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Reuse and the Benefit to Community

Onondaga Lake Superfund Site

Introduction

Onondaga Lake is located in Onondaga County in upstate New York (Figure 1). The site includes the lake and seven major and other minor tributaries and upland sources of contamination. The lake covers about 4.6 square miles. Its shoreline borders the city of Syracuse, as well as the towns of Geddes and Salina and the villages of Solvay and Liverpool. In the late 19th Century and early 20th Century, Onondaga Lake served as a popular tourist destination with beaches, resorts and amusement parks. During the period between the late 1800s to mid-1900s, the lake's western shore became industrialized. In the mid-1900s the fishing and resort industry began to decline and the lake was largely unusable. Cleanup of the lake began in the late 1970s. The coordination of State and federal officials, responsible parties, and local interest and expertise has been instrumental in the cleanup and restoration of Onondaga Lake.

Superfund site restoration and reuse can revitalize local economies with jobs, new businesses, tax revenues and local spending. Cleanup may also take place while active land uses remain on site. This case study explores the Onondaga Lake area's cleanup and reuse, illustrating the beneficial effects of continued use and redevelopment at Superfund sites.

Beneficial Effects

Onondaga Lake has been cleaned up and reestablished as a valuable recreational and ecological resource.

Site businesses and facilities employ about 248 people, providing estimated annual employment income of over $14 million and generating $83 million in annual sales revenue.

Site properties are currently valued at over $340 million and generate about $185 thousand in annual property tax revenues.

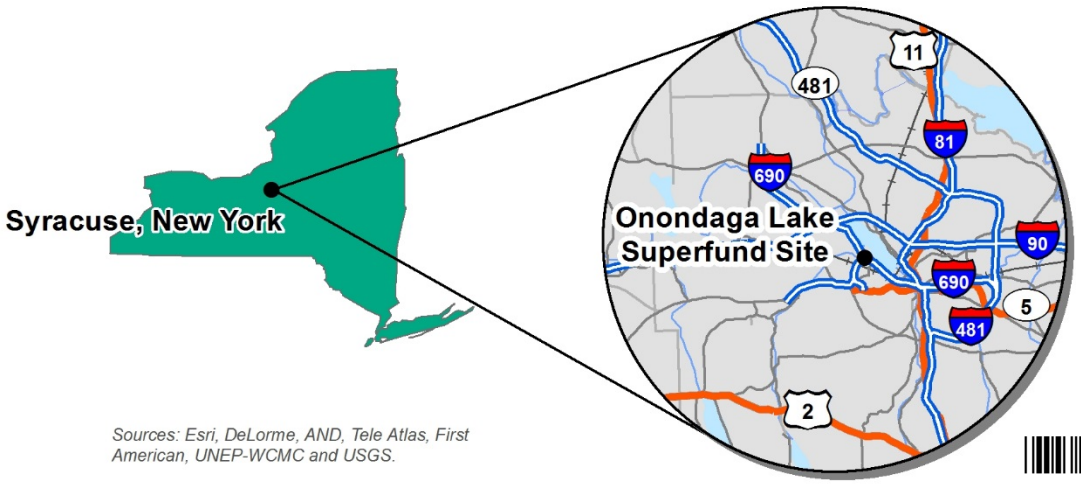

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Figure 1. Location map for the Onondaga Lake Superfund site near Syracuse in Onondaga County, New York.

Site History

Beginning in the 1880s, predecessor companies to Honeywell International (Solvay Process Company, Allied Chemical Corporation and Allied Signal) began operating on the west side of the lake because of the availability of salt and limestone along and in the vicinity of Onondaga Lake. The city's sanitary systems were built and expanded in the 1900s. The Metropolitan Syracuse Wastewater Treatment Plant (Metro) was built on the southeast end of the lake. The facility, a municipal sewage treatment plant, remains active and discharges to the lake.

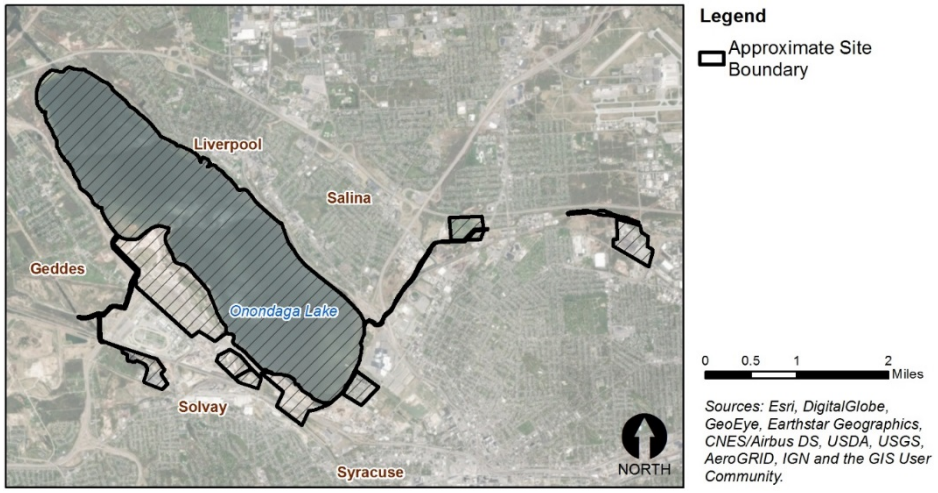
In the late 1800s and early 1900s, Onondaga Lake supported a thriving resort industry based upon the recreational utilization of the lake, including swimming and recreational fishing. The lake also had a plentiful cold-water fishery, which supported a commercial fishing industry until the late 1800s. In the late 1800s, Onondaga Lake became a receptacle for both industrial and municipal wastes.

Onondaga Lake received industrial and municipal sewage discharges both from local sources and upland sources. These discharges included nutrients and contaminants. Nutrients promoted the growth of bacteria and harmful microorganisms, which consumed oxygen, resulting in low oxygen levels in the lake. Onondaga lake surface water and sediment, and groundwater beneath adjacent upland sources, were impacted.

By 1940 state agencies banned swimming in the lake. The agencies also banned fishing between 1970 and 1986 due to contamination in fish. Since 1986, the ban on fishing has been replaced with fish consumption advisories issued by the New York State Department of Health (NYSDOH). In 1994, the lake and related upland sites were placed on the EPA Superfund program's National Priorities List. Several of the upland sites were already listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites (State Superfund program). The site includes Onondaga Lake and seven major and other minor tributaries and upland sources of contamination. The New York State Department of Environmental Conservation is the lead regulatory agency for most of the site's cleanup.

Honeywell is the primary potentially responsible party for the industrial pollution in and around the lake. Other industrial and manufacturing facilities along the shoreline and tributaries to the lake are sources of contamination as well.

Figure 2. Map showing the location of site subsites.



Site Cleanup and Transformation

Cleanup of the lake began in the late 1970s following passage of the Clean Water Act. In 1979, Metro upgraded treatment systems. In 1987, Onondaga County began implementing best management practices for sewer interception. In 1989, the State entered into a Consent Agreement with Onondaga County for studies to evaluate the need for upgrading Metro further and treating combined sewer overflows (CSOs). Since 1990, Onondaga County has improved Metro's capacity to treat wastewater. In addition to Metro upgrades, Onondaga County projects control stormwater runoff and reduce the number of CSOs. A fish consumption advisory remains in effect.

Between 1998 and 2018, site agencies selected remedies for 11 of the Superfund subsites. Investigations are ongoing at some of the subsites. Cleanup to date has included:

- Dredging contaminated sediments (completed in 2014).
- Excavating and capping contaminated soils.
- Capping contaminated sediments (completed in 2016).
- Treating contaminated materials (in place, on and off-site).
- Collecting and treating contaminated groundwater.
- Restoring habitat, including improving wetlands and planting native plants, shrubs and trees in shoreline areas (completed in 2017).

In 2012, EPA held a Superfund Job Training Initiative at the Site. The Superfund Job Training Initiative is a job readiness program that provides training and employment opportunities for people living in communities affected by Superfund sites. Twelve participants graduated from the program.

Honeywell currently maintains a visitors' center on the lake which provides the public with information on the cleanup. Public interest and knowledge has been incorporated throughout the cleanup to ensure a shared vision of continued and future use of the lake as a recreational and ecological center. Stakeholders and regulators have worked together to optimize the opportunity to turn a polluted lake into a valuable local and regional resource.

Beneficial Effects

Once considered to be the most polluted lake in America, Onondaga Lake is no longer a community eyesore. Today, the lake is open for recreation, including boating and fishing, and surrounded by a network of recreation trails. Current uses of the site include the St. Joseph's Health Amphitheater at Lakeview, parking areas (used for the New York State Fairgrounds and amphitheater events), Metro, Honeywell's groundwater treatment plant, and a busy industrial complex. Businesses on site bolster the regional economy, improve property values and help generate local and state tax revenues. Outdoor recreation opportunities allow people to enjoy the lake and bring together local people through the many events held on the lake. Improved ecological habitat provides the resources needed for native

Figure 3. Lake trails include rest areas with beautiful views of the water.

plants and animals. Site cleanup and transformation has resulted in additional area-wide investments including:

- State upgrades to the New York State Fairgrounds.
- Expansion of Destiny USA on the shore of Onondaga Lake.
- Cleanup and development of Onondaga Lake's Inner Harbor, including hotels and mixed-use buildings with multi-unit residences.

The following sections describes the beneficial effects of continued uses and reuses at the site.

Recreation Activities

Onondaga Lake is a beautiful natural and recreational resource in high demand by area residents and visitors. Much of the shoreline is Onondaga County parkland and popular cycling and walking trails run around most of the lake. Onondaga County and Honeywell plan to extend the trails so that they connect communities around the entire lake. The planned trails will also connect to the Empire State Trail. The Onondaga Yacht Club and a county-run marina are located on the eastern side of the lake, in Liverpool. A rental shop on the northern end of the lake rents kayaks and canoes. In addition to supporting everyday boating, fishing, and rowing, the lake also hosts fishing derbies, rowing events and other on-water events. Future plans call for a public boat launch, fishing piers and potential beach construction on site.

Figure 4. Active wildlife areas are located on the lake and in wetlands.

Ecological Benefits

As part of the cleanup, Honeywell has restored habitat areas, returning parts of the site to ecological use. To date, about 90 acres of wetlands have been restored and about 1.1 million native plants have been planted. This habitat provides the resources needed for a sustainable ecosystem. More than 250 wildlife species are now found on site, including more than 120 bird species. Threatened bird species listed on New York State's Endangered and Threatened Species list observed onsite include the pied-billed grebe, the northern harrier and the bald eagle. The lake bottom has been capped with natural materials that provide a habitat layer that promotes underwater vegetation growth. Areas of the lake have been restored to promote fish spawning. Ongoing monitoring and maintenance activities maintain the restoration efforts and remove invasive species.

Why Are Wetlands Economically Important?

Wetlands provide a wide variety of benefits, including flood control, water quality improvement, fish and wildlife habitat, and recreation amenities. Replacing the water treatment services they provide with manmade facilities, for example, would be expensive. Worldwide, wetlands are estimated to provide $14.9 trillion in ecosystem services. To learn more, see EPA's *Economic Benefits of Wetlands* fact sheet, available at https://www.epa.gov/sites/production/files/2016-02/documents/economicbenefits.pdf.

Educational Benefits

In 2012, the Onondaga Lake Conservation Corps was established. The Corps is a group of community volunteers who contribute to restoration projects that create and improve wildlife habitat in the Onondaga Lake watershed. Corps partners include Audubon New York, Montezuma Audubon Center, Onondaga Audubon Center, Onondaga Audubon Society, Parsons Corporation, O'Brien & Gere (OBG), Anchor QEA, Bond Schoeneck & King, SUNY College of Environmental Science and Forestry (SUNY-ESF), Habitat Gardening in Central New York, and Honeywell. Schools, community groups, local organizations and individuals are all welcome. The Corps also provides educational materials to help middle-school students learn about the cleanup. Corps worksheets discuss how science, technology, engineering and math have been vital parts of the restoration of Onondaga Lake and the surrounding area.

Honeywell Hometown Solutions (the company's corporate citizenship initiative) sponsors Honeywell Summer Science Week. The Milton J. Rubenstein Museum of Science & Technology organizes the event. In 2018, Honeywell Summer Science Week celebrated its 13th year. Over that time, more than 800 middle school students have completed field research and learned about the Onondaga Lake cleanup. Participating organizations include Montezuma Audubon Center, the U.S. Geological Survey, OBG, Parsons, the Onondaga County Department of Water Environment Protection, and faculty and graduate students from Syracuse University and SUNY-ESF.

County of Onondaga CSO Green Infrastructure

Onondaga County has developed an innovative green infrastructure strategy called "Save the Rain." The goal is to reduce the amount of stormwater entering storm sewers and contributing to CSO discharges, which historically contributed to contamination in the lake. Green infrastructure – rain gardens, green roofs, porous pavement, vegetated infiltration basins, tree plantings – helps reduce runoff by facilitating soil infiltration and the capture and reuse of stormwater before it enters the sewer system. A rainwater collection system at the Oncenter War Memorial Arena collects water that is used to make ice for the ice rink. The program also involves local youth in the Onondaga Earth Corps program. Onondaga Earth Corps and Save the Rain partner to maintain Syracuse's green infrastructure resources.

Figure 5. Green roofs offer interesting views while absorbing rainwater and reducing runoff

Figure 6. Green streets are both beautiful and functional

St. Joseph's Health Amphitheater at Lakeview

The St. Joseph's Health Amphitheater at Lakeview is an outdoor entertainment venue located on the shores of Onondaga Lake. It opened in 2015. The outdoor event complex can host up to 17,500 people in covered and lawn seating. It includes nature and recreation areas (the bike path continues through the amphitheater area), boat docks, and vendor and festival areas. Concert attendees enjoy views of the lake and sunsets from their seats. The amphitheater hosts more than 20 concerts per year. The facility generates about $300,000 in estimated annual sales revenues.

Figure 7. Amphitheater located on the shore of Onondaga Lake

Metro

Metro, a municipal sewage treatment plant, is located on the south shore of Onondaga Lake. Since 1990, Onondaga County has improved Metro's capacity and ability to treat wastewater through projects such as advanced nutrient removal, odor control upgrades, an aeration system upgrade, digital system improvements, increased capacity for chemical storage and feed facilities and digester modifications. As a result, ammonia and phosphorus concentrations in the lake have decreased significantly. The lower concentrations have improved conditions for young fish and other sensitive aquatic life and have enhanced fish spawning and migration patterns. In addition, dissolved oxygen in the lake's upper water has increased and the frequency of algal blooms is diminishing. This County-owned sewage treatment plant provides about $1.8 million in estimated annual employment income to the community.

Figure 8. Metro state of the art facility and upgrades

Salina Industrial Powerpark

In 2006, the former GM factory at the General Motors – Inland Fisher Guide subsite was redeveloped into an industrial park. Salina Industrial Powerpark covers 78 acres and includes more than 800,000 square feet of manufacturing space. The park includes a management office and a maintenance shop. About 200 people work at the industrial park. The businesses provide about $12.5 million in estimated annual employment income to the community. The businesses generated about $80 million in estimated annual sales revenues. Current tenants include:

Figure 9. Salina Industrial Powerpark provides industrial space for businesses

- Balkan Beverages (distributor of non-alcoholic beverages)
- Carpenter Industries (abrasive blasting and industrial coating business).
- Express Metals Outlet, a Klein Steel Company (metals supplier and processing center).

- Nuclimate Air Quality Systems (heating, ventilation and air conditioning equipment and air terminal devices provider).
- R&D Aluminum Fabricators (aluminum fabrication business).
- Roth Global Plastics (plastics blow molding manufacturing facility).
- SRC Tech Inc. (manufacturing and life cycle management company)
- Stone Central (granite and stone countertop fabricator).
- Sullivan, Bazinet, Bongio (engineering and design firm for modular controlled environments).
- Syracuse Glass Company (architectural and tempered glass building product manufacturer).
- Tom Perry Furniture (customized furniture and cabinet business).

"Community interest in site restoration has been very high and integral to the success of this project. Volunteers participate in planting shoreline areas to establish and enhance natural habitat. Honeywell and the regulatory agencies promote and encourage community involvement in the development of cleanup plans and restoration projects in and around the Lake."

– Bob Nunes, EPA, Remedial Project Manager

Property Values and Tax Revenues

On-site properties help generate property tax revenues that support local government and public services. Today, site properties have a combined value of over $340 million. In 2018, site properties will generate over $185 thousand in total property tax revenues. On-site businesses also generate tax revenues through the collection of sales taxes, which support state and local governments.[1]

Conclusion

Collaboration and cooperation among EPA, New York State, Honeywell, Onondaga County, potentially responsible parties and community members was vital to the successful and ongoing cleanup and beneficial reuse of the Onondaga Lake Superfund site. The carefully designed cleanup protects public health and the environment while the restored lake provides a regional recreation resource that attracts visitors, businesses and investment. Looking forward, project partners will continue to work together to ensure the remedy's long-term protectiveness and support area communities' ongoing growth and revitalization.

This once-contaminated area now supports businesses that provide jobs and services to the community and recreational and ecological opportunities that better the community and ecosystems. Today, on-site businesses and facilities support local economic growth, providing about 248 jobs and over $14 million in estimated annual employee income. In 2018, on-site businesses generated nearly $83 million in sales revenue.

For more information about Superfund Redevelopment, visit: https://www.epa.gov/superfund-redevelopment-initiative.

[1] The combined sales tax rate for Onondaga County, New York is 8 percent. For more information, see https://www.tax.ny.gov/bus/st/rates.htm.

Technical Appendix

Employment Information for On-Site Jobs

EPA obtained the data included in this appendix directly from reputable sources and reported the data as presented by those sources. Information on the number of employees and sales volume for on-site businesses came from the Hoovers/Dun & Bradstreet (D&B) database.[1] EPA also gathered information on businesses and corporations from D&B. D&B maintains a database of 300 million businesses worldwide.

When Hoovers/D&B database research was unable to identify employment and sales volume for on-site businesses, EPA used the ReferenceUSA database.[2] In cases where ReferenceUSA did not include employment and sales volume for on-site businesses, EPA used the Manta database.[3] These databases include data reported by businesses. Accordingly, some reported values might be underestimates or overestimates.

Wage and Income Information for On-Site Jobs

EPA obtained wage and income information from the U.S. Bureau of Labor Statistics (BLS). Part of the U.S. Department of Labor, the BLS is the principal federal agency responsible for measuring labor market activity, working conditions and price changes in the economy.

EPA used the BLS Quarterly Census of Employment and Wages database to obtain average weekly wage data for businesses at the Onondaga Lake Superfund site. Average weekly wage data were identified by matching the North American Industry Classification System (NAICS) codes for each type of business with weekly wage data for corresponding businesses in Onondaga County. If weekly wage data were not available at the county level, EPA sought wage data by state or national level, respectively. In cases where wage data were not available for the six-digit NAICS code, EPA used higher-level (less-detailed) NAICS codes to obtain the wage data.

To determine the annual wages (mean annual) earned from jobs generated by each of the selected businesses at the Onondaga Lake Superfund site, EPA multiplied the average weekly wage figure by the number of weeks in a year (52) and by the number of jobs (employees) for each business.

[1] http://www.dnb.com
[2] http://resource.referenceusa.com
[3] https://www.manta.com

Table 1. Onondaga Lake Superfund Site: Information for On-Site Organizations and Businesses

On-Site Business	NAICS Code[a]	NAICS Title	Number of Employees[b]	Average Weekly Wage (2017)[c]	Annual Wage (Mean Annual) per Employee	Total Annual Employee Income[d]	Annual Sales (2017)[b]
Balkan Beverage	424490	Other Grocery and Related Products Merchant Wholesalers	NA	NA	NA	NA	NA
Carpenter Industries	332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	11	$1,044	$54,288	$597,168	$1,300,000
County of Onondaga	924110	Administration of Air and Water Resource and Solid Waste Management Programs	35	$1,018	$52,936	$1,852,760	NA
Klein Steel Service	423510	Metal Service Centers and Other Metal Merchant Wholesalers	4	$1,241	$64,532	$258,128	$7,293,000[e]
Nuclimate Air Quality Systems, Inc.	333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	19	$1,344	$69,888	$1,327,872	$2,600,000
R&D Aluminum Fabricators, Inc.	332321	Metal Window and Door Manufacturing	3	$1,182	$61,464	$184,392	$301,000
Roth Global Plastics, Inc.	326199	All Other Plastics Manufacturing	20	$1,096	$56,992	$1,139,840	$5,400,000
Salina Industrial Powerpark Maintenance	561790	Other Services to Buildings and Dwellings	5[f]	$717	$37,284	$186,420	$10,000,000[f]
SRC Tech, Inc.	51120	Software Publishers	10[e]	$1,337	$69,524	$695,240	$6,419,000[e]
St. Joseph's Health Amphitheater at Lakeview	71110	Theater Companies & Dinner Theaters	1[e]	$616	$32,032	$32,032	$322,000[e]

On-Site Business	NAICS Code[a]	NAICS Title	Number of Employees[b]	Average Weekly Wage (2017)[c]	Annual Wage (Mean Annual) per Employee	Total Annual Employee Income[d]	Annual Sales (2017)[b]
Stone Central	423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers	2	$1,226	$63,752	$127,504	$294,000
Sullivan, Bazinet, Bongio Inc.	333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing	30	$1,157	$60,164	$1,804,920	$7,300,000
Syracuse Glass Company	423390	Other Construction Material Merchant Wholesalers	78	$1,198	$62,296	$4,859,088	$40,000,000
Tom Perry Furniture	337110	Wood Kitchen Cabinet and Countertop Manufacturing	30	$890	$46,280	$1,388,400	$2,000,000
Total			248			$14,453,764	$83,229,000

[a] NAICS code provided in the D&B database, unless otherwise noted.
[b] Data are from the D&B database, unless otherwise noted.
[c] Average weekly wage per employee based on BLS 2017 Average Weekly Wage data.
[d] Total annual employee income figures derived by multiplying "Number of Employees" by "Annual Wage (Mean Annual) per Employee."
[e] Data are from the ReferenceUSA database.
[f] Data are from the Manta website.
NA = Not available

Property Values and Local Tax Revenue Generated from Property Taxes

EPA obtained data on the most recently assessed values for property parcels at the Onondaga Lake Superfund site in August 2018 through property records accessible through Onondaga County's online property appraisal database.[4] EPA also obtained 2018 property tax information for the site parcels.[5]

[4] Onondaga County Property Values: http://ocfintax.ongov.net/Imate/search.aspx
[5] Onondaga County Property Taxes: https://onondaga.go2gov.net/faces/_rlvid.jsp?_rap=applicationBean.client.searchOptions%5B0%5D.action&_rvip=/search.jsp

Table 2. Property Value and Tax Summary for Taxes Payable in 2018

Parcel ID No.	Parcel Address	Total Market Value of Land and Improvements (2018)	Total Property Tax (2018)
023.-08-03.0	General Motors Cir	$18,800.00	$733.31
023.-08-02.0	General Motors Cir	$10,000.00	$374.11
023.-08-01.0	General Motors Cir	$50,000.00	$1,870.50
028.-01-09.1	1563 Willis Ave	$55,506.00	$13,080.81
030.-01-01.0	Onondaga Lake Park	$742,697.00	$0.00[a]
029.-01-02.0	612 State Fair Blvd	$7,098,090.00	$435.26
029.-01-03.1	Rte 690	$78,652.00	$3,548.06
029.-01-01.0	Onondaga Lake Park	$908,539.00	$0.00[a]
093.-01-02.0	Onondaga Lk	$30,500.00	$0.00[a]
092.-01-03.0	Onondaga Lk	$60,000.00	$0.00[a]
073.-01-10.2	Brewerton Rd	$30,000.00	$9.71
086.-02-17.0	Terminal Rd E(behind 243)	$5,300.00	$0.33
092.-01-01.0	Onondaga Lake Pkwy	$188,939.00	$5,432.02
067.-01-20.0	1 General Motors Dr	$1,500,000.00	$87,709.10
067.-01-18.4	Factory Ave	$1,980.00	$92.07
067.-01-21.1	Factory Ave	$1.00	$0.04
067.-01-09.1	Factory Ave	$5,500.00	$255.74
067.-01-18.3	Factory Ave	$830.00	$38.60
073.-01-09.1	Brewerton Rd	$5,200.00	$205.61
073.-01-09.2	Brewerton Rd	$1,500.00	$59.32
073.-01-10.4	Brewerton Rd	$450,000.00	$562.83
073.-01-13.0	Brewerton Rd	$10,000.00	$0.62
114.-01-14.0	1034 Hiawatha Blvd W	$107,500.00	$3,376.24
114.-01-20.0	1800 Erie Blvd W Rear	$1,875.00	$0.06
114.-01-06.1	533 State Fair Blvd	$476,250.00	$15,005.58
114.-01-19.0	960 Hiawatha Blvd W Rear	$1,362,500.00	$23,431.34.00
001.1-01-01.0	635 Seventh North St Rear	$12,500.00	$0.42
114.-02-45.0	574 State Fair Blvd Rear	$3,875.00	$121.70

Parcel ID No.	Parcel Address	Total Market Value of Land and Improvements (2018)	Total Property Tax (2018)
114.-02-44.0	540 State Fair Blvd Rear To B	$7,625.00	$239.47
114.-02-43.0	524 State Fair Blvd Rear	$4,125.00	$129.55
114.-01-18.0	962 Hiawatha Blvd W Rear	$487,500.00	$15,310.81
114.-02-42.0	516 State Fair Blvd Rear	$10,000.00	$313.98
114.-02-35.0	650 Hiawatha Blvd W Rear Junc	$750.00	$192.52
114.-02-34.0	702 Hiawatha Blvd W Rear Of J	$3,500.00	$54.02
114.-02-41.0	700 Hiawatha Blvd W Rear To B	$10,625.00	$695.04
114.-02-40.0	652 Hiawatha Blvd W Rear	$1,875.00	$169.60
114.-02-39.0	608 Hiawatha Blvd W Rear	$2,125.00	$185.60
114.-02-38.0	604 Hiawatha Blvd W	$4,875.00	$488.40
114.-02-14.0	580 Hiawatha Blvd W	$4,545,750.00	$298.59
114.-02-37.0	602 Hiawatha Blvd W Rear & Ju	$1,125.00	$0.04
114.-02-36.0	606 Hiawatha Blvd W Rear Jun	$750.00	$192.52
114.-02-15.0	600 Hiawatha Blvd W	$6,907,500.00	$234.30
114.-02-16.0	650 Hiawatha Blvd W	$315,000,000.00	$11,138.69
Water	NA	NA	NA
Water	NA	NA	NA
		$340,204,659.00	$185,986.51

NA = Not available

[a] A property tax of $0.00 denotes that the parcel is tax-exempt, due to being owned by either the locality, state or federal government.