16 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

16.1 Introduction

Per the 2021 *City Environmental Quality Review (CEQR) Technical Manual*, increased concentrations of greenhouse gases (GHGs) are changing the global climate, resulting in wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although this change is occurring on a global scale, the environmental effects of climate change are also likely to be felt at the local level.

Through *PlaNYC*, New York City's long-term sustainability program – and enhanced by *OneNYC 2050* – the City advances sustainability initiatives and goals to both greatly reduce GHG emissions and increase the City's resilience to climate change. The goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 was codified by Local Law 22 of 2008, known as the New York City Climate Protection Act (the "GHG reduction goal"). Subsequently, the City committed to an 80 percent reduction in greenhouse gases by the year 2050. Local Law 66 of 2014 was adopted on December 14, 2014, which codified the City's goal to reduce citywide greenhouse gas emissions by 80 percent by 2050 ("80 x 50"). In April 2019, *OneNYC 2050* was published as an update to *OneNYC*, which included a commitment to citywide carbon neutrality by 2050.

In addition, in December of 2021, the New York City Council enacted Local Law 154 of 2021, which prohibits the combustion of substances with certain emissions profiles in buildings within the City. The Local Law sets restrictions on fossil fuel usage by phasing in strict emissions limits beginning in 2023 for new residential and commercial developments.

A proposed project's contribution of GHG emissions to global GHG emissions is likely to be considered insignificant when measured against the scale and magnitude of global climate change. However, certain projects' contributions of GHG emissions are analyzed

to determine their consistency with the City's GHG reduction goal, which is currently the most appropriate standard to analyze a project under CEQR. The GHG consistency assessment focuses on those projects that have the greatest potential to produce GHG emissions and evaluates their potential that may result in significant inconsistencies with the GHG reduction goal. The *CEQR Technical Manual* recommends that a GHG consistency assessment be conducted for any project resulting in 350,000 square feet (sf) or more of development where an environmental impact statement (EIS) is required, and for other energy-intensive projects.

The Proposed Actions would enable the construction of the Proposed Facility – an approximately 3,093,880-gross-square-foot (gsf) gaming and recreational facility containing food and beverage, and support space, a 500-key hotel with a spa and meeting space, a 2,000-person event space, and approximately 6,100 gsf of sundry retail. Additionally, the Proposed Actions would allow the development of an approximately 40,160-gsf replacement golf clubhouse north of the Proposed Facility. As a part of the Proposed Development, Ring Road would be widened to accommodate vehicles, bicycles, and pedestrians accessing the Park and the Proposed Facility in coordination with NYC Department of Transportation (NYCDOT).

The Proposed Facility and the replacement golf clubhouse would result in the development of more than 350,000 sf and would comprise commercial, hotel, and accessory parking uses.[1] Therefore, a GHG consistency assessment is warranted. Both buildings would use electricity to power the hot water and heating, ventilation, and cooling (HVAC) systems; however, a worst-case estimate of project-generated GHG emissions resulting from the use of natural gas within the Proposed Facility and replacement golf clubhouse is presented in this chapter, along with an assessment of the Proposed Actions' consistency with the citywide GHG reduction goal. This approach was devised to account for a worst-case condition and to capture the potential that the commercial kitchens would use combustion sources.

16.2 Principal Conclusions

Greenhouse Gas Emissions

The Proposed Actions would not result in a significant adverse greenhouse gas emissions and climate change impact. The Proposed Actions would generate an estimated 82,820.77 metric tons of carbon dioxide equivalent (CO_2e) annually under worst-case conditions. Of these annual CO_2e emissions, an estimated 36,061.19 tons would be from building operations (if totally powered by natural gas), and an estimated 46,759.58 metric tons would result from mobile sources. Under this worst-case scenario, the project-generated GHG emissions would be less than 0.15 percent of the City's overall 2022 GHG emissions of approximately 53.7 million metric tons (the latest available data). Based on the assumption that construction-generated GHG emissions would be equivalent to between five- and ten-years' worth of operational GHG emissions, the estimated construction-generated GHG emissions would be approximately between 180,306 and 360,612 metric tons of CO_2e.

[1] Pursuant to CEQR, the GHG assessment is based on total GHG emissions associated with a project, rather than the relative increment of a project's GHG emissions as compared to the No-Action scenario.

The Proposed Actions would advance New York City's GHG reduction goals because the Proposed Development would comply with Local Law 154 by using electric-powered HVAC and hot water systems. Further, the Proposed Development would utilize heat pumps to the extent practicable, which would reduce GHG emissions. Project-generated development would be required to comply with other local laws intended to reduce the GHG emissions such as Local Law 22 of 2008 (known as the New York City Climate Protection Act); the Greener, Greater Building Plan; Local Law 66 of 2014 ("80 x 50"); Local Law 133 of 2016; and the New York City Conservation Code. The new buildings would be subject to the New York City Energy Conservation Code (NYCECC), which was updated in 2020 to be one of the most stringent energy efficient standards nationwide for sustainability and efficiency. The Proposed Development would therefore comply with the City's emissions reduction goals by enabling new construction that minimizes GHG emissions and adheres to the resource- and energy-efficiency standards for new buildings in New York City.

The Proposed Development would enable a gaming facility with table games in New York City, a municipality where no such facilities currently exist. The Proposed Facility is expected to draw customers that currently travel outside of New York City to destinations such as Atlantic City, upstate New York, Pennsylvania, or Connecticut for table games. The reduced GHG emissions from changes to behavioral or travel patterns are not accounted for to represent a worst-case condition.

Furthermore, the Proposed Development is expected to increase the accessibility to public transit at the Development Site through improvements to Ring Road. As a part of the roadway improvements, a parking lane would be included and could serve as a future bus stop location with approval by NYCDOT and the Metropolitan Transportation Authority (MTA). Thus, the Proposed Development is expected to generate fewer emissions from mobile source emissions than estimated using CEQR methodologies.

Climate Change

As described in Policy 6.2 of the WRP Assessment (Appendix A), the Preliminary Flood Insurance Rate Maps (pFIRM) published by the Federal Emergency Management Agency (FEMA) identifies portions of the Development Site in a one percent annual chance (1-in-100 year) floodplain. This floodplain has a Base Flood Elevation (BFE) of 13 feet, as measured in the North American Vertical Datum of 1988 (NAVD88). Additional portions of the Development Site are shown in the 0.2-percent annual chance (1-in-500 year) floodplain, and the majority of the Development Site is an area of minimal flood hazard chance. The Development Site is in a coastal area that is susceptible to storm surge and coastal flooding.

Portions of the Development Site are also in the future 100- and 500-year projected flood zones that were developed by the New York City Panel on Climate Change (NPCC) through the year 2100. These projected future flood zones account for a projected sea level rise (SLR) of 75 inches.

The Proposed Development will have a Design Flood Elevation (DFE) of 15 feet. At this elevation, the Proposed Development would be two feet above the current BFE. Mechanical spaces are planned at or above elevation 15 feet. The proposed floodproofing would be achieved by a combination of waterproofed exterior walls and slabs, and, where applicable, flood gates at the building entrances. The Proposed Development would not preclude the ability to increase the DFE post-construction.

The Proposed Development would not increase the potential for flooding or flooding severity. The Proposed Actions also would not preclude the implementation of adaptive solutions in the future, including any technological advancements not yet developed. Based on this information, the Proposed Actions would be consistent with the New York City policies regarding adaptation to climate change despite the Development Site's location in an area of flood risk.

16.3 Methodology

Greenhouse Gas Emissions

New York City determined that a CEQR GHG analysis is appropriate for certain projects because:

1. greenhouse gas emission levels may be directly affected by a project's effect on energy use;
2. the United States Supreme Court has upheld the determination that carbon dioxide, one of the main greenhouse gases, is an air pollutant, subject to regulation as defined by the Clean Air Act;
3. Local Law 22 of 2008 codified *PlaNYC's* citywide GHG emissions reduction goal of 30 percent below 2005 levels by 2030; and
4. Local Law 66 of 2014 codified the City's longer-term goal to reduce GHG emissions to 80 percent below 2005 levels by 2050 and has published a study evaluating the potential for achieving that goal.

Per the *CEQR Technical Manual*, the GHG consistency assessment focuses on Proposed Actions that would result in the development of 350,000 sf or greater and other energy-intense projects. The Proposed Actions are projected to result in approximately 3,134,040-gsf of commercial development and accessory parking across the two buildings.

A project's GHG emissions can generally be assessed in two steps. For step one, a project's emissions are estimated using the main emissions sources: on-site operational emissions (direct and indirect); mobile source emissions (direct and indirect); and, when applicable, emissions from construction or solid waste management. After the emissions are estimated, the source of GHG emissions are examined and qualitatively compared to the City's GHG reduction goals. As defined in the *CEQR Technical Manual*, the qualitative goals that should be assessed, as relevant to the Proposed Actions, are:

- construct new resource- and energy-efficient buildings or improve the efficiency of existing buildings;
- provide clean, renewable power through the replacement of inefficient power plants with state-of-the-art technology and expanding the use of clean distributed power generation;
- encourage transit-oriented development; and
- encourage sustainable transportation by improving public transit, improving the efficiency of private vehicles, and decreasing the carbon intensity of fuels.

Recognized Greenhouse Gases

GHGs are the gaseous constituents of the atmosphere – both natural and anthropogenic – that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the general warming of the Earth's atmosphere, or the "greenhouse effect." Some GHGs, such as carbon dioxide, occur naturally and are emitted into the atmosphere through both natural processes and human activities. The principal GHG emissions of concern resulting from human activities are described below.

Carbon Dioxide (CO_2)

Carbon dioxide (CO_2) enters the atmosphere via the combustion of fossil fuels (oil, natural gas, and coal), solid waste, trees, and wood products, and by other chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle. Although not the GHG with the strongest greenhouse effect per molecule, CO_2 is by far the most abundant and most influential GHG.

Methane (CH_4)

Methane (CH_4) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, as well as by the decay of organic waste in municipal solid waste landfills. Methane, in addition to nitrous oxide (noted below), plays an important role because the removal processes for these compounds are limited and they have a relatively high impact on global climate change as compared to an equal quantity of CO_2.

Nitrous Oxide (N_2O)

Nitrous oxide (N_2O) is emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste.

Fluorinated Gases

Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are powerful synthetic greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone depleting substances (e.g., chlorofluorocarbons [CFCs], hydrochlorofluorocarbons [HCFCs], and halons). These gases are typically emitted in smaller quantities. However, because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases (High GWP gases).

Global Warming Potential

The *CEQR Technical Manual* lists six GHGs that could potentially be included in the scope of an environmental review: CO_2, N_2O, Methane, Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF_6). This analysis focused on CO_2, N_2O, and methane because no significant direct or indirect sources of HFCs, PFCs, or SF_6 would result from the adoption of the Proposed Actions.

GHGs differ in their ability to trap heat. To compare emissions of GHGs, compilers use a weighting factor called a Global Warming Potential (GWP). The heat-trapping ability of

one metric ton (1,000 kilograms (kg)) of CO_2 is taken as the standard, and emissions are expressed in terms of CO_2e, but can also be expressed in terms of carbon equivalents. The GWPs for the main GHGs are presented in Table 16-1.

Table 16-1: Global Warming Potential for Primary Greenhouse Gases

Greenhouse Gas	Common Sources	Warming Potential
CO_2	Fossil fuel combustion, forest clearing, cement production	1
CH_4 - Methane	Landfills, production and distribution of natural gas and petroleum, anaerobic digestion, rice cultivation, fossil fuel combustion	21
N_2O - Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure	310
HFC's – Hydro-fluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing	140-11,700[1]
PFC's - Perfluorocarbons	Aluminum production, semiconductor manufacturing	6,500-9,200[2]
SF_6 - Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production	23,900

[1, 2] The GWPs of HFCs and PFCs vary depending on the specific compound emitted. A full list of these GWPs is available at https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.
Note**:** Since the Second Assessment Report (SAR) was published in 1995, the International Panel on Climate Change (IPCC) has published updated GWP values in its Fifth Assessment Report (AR5) that reflect new information on atmospheric lifetimes of greenhouse gases and an improved calculation of the radiative forcing of CO_2. However, GWP values from the SAR are still used by international convention to maintain consistency in GHG reporting, including by the United States when reporting under the United Nations Framework Convention on Climate Change.

Applicable Regulations

To reach its aggressive sustainability goals, the City has launched initiatives and implemented various local laws aimed at energy efficiency measures and reduction of GHG emissions. The following regulations provide guidance for current buildings and future growth in New York City and are applicable to the Proposed Development.

Local Law 22 of 2008

In 2008, Local Law 22 – known as the New York City Climate Protection Act (the "GHG reduction goal") – codified the City's goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 ("30 x 30"). This goal was developed to plan for an increase in population of almost one million residents while achieving significant greenhouse gas reductions.

Greener, Greater Building Plan

The Greener, Greater Building Plan (GGBP) is a set of comprehensive energy efficiency laws which target larger buildings in New York City. The plan consists of four local laws that require: 1) large buildings (originally buildings greater than 50,000 sf) to annually benchmark their energy consumption (Local Law 84 of 2009); 2) a local energy code to be adopted (Local Law 85 of 2009); 3) an energy audit and retro-commissioning conducted every 10 years (Local Law 87 of 2009); and 4) lighting upgrade in non-residential spaces to meet code, and provision of sub-meters to large commercial tenants (Local Law 88 of 2009).

Local Law 66 of 2014

In 2014, the City Council passed Local Law 66, a law that committed the City to reduce citywide greenhouse gas emissions by 80 percent below 2005 levels by 2050("80 x 50"). The law also set forth an interim target to reduce GHG emissions 40 percent by 2030 (known as "40 x 30").

Local Law 133 of 2016

In 2016, City Council passed Local Law 133, which made the reporting requirements of energy and water consumption data applicable to all buildings over 25,000 sf, expanding from the prior Local Law 84 (2009). This law also requires the city to provide benchmarking assistance.

Local Law 97 of 2019[2]

Local Law 97 reflects the city's aim to reduce overall emissions by 80 percent by 2050. Under Local Law 97, buildings over 25,000 gsf must meet annual whole-building carbon intensity limits based on building type beginning in 2024. To comply, building owners must submit an emissions intensity report stamped by a registered design professional every year starting in 2025. For buildings that do not comply with the emissions targets, building owners must pay a fine if the building's carbon footprint exceeds the limit. The law, which applies citywide, incentivizes reduction in GHG emissions.

New York City Energy Conservation Code (NYCECC)

The NYCECC is one of the Construction Codes that established minimum standards for the design, construction, and occupancy of buildings to protect public health, safety, general welfare, and the environment. The energy code regulates building systems that most impact energy use: the envelope, heating and cooling, hot water, lighting, and power. The code specifies requirements for each system to ensure a baseline of efficiency is built in. The NYCECC continues to ensure that the construction of new buildings, additions, and alterations will contribute to the 80 percent greenhouse gas reduction by 2050.

Local Law 154 of 2021

In 2021 City Council passed Local Law 154, which prohibits the combustion of substances with certain emissions profiles in buildings within the City. Specifically, the combustion of a substances that emits 25 kilograms or more of carbon dioxide per million British thermal units of energy is prohibited in new buildings. The law sets restrictions on fossil fuel usage in newly constructed residential and commercial buildings by phasing in strict emissions limits beginning in 2024. By the end of 2027, Local Law 154 requires that all new buildings approved for construction must be powered only by non-combustion mechanical systems.

[2] In September of 2024 the New York City Department of Buildings issued proposed changes to Local Law 97, including changes to how the City would calculate emissions. These changes would alter the rules of Local Law 97.

Greenhouse Gas Emissions Sources

Operational Building GHG Emissions

Per the *CEQR Technical Manual*, annual GHG emissions should be estimated based on a project's anticipated future floor area and energy usage. Energy usage was estimated based on the multipliers provided in Table 15-1 in Chapter 15 "Energy" of the *CEQR Technical Manual*. While the primary source of energy for the Proposed Development would be electricity, natural gas was used as a worst-case condition. Table 18-3 of the in Chapter 18 "Greenhouse Gas Emissions and Climate Change" of the *CEQR Technical Manual* provided the conversion factor for natural gas to identify the total GHG emissions of the Proposed Actions in metric tons.

Mobile Source Emissions

The number of With-Action annual weekday vehicle trips by mode (passenger vehicles, taxis, and trucks) was taken from the transportation planning assumptions developed for the traffic analysis presented in Chapter 14 of this EIS, "Transportation." The assumptions used to calculate annual GHG vehicular emissions include the average daily weekday and Saturday person-trips and delivery trips by use and the percentage of vehicle trips by mode. To conservatively estimate annual totals, the number of trips on Sunday was assumed to equal the number of Saturday trips.

The average one-way trip distances shown in Tables 18-5 and 18-6 of the *CEQR Technical Manual* were used to estimate annual vehicle miles traveled by cars and taxis. The average truck trip was assumed to be 38 miles, per the *CEQR Technical Manual*. Table 18-7 of the *CEQR Technical Manual* was used to determine the percentage of vehicle miles traveled by road type. The *CEQR Technical Manual*'s mobile GHG emissions calculator was used to obtain an estimate of car, taxi, and truck GHG emissions attributable to the Proposed Actions.

Construction Emissions

GHG emissions associated with project-generated construction are based on analyses prepared for other development projects in New York City that have shown construction emissions (both direct and emissions embedded in the production of materials, including on-site construction equipment, delivery trucks, and upstream emissions from the production of steel, rebar, aluminum, and cement used for construction) would be equivalent to the total emissions from the operation of the buildings over approximately five to ten years. Construction-generated emissions were estimated using this assumption.

Emissions from Solid Waste Management

The Proposed Actions would not fundamentally change the City's solid waste management system; therefore, an estimate of emissions from solid waste management is not warranted.

Climate Change

Depending on a project's sensitivity, location, and useful life, a qualitative discussion of the potential effects of climate change on a proposed project may be appropriate in an environmental review. Rising sea levels, increases in storm surges, and coastal flooding

are the most immediate threats in New York City for which site-specific conditions can be assessed, and an analysis of climate change may be deemed warranted for sites located within the existing 100- or 500-year flood zones.

Per the FEMA Preliminary Flood Insurance Rate Maps (FIRMs) issued in 2015, the Development Site is partially in the 100- and 500-year flood zones identified by FEMA. The SLR projections published by NPCC are outlined in Table 18-2 of the *CEQR Technical Manual*. Table 18-2, the *NPCC Baseline Climate and Mean Annual Changes* data indicate that SLR could reach 31 inches by 2050. Because portions of the Development Site are within the projected future 100-and 500-year flood plains from the 2020s through 2100, the Development Site is susceptible to storm surge and coastal flooding, and an assessment of climate change is warranted.

Climate Change Resilience

The Proposed Actions would allow new construction within a coastal floodplain and the potential effects of global climate change on the Proposed Actions must be considered. Standards for analysis of the effects of climate change on a proposed project are still being developed and have not yet been defined in CEQR. However, the Waterfront Revitalization Program (WRP)[3] Assessment addresses climate change and SLR. The WRP requires consideration of climate change and SLR in the planning and design of waterfront developments. As set forth in more detail in the *CEQR Technical Manual*, the provisions of the revised WRP are applied by city agencies when conducting an environmental review.

Development of Policy to Improve Climate Change Resilience

Federal

In recognition of the important role that the federal government plays in addressing adaptation to climate change, a federal executive order signed October 5, 2009, charged the Interagency Climate Change Adaptation Task Force – composed of representatives from more than 20 federal agencies – to recommend policies and practices that can reinforce a national climate change adaptation strategy. The 2011 progress report by the Task Force included recommendations to build resilience to climate change in communities by integrating adaptation considerations into national programs that affect communities, facilitating the incorporation of climate change risks into insurance mechanisms, and addressing additional crosscutting issues, such as strengthening resilience of coastal, ocean, and Great Lakes communities.[4]

In February 2013, federal agencies released a Climate Action Plan[5], outlining a plan for resiliency that includes building stronger and safer infrastructure through agency support in investment, developing standards, and other measures. The plan was followed by an executive order[6] in November 2013 that directed agencies to prepare the nation for

[3] City of New York Department of City Planning. *The New York City Waterfront Revitalization Program*. 2013. Approved by NY State in 2016.
[4] The White House Council on Environmental Quality. Progress Report of the Interagency Climate Change Adaption Task Force: Federal Actions for a Climate Resilient Nation. October 2011.
[5] Executive Office of the President. *The President's Climate Action Plan*, June 2013.
[6] The White House. Executive Order [13653] – Preparing the United States for the Impacts of Climate Change, November 1, 2013.

impending impacts on the environment brought by climate change and to implement risk management strategies to lessen the harm done by these impacts.

In January 2015, then-President Obama issued an executive order[7] requiring federal projects use natural systems and approaches where possible to develop adaptation alternatives, and to redefine the floodplain elevation. This executive order was revoked by Executive Order 13807 of August 15, 2017, before being reinstated by Executive Order 14030 on May 20, 2021.

New York State

The New York State Sea Level Rise Task Force was created in 2007 to assess potential impacts on the State's coastlines from rising seas and increased storm surge. The Task Force prepared a report of its findings and recommendations including protective and adaptive measures.[8] The recommendations seek to: provide more protective standards for coastal development, wetlands protection, shoreline armoring, and post-storm recovery; implement adaptive measures for habitats; integrate climate change adaptation strategies into state environmental plans; and amend local and state regulations or statutes to respond to climate change. The Task Force also recommended the formal adoption of projections of SLR.

The New York State Climate Action Plan Interim Report released by the task force in 2010 identified a number of policy options and actions that could increase the climate change resilience of natural systems, the built environment, and key economic sectors—focusing on agriculture, vulnerable coastal zones, ecosystems, water resources, energy infrastructure, public health, telecommunications and information infrastructure, and transportation.[9] New York State's Community Risk and Resiliency Act (CRRA)[10] requires that applicants to certain State programs demonstrate that they have taken into account future physical climate risks from storm surges, sea-level rise and flooding, and required the New York State Department of Environmental Conservation (NYSDEC) to establish official State sea-level rise projections by January 1, 2016. These projections provide the basis for State adaptation decisions and are available for use by all decision makers. NYSDEC published a draft on November 2, 2015, proposing to adopt existing projections for use (see discussion of NPCC below). CRRA applies to specific State permitting, funding and regulatory decisions, including smart growth assessments; funding for wastewater treatment plants; siting of hazardous waste facilities; design and construction of petroleum and chemical bulk storage facilities; oil and gas drilling, and State acquisition of open space.

New York City

In New York City, the Climate Change Adaptation Task Force is tasked with securing the City's critical infrastructure against rising seas, higher temperatures, and fluctuating water supplies that are projected to result from climate change. The Task Force is composed of New York City and State agencies, public authorities, and companies that operate, regulate, or maintain critical infrastructure in New York City. The approaches suggested

[7] The White House. Executive Order [13690] – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input. January 30, 2015.
[8] New York State Sea Level Rise Task Force. *Report to the Legislature*. December 2010.
[9] NYSERDA. New York State Climate Action Plan. Interim Report. November 2010.
[10] Community Risk and Resiliency Act. Chapter 355, NY Laws of 2014. April 9, 2013. Signed September 22, 2014.

for the City include ways to assess risks, prioritize strategies, and examine how standards and regulations may need to be adjusted in response to a changing climate.

To assist the task force, the NPCC – a panel that includes leading climatologists, sea-level rise specialists, adaptation experts, engineers, and representatives from the insurance and legal sectors – has prepared a set of climate change projections for the New York City region[11] and recommended approaches to create an effective adaptation program for critical infrastructure. The recommendations were last updated in April 2024.[12]

The climate change projections put forth by the NPCC included a summary of previously published baseline and projected climate conditions throughout the 21st century including heat waves and cold events, intense precipitation and droughts, SLR, and coastal storm levels and frequency. The NPCC projected that sea levels are likely to increase by the 2050s in the range of 14 to 19 inches, with a higher end estimate of up to 39 inches by the 2080s; and, by 2100, up to five feet. Under worst-case scenario projections, sea levels could rise up to 81 inches by the 2080s and 114 inches by 2100 due to accelerated loss of land-based ice. In general, sea level rise in NYC is projected to exceed the global average and accelerate as the century progresses. These changes to the climate could lead to thermal expansion and redistribution of ocean water mass in the mid-Atlantic region, including New York City. This could also cause an increase in coastal flooding in the southeast of the United States.

The New York City Green Code Task Force (2010 Report) also recommended strategies to address climate change resilience in buildings and to improve storm water management.[13] Some of the recommendations called for further study, while others that could serve as the basis for revisions to building code requirements. Notably, one recommendation is to require new developments within the projected future 100-year floodplain to meet the same standards as buildings in the current 100-year flood zone.

The City is currently working with FEMA to revise the FIRMs using the recently acquired detailed Light Detection and Ranging (LiDAR) data. In 2015, FEMA published Preliminary Flood Insurance Rate Maps as part of a citywide flood map update.

The New York City Department of Environmental Protection (NYCDEP) is evaluating adaptive strategies for City water and wastewater infrastructure. The City has already developed a *New York City Green Infrastructure Plan,*[14] and a *Sustainable Stormwater Management Plan.*[15] Additionally, NYCDEP published the Uniform Stormwater Rule[16], which regulates how stormwater is managed (both quality and volume) for new developments. Many of the strategies discussed in these plans would improve the City's resilience to climate change.

Strategies and guidelines to address the effects of climate change are being developed across levels of government, and the NYC City Council released a report containing

[11] New York City Panel on Climate Change. Climate Change Adaptation in New York City: Building a Risk Management Response. Annals of the New York Academy of Sciences, May 2010.
[12] New York City Panel on Climate Change 4th Assessment Climate Risk and Equity: Advancing Knowledge Toward a Sustainable Future – Introduction. April 2024.
[13] New York City Green Codes Task Force. *Recommendations to New York City Building Code*. February 2010.
[14] New York City. New York City Green Infrastructure 2023 Annual Report.
[15] New York City. Sustainable Stormwater Management Plan. October 2012.
[16] New York City. Uniform Stormwater Rule. February 2022.

recommendations on resiliency and planning for climate change.[17] Currently, there are no specific requirements or accepted recommendations for development projects in New York City. However, the WRP Assessment requires consideration of climate change and SLR in planning and design of waterfront development. As set forth in more detail in the City's *CEQR Technical Manual*, the provisions of the WRP are applied by city agencies when conducting environmental review and are described further in Chapter 2 of this EIS, "Land Use, Zoning, and Public Policy."

The WRP Policies 6.1 and 6.2 require that developments in the NYC Coastal Zone Boundary be reviewed under CEQR to consider potential risks to the project related to coastal flooding, including critical electrical and mechanical systems, residential living areas, and public access areas. The policies further require that the developments incorporate design techniques to address these risks. Projects with new structures directly in the water or on the water should be designed to protect the structures from flooding and storm surge. The shoreline waterfront and habitat should be protected with vegetation and other measures.

Climate change considerations and measures to increase climate resilience that would be implemented as part of the Proposed Actions are considered in this assessment and the WRP Assessment provided in Appendix A. If additional climate change considerations are incorporated into state and/or local laws prior to project-generated construction, the development would be constructed to meet or exceed the minimum requirements in effect at the time of construction.

New development in a FEMA-identified floodplain must also follow the 2022 New York City Building Code Appendix G "Flood-Resistant Construction." The objectives of the Building Code are similar to the climate change policies described above, including:

- Protect human life;
- Minimize the expenditure of public money for flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding;
- Minimize prolonged business interruption;
- Minimize damage to structures located in areas of special flood hazard;
- Minimize damage to public facilities and utilities such as water, electricity, telephone and sewer lines, and streets and bridges located in flood hazard areas;
- Maintain a stable tax base by providing the sound use and development of the flood prone areas; and
- Ensure that potential owners and occupants are notified that property is within flood hazard areas.

Importantly, New York City Building Code requires that new commercial buildings have a DFE at least two feet about the BFE.

[17] New York City. Securing Our Future: Strategies for New York City in the Fight Against Climate Change. March 2020.

16.4 Assessment

Operational Building GHG Emissions

The Proposed Actions would result in development of the Proposed Facility and replacement golf clubhouse and improvements to Ring Road. Both buildings would use electricity to power their HVAC systems because of the requirements of Local Law 97 of 2019 and the emissions restrictions of Local Law 154 of 2021. However, natural gas was used as a worst-case condition (and to capture the natural gas that may be combusted by eating and drinking establishments for cooking in the Proposed Facility), and the estimated worst-case GHG emissions associated with the Proposed Actions during the operational period are shown in Table 16-2~~Table 16-2~~.

Table 16-2: Project-Generated Annual Operational Emissions

With-Action Energy Use (MMBTUs/Year)	Conversion Factor for Natural Gas (kg CO_2e/MMBtu)	Projected Worst-Case GHG Emissions (kg)	GHG Emissions (metric tons)
677,892.85	53.196	36,061,188	36,061.19

Mobile Source GHG Emissions

The projected daily average With-Action trips by passenger vehicles, taxis, and trucks are summarized in Table 16-3~~Table 16-3~~. Passenger vehicles would account for approximately 28,820, taxis would account for 10,152, and trucks would account for 328 daily one-way trips.

Table 16-3: Daily Average One-Way Trips (Including Off-Peak) by Mode

Daily Trips	Passenger Vehicles	Taxi	Truck[2]
Weekday	27,005	9,613	365
Weekend	33,356	11,498	236
Average[1]	**28,820**	**10,152**	**328**

1 The average daily trips were calculated by multiplying the weekday trips by 5/7 (representing 5 days of out of a 7-day week) and adding to the product of the weekend trips multiplied by 2/7 (representing 2 days out of a 7-day week).
2 This includes trucks and coach buses.

As presented in Table 16-4~~Table 16-4~~, the vehicle trips generated by the Projected Actions would travel an estimated 117.9 million miles annually. Of these 117.9 million vehicle miles traveled annually, passenger vehicles would account for 84.2 million miles, taxis would account for 29.2 million miles, and trucks would account for 4.6 million miles.

Table 16-4: With-Action Condition – Projected Annual Miles Traveled

			Total Miles	
Vehicle Type	**Daily Trips**	**Multiplier[1]**	**Daily**	**Yearly**
Passenger Vehicles	28,820	8	230,557	84,153,149
Taxis	10,152	7.88	79,994	29,197,950
Trucks	328	38	12,469	4,551,341
Total	**39,299**	**-**	**323,020**	**117,902,440**

1. Per *CEQR Technical Manual*.

The mobile GHG emissions calculator provided in the *CEQR Technical Manual* was used to obtain an estimate of car, taxi, and truck GHG emissions attributable to the Proposed

Actions. Table 16-5~~Table 16-5~~ shows annual mobile source emissions related to the Proposed Actions would result in an estimated 46,760 metric tons of CO_2e.

Table 16-5: Annual Mobile Source Emissions (CO_2e – metric tons/year)

Road Type	Passenger Vehicles	Taxis	Trucks	Total CO_2e
Local	12,911.74	4,023.24	3,350.19	20,285.17
Arterial	12,768.68	3,965.15	3,001.11	19,734.93
Interstate/Expressway	4,398.91	1,342.59	997.99	6,739.49
Total	**30,079.33**	**9,330.98**	**7,349.28**	**46,759.58**

Cumulative Operational (Building and Mobile) GHG Emissions

The estimated With-Action GHG emissions are shown in Table 16-6~~Table 16-6~~. The estimated total of 111,167.89 metric tons of GHG emissions is comprised of 36,061.19 metric tons of CO_2e from operational emissions and 46,759.58 metric tons of CO_2e from mobile source emissions, which is approximately 0.15 percent of New York City's 2022 annual total of 53.7 million metric tons.

Table 16-6: Summary of Projected Worst-Case Annual Operational GHG Emissions

Emissions Source	CO_2e Emissions (metric tons)
Operations	36,061.19
Mobile Sources	46,759.58
Total	**82,820.77**

Construction GHG Emissions

Per the *CEQR Technical Manual*, emissions associated with construction of the Proposed Development were assessed qualitatively and are conservatively estimated to be equivalent to approximately five to ten years of operational emissions, including both direct energy and emissions embedded in materials (extraction, production, and transport). For the Proposed Development – which would generate a CO_2e of 36,061.19 metric tons annually during its operational period – the estimated construction-generated GHG emissions would equate to between 180,306 and 360,612 metric tons of CO_2e over the course of construction.

Consistency with the GHG Reduction Goal

Per the *CEQR Technical Manual*, the assessment of consistency with the City GHG reduction goal should answer the following question: *"Is the project consistent with the goal of reducing GHG emissions, specifically the attainment of the City's established GHG reduction goal of reducing citywide GHG emissions by 30 percent below 2005 levels by 2030?"* To determine consistency with the City's overall GHG reduction goal, the four major goals as cited in the *CEQR Technical Manual* are used to assess a project:

- Pursue transit-oriented development;
- Generate clean renewable power through the replacement of inefficient power plants with state-of-the-art technology and expanding the use of clean distributed generation (not applicable in the case of the Proposed Actions);

- Construct new resource- and energy-efficient buildings (including the use of sustainable construction materials and practices) and improve the efficiency of existing buildings; and
- Encourage sustainable transportation through improving public transit, improving the efficiency of private vehicles, and decreasing the carbon intensity of fuels.

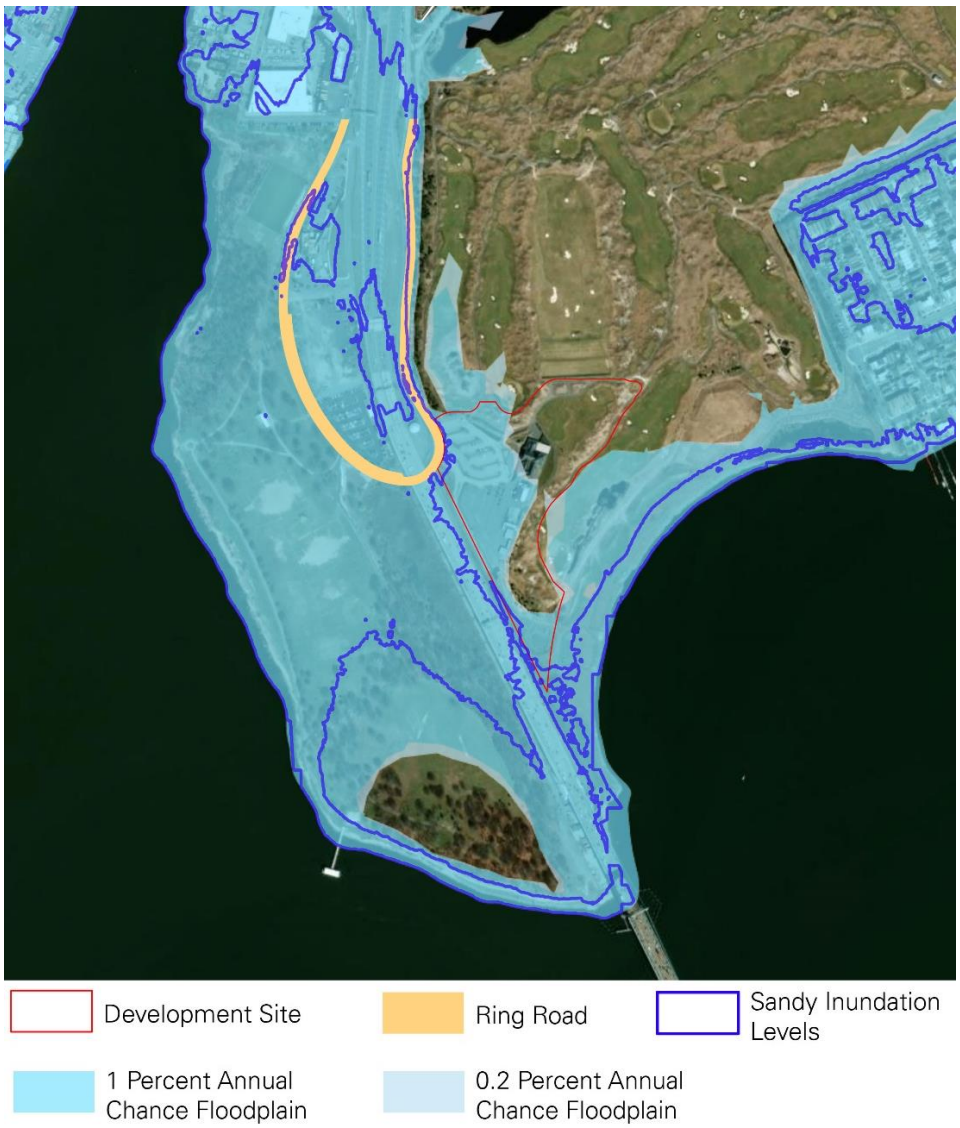
The Proposed Actions show consistency with these goals in that:

- The Proposed Actions would make improvements to Ring Road, including an on-street parking lane, which would also have the capacity to serve, in part, as an MTA bus stop. This would expand residents' and visitors' options for public transportation in an area where few public transportation options are available;
- As a part of the improvements to Ring Road, new sidewalks and a dedicated two-way cycling lane would be developed within the right-of-way, which would provide residents' and visitors' with safer, mor sustainable, and improved connections within the Park and to existing pedestrian and cycling infrastructure in the surrounding area;
- Project-generated development would connect to existing urban infrastructure, making use of existing materials. The proposed buildings would be constructed with modern construction materials typical of other recent construction projects in New York City;
- Currently, stormwater generated on the Development Site and Ring Road is discharged directly to the East River and Westchester Creek. The Proposed Development would follow the Unified Stormwater Rule to manage stormwater volumes and follow Best Management Practices (BMPs) to avoid potential impacts to surrounding waterbodies. The Uniform Stormwater Rule also requires that a portion of stormwater runoff from a newly developed site be treated. Thus, the Proposed Actions would improve water quality over existing conditions;
- The Proposed Development would be subject to the NYCECC, which are among the nation's highest standards for sustainability and efficiency. The NYCECC governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope of new buildings. In compliance with this code, project-generated development must meet standards for energy efficiency;
- The Proposed Development would be required to comply with GHG-reduction measures required by local laws, such as Local Law 22 of 2008, Local Law 66 of 2014, Local Law 97 of 2019, and Local Law 154 of 2021. The Proposed Development would use electric-powered HVAC and hot water systems;
- Portions of the Development Site would be improved with new native and non-invasive plantings, which would capture and sequester CO_2 through photosynthesis;
- The Proposed Actions would not permit energy-intensive uses such as data centers or web hosting facilities, nor would they remove a source of energy generation. Fixtures and appliances would comply with the energy efficiency standards of the New York City Energy Conservation Code. For these reasons, the Proposed Actions would not result in a significant adverse impact on energy systems; and
- The Proposed Facility and replacement golf clubhouse would be serviced by private carters for solid waste and do not have the potential to affect the city's solid waste management system.

Resilience of the Proposed Development to Climate Change

To determine absolute elevations of floodwaters that could affect the Proposed Actions, the 2015 pFIRMs published by FEMA were consulted to identify the area's flood zones.[18] The Development Site contains AE and X flood zones, and other areas in an area of minimal flood hazard chance. The AE zone has a one percent annual (100-year flood zone) flood hazard chance, and the X Zone has a 0.2 percent annual (500-year flood zone) flood hazard chance. Within the Development Site's AE zones, the base flood elevation is 13 feet above sea level; FEMA pFIRMs do not provide a flood elevation in Zone X. Both AE and X zones are mapped across portions of the Development Site and Ring Road.

Figure 16-1: Super Storm Sandy Inundation Zone



Note: This graphic was added for the FEIS.

[18] FEMA, Region II Coastal Analysis and Mapping Flood Hazard Mapping Tool http://www.region2coastal.com/view-flood-maps-data/what-is-my-bfe-address-lookup-tool/

The replacement golf clubhouse would be sited within an area of minimal flood hazard. The flood plains identified in the FEMA pFIRM do not directly account for sea level increases from climate change. For climate change effects, the NPCC directs that these flood levels should be increased by 30 inches (NPCC 2050) for commercial uses and 75 inches (NPCC 2100) for critical infrastructure and residential uses. Figure 16-1 shows the projected future floodplains in the year 2100 in comparison to the Superstorm Sandy inundation zone.

Because the Development Site is within the NYC Coastal Zone Boundary, the potential effects of global climate change were considered in the WRP Assessment in Appendix A of this EIS. The WRP identified several project features of the Proposed Development that would be considered "vulnerable" and "critical." Of the features analyzed, the cellar of the Proposed Facility would be the lowest-lying feature at approximately 15 feet NAVD88. The DFE would be two feet above the current BFE, as required by Appendix G of the New York City Building Code. Mechanical spaces are planned at or above elevation 15 feet. The proposed floodproofing would be achieved by a combination of waterproofed exterior walls and slabs, and, where applicable, flood gates at the building entrances. The replacement golf clubhouse would have a cellar at an elevation of 25 feet. Both the Proposed Facility and replacement golf clubhouse would have a ground floor elevation of 35 feet. The ground floor of the Proposed Facility would contain retail, hotel lobby, restaurants, and gaming space. Hotel rooms within the Proposed Facility would not be developed below an elevation of 75 feet. The replacement golf clubhouse ground floor would contain office space, pro-shop, bar, and kitchen space.

As further discussed in the WRP (Appendix A) the following resiliency measures would be incorporated into the Proposed Development:

- Native and non-invasive vegetation would be planted on the Development Site;
- New development would comply with DEP's Unified Stormwater Rule, which would require pretreatment and volume control of stormwater before being discharged into the City's stormwater system;
- New development would use stormwater BMPs such as a green roofs, hydrodynamic separators, or other NYCDEP/NYSDEC-approved stormwater management practices to treat the stormwater directed off-site. Thus, the Proposed Actions would improve water quality over existing conditions;
- If mechanical space is developed below elevation 15, it would be dry floodproofed up to at least the DFE, as previously discussed; and
- Ring Road would be improved with new infrastructure to manage stormwater and reduce the potential for flooding.

Based on the above review and design commitments, the Proposed Actions would be consistent with New York City policies regarding adaptation to climate change, and no significant adverse climate change impacts would occur as part of the Proposed Actions.