

CHAPTER 5

CUMULATIVE IMPACTS FROM THE PROPOSED ACTION

A. INTRODUCTION

The New York City Department of Health (NYCDOH) is proposing both the *Mosquito-Borne Disease Control Program* and the *Mosquito Population Control Program in the Rockaways* under the Adult Mosquito Control Programs. Chapters 3 and 4 of this study identified the potential impacts that would be associated with each of these programs. Based on the results of these studies and the planned operation of the two programs, the potential cumulative impacts from the Proposed Action were evaluated, and the results of this assessment are provided below.

The analyses which are presented in Chapter 3 for the *Mosquito-Borne Disease Control Program*, conservatively evaluated the potential Citywide effects from ten spray events over a 2-month period, with some relatively short time periods between applications. The analyses in Chapter 4 for the *Mosquito Population Control Program in the Rockaways* evaluated the potential effects in and adjacent to the Rockaways Peninsula from six spray events over a 3-month period from this proposed program.

In the event that NYCDOH surveillance of mosquito-borne pathogens indicates that there is a threat to public health from mosquitoes on the Rockaway Peninsula, considerations will be given to the most recent applications of adulticides at the Peninsula under the *Mosquito Population Control Program in the Rockaways*. If adulticide applications have occurred on the Peninsula in the time period between surveillance detection of the public threat from mosquito-borne virus, NYCDOH will continue surveillance of the adult mosquito population until the increase in mosquito population again presents a threat to human health from mosquito-borne pathogens.

B. PROBABLE CUMULATIVE IMPACTS FROM THE PROPOSED ACTION

LAND USE, COMMUNITY FACILITIES, PUBLIC POLICY & ZONING

The application of adulticides under the proposed programs are not expected to directly change the use of land within Rockaway Peninsula or the City. However, the programs may cause some spaces normally open to public use to be closed immediately before, during and shortly after application. This would be considered a direct short-term impact to that use. Overall, while the adulticide applications may temporarily affect the use of land, no significant adverse land use impacts are expected in the as a result of the proposed adulticiding activities under both programs. Based on the corresponding analyses in Chapters 3 and 4 for this area of study, no significant adverse impacts

would be expected on Land Use, Community Facilities, Public Policy & Zoning from the Proposed Action.

PUBLIC HEALTH

No potential adverse long-term public health impacts from the application of adulticides are expected from both programs. All of the active ingredients and certain inert ingredients have been linked to skin and eye irritation in humans. There would be potential adverse skin and eye irritation impacts to people who are sensitive to the active and inert ingredients. These adverse effects could occur among workers and residents who are directly exposed to the adulticides, especially due to direct contact near the point of application. While these potential adverse impacts would be reduced by public information announcements (both in the media and by police vehicles escorting ground applications), it is assumed that not all of the population would be able to avoid direct contact with the adulticides and, therefore, this would result in potential unavoidable adverse impacts from skin and eye irritation. These impacts would be localized for both programs, and no cumulative adverse impacts on public health would be expected.

NATURAL RESOURCES

The natural resources impact assessment identified many species and pathways which would not be adversely affected by either of the proposed programs. No significant adverse impacts are expected on endangered species, and no significant adverse impacts are expected from the application equipment, including trucks or aircraft applying adulticides.

Potentially adverse impacts on natural resources were identified by drift and deposition onto freshwater ponds (which is not applicable to the *Mosquito Control Program in the Rockaways* since there are no freshwater ponds on the peninsula), direct contact with airborne adulticides or runoff of adulticides from rainfall after application. While there may be some adverse effects and losses of individual nighttime active terrestrial arthropod species as a result of the Proposed Action, these potential adverse effects are not considered to be significant adverse impacts.

Potential adverse affects may occur to aquatic species immediately near the discharge points of stormwater outfalls if it rains after an application of adulticides. When the characteristics of the habitats found in New York City are considered, in combination with field studies of the fate and effect of the adulticides or active ingredients, the potential adverse impacts from the *Mosquito-Borne Disease Control Program* to aquatic and terrestrial animals identified as part of the risk assessment are not predicted to be significant, with the exception of potential significant adverse impacts from malathion runoff into Jamaica Bay or other inlet bays with limited tidal flushing and which receive large stormwater discharges.

The potential concentrations of malathion (due to runoff if a storm event occurs after application of malathion over a large land coverage that drains to Jamaica Bay) in the waters of Jamaica Bay could be well above estimated no effect levels for crustaceans in Jamaica Bay. The analyses performed for the EIS, assumed that a large coverage of land in Brooklyn and Queens would have malathion applied, and rainfall after the application would result in a large runoff of this active ingredient to Jamaica Bay.

The potential risks to aquatic and terrestrial organisms from the *Mosquito Population Control Program in the Rockaways* were lower than those calculated for the *Mosquito-Borne Disease Control Program* and are not expected to result in significant adverse impacts to these resources.

Measures have been included in both programs to reduce the potential for significant adverse impacts to natural resources while still protecting human health. Both programs include maintaining a 100-foot setback from surface waters for ground applications of adulticides (plus a 300-foot setback for aerial applications, but this is not applicable to the *Mosquito Control Program in the Rockaways* since no aerial applications would occur under this program). Neither program would spray within 100 feet of the beach/dune areas of the Rockaways that provide habitat for endangered species. The only resources with the potential to be directly affected from deposition of the adulticides or runoff containing the adulticides from the cumulative interaction of both programs would be the aquatic resources and tidal wetlands of Jamaica Bay. The natural resources impact assessment indicates that the application of the adulticides in both programs would not result in significant adverse impacts on larger terrestrial organisms through inhalation, consumption of vegetation or insects, or consumption of fish that had bioconcentrated the active ingredients in the adulticides. Because impacts from the *Mosquito Population Control Program in the Rockaways* would be localized to the Rockaway Peninsula, which makes up a small portion of the land area draining to the Bay, and the proposed application schedule would provide time for the adulticides to degrade significantly between applications, the cumulative impact of the Proposed Action would not be worse than those projected for the Bay in Chapter 3.D, "Natural Resources," for the *Mosquito-Borne Disease Control Program* which evaluated all of the land area within the City draining to the Bay.

The one identified significant adverse impact (i.e., the runoff of malathion into Jamaica Bay and the resultant predicted impact on crustaceans) would also be the only predicted significant adverse impacts from both programs.

WATER SUPPLY

In this area of study, there were no predicted significant adverse impacts from the *Mosquito-Borne Disease Control Program* or the *Mosquito Population Control Program in the Rockaways*. Both programs would have the potential to affect a common source of groundwater supplies below Queens, including Rockaway Peninsula. However, based on the results of the maximum expected concentrations of adulticides into the groundwater supply, the cumulative impacts from the Proposed Action would not result in any significant adverse impacts on the water supply.

WATER QUALITY

The only surface water resource with the potential to have cumulative water quality effects from deposition of the active ingredients in drift during ground application or stormwater discharge following a spray event from the two programs is Jamaica Bay. No significant adverse impacts to water quality in Jamaica Bay are expected from the *Mosquito-Borne Disease Control Program* or the *Mosquito Population Control Program in the Rockaways* with the exception of the active ingredient malathion. Malathion is the only active ingredient with a state water quality standard. This standard applies to most of the surface water classes in and around the City (0.1 µg/L). The estimated exposure concentration in Jamaica Bay calculated from the *Mosquito-Borne Disease Control Program* in the Tier II ecological risk assessment suggests that the ground application of malathion has the potential to result in concentrations in Jamaica Bay waters that exceed the State standard. The estimated exposure concentration in Jamaica Bay calculated as part of the Tier II ecological risk assessment for the *Mosquito Population Control Program in the Rockaways* also suggests a potential for malathion application to result in an exceedance of the State water quality standard in Jamaica Bay. However, because the *Mosquito Population Control Program in the Rockaways* would be applied on a much smaller scale and affect a much smaller land mass than the *Mosquito-Borne Disease Control*

Program, the volume of stormwater runoff containing adulticides from the Rockaways would be small compared to the stormwater discharged from the remaining areas of the City draining to the Bay. The cumulative impact of the two proposed programs, therefore, should be no greater than the those projected from the Citywide *Mosquito-Borne Disease Control Program* discussed in Chapter 3.F, “Water Quality,” which were not expected to be significant adverse impacts with the exception of malathion.

INFRASTRUCTURE

There are no expected significant adverse impacts on the City’s sanitation, roadways, bridges, tunnels, wastewater collection, and public transportation from either of the programs, nor are there any expected significant cumulative impacts from the Proposed Action.

HAZARDOUS MATERIALS

The handling of adulticide materials for both programs would likely be under the auspices under one contractor (or City staff). All contractors involved in either proposed program will be responsible for proper transportation, storage, and disposal of potentially hazardous materials and for the proper reporting and cleanup of any spills. The program elements to minimize the risk of handling of the materials or cleanup activities in case of an accidental spill would be common to both programs. Therefore, there are no expected adverse cumulative impacts from the Proposed Action for hazardous materials.

SOCIOECONOMIC CONDITIONS

There are no expected significant socioeconomic adverse impacts from either of the proposed programs, nor are there any expected cumulative adverse impacts from the Proposed Action in this area of study.

OPEN SPACE

Since adulticiding would occur on a limited number of nights for a limited duration for both programs, and since the reduction in use of open spaces would be similar to the reduction that would take place in the No Action condition for both programs, the cumulative impacts to open space resources would not be considered significant adverse impacts.

CULTURAL RESOURCES

While the adulticiding activities are expected to reduce or prevent the use of the outdoor components of these cultural resources for both programs, such reductions would be temporary in nature—limited to the period of application and potentially the hours immediately before and after application. As such, the potential cumulative effect of the adulticiding activities under both programs would not result in significant adverse impacts to any cultural resources.

VISUAL RESOURCES

The only short-term visual changes that would occur from both programs would be trucks passing through during periods of application (helicopter/fixed wing aircraft passing over neighborhoods would only occur under the proposed *Mosquito-Borne Disease Control Program*). Driving at 10- to 30-miles-per-hour, trucks would pass through blocks quickly, as would any police escort vehicles preceding such trucks. Therefore, there would be no expected cumulative significant adverse impacts on visual resources.

TRANSPORTATION

Neither proposed program would be expected to result in a significant number of vehicle trips or result in significant adverse impacts on transportation, and no significant cumulative adverse impacts are expected from the two proposed programs.

AIR QUALITY

Neither Proposed Action would not result in a significant number of new ground (or aircraft trips in the case of the *Mosquito-Borne Disease Control Program*) throughout the City nor would the action result in any exceedances of PM₁₀ air quality standards. The maximum air quality effects of the applications would be quite localized, and for truck applications, immediately near the point of applications. Therefore, the cumulative impact of the two proposed programs would not result in exacerbations or new violations of any Federal or New York State Ambient Air Quality Standards, and thus, the programs would be consistent with New York State Implementation Plans.

NOISE

As discussed in the noise impact assessments in Chapters 3.O, “Noise” and 4.O, “Noise,” both programs are expected to result in significant adverse noise impacts from police escort/truck applications (and aircraft operations for the *Mosquito-Borne Disease Control Program*). Each truck would be escorted by police vehicle with an announcement to warn people about the spraying. This warning vehicle’s purpose is to produce announcements that the public can hear, and, therefore, it will produce short-term noise levels that are noticeable and may be considered to be intrusive. Since the function of the police warning announcement is to make the public aware and minimize potential direct impacts on the public, the noise impacts from such operations would not be mitigated. These noise impacts from truck applications are expected to be localized, and the cumulative impacts from both programs would be the same as that from each individual program.

WATERFRONT REVITALIZATION PROGRAM POLICIES

The only common waterfront properties which could be affected from both programs is the Rockaways peninsula, and potential impacts on fish and wildlife habitats and resources from the *Mosquito Population Control Program in the Rockaways* are expected to be significantly less than those estimated for the worst-case scenarios projected for the *Mosquito-Borne Disease Control Program*. Because of these potential impacts, the programs have been developed to minimize potential significant adverse impacts to these resources while still protecting human health. During adulticide spray events, to protect and preserve significant coastal fish and wildlife habitats, both programs would maintain a 100- and (300-foot buffer for aerial applications under the *Mosquito-Borne Disease Control Program*) around water bodies for truck application of adulticides. Transportation and storage of adulticides would be conducted in a manner that would minimize the potential for spills into coastal waters. In the event of a spill, mitigation measures have been developed to minimize significant adverse impacts.

Chapters 3P and 4P discussed the consistency with these policies for the two programs. Provided below is a detailed description on the consistency determination for policies 7 and 8 for the Proposed Action.

Policy 7: Significant coastal fish and wildlife habitats will be protected and preserved so as to maintain their viability as habitats.

Background

In recognition that certain fish and wildlife habitats are critical to the maintenance of specific populations of fish or wildlife, the NYSDOS developed a definition of what would constitute significant habitat for coastal fish and wildlife to better protect these resources. The NYSDOS defines these significant habitats as having one or more of the following characteristics:

- Are essential to the survival of a large portion of a particular fish or wildlife population (e.g. feeding grounds, nursery areas);
- Support populations of rare and endangered species;
- Are found at a very low frequency within a coastal region;
- Support fish and wildlife populations having significant commercial and/or recreational value; and
- Would be difficult or impossible to replace.

In order to preserve and protect these significant coastal habitats, an activity cannot be conducted in the coastal zone if it would result in either of the following:

- Destruction of a significant habitat—destruction would include the loss of fish or wildlife through physical alteration or disturbance of the habitat or introduction of pollution to the habitat, or through the indirect effects of these actions on a designated significant habitat area. Habitat destruction can include vegetation changes, changes in substrate or hydrology, or increases in runoff, erosion, sedimentation, or pollution.
- Significant impairment of a critical habitat—significant impairment is defined as a reduction in vital resources (food, shelter, space) or a change in the environmental conditions (such as temperature, substrate, or salinity) such that one or more is outside the tolerance range of important species of fish or wildlife dependent on that habitat. Indicators that a habitat has been significantly impaired include reduced carrying capacity, changes in community structure such as food chain relationships and species diversity, reduced productivity, and increases in disease and mortality. The tolerance range is the range of ecological conditions that supports a species population or has the potential to support a restored population. Increases in emigration or death rates would suggest that an environmental factor has fallen outside the tolerance limit. The NYSDOS lists the following parameters that should be considered in determining whether an activity in the coastal zone will result in the impairment of a designated critical habitat (NYSDOS 1999. Significant Coastal Fish and Wildlife Habitats Program, a Part of the New York Coastal Management Program and New York City's Approved Waterfront Revitalization Program):
 - Physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth, morphology, substrate type, vegetation, structure, erosion and sedimentation rates;
 - Biological parameters including community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; and
 - Chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, salinity, and pollutants (heavy metals, toxics and hazardous materials).

Activities identified by the NYSDOS as most likely to affect significant coastal fish and wildlife habitats (www.dos.state.ny.us/cstl/policies/policy7.html) include the following:

- Draining wetlands or ponds.
- Filling wetlands, portions of streams, lakes, bays or estuaries.
- Land grading—vegetation removal, increased surface runoff, increased soil erosion and downstream sedimentation.
- Clear cutting—loss of vegetation, increased fluctuation of surface runoff, streambed scouring, soil erosion, and sediment deposition.
- Dredging or excavation—change in substrate composition, possible resuspension of contaminants, removal of aquatic vegetation, or change in circulation patterns and sediment transport.
- Dredge spoil disposal—shoaling of littoral areas or change in circulation patterns.
- Physical alteration of shore areas due to channelization or construction of shore structure, may include change in volume and rate of flow or increase in scouring or sedimentation.
- Introduction, storage or disposal of pollutants such as chemical, petrochemical, solid wastes, nuclear wastes, toxic material, pesticide, sewage effluent, urban and rural runoff, or leachate of hazardous and toxic substances stored in landfills.

The NYSDOS has designated the following 15 areas within New York City as Significant Coastal Fish and Wildlife Habitats.

- Lemon Creek, Staten Island—Included within the Lemon Creek/Wolfe’s Pond representative area evaluated in the EIS, it is a 70-acre area of salt marsh and coastal freshwater wetland that represents the only undisturbed tidal wetland on the south shore of Staten Island.
- Fresh Kills, Staten Island—Includes approximately 1,000 acres of tidal wetlands on the Arthur Kill that are degraded but still provide valuable habitats for fish and wildlife and a wintering area for the threatened northern harrier.
- Pralls Island, Staten Island—80-acre island in the Arthur Kill used for nesting by colonial water birds.
- Sawmill Creek Marshes, Staten Island—Approximately 150 acres of marshes on the northwestern portion of Staten Island including Chelsea Marsh and Merrell’s Marsh. Though affected by human activities this marsh area has one of the few known populations of the southern leopard frog in the state. It also provides foraging habitat for water birds.
- Goethals Bridge Pond, Staten Island—This approximately 50-acre wetland and shallow pond system provides a breeding habitat for some waterfowl, shorebirds, and migratory songbirds. It is an important feeding area for migratory birds and nesting colonial water birds from Pralls Island and Shooters Island.
- Shooters Island, Staten Island—Approximately 50 acres of this island at the confluence of the Arthur Kill and the Kill Van Kull is in the State of New York. It provides nesting habitat for colonial water birds.
- Lower Hudson Reach—The 19-mile reach of the river from Battery Park to Yonkers that sustains a diverse community of benthic organisms, plankton, and fish. This portion of the

river provides important wintering habitat for striped bass and winter flounder, as well as waterfowl habitat.

North and South Brother Islands, Bronx—The 10-acre South Brother Island and 15-acre North Brother Island provide nesting habitat for colonial waterbirds and gulls.

Pelham Bay Park Wetlands, Bronx—An approximately 475-acre marsh associated with the Hutchinson River, and the Lagoon, an approximately 275-acre narrow bay and wetland complex located around Hunter Island, provide an estuarine habitat used by waterfowl, shorebirds, songbirds, wading birds, and raptors for feeding, resting, and overwintering.

Little Neck Bay, Queens—This approximately 1400-acre shallow embayment on the north shore of Long Island is important for waterfowl, finfish and shell fish year-round.

Alley Pond Park, Queens—This 225-acre area includes saltmarsh, tidal flats, freshwater wetlands, and woodlands on the East River/western Long Island Sound area and provides breeding habitat for waterfowl, wading birds, and songbirds.

Udall's Cove, Queens—Located at the southeastern end of Little Neck Bay in the western portion of Long Island Sound, this approximately 120-acre area includes tidal shallows and salt marsh, and adjacent uplands used by finfish, shellfish, waterfowl, wading birds, and songbirds, as well as by mammals such as muskrat, opossum and raccon.

Meadow and Willow Lakes, Queens—Located within Flushing Meadows Corona Park, the approximately 100-acre Meadow Lake and 40-acre Willow Lake provide open water and freshwater wetland habitats used by wading birds, waterfowl, and songbirds as well as a warmwater fishery.

Jamaica Bay, Queens—Included within the Jamaica Bay and Environs/Paerdegat Basin Representative Area, this approximately 10,000-acre complex of estuarine water and tidal marsh provides important habitat for fish, invertebrates, waterfowl, wading birds, shorebirds, songbirds, and insects as described in Chapter 3.D of the EIS.

Breezy Point, Queens—The 290-acre tip of the Rockaway peninsula includes dune and beach areas, as well as tidal wetlands. It provides important nesting habitat for breeding colonies of endangered or threatened shorebirds.

The New York City Waterfront Revitalization Program (WRP) is the City's principal coastal zone management tool. The program policies within the WRP that address natural area preservation and restoration mirror the NYSDOS Fish and Wildlife Policies by recognizing the need to protect and restore the quality and function of ecological systems, protecting and improving water quality, and minimizing environmental degradation from solid waste and hazardous substances within the City's coastal zone.

Consistency Assessment

The proposed action, the application of adulticides for the control of mosquito-borne disease city-wide and mosquitoes in the Rockaways, will not result in the physical alteration or disturbance of any habitats or the alteration of hydrology, runoff, erosion or sedimentation currently occurring in the coastal zone. The focus of the natural resource assessment, and of this consistency assessment for significant coastal fish and wildlife habitats, is the potential effect of the active ingredients on the City's natural resources.

As described above, the significant coastal fish and wildlife habitats identified for New York City include upland areas on islands and areas adjacent to wetlands or water bodies that are important for nesting or foraging habitat for birds; freshwater wetlands associated with ponds or streams; tidal wetlands; estuarine areas that include open water and tidal flats; and beach and dune areas. All of these areas are important for the habitat they provide to birds, fish, benthic invertebrates, mammals, reptiles and amphibians, and endangered or threatened species. Chapters 3.D and 4.D of the EIS evaluated the potential impact to the natural resources of New York City described for the representative areas from the application of the adulticides through a weight of evidence approach that considered the following.

- The physical and chemical properties of the adulticide active ingredients.
- The results of the screening level (Tier I) and focused (Tier II) ecological risk assessments to assess the potential toxicological risks to the terrestrial and aquatic resources found within the representative areas. The risk analysis evaluated the potential ecological risks from the active ingredients to:
 - Terrestrial organisms through inhalation, eating food contaminated with the adulticides, bird preening, drinking water from puddles containing the active ingredients, and raptors or mammals consuming fish that have bioconcentrated the active ingredients from surface waters;
 - aquatic organisms in ponds exposed to drift during adulticide application; and
 - wetlands receiving stormwater discharge containing the active ingredients.
- Results documented from empirical studies of the adulticides when actually applied in the environment.
- Best professional judgment.

The significance of the potential impacts from the various active ingredients on resources found in the representative areas was assessed in accordance with the guidelines presented in the *CEQR Technical Manual*.

The analysis of potential impacts to the City's natural resources presented in Chapter 3.D of the EIS addressed all of the habitat types found within the 15 significant coastal fish and wildlife habitats located within New York City. In fact, two of the significant coastal fish and wildlife habitats were located within the representative areas and are directly addressed in the analysis of impacts.

The results of the analysis of potential effects on natural resources suggested no potential adverse effects to birds or mammals from direct inhalation of the active ingredients, consumption of food containing the active ingredients, or from preening in birds. Although nontarget terrestrial insects will be affected, the impact to the insect populations within the City will not be significant because of the demonstrated ability of insect populations to rebound following adulticide applications. Indirect effects on birds, predatory insects, mammals, reptiles and amphibians due to the loss of prey species should be minimal because of the ability of most of these groups to use a variety of prey items, or because the preferred foraging location is close to the ground where fewer insects will be affected. Therefore, there will be no destruction of significant habitat or impairment of critical habitat within the terrestrial portions of the significant coastal fish and wildlife habitats found within the City.

The risk assessment suggested little effect on aquatic organisms in ponds from the application of sumithrin or PBO, assuming a minimum 100-foot setback between the truck applying the adulticide

and the pond. Considering the empirical evidence for the other active ingredients, and their physical and chemical properties (particularly the affinity for organic matter in soil and sediments), the application of the other active ingredients should not result in significant adverse impacts on aquatic resources in ponds. The 100-foot setback from water bodies followed during truck application and 300-foot setback from water bodies followed by the City during aerial application will minimize the drift of adulticide to ponds. Therefore, the application of the adulticides under the Proposed Action would not result in the destruction or significant impairment of ponds or lakes found within the significant coastal fish and wildlife habitats located within the City.

In freshwater wetlands, such as those along Lemon Creek and the other wetlands on Staten Island classified as significant coastal fish and wildlife habitats that receive stormwater runoff, sumithrin does not appear to result in impacts to invertebrates or fish. Considering the empirical evidence for the other active ingredients, and their physical and chemical properties (particularly the affinity for organic matter in soil and sediments), the application of the other active ingredients should not result in significant adverse impacts to aquatic resources in freshwater wetlands. The 100-foot and 300-foot setbacks from water bodies used during truck and aerial application, respectively, will further reduce the introduction of the active ingredients into wetlands associated with the water bodies. Although there is the potential for some aquatic organisms in freshwater wetlands to be affected within the vicinity of the discharge, the loss of these individuals would not result in changes in the aquatic community structure or other significant impairments of the freshwater wetland habitats within the significant coastal fish and wildlife habitats identified in New York City.

For estuarine wetlands, sumithrin, resmethrin, PBO, permethrin, and naled do not appear to have the potential to cause significant adverse effects on aquatic resources. The impact assessment presented in Chapter 3.D of the EIS identified a potential for adverse impact to crustaceans in Jamaica Bay and other estuarine wetlands with limited flushing, from the application of malathion. These impacts are most likely in the near-shore areas within the vicinity of the discharges. Malathion appears to have the potential to cause significant adverse effects to crustaceans in poorly flushed estuarine wetlands such as those of Jamaica Bay. However, such impacts would be short-term in nature, and would not result in the destruction of a significant habitats or significant impairment of these critical habitats. Mitigation methods to reduce such calculated impacts have been identified (e.g., completion of the Paerdegat Basin CSO overflow tank, use of finer droplet sizes). Should the City choose to apply an adulticide with malathion as the active ingredient, a monitoring program will be initiated to assess the effects on water quality and aquatic organisms. Other estuarine waters such as the Hudson River, Raritan Bay, East River or the New York Harbor do not have a potential for adverse impacts from malathion because of they are well flushed and have relatively short residence times.

The Breezy Point significant coastal fish and wildlife habitat will not be affected by the proposed action because no pesticides will be applied on federal lands. Therefore, the proposed action would be consistent with Policy 7.

Policy 8: Protect fish and wildlife resources from the introduction of hazardous wastes and other pollutants which bioaccumulate in the food chain or which cause significant sublethal or lethal effects on those resources.

Background

The NYS DOS refers to the definition of hazardous waste presented in Environmental Conservation Law [S27-0901(3)] as “waste or combination of wastes which because of its quantity, concentration, or physical, chemical or infectious characteristics may; (1) cause, or significantly contribute to, an

increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or otherwise managed.”

Consistency Assessment

The proposed action would not result in the release of any hazardous wastes to the environment. The effects of the adulticides on the resources found within the coastal zone were presented in the previous discussion of consistency of the proposed action with respect to Policy 7. With the exception of the application of malathion in areas with limited flushing such as Jamaica Bay, the application of the adulticides should not cause significant adverse impacts to organisms within the coastal zone. Additionally, as discussed in Chapter 3.C, none of the active ingredients or synergists are expected to bioaccumulate, and food chain effects for the adulticides examined in the EIS have not been observed in nature. Therefore, the proposed action would be consistent with Policy 8.

UNAVOIDABLE ADVERSE IMPACTS

Potential unavoidable adverse impacts—either adverse effects or significant adverse impacts—that are expected as a result of the Proposed Action include:

- ❧ Significant adverse impacts would occur on crustaceans in Jamaica Bay and similar inlet bays with stormwater outfalls and limited tidal flushing (e.g., Little Neck Bay in Northern Queens) if it rains after the application of malathion over a large land area under the *Mosquito-Borne Disease Control Program*, but impacts from malathion on these waterbodies under the *Mosquito Population Control Program in the Rockaways* would be significantly less. The cumulative unavoidable adverse impact would be equivalent to the predicted *Mosquito-Borne Disease Control Program* impacts.
- ❧ Short-term losses of aquatic life from stormwater runoff of active ingredients of adulticides near the points of discharge for all active ingredients. These losses are predicted in localized areas during rain events immediately following application of adulticides over large land areas that drain into inlet bays (e.g., Jamaica Bay, Little Neck Bay).
- ❧ The loss of individuals in some species of terrestrial arthropods (i.e., nighttime flying insects) from the application of adulticides directly exposed to these ingredients during the application of products.
- ❧ Potential significant adverse impacts are expected from the predicted exceedence of malathion water quality standards from the application of malathion from both programs, due to runoff.
- ❧ Noise from either low flying aircraft (only for the *Mosquito-Borne Disease Control Program*) or truck application of adulticides with police warning announcements in front of the trucks would be a significant adverse impact.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

There are several resources that would be expended in the operation of both programs, including fuel in the form of gas and electricity consumed during operations, and the human effort required to plan and implement the programs' components. These resources are considered irretrievably committed

because their reuse for some purpose other than the projects would be highly unlikely. There would be no significant cumulative effect on the irreversible and irretrievable commitment of resources from the implementation of both programs.

ENERGY

The proposed programs are not expected to raise any significant issues related to long-term demands for or significant impacts on the City's energy system. Energy consumption associated with each of the proposed activities would not result in any significant adverse effects on energy fuel resources, nor would the cumulative consumption under both programs result in adverse impacts on energy fuel resources.

GROWTH INDUCING ASPECTS

The proposed programs are not expected to alter regional growth patterns, impact residential settlement patterns, affect the growth in employment centers, or significantly induce development within the Rockaways Peninsula or the City. The cumulative impact of both programs would not significantly affect these patterns also.

ALTERNATIVES

Many of the alternatives for each program are similar. In the case of a public health threat indicated via surveillance for the *Mosquito-Borne Disease Control Program*, these alternative methods of control will not wholly substitute for an adulticiding plan and the significant reduction of adult mosquitoes. In general, these alternatives have limitations and inabilities to reduce significant numbers of adult mosquitoes, which make them inadequate to wholly substitute for the use of adulticides. Some of the alternatives may be used in addition to the application of larvicides and adulticides to supplement the effectiveness of controlling adult mosquito populations. For those alternatives that would potentially result in significant adverse impacts, should NYCDOH elect to employ them in the future, an environmental review of the potential cumulative impacts under both programs would have to be performed before implementation of such alternatives.

MITIGATION

Natural Resources

As a result of both programs, potential significant adverse impacts are predicted to crustaceans in Jamaica Bay from runoff if malathion is applied. NYCDOH would conduct pre- and post-application monitoring of adulticide ingredients in places with limited tidal flushing (e.g., Jamaica Bay) if malathion were applied in the future. The cumulative impacts of both programs from malathion runoff into Jamaica Bay would be equivalent to those calculated for the *Mosquito-Borne Disease Control Program*.

Water Quality

Potential significant adverse impacts due to the predicted exceedance of the water quality standard for malathion were identified for both programs. NYCDOH would perform pre- and post-application monitoring of malathion levels in runoff to Jamaica Bay if malathion were applied at some time in the future. If the predicted levels of malathion are as high as those estimated for the runoff in this EIS, these impacts would occur and remain unmitigated from both programs.

Noise

Potential significant adverse impacts from both programs were predicted from police escort/truck operations (and aircraft operations for the *Mosquito-Borne Disease Control Program*). Each truck would be escorted by police vehicle with an announcement to warn people about the spraying. This warning vehicle's purpose is to produce announcements that the public can hear, and, therefore, it will produce short-term noise levels that are noticeable and may be considered to be intrusive. When the police warning vehicle which is making an announcement and the spray truck pass, both in quiet neighborhoods and even in neighborhoods that are not particularly quiet, they will produce short-term passby noise levels that are likely to be noticeable and intrusive to residents. Since the function of the police warning announcement is to make the public aware and minimize potential direct impacts on the public, the noise impacts from such operations would not be mitigated. These noise impacts from truck applications are expected to be localized, and the cumulative impacts from both programs, which would remain unmitigated, would be the same as that from each individual program. 

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