter functions of this habitat for associated fish and crustacean species.

- Suspended sediments can cause both short- and long-term responses/impacts on aquatic biota including social disruption, changes in migratory patterns, displacement of fish, intraspecific aggression, reproductive pairing–spawning success, predator–prey interactions, food web dynamic alternations, larvae disbursement and settlement, reduced hatching success, and direct mortality. (Coen, 1995; Kjelland et al., 2015).
- Heavy metals may also negatively affect various metabolic processes on benthonic communities resulting in developmental retardation, high incidences of mortality, hatching delay, altered body-shape, and body anomalies (Sfakianakis et al., 2015).

Sources:

Coen, L.D. (12 January 1995). A review of the potential impacts of mechanical harvesting on subtidal and intertidal shellfish resources. South Carolina Division of Natural Resources, Marine Resources Research Institute, James Island, South Carolina, pg. 46. Accessed at: http://portal.dnr.sc.gov/marine/mrri/shellfish/harvester.pdf

Kjelland, M.E., Woodley, C.M., Swannack, T.M. and Smith, D.L. (23 July 2015). A review of the potential effects of suspended sediment on fishes: potential dredging-related physiological, behavioral, and transgenerational implications. Environment Systems and Decisions, 35(3), pp.334-350. Accessed at: https://link.springer.com/content/pdf/10.1007%2Fs10669-015-9557-2.pdf

Sfakianakis, D.G., Renieri, E., Kentouri, M. and Tsatsakis, A.M. (February 2015). Effect of heavy metals on fish larvae deformities: a review. Environmental Research, Vol. 137, pp.246-255.

Wilber, D.H. and Clarke, D.G. (2010). Dredging activities and the potential impacts of sediment resuspension and sedimentation on oyster reefs. In Proceedings of the Western Dredging Association Thirtieth Technical Conference, San Juan, Puerto Rico (Vol. 6169)

3. Impacts from Warming of the Waters

- Malin Pinsky, a professor of ecology and evolution at Rutgers University and the author of a recent study about how climate change has reshuffled fisheries, noted that: Shellfish, which are sensitive to both the warming and the higher acidification of seawater as it stores more carbon dioxide, move relatively slowly to escape the threats. Surf clams along the East Coast die when it becomes too hot.

  Source: Fialka, John. (2018 April 3). *Fish forced to 'move, die or evolve'* accessed at: https://www.eenews.net/climatewire/2018/04/03/stories/1060077965,

- A regulatory challenge under a warmer climate scenario in the Harbor Estuary involves the applicability of existing restrictions on in-water construction or maintenance dredging operations. "Environmental windows" have been established to minimize potential adverse impacts on important fisheries resources. Regulators (USACE, NOAA, NYSDEC, NJ DEP, and cooperating agencies) typically set windows which allow dredging and construction activities during periods determined to ensure minimal impacts on designated species. Some of these windows have been in place for more than thirty years. In general, the windows are set using a policy that emphasizes risk avoidance when possible, risk management when avoidance is not possible, and lastly, mitigation when necessary to offset unavoidable impacts (Tanski et al. 2014). Priority

species of concern include American eel (Anguilla rostrata), Atlantic menhaden (Brevoortia tyrannus), Atlantic sturgeon (Acipenser oxyrinchus), blue crab, American lobster, river herring, summer flounder, tautog (Tautoga onitis) weakfish, and winter flounder, many of which are expected to respond to warming estuarine conditions by altering their seasonal and spatial distribution patterns (Tanski et al. 2014). As these target species populations in the Harbor Estuary respond to climate change, existing operational windows may require re-evaluation and adjustment.

Source: https://www.hudsonriver.org/wp-content/uploads/2017/10/HEP-Climate-Fish-Report.pdf

- Construction activities will create **thermal discharges**. A number of marine species are sensitive to fluctuations in water temperature – for example, the eggs of Atlantic cod and winter flounder. The massive construction barges and large machines, such as drilling equipment, will likely raise temperatures in surrounding waters.
  - **Atlantic Sturgeon:** Warming waters have made it difficult to determine migration windows for the sturgeon, adding to the concerns about construction timing. In addition, a 2013 study noted that "increased salt-water intrusion from the marine environment [into freshwater spawning territory] is likely to occur under predicted scenarios of climate change and sea level rise, markedly constrain[ing] areas of suitable habitat for Atlantic sturgeon."
  - **Winter Flounder:** HEP noted that populations of Winter flounder off the Atlantic coast had declined by as much as 90% due to warming waters. "An increase in winter water temperatures in estuaries supporting winter flounder populations is potentially a critical threat to recruitment, because of increased susceptibility to predation."

    Source: https://www.hudsonriver.org/NYNJHEPClimateVulnerability.pdf

- Hurricane Sandy showed how vulnerable the Bayshore communities are to storms. To remove shellfish communities, which provide a natural and effective way to protect from future storm surges, is irresponsible.

- **Shellfish**, which are sensitive to both the warming and the higher acidification of seawater as it stores more carbon dioxide, move relatively slowly to escape the threats. Surfclams along the East Coast die when it becomes too hot.
  - **Clams:** HEP noted that ocean acidification may make it more difficult for clams and other calcifying species to make their shells and exoskeletons and is a threat to the development of sensitive fish and oyster larvae.

    Source: https://www.hudsonriver.org/NYNJHEPClimateVulnerability.pdf

In New Jersey, temperature criteria for "saline/estuarine waters" are summarized in "Surface Water Quality Standards" [N.J.A.C. 7:9B-1.14(d)] and "Stormwater Management" [N.J.A.C. 7:8]. As defined in the New Jersey regulations:

"Heat dissipation area" means a mixing zone, as may be designated by the Department, into which thermal effluents may be discharged for the purpose of mixing, dispersing, or dissipating such effluents without creating nuisances, hazardous conditions, or violating the provisions of this chapter, the Surface Water Quality Standards. "Thermal alterations" means the increase or decrease in the temperature of surface waters, above or below the natural temperature, that may be caused by the activities of man.