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1 Introduction and Purpose

1.1 INTRODUCTION

The Vacuum Oil Brownfield Opportunity Area (VOBOA) Step 3 Implementation Plan includes 148 acres bounded by the Plymouth Avenue commercial corridor on the west, Ford Street to the north, and the Genesee River to the south and east (Map 1).

The Vacuum Oil BOA is located within the limits of the City's West River Wall Project, which aims to provide improved accessibility to the Genesee River from the Corn Hill and PLEX neighborhoods (Exhibit 1), while also providing flood protection consistent with the National Flood Insurance Program (NFIP) and Federal Emergency Management Agency (FEMA) requirements, and sound engineering and science principles.

This grading study deals specifically with the VOBOA Preferred Parks, Open Space, and Public Waterfront Concept Master Plan developed from the comprehensive VOBOA Vision Plan (Map 2). This study explores various degrees of land forming to achieve the development goals expressed in the VOBOA, particularly the waterfront mixed use development and parkland and trail enhancement projects.

The VOBOA Preferred Parks, Open Space, and Public Waterfront Concept Master Plan focuses on the undeveloped and abandoned former industrial properties adjacent to the river. A new roadway is envisioned at the end of Flint Street that runs south within the alignment of the former canal. It terminates with a squared roundabout and provides public access to new and existing development parcels, as well as proposed enhanced trail and parkland facilities.



Exhibit 1 – Vacuum Oil Brownfield Opportunity Area and Corn Hill



2 Cut and Fill Analysis

2.1 EXISTING CONDITIONS SUMMARY

2.1.1 Flood Hazards

Protection from Genesee River flooding in the VOBOA Study Area was historically provided by the existing river wall, constructed by the New York State Canal Corporation (NYSCC) as part of the Barge Canal system upgrade in 1916. The wall was not originally constructed as a flood protection wall, but as a navigation wall, used to canalize the Genesee River between the junction of the Barge Canal and Court Street dam to serve the many industries that were located along both sides of the river in the early 20th century. As the river wall was not designed as a flood protection system, it is not recognized by the Federal Emergency Management Agency (FEMA) for flood insurance purposes as an “accredited” levee/floodwall system. In addition, failures and other deterioration in the river wall over time have rendered it less effective and the most recent FEMA flood maps indicate that the river wall does not provide flood protection.

According to mapping prepared by FEMA, the majority of the VOBOA Study Area is in a flood area classified as X, which are areas between the limits of the 100-year and 500-year floods (Map 3). A considerable extent of land behind the Genesee River Trail and river wall are in an AE classified flood hazard area, which are within the 100-year floodplain. These areas are primarily located along the Genesee River and former Genesee Valley Canal footprint. The former railroad embankment (now Genesee Riverway Trail) that begins at Violetta Street, and rises as it extends south to the railroad/pedestrian bridge over the Genesee River, provides some protection from flooding, but it is not recognized by FEMA as an “accredited” system of flood protection. Map 4 illustrates the FEMA 100-year floodplain overlaid onto the VOBOA Preferred Parks, Open Space, and Public Waterfront Concept Master Plan.

The existing river wall rises above the top of the Genesee Riverway Trail elevation at Violetta Street and continues to rise in height going north towards the Ford Street Bridge. Functionally, the river wall is a visual and physical barrier between the PLEX neighborhood and the river corridor.

The City of Rochester practices floodplain management through its participation in the National Flood Insurance Program (NFIP). This program provides for otherwise unavailable flood insurance, in return for the City adopting and enforcing a Flood Damage Prevention Ordinance. This ordinance requires all new and substantially improved structures in the mapped floodplain to be elevated to or above the 100-year flood elevation (frequently referred to as the Base Flood Elevation, or BFE) or provide a levee/floodwall system that meets FEMA standards for accredited levee systems (44 CFR Part 65.10). In New York State, through the state's requirement of adoption of higher standards, new and substantially improved construction in the mapped floodplain must be 2.0 feet above BFE. An additional provision of the NFIP is a requirement to purchase flood insurance for properties purchased with federally insured mortgages.



Filling in of the low-lying areas within the AE classified flood hazard area (100-year floodplain), or reconstruction of the river wall to meet FEMA criteria for levees and floodwalls, would relieve the financial burden to property owners in the VOBOA study area, increase protection from flooding in case of a major flood event, and make the riverfront area more desirable for future development.

2.1.2 Grading Options and Recommendations

Several grading options were explored for this study as viable alternatives to the costly complete reconstruction of the river wall or construction of a maintenance-intensive engineered earthen berm or levee as an accredited system for flood protection. Grading solutions were limited to City-owned or controlled properties. Map 5 illustrates the current ownership of lands in the VOBOA within the waterfront target area.

Two approaches were taken: remove the lands from the 100-year floodplain by filling low areas to bring grades above the 100-year BFE; or provide protection via an accreditable engineered wall or levee system. The accreditation standards include having a minimum of three feet of freeboard (vertical distance) between the 100-year water surface elevation and the top of the proposed flood protection system. Therefore, the height and top elevation of any proposed floodwall/levee system would be based on these standards rather than in comparison to the height or top elevation of the existing navigation wall or the former railroad embankment. To remain in compliance with the NFIP, the City of Rochester must either require all new buildings located within the 100-year floodplain to have the lowest floor elevated a minimum of two feet above the Base (100-year) flood elevation or provide a levee/floodwall system that meets FEMA standards for accredited levee systems (44 CFR Part 65.10).

Filling requires the movement to or placement of large amounts of soil into the low-lying areas. Although disruptive, it would occur only once, and the floodplain disappears. The construction of an accredited wall or levee system in the BOA could ultimately span up to 4,200 LF along the river shore and would require continual maintenance to keep the flood protection system intact.

Option 1 (Null Option) is essentially a do-nothing option that does not remove or protect any properties from the current FEMA-mapped floodplain.

Option 2A (Fill Option – South of Flint Street) involves the filling in of AE classified flood hazard areas (100-year floodplain) equal to the FEMA base flood elevation (BFE) plus three (3) feet (approximately 519'+/-).

Option 2B (Full Protection Option) involves the construction of an accreditable engineered system (wall or berm or combination of the two) from the northern end of the project area at Ford Street south to Flint Street. The wall or berm needs to be at an elevation of 3 feet minimum higher than the FEMA BFE.

Option 2C (Partial Protection Option) involves the construction of an accreditable engineered system (wall or berm or combination of the two) only on the northern end of the project area.

Options 2B and 2C both include the fill option south of Flint Street, with different approaches to flood protection north of Flint Street.

A more detailed explanation of the various options and their benefits follow.



Option 1 – Null Option

Option 1 is a do-nothing scenario that does not remove any properties from the current FEMA special flood hazard area (100-year floodplain). No regrading of the site nor construction of an accreditable engineered levee or wall system is proposed. All development parcels or portions thereof occurring within the 100-year floodplain will remain and are subject to floodplain development requirements in the building code.

Option 2A – Fill Option South of Flint Street – Do Nothing North of Flint Street

Option 2A (Map 6) seeks to fill in low-lying areas within the floodplain on the proposed roadway and future development parcels up to an elevation at or greater than the FEMA BFE of 516.4' +/- plus three (3) feet of freeboard, or 519.4' +/- . This would remove the development parcels identified in the Master Plan from the 100-year floodplain and remove all building restrictions related to it. Non development parcels south of Flint Street will remain in the 100-year floodplain and be used for parkland and wetland mitigation activities.

Factoring in the design of the new roadway and its infrastructure, it was determined that the minimum surface elevation required is 520' in order to facilitate positive drainage of the underground storm sewer system. Therefore, south of Flint Street, the new access road (the Square-About) and the adjacent development parcels to its east (5 Flint Street) and south need to be filled up to a minimum elevation of 520'. The current owner of 5 Flint Street has indicated they will fill in the lower floor of the existing building at 5 Flint Street in order to accommodate the required grading. Filling the roadway to the 520' elevation will also necessitate the regrading of 15 Flint Street to the west.

The filling of the 100-year floodplain within the proposed roadway and development parcel, along with removal of part or all of the existing river wall up to the railroad pedestrian bridge to the south, and regrading of the frontage shoreline to provide visual and physical access, will require approximately 77,320 cubic yards of imported clean fill. This assumes that no excavate generated on site is suitable for fill. If, during grading operations it is determined that any or all the excavated soils meet structural and environmental guidelines, that amount of imported fill may be reduced. The remaining low-lying area south of the southern development parcel will not be filled in. This is intended to be utilized for wetland mitigation for the small scattered wetlands to be filled that occur within the Vacuum Oil BOA project area, green infrastructure for the new roadway, and as parkland for the neighborhood. This option will remove 5.83 acres of 100-year floodplain and afford the same level of protection to the landowners as is intended to be provided by the West River Wall Phase I project in the Corn Hill neighborhood. In Corn Hill, flood protection will be achieved with a combination reconstructed floodwall and earthen berm levee.

See Appendix A for Option 2A grading plan, sections, and rough earthwork calculations.

Fill Option Additional Requirements

Filling in the 100-year floodplain will require the following sequence of events:

1. Fill the low-lying areas of the parcels to an elevation equal to greater than the FEMA base flood elevation (BFE, also known as the 100-yr elevation).



2. Stop all construction work. Perform no excavation work!
3. Perform a field survey and generate a certified topographic map showing that the elevation of the parcels is equal to greater than the BFE.
4. Submit a LOMR-F application to FEMA to remove the parcels from the special flood hazard area (100-yr floodplain). Currently, the fee for a multiple lot LOMR-F request is \$800.
5. Wait for approval from FEMA. This process typically takes about 60 days but there are no specific review times provided by FEMA.

Once approved, the parcels are not subject to floodplain development regulations, i.e. no requirements regarding first floor elevations or excavation.

Flood insurance will not be automatically required. The mortgage lender reserves the right to require the borrower to purchase flood insurance (this is the case for properties everywhere).

Note – The FEMA map will not physically change, FEMA's approval will be a document which indicates that the designated parcels have been removed from the special flood hazard area. That document gets shown to the mortgage lender to prove that the property is not in the special flood hazard area.

The order of steps 1-5 above is of the utmost importance. Not following these steps could result in mandatory flood insurance requirements even after all the filling work has occurred. You cannot “build first and ask for permission later” with FEMA.

Option 2B – Full Protection Option – North of Flint Street

Option 2B (Map 7) involves the construction of an accreditable engineered system (wall or berm or combination of the two) from the northern end of the project site at Ford Street south to Flint Street. The wall and/or berm is required to be at a height of the FEMA BFE plus 3 feet of freeboard, thereby providing a comparable level of flood protection intended to be provided to the Corn Hill neighborhood to the north under the West River Wall Phase I project. This engineered system would provide the most protection removing all the low-lying areas north of Flint Street from the 100-year floodplain and all development restrictions associated with building within the 100-year floodplain. This option would require the construction of approximately 2350 LF of an accreditable engineered system with a top elevation ranging from 518.6' +/- at its north end at Ford Street to 519.2' +/- at its southern tie-in at Flint Street. At Flint Street the flood protection system must tie-in to high ground in order to be a certifiable flood protection system. Due to the additional 3 feet of freeboard required for the engineered system, the top of the wall or berm would be approximately 6 to 6.6' above the river's Ordinary High Water (normal operating pool) of 512.6'.

Option 2B assumes south of Flint Street will receive the flood protection treatment as described in Option 2A.

Option 2C – Partial Protection Option – North of Flint Street

Option 2C (Map 8) involves the construction of an accreditable engineered system (wall or berm or combination of the two) from the northern end of the project site at Ford Street, south to the southern tip of the Church of Love parcel, then northwest along the former canal bed up to Exchange Street. This



engineered system is required to be at a height of the FEMA BFE plus 3 feet of freeboard, thereby providing a comparable level of flood protection intended to be provided to the Corn Hill neighborhood to the north under the West River Wall Phase I project. The configuration of this engineered system would serve to remove the entire Church of Love property from the 100-year floodplain. Low-lying areas south of the Church of Love property and north of Flint Street would remain within the 100-year floodplain along with all its development constraints. However, aside from one private residence whose driveway lies partially within the floodplain, all other low-lying areas can be filled to a minimum elevation of 516'+/- to remove them from the 100-year floodplain as envisioned by the Master Plan. Option 2C requires the construction of approximately 2100 LF of an accreditable engineered system with a top elevation ranging from 518.6' at its northern end to 518.9 at its southern end.

Fill options were deemed to be infeasible and were not recommended for the area north of Flint Street. The City-owned property north of Flint street is limited and although it can be filled in to be brought out of the AE classified flood hazard areas (100-year floodplain), remaining lands to the west of the City property would remain low within the floodplain. The only current opportunity for the City to bring these properties out of the floodplain is to provide the accreditable engineered system as proposed in Options 2B and 2C. As noted in Option 2C, the individual landowner whose property occurs within the 100-year floodplain always has the option of filling in their property to a minimum elevation of approximately 516 to bring it out of the 100-year floodplain regardless.

Option 2C assumes south of Flint Street will receive the flood protection treatment as described in Option 2A.

Protection Options Additional Requirements

The design of an accreditable engineered wall or levee system will require the following:

Submit the design to FEMA in a Conditional Letter of Map Submission (CLOMR). A CLOMR is a way of protecting the City or developer's investment. A CLOMR asks FEMA, "If we build what we are proposing, will you change your maps in the way we expect?" You do not want to build something and find out later that FEMA does not agree with your design. FEMA does not actually change anything at this point in the process. They will not make changes until something is built.

- Currently, the fee for FEMA review is \$9,250.
- Submission requires design plans and a detailed hydraulic analysis.

Wait for CLOMR approval prior to construction.

Once the project is built, provide as-built survey information to FEMA in a Letter of Map Revision (LOMR). If FEMA agrees that the project was built as proposed, they will approve the LOMR.

- FEMA LOMR review fee currently is \$8,250.
- The floodplain delineation on the FEMA Flood Insurance Rate Maps will be revised.



With LOMR approval, the area behind the levee will be designated as Zone X – Shaded. This is the same as being removed from the special flood hazard area. The parcels are not subject to floodplain development regulations. The low-lying areas do not need to be filled – they can remain as-is.

- There are no requirements regarding first floor elevations or excavation.

Flood insurance will not be automatically required. The mortgage lender reserves the right to require the borrower to purchase flood insurance (this is the case for properties everywhere).

Note – a certifiable levee system (wall, berm or both) must be designed to an elevation that is at least 3 ft higher than the FEMA BFE. The levee system also must meet other stability and seepage requirements. The levee system must tie-in to high ground at the upstream and downstream end.

3 Stormwater

The proposed stormwater management plan for this development is to intercept and detain stormwater runoff throughout the site before it enters the Genesee River or the combined (sanitary and stormwater) sewer system.

Municipal and state standards discourage stormwater from entering combined sewer infrastructure systems. The Vacuum Oil site should be developed with a system of stormwater Best Management Practices (BMP) that will slow the rate of flow, reduce the amount of stormwater leaving the site, and treat the stormwater that flows to the Genesee River. A variety of standard BMPs will be used to collectively achieve stormwater management goals defined in the New York State Department of Conservation Stormwater Management Design Manual (NYSDEC SMM).

3.1 DRAINAGE AREAS

The VOBOA Study Area is located in what is known as the *Genesee River Watershed*. For the purpose of this evaluation, the Vacuum Oil project site has been divided into eight drainage areas based on land use, existing property boundaries, and proposed drainage outlets (Map 9). The use of property boundaries for defining the drainage areas in this evaluation also corresponds to the anticipated phased development of the site. It is assumed that public roadways and park areas will likely be constructed first, followed by development of the private parcels.

The future grading and configuration of the private parcels, defined as Drainage Areas 1, 3 and 7, is currently unknown and, therefore, subdividing these areas into smaller sub-drainage areas for this evaluation is not practical. Similarly, the future grading and configuration of the park land, defined as Drainage Areas 4 and 8, is also unknown and, therefore, division of these larger areas into sub-drainage areas was not warranted at this level of project development.

3.2 EXISTING DRAINAGE

Currently there is limited existing stormwater infrastructure within the proposed development area. There is an inlet located at the east end of Flint Street, north of the pavement, that ties into the existing combined sewer. According to the record plans, this inlet was installed in 1995 to capture drainage from the green space between the development along Exchange Street and the bike trail from Flint Street to



Doran Street. The ground elevation of this parcel is currently at or below the average water level of the river, and it is recommended that this outlet be kept in service for any future development.

There are no closed drainage systems located along Flint Street east of Exchange Street. Currently stormwater flows easterly over the Flint Street pavement and drains into the inlet noted above, as it is the lowest point near the terminus of the street.

The wooded area south of Flint Street that was once the location of the Vacuum Oil company, denoted as Drainage Areas 1, 2, 3, and 5 above, is generally lower than the surrounding land and, from site observations and review of available record plans, does not appear to drain directly to the river. When water inundates the area at the north end of the drainage area, it passes through an existing culvert under Flint Street or overtops the road and eventually drains out the interceptor inlet noted above. The remainder of the drainage area likely percolates into the existing ground or, when the standing water elevation exceeds the elevation of the sanitary sewer manholes, it infiltrates into the combined sewer system.

3.3 PROPOSED DRAINAGE

A goal for this project will be to prevent stormwater runoff from entering the combined municipal sewer system, to the greatest extent practicable, and provide the required water quality volume treatment for improvements located within City property.

Drainage Areas 1 and a portion of 2 are privately owned properties for which the final site configuration is unknown. Proposed storm sewers installed along existing Flint Street and its extension will need to be deep enough and sized appropriately to remove stormwater from these areas. These areas will also require raising the finished grade to above the 100-year floodplain elevation. Water quality treatment will be the responsibility of the property developers and will need to be performed onsite to comply with the stormwater management goals prior to any discharge into the storm sewers.

Drainage Area 3, while currently public property, would be sold for private development as part of the master plan, with the final site configuration to be determined. Like Drainage Areas 1 and 2 described above, the elevation of the parcel will also need to be raised to above the 100-year floodplain elevation. Located at the terminus of the proposed road in Drainage Area 5, the stormwater collected in this area will have the opportunity to drain into the closed roadway system to the west or could be directed to the proposed vegetated swale to the south.

Drainage Area 4 is comprised of existing park land and wooded areas. The proposed development for this land is mitigation wetlands while maintaining the green space and most of the existing natural drainage patterns on remaining undisturbed areas. Proposed grading related to park improvements should direct stormwater to the proposed vegetated swale, which will convey stormwater from the roadway storm sewer to the river.

In Drainage Area 5, the existing wooded area will be transformed into a new public roadway. In order to keep the roadway above the floodplain, the area will need to be raised several feet above existing grade. A closed drainage storm sewer is proposed under the street that will outlet at the southern terminus of the road, where a vegetated swale will outlet the stormwater to the river.



Drainage Area 6 consists of the reconstructed Flint Street pavement section. When reconstructed, the stormwater from the pavement section should be collected in a closed system and conveyed to the river, as opposed to flowing into the combined sewer as it currently does.

As the roadways in Drainage Areas 5 and 6 will likely be constructed prior to the development of the surrounding parcels, the storm sewers should be sized conservatively to accept the flow from the public right of way and adjacent parcels. The inverts should also be kept as low in elevation as possible to make draining the adjacent parcels more feasible for developers and, therefore, make development more attractive.

Drainage Area 7 will include the redeveloped private property for which the final site configuration is unknown. The parcel generally slopes to the east and towards the river, which could make stormwater collection a challenge depending on the final site grading. Being able to utilize the proposed storm sewers along Flint Street will be important to ensuring the parcel can be fully built out.

Drainage Area 8 consists of the existing park land north of Flint Street. Much of the low-lying area will need to remain connected to the existing combined sewer system, as the ground elevation is lower than the normal water elevation of the river.

Pipe inverts for drainage areas that outlet to the river are generally controlled by the outlet elevation being set at EL. 512.6, which is the normal water surface elevation of the river. Final design of any development on the Vacuum Oil site should consult the Vacuum Oil-South Genesee River BOA Implementation Strategy/Environmental Impact for additional information and guidance related to the hydraulics of the river.

3.4 STORMWATER MANAGEMENT AND GREEN INFRASTRUCTURE

Within the drainage areas, a combination of vegetated best management practices will contribute to the reduction of runoff, treatment of stormwater, and conveyance to the drainage outlets.

The estimated impervious cover and projected treatment volumes for these areas are summarized in Table 1. For the purpose of this evaluation, it was assumed that the full build out of the private development parcels defined as Drainage Areas 1, 2, 3, and 7 would result in 75% impervious cover. Map 10 Illustrates the proposed stormwater management and green infrastructure opportunities anticipated for the development of the Vacuum Oil Preferred Parks, Open Space, and Public Waterfront Concept Master Plan.



Table 1

ESTIMATED IMPERVIOUS COVER STORMWATER RUNOFF TREATMENT VOLUMES								
DRAINAGE ZONE	DEVELOPMENT TYPE	TOTAL AREA (ACRES) (SQ FEET)	PROPOSED IMPERVIOUS COVER (ACRES)			TOTAL IMPERVIOUS COVER (ACRES)	PROJECTED WATER QUALITY VOLUME (WQv) (ACRE-FEET)	PROJECTED RUNOFF REDUCTION VOLUME (RRv) (ACRE-FEET)
			BUILDINGS	PAVEMENT	TRAIL			
1	NEW	5.55	2.61	0.03		2.64	0.221	0.041
2	NEW	1.89	0.95	0.47		1.42	0.114	0.019
3	NEW	0.84	0.42	0.21		0.63	0.051	0.01
4	NEW	11.39			1.33	1.33	0	0
5	NEW	3.10		1.33		1.33	0.113	0.021
6	REDEVELOPMENT ACTIVITY	0.78	0.02	0.45		0.47	0.011	0
7	REDEVELOPMENT ACTIVITY	6.83	3.42	1.71		5.12	0.103	0
8	NEW	5.97		0.10	1.09	1.19	0.033	0
TOTAL		36.35	7.41	4.31	2.42	14.14	0.646	0.091

NOTE:

1. AS PER APPENDIX B - TABLE 1 OF THE SPDES GENERAL PERMIT, BIKE PATHS AND TRAILS ARE NOT A CONSTRUCTION ACTIVITY THAT REQUIRE POST CONSTRUCTION STORMWATER MANAGEMENT AND THEREFORE THE IMPERVIOUS AREAS OF THE PROPOSED TRAILS, WHILE LISTED IN THE TABLE ABOVE, ARE NOT ACCOUNTED FOR IN THE TOTAL WATER QUALITY VOLUME GOAL.

2. RUNOFF REDUCTION VALUE OF 0 WAS CALCULATED FOR AREAS 4,6,7,AND 8 BASED ON CONCEPTUAL PLANS WHICH REPRESENTED AN OVERALL REDUCTION IN IMPERVIOUS AREA FOR THAT DRAINAGE AREA.

The water quality volume shown in Table 1 was calculated based on the following criteria:

1. A value of 1.0 was used for the 90% Rainfall Event Number based on the project location of Rochester and using Figure 4.1 in the NYSDEC SMM.
2. Drainage Areas 1, 2, 3, and 5 are considered “new development” per the NYSDEC SMM. The full Water Quality Volume (WQv) for these areas will be treated by a proposed series of BMPs.
3. Drainage Areas 4 and 8 will redevelop existing park land and green space in kind with new trails and landscape features constructed along the river. The proposed trails are exempt from WQv requirements per Appendix B, Table 1 of the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002). Only the impervious surfaces related to the parking area at the terminus of Flint Street will need to be considered for WQv treatment.
4. Drainage Areas 6 and 7 are considered “redevelopment” per the NYSDEC SSM.

As all the drainage areas ultimately drain to the Genesee River or the combined municipal sewer system, management of the Channel Protection Volume (Cpv), Overbank Flood (Qp), and Extreme Storm (Qf) are not required as per Chapter 4 of the NYSDEC SMM.



As discussed previously, Drainage Areas 1, 2, 3, and 7 are or will be privately owned and currently have no plans for development. These properties will need to address water quality volume treatment of stormwater for their respective parcels prior to it leaving the site. Depending on what the final use is for each parcel, developers have a wide array of green infrastructure to choose from to treat the stormwater runoff. Typical methods could include parking lot bioswales, biofilter planters, vegetated swales, and porous pavements for example.

Drainage Areas 4 and 8 are park land, so the water quality treatment volume is low. Installation of a 20 ft. wide by 100 ft. long bioswale adjacent to the proposed parking lot at the terminus of Flint Street would be enough to treat the runoff.

Drainage Area 5 will be new development of impervious surfaces and require the largest volume of water quality treatment of all the City-owned Vacuum Oil areas. Water quality could be addressed with the use of several bioswales adjacent to the proposed street, ranging in width between 4 ft. and 8 ft. and approximately 250 ft. long each. The center median of the turnaround at the end of the proposed road is an optimal location to install a bioswale to treat the impervious area of the roadway, surrounding sidewalks and hardscapes. A 20 ft. wide by 100 ft. long bioswale integrated into the landscape of the central median could provide enough water quality volume treatment for the drainage area if swales along the roadway are not desirable. See Appendix B for the proposed new road profile.

Drainage Area 6 consists primarily of the reconstruction of Flint Street and since this is a redevelopment activity it does not carry a large water quality volume requirement. However, depending on phasing and final design, if reconstruction limits require more than 1 acre of disturbance, the water quality volumes could be addressed by the use of pervious pavements in the highway section or bioswales around the road terminus that would feed into the stormwater outlet to the river. See Appendix C for the Flint Street profile.

The runoff reduction volume used when developing approximate swale sizes assumes a specific reduction factor of 0.2, representing Hydrologic Soil Group D. Soils on the site are classified as “urban soils” per USDA Soil survey results. Runoff reduction will be achieved through the use of vegetated BMPs. However, at this time, the ability to percolate stormwater runoff on the site is unknown and further geotechnical testing would be required to determine if it is possible to achieve the full Runoff Reduction Volume (RRv), as described in the NYSDEC SMM.

The proposed BMPs identified in this evaluation are intended to manage stormwater runoff from streets and rights-of-ways and are based upon master planning assumptions made about land cover of future development on private parcels. Differences between the assumed developments’ impervious area and what is actually built may require additional on-site stormwater treatment practices to be constructed to meet the full requirements in the NYSDEC SMM.

The land uses and building footprints in this plan represent a modeled demand for growth. The plan should not be interpreted as definitive, final land use and building sizes; the actual use will dictate the specifics of the stormwater management plan. Instead, the plan should be considered as a framework that offers key drainage design principles and describes a desired arrangement of drainage paths and treatment processes.



4 Utilities

This section will present a concept design for utility connections necessary to support development of the Vacuum Oil site and quantify any impact that the project will have on the City's existing utility infrastructure.

4.1 PUBLIC WATER SYSTEM

The City of Rochester is responsible for maintaining their network of pipes, valves, and hydrants.

A 16-inch diameter water main exists along the north side of Flint Street. Water services for adjacent land parcels are connected to this water main. A waterline extension of the existing 16-inch diameter main is proposed along the east side of the proposed road to service the future developments. The waterline should be located along the east side of the road to keep it separated from the existing combined sewer on the west side.

A 36-inch diameter water main along the south side of Flint Street serves as a transmission line for the City's water network and has no connections within the proposed development boundaries.

As part of a 2019 capital improvement program the City will be replacing or adding valves to these existing waterlines between Exchange Street and the Genesee River.

4.2 MUNICIPAL SEWER SYSTEM

Monroe County Division of Pure Waters owns and maintains the existing combined sewer within the Vacuum Oil site. An existing reinforced concrete trunk sewer known as the Doran Street Interceptor runs through the Vacuum Oil site and varies in size from 24-inch to 42-inch diameter. The combined flow in the interceptor sewer flows northward to the West Side Tunnel system, which was created as part of the City's Combined Sewer Overflow Abatement Program.

Bergmann initially evaluated installation of a separate small diameter collection network to convey sewage from the various developments into the trunk sewer at a single point source. Due to the shallow depth of the existing trunk sewer and additional utilities limiting space within the right of way, it was determined that connecting individual developments directly to the Doran Street Interceptor with sewer laterals would be a preferred alternative. This concept was discussed with Pure Waters personnel and determined to be a viable option. Sanitary laterals should be a minimum of 4-inches in diameter and incorporate a clean out every 75 feet along the lateral. New connections to the existing trunk sewer will require Pure Waters and Monroe County Department of Health review, including, but not limited to, submission of form BSP-5, a basis of design report and relevant design plans and specifications.

The existing trunk sewer should be inspected prior to development and raising the elevation of the sites. The existing manholes within the limits of any increased grade will either need to be extended or replaced entirely. In addition, Pure Waters staff indicated that capacity exists within the trunk sewer to accommodate connections from potential development. It is recommended that a capacity analysis be completed during the final design phase, once private property uses have been determined, to confirm the expected sanitary flow contribution from development and available capacity in the trunk sewer.



It should also be noted that adjacent to the existing sewer pipe, exists an abandoned 3'-0" x 2'-2" stone box sewer. Record plans note that the manholes were infilled with concrete and sand; however, it should be confirmed that the stone box was also filled and does not pose a risk to supporting any potential structures or infrastructure.

4.3 ELECTRIC

Rochester Gas and Electric owns and maintains the existing electrical power service facilities located within the public right-of-way.

There are power service poles along the south side of Flint Street that provide electrical service to the existing buildings along Flint Street. Overhead power details need to be coordinated with actual development once that is determined. The preferred corridor for the overhead electrical lines is along the west side of the proposed road to avoid potential conflicts with the proposed storm sewer, waterline and gas line.

There are also electrical transmission lines that run north and south along the Riverway Trail and Genesee River. The poles which support the transmission lines will likely need to be replaced to accommodate the lower elevation proposed along the river and avoid conflict with the proposed park land design.

There are currently no existing underground fiber optic or television cable facilities located within the project limits. If necessary, it is assumed these utilities will co-occupy the overhead power service poles as needed.

4.4 GAS

Rochester Gas and Electric owns and maintains the existing underground gas service facilities located within the public right-of-way.

There is an existing 4-inch diameter gas main located under the south side of Flint Street and it would need to be extended to provide additional services for the site development to the south of Flint Street. The preferred location for the extended gas main would be along the east side of the proposed road to avoid the existing sanitary sewer, abandoned sewer facilities, and the overhead power poles.

4.5 STORMWATER

Flint Street, between Exchange Street and the Genesee River, does not have a closed drainage system. The proposed storm sewer layout along Flint Street will have a main collector on the south side of the street with catch basins that feed into it from the north side via laterals. This configuration will keep the storm sewer deeper than the existing waterlines. The actual depth and alignment of the 36-inch waterline will need to be field verified to avoid potential conflict with the storm sewer. The storm sewers from Flint Street will outlet through the existing wall, above the normal water surface elevation of the river.

Stormwater facilities along the proposed road will divide the drainage flow so it can outlet in two directions. The north half of the road will flow towards Flint Street in a closed system and share the same outlet to the river. The south half of the road and the median area at the terminus will be collected in a closed system and conveyed into a vegetated swale that will pass through the park and outlet to the



river. The split flow paths will provide greater flexibility for future development, as it will allow for deeper inverts at the south side of the site to outlet storm drainage to.

The Vacuum Oil concept utility plan is more fully illustrated on Map 11.

5 Wetland Mitigation

5.1 MITIGATION JUSTIFICATION

5.1.1 Introduction

The City of Rochester is sponsoring the Vacuum Oil – South Genesee River Corridor Brownfield Opportunity Area (BOA) project. The main purposes of the project are to redevelop and reuse the vacant, abandoned, and underutilized properties; strengthen and diversify residential neighborhoods; and reconnect the community with the Genesee Riverfront.

The wetland delineation was conducted in October 2015. All wetlands were delineated in accordance with the conditions and guidelines of the United States Army Corps of Engineers (USACE) 1987 Delineation Manual and the Northeast and Northcentral Regional Supplement. The area encompassed for the delineation effort is herein referred to as the Project Study Area (PSA) and included the undeveloped areas bound to the east by the Genesee River and to the west by a steep topographic gradient and urban areas including the eastern ends of Violetta Street, Flint Street, and Riverview Place. The northern extent of the PSA is bound by Ford Street, and the southern extent is the intersection of the Genesee River Trail and S. Plymouth Avenue. The total area covered by the PSA is approximately 30 acres (Map 12). The results of the delineation effort are documented in the Final Wetland Assessment and Delineation Ecological Screening & Invasive Species Report (Wetland Report) prepared by Shumaker Consulting Engineering and Land Surveying, D.P.C. (SCE) dated June 2017. A Jurisdictional Determination letter dated April 28, 2017 confirms that all delineated resources are under the jurisdiction of the USACE.

Project-related activities impacting wetlands will require authorization under a USACE permit.

Design plans will need to be reviewed to determine applicability of nationwide versus individual permits. As the BOA project is progressed, impacts to aquatic resources will be assessed and applicable permits will be obtained.

The following report is prepared by SCE and presents a preliminary compensatory mitigation plan to compensate for the unavoidable aquatic resource impacts that will occur as a result of the proposed project. This 30% report includes a general, preliminary discussion of the on-site wetland mitigation which may be provided for this project. Some of the site characteristics such as the existing soils and hydrology indicate there may be challenges to creating a wetland in this location. Detailed studies of all site characteristics pertinent to wetland creation should be conducted prior to commitment to a final mitigation design. Nonetheless, a preliminary plan has been produced with the assumption that these challenges can be overcome.



5.1.2 Measures to Limit Impacts

The first step in limiting aquatic resource impacts is avoidance. When avoidance is not practicable, minimization and finally mitigation are pursued. As design of the BOA project is progressed these measures will be considered in this order. It is anticipated that impacts to Wetland D will be avoided as it is situated primarily off of City-owned property. Impacts to the remaining delineated wetlands are probable, but will be minimized to the greatest extent practicable. For the purposes of this preliminary mitigation study it has been presumed that the project will incur impacts to the entirety of Wetlands A, B, C, E & F.

5.1.3 Sequence of Mitigation

As this project is in a preliminary phase, a detailed sequence of mitigation has not yet been developed. As the project design progresses, an erosion and sediment control plan will be developed and implemented before the commencement of construction activities, including mitigation. It is likely that USACE permit conditions will require the mitigation area construction to be concurrent with the construction of the BOA project such that temporal losses of resources are avoided.

5.2 MITIGATION GOALS AND OBJECTIVES

5.2.1 Impact Site(s)

a. *Proposed Impacts to Wetlands and Waters of the United States*

Six (6) wetlands and one ephemeral stream have been identified within the PSA. The existing conditions of these resources have been previously described in the Wetland Report prepared by SCE dated June 2017. All identified resources are confirmed to be under the jurisdiction of the USACE.

To ensure sufficient area is available for mitigation, impacts have been anticipated to the entirety of Wetlands A, B, C, E, & F. Wetland D is not within city-owned property and will not be impacted. The total area of assumed impact, excluding Wetland D, is 0.545 acres.

Wetland A

Wetland A is a regularly mowed emergent depression in the northern portion of the PSA (Map 13). Wetland A presently provides flood flow alteration and nutrient removal. In Wetland A, impacts may result from placement of the trail, grading, and landscaping. Wetland A is dominated by Canada rush (*Juncus canadensis*), fowl bluegrass (*Poa palustris*), and another unidentifiable mowed grass. Additional wetland species included narrow-leaf cattail (*Typha angustifolia*), Pennsylvania smartweed (*Persicaria pennsylvanica*), and curly dock (*Rumex crispus*). Wetland A encompasses approximately 0.019 acres within the project area. Impacts to the entirety of this area have been anticipated for planning purposes.

Wetland B

Wetland B is a palustrine scrub-shrub wetland situated immediately north of Flint Street's eastern terminus (Map 13). This wetland is situated in a depressional area that has been identified as a former canal bed. It currently provides flood flow alteration, groundwater recharge, and nutrient removal. In Wetland B, impacts may result from placement of the trail, parking area, grading, and landscaping. Wetland B is dominated by White willow (*Salix alba*), box elder (*Acer negundo*), quaking aspen (*Populus*



tremuloides), red osier dogwood (*Cornus sericea*), purple loosestrife (*Lythrum salicaria*), and common mugwort (*Artemisia vulgaris*). Wetland B encompasses approximately 0.043 acres within the project area. Impacts to the entirety of this area have been anticipated for planning purposes.

Wetland C

Wetland C is a palustrine forested wetland situated near the center of the PSA, immediately south of Flint Street's eastern terminus (Map 13). This wetland is located in a depressional area that has been identified as the former Genesee River Canal bed. Wetland C currently provides groundwater recharge, flood flow alteration, and wildlife habitat. In Wetland C, impacts may result from construction of new roadway, grading, and landscaping. Wetland C is dominated by black willow, common buckthorn (*Rhamnus cathartica*), green ash (*Fraxinus pennsylvanica*), purple loosestrife, horsetails (*Equisetum* sp.), poison ivy (*Toxicodendron radicans*), and grape (*Vitis* sp.). Wetland C encompasses approximately 0.364 acre within the project area. Impacts to the entirety of this area have been anticipated for planning purposes.

Wetland D

Wetland D is a shallow emergent marsh situated near the southwestern corner of the PSA (Map 13). This wetland is at the toe of a steep slope and is anticipated to be fed by surface runoff and a groundwater seep. Impacts are not anticipated to Wetland D, as it is not within the city-owned parcel. Wetland D is dominated by box elder, bulrush (*Scirpus* sp.), white grass (*Leersia virginica*), narrow-leaf cattail, and crowned beggarticks (*Bidens trichosperma*). Wetland D encompasses approximately 0.274 acre.

Wetland E

Wetland E is a palustrine forested wetland situated near the southeastern portion of the PSA (Map 13). This wetland is adjacent to the Genesee Riverway Trail and was likely excavated during construction of the old railroad which the trail follows. In Wetland E, impacts may result from placement of the trail, grading, and landscaping. Wetland E is dominated by black willow, eastern cottonwood (*Populus deltoides*), red osier dogwood, box elder, grape, and poison ivy. Wetland E encompasses approximately 0.078 acre within the project area. Impacts to the entirety of this area have been anticipated for planning purposes.

Wetland F

Wetland F is palustrine forested wetland situated in the southeastern portion of the PSA, north of Wetland E (Map 13). This wetland is adjacent to the Genesee Riverway Trail and was likely excavated during construction of the old railroad which the trail follows. In Wetland F, impacts may result from placement of the trail, grading, and landscaping. Wetland F is dominated by silver maple (*Acer saccharinum*), green ash, and redosier dogwood. Wetland F encompasses approximately 0.041 acre within the project area. Impacts to the entirety of this area have been anticipated for planning purposes.

Ephemeral Stream 1

Stream 1 is an ephemeral unnamed tributary to the Genesee River. It is located in the southern portion of the PSA and southwest of Wetland E (Map 13). This tributary begins at a culvert draining from Wetland E and flows to the River. The substrate consists of silt and detritus with small amounts of woody and emergent vegetation growing within the channel. Approximately 378 linear feet of stream are present within the PSA. Impacts are not anticipated to this resource.



Overall wetland area within the PSA totals approximately 0.819 acres. The impacts to wetlands within the PSA have been estimated at 0.545 acres, of which 0.019 acre consists of shallow emergent marsh, 0.043 acres of shrub swamp and 0.483 acres of floodplain forest wetland.

b. Contributions to Watershed

The Compensatory Mitigation for Losses of Aquatic Resources; Final Rule document issued by three (3) regulating agencies (USACE, New York State Department of State and US Environmental Protection Agency) requires compensatory mitigation to replace aquatic resource functions/services unavoidably lost or adversely affected by authorized activities. The USACE identifies 13 wetland functions/services that federal regulations seek to protect. These functions/services are: groundwater recharge/discharge; flood flow alteration; fish and shellfish habitat; sediment/toxicant/pathogen retention; nutrient removal/retention/transformation; production export; sediment/shoreline stabilization; wildlife habitat; recreation; educational/scientific value; uniqueness/heritage; visual quality/aesthetics, and endangered species habitat.

Not all wetland systems provide all known wetland functions/services. These functions/services are highly dependent on the location within the watershed, land use within the watershed, physical characteristics of the wetland area and proximity to other water features. Delineated wetland areas were inspected to determine which of the above functions/services are currently being supported at those locations. Functions/services were assigned by 'best professional judgment' using the criteria and forms set forth in *The ACOE Highway Methodology Workbook Supplement* (1995). The completed forms and the key to the criteria are provided in Appendix C of the Wetland Report dated June 2017.

The evaluation found flood flow alteration to be the principal function/service supported by all of the impacted wetlands within the PSA. Other functions provided by one or more of the wetlands include nutrient retention, groundwater recharge, and wildlife habitat.

5.2.2 Mitigation Site

The mitigation site selection process typically involves reviewing and assessing locations within the project vicinity and its impacted watershed for basic information, including dominant plant species, soil type and hydrologic characteristics. These areas are also preliminarily assessed for topography; the potential for establishing an adequate water regime; the potential for the area to provide good wildlife habitat; and any limiting factors (e.g. limited available space, a need for excessive removal of fill or the presence of invasive species). If potentially sustainable wetland mitigation areas are not found within the project vicinity then potential off-site areas are investigated until a suitable site is identified. Proposed mitigation activities for this project will occur within the southwestern portion of the PSA, and be utilized as an interpretive attraction along a proposed pedestrian trail. The preliminary mitigation design calls for the creation of 1.103 acres of compensatory wetland in the floodplain forest area southeast of Cottage Street (Map 14).



The preconstruction conditions are shown in the photographs previously provided in the Wetland Report. The proposed mitigation area is a relatively flat upland forest adjacent to the Genesee River. A berm provides a topographic and hydrologic separation between the upland forest and the river.

The mitigation design will create 0.30 of shallow emergent marsh within the mitigation area. Three separate areas connected by swales will be constructed at elevations to sustain emergent marsh communities. The mitigation design will also create 0.35 of floodplain forest in three distinct areas and 0.46 acres of shrub swamp. The shrub swamp will be created in the transitional areas between the shallow emergent marsh and the floodplain forest areas. Combining shallow emergent marsh, shrub swamp, and floodplain forest wetland mitigation requirements is expected to create structural and species diversity within the mitigation area. The design of the mitigation area is shown in plan view on Map 16; the vegetative communities are depicted on Map 17.

a. Functional Assessment of Selected Wetland Mitigation Measures

The mitigation site will provide compensatory replacement for wetland functions/services that will be impacted in the five (5) wetlands due to road and trail construction, grading, and landscaping associated with this project. The existing wetlands and proposed mitigation site are all within the Genesee River drainage area, ensuring that the existing principal functions/services of the project study area wetlands for the Genesee River watershed are preserved. These principal wetland functions/services include: flood flow alteration, groundwater recharge/discharge, nutrient retention, and wildlife habitat. In addition to replacing lost functions/services, other functions/services such as sediment/toxicant/pathogen retention, production export, and visual quality/aesthetics may be gained as a result of the construction of the compensatory wetland. Sediment trapping may occur from runoff of existing developed areas. Production export could be expected to occur, because of planned vegetative diversity. Visual quality/aesthetic opportunities are expected as a result of the multiple wetland communities being created in close proximity to the recreational trail.

b. Watershed Contributions of Selected Wetland Mitigation Measures

State, County and Town regional plans that describe aquatic resource objectives of the Genesee River watershed were not identified during the development of this report.

c. Rationale for Selected Wetland Mitigation Measures

Project related impacts will occur at several locations throughout the proposed project site. Mitigating for these impacts on-site increases the likelihood that the functions and values could be maintained in the same watershed and community. By combining mitigation from all impacted wetlands into one mitigation site, the chances of mitigation success is maximized. Small-scale, scattered mitigation areas generally provide only limited benefits. Small mitigation wetlands often do not persist over time and in general this approach is less successful than consolidating compensatory efforts into a single larger mitigation area. Larger projects tend to be more cost effective, more successful, and are more likely to provide long-term wetland benefits. For these reasons, the goal of this mitigation strategy is to create a single in-kind mitigation area.



d. *Goals of Selected Wetland Mitigation Measures*

The goal of the compensatory wetland mitigation site is to create a viable wetland that replaces the permanently impacted wetlands and their functions and services. As the mitigation site design is progressed, more specific, measurable goals will be defined. Some typical mitigation goals include the following:

- Establish a hydroperiod of 14 or more consecutive days during the growing season.
- Establish an 85% or greater native hydrophytic species dominance. This will be accomplished through seasonally appropriate planting periods, planting maintenance and replacement, and control of invasive plant species.
- Maintain the existing functions and services within the Genesee watershed. The existing wetlands within the project corridor and the mitigation site have been assessed for functions and services using *The ACOE Highway Methodology Workbook Supplement* (1995) as discussed above.

5.3 PERFORMANCE STANDARDS

5.3.1 Parameters for Performance Monitoring

The performance of the wetland mitigation site will be assessed by obtaining soils, hydrology and vegetation data at fixed locations, as well as considering the functionality of the overall compensatory mitigation wetland. The resulting functions/services of the compensatory mitigation site will be compared to those identified for the impacted wetlands within the subject project corridor. As discussed in Section 5.2.1.b., all of the impacted wetlands within the project corridor principally provide flood flow alteration. Some wetlands also provide nutrient retention, groundwater discharge/recharge, and/or wildlife habitat. These are the targeted functions to be replicated at the mitigation site.

5.3.2 Application of Performance Standards

The function and service capabilities of the wetland mitigation site would be assessed throughout the monitoring period based on 'best professional judgment'. Wetland functions are defined as a process or series of processes that take place within a wetland. These include the storage of water, transformation of nutrients, growth of living matter, and diversity of wetland plants. They have value for the wetland itself, for surrounding ecosystems, and for people. The success of the mitigation site to replicate a specific function/service will be based on whether or not certain parameters have been created on site to support the targeted functions/service areas. The targeted function of wildlife habitat may include, but is not limited to, consideration of the following parameters: presence of wildlife food sources within the wetland or nearby; high density of the wetland vegetation; indications of less disturbance-tolerant species present in the wetland. The targeted function of groundwater recharge/discharge may include, but is not limited to, consideration of the following parameters: potential or known occurrences of public or private wells exist downstream of the wetland; signs of variable water levels, and association with a watercourse. The targeted function of sediment/shoreline stabilization may include, but is not limited to, consideration of the following parameters: indications of erosion, siltation; presence of potential sediment sources upstream; a distinct step between the waterbody and the adjacent land with dense roots throughout. The targeted function of flood flow alteration may include, but is not limited to,



consideration of the following parameters: wetland occurs in the upper portion of its watershed; wetland exists in a relatively flat area that has flood storage potential; wetland receives and retains overland or sheet flow runoff from surrounding uplands.

5.4 MITIGATION SITE SELECTION

5.4.1 Rationale for Site Selection

The mitigation site selection process involves reviewing and assessing locations within the project corridor and its impacted watershed for basic information including dominant plant species, soil type and hydrologic characteristics. These areas are also preliminary assessed for topography; the potential for establishing an adequate water regime; the potential for the area to provide good wildlife habitat; and any limiting factors (e.g. limited available space, a need for excessive removal or fill or the presence of invasive species). Site selection and design for this project has been performed in concurrence with information presented in the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule document issued by three (3) regulating agencies (USACE, New York State Department of State and US Environmental Protection Agency).

The proposed mitigation site has been situated in the southwestern portion of the project site due to the constraints of the project limits, proposed development parcel boundaries, city-owned parcel boundaries, and topography. Some preliminary studies suggest that the on-site soils and hydrology may pose challenges for wetland creation. Additional studies of pertinent site characteristics should be undertaken prior to commitment to a final mitigation method and design.

5.4.2 Deed Restrictions, Easements, Rights-of-Way

Deed restrictions, easements, and rights-of-way will not be required as the proposed mitigation site is within city-owned property.

5.4.3 Design Sustainability

As the design is progressed, features will be included to promote sustainable growth of a dominance of hydrophytic vegetation. These features include infiltration testing of the existing soils, the placement of suitable substrate for vegetation, the refinement of wetland water budgets to ensure an adequate supply of hydrology, and planting/seeding with appropriate native wetland plant species capable of on-site propagation.

5.4.4 Design Constraints

The design constraints at the mitigation site are: limited existing hydrology (i.e. lack of surface water or groundwater contributions), sandy/gravelly fill soils, and siting constraints due to project limits, city-owned parcel boundaries, and topography.

5.4.5 Coordination with State and Federal Agencies

The U.S. Army Corps of Engineers (USACE) and NYSDEC have not yet been consulted on the wetland mitigation aspects of this project. As project design is progressed and resource impacts are better defined, consultation regarding mitigation can commence. A detailed design-level mitigation plan will



be designed which follows the guidance set forth by the USACE. Further, the USACE will need to approve the mitigation and monitoring plan as a condition of the permit authorization.

5.4.6 Coordination with State Historic Preservation Office (SHPO)

The Genesee riverfront has a long history of occupation and development. Much of the project area was formerly the Genesee Valley Canal, and then the Western New York and Pennsylvania Railroad. Industry within the project area has historically included the Vacuum Oil refinery and Sears, Roebuck and Company. Plymouth Avenue was a corridor along the Underground Railroad, and Camp Fitz-John Porter in the southern portion of the PSA was once a training center for Civil War recruits. Several other historic districts and structures are in close proximity.

Formal consultation has not yet occurred with SHPO and can be initiated when the project design has progressed further.

5.5 BASELINE INFORMATION

5.5.1 Impact Site(s)

a. *Location*

1) Coordinates

The approximate center coordinates of the proposed BOA development are latitude 43.13655° and longitude -77.62104°.

2) Written Location Description

The subject project is within the City of Rochester, Monroe County, New York. The project encompasses the underutilized and undeveloped areas bound to the east by the Genesee River and to the west by a steep topographic gradient, and urban areas including the eastern ends of Violetta Street, Flint Street, and Riverview Place. The northern extent of the project area is bound by Ford Street, and the southern extent is the intersection of the Genesee River Trail and S Plymouth Avenue (Map 12).

3) Section, Block, Lot, Township/City/Village, County

The project area is depicted on the Rochester East Quadrangle, City of Rochester, Monroe County, New York at the above referenced Latitude/Longitude. A Project Location Map is included as Map 12.

4) Hydrologic Unit Code

The project corridor is situated within the Lower Genesee Watershed. The eight (8) digit hydrologic unit code for the watershed is 04130003.

5) Site Photos and Photo Location Map

Photographs of the impacted wetlands within the project area were previously provided in the Wetland Report.



b. Site Information

1) Describe Type and Purpose of Work at Each Impact Site

The detailed activities of the BOA project have not yet been finalized; therefore, a discussion of resource-specific impacts is premature. This preliminary mitigation design presumes that all on-site wetlands (A, B, C, E, & F) will be impacted entirely. As the project design continues, avoidance and minimization measures will be implemented to reduce impacts to the greatest extent practicable.

2) Description and Quantification of Aquatic Resource Size, Type, Functions and Services that will be impacted at the Proposed Impact Site.

Please reference Section 5.2.1 of this report for a discussion of wetland size, type, functions and potential impacts.

3) Describe the Proposed Temporary and Permanent Impacts to the Aquatic Environment

The project will result in a temporary reduction of shrub swamp, forested and emergent wetland acreage within the Genesee River basin.

The wetland functions/services affected within the project area will be replaced at an on-site compensatory mitigation wetland that will provide increased functional capacity and area within the Genesee River watershed as well as the overall Lake Ontario watershed. The specific goals of the proposed wetland mitigation area will be better defined when resource impacts have been finalized. They will include providing the same functions as the impacted wetlands.

The subject project will result in both direct fill-related and indirect impacts to wetlands. For the purposes of this preliminary mitigation study, it has been assumed that the entirety of Wetlands A, B, C, E and F will be impacted. Direct impacts are anticipated from roadway construction, trail construction, grading, and landscaping. Temporary and/or indirect impacts have not been considered in this preliminary study.

Erosion and sediment control measures will be designed and employed to prevent excess sediment from entering the Genesee River, the ephemeral tributary, and any adjacent undisturbed wetland areas.

4) Surrounding Land Use

This project area is part of the Genesee River Basin and the immediately adjacent landscape is northern hardwood forest. Single family homes, commercial properties, and abandoned industry are within and adjacent to the proposed development corridor. The Genesee Riverway Trail roughly parallels the shoreline. Six (6) small wetlands and one (1) ephemeral stream were identified in the project area.



5) Impairment Status and Impairment Type of Aquatic Resources

The impacted wetlands identified within the project area consist of emergent, scrub-shrub, and forested wetlands. Their functional capacities generally include flood flow alteration, groundwater recharge/discharge, wildlife habitat, and nutrient retention. Invasive plant species were observed in Wetlands B and C in non-dominant amounts.

6) Cover Types within the Project Area

The project area primarily consists of northern hardwood forest and few wetlands. Detailed information regarding the ecology of the area can be found in the Wetland Report for the project.

7) Size/Width of Natural Buffers

The BOA project area is naturally bound to the east and south by the Genesee River and to the southwest by a steep topographic gradient. To the north and northwest, residential, commercial, and industrial development is immediately adjacent. Along with improving public access to the Genesee River waterfront, areas of natural shoreline will be implemented to restore the buffer between the river and development. Natural shorelines can offer protection in both directions; protecting developed areas from river flood waters and protecting the river from human impacts.

8) Current Owner(s)

The City of Rochester currently owns the parcels proposed for development of the BOA improvements and mitigation area.

9) Existing Wildlife Usage

A number of ecological studies were performed in support of this project. Based on results of observations noted during routine field investigations, it has been determined that the project area, including wetlands provides both food and cover for wildlife species. Waterfowl (Canadian geese), songbirds, and small mammals are common.

10) Known or Potential Cultural Resources

Formal consultation has not yet been conducted with SHPO. Several historically notable sites and areas are present within and in proximity to the proposed project area. As the project design is advanced, SHPO will be consulted to identify potential on-site cultural resources and determine if the project, inclusive of the mitigation site may have any effect on them.

11) Historic and Current Land Use

The project area has a long history of various developments, from railroads and canals to manufacturing. The existing land use is recreational along the Genesee Riverway Trail, underutilized industrial buildings, and undeveloped hardwood forest.



12) Known Listed Hazardous Materials Sites

Brownfield sites are properties whose expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. This corridor in particular is the former home of the Vacuum Oil Rochester Works facility, which refined and distributed petroleum-based products in the 19th and 20th centuries. Environmental studies have been conducted for individual parcels and small portions of the BOA project area. The former Vacuum Oil site encompasses 14 properties and is the most significant hazard associated with the BOA project. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals-contaminated soils and groundwater are prevalent across multiple parcels. Some remediation efforts have been undertaken to remove sludge and other contaminated media. The various parcels within the BOA area are at varying stages of the Brownfield cleanup process, from identification and quantification of hazardous materials, to remediation. In some parcels, additional investigations are necessary to identify the full extent and remediation options for on-site contamination.

c. *Watershed*

1) Description of Landscape Connectivity

As described in current literature, landscape connectivity is the relationship between the native species and their response to the surrounding landscape. Landscape connectivity is considered species and landscape specific. The project area includes an isolated forest community along the shore of the Genesee River, and is unlikely to provide any connectivity to other wildlife habitats. The Genesee Riverway Trail provides a pedestrian connection between the heart of downtown Rochester to suburban neighborhoods and the University of Rochester on the south side of the River.

2) Describe Aquatic Resource Concerns in the Watershed

The NYSDEC has listed the Lower Genesee River on the Section 303(d) list of impaired waters. The river is listed due to impairment from PCBs, Mirex, and Dioxin.

3) Documentation of Coordination

Coordination with state and federal agencies regarding wetland mitigation has not yet been conducted.

d. *Wetland Classification and Functional Assessment*

1) Classification of Wetlands

The largest amount of impact will occur to forested wetlands, with a lesser amount of impact occurring to shrub swamp and shallow emergent marsh communities respectively. Wetland hydrology is provided mainly by runoff from the surrounding adjacent uplands.



2) Assessment of the Functions and Services of the Impacted Wetlands

The discussions included in Section 5.2.1.b and other sections above, demonstrate the existing functions/services that the impacted wetlands contribute to the watershed. The most important functions/services provided by these wetlands are flood flow alteration, groundwater recharge, nutrient retention, and wildlife habitat.

For the purposes of this preliminary mitigation assessment it has been assumed that the project will impact the entirety of Wetlands A, B, C, E, and F. As the project design progresses, all practicable measures will be used to avoid and minimize impacts to these resources. Where applicable, stormwater pollution prevention measures will be utilized to mitigate any potential changes in water quantity/quality resulting from the proposed disturbance and impacts to currently undeveloped land including the wetlands.

e. *Existing Hydrology*

1) Delineation of All Waters On-site

The project area wetlands and stream were delineated by SCE October 19 and 20, 2015. A USACE Jurisdictional site walk was performed with a representative of the USACE Buffalo District. As a result of the site walk, all on-site resources were determined to be jurisdictional. A Jurisdictional Determination was issued on April 28, 2017.

2) Water Budget and Hydroperiod

Water budgets for the impacted wetlands were not created; however, their existing hydroperiods were observed and noted during the delineation efforts.

3) Presence and Effect of Tidal Waters, Spring High Tide, Mean High Water, and Mean Low Water Elevations

Although the project area is immediately adjacent to the Genesee River, the old railroad line (which is now the location of the Riverway Trail), acts as a berm restricting overflow to the majority of the corridor. No other tides or high waters influence this site.

4) Watershed Area

The proposed project impact and mitigation areas are located in the lower Genesee River watershed which is 1,070 square miles in size.

5) Location, Installation and Use of Monitoring Wells

Several monitoring wells are located throughout the BOA area. These were installed in an effort to monitor contamination from former industries at the site. Limited data has been obtained from these wells. No additional monitoring wells are proposed to be installed for the wetland mitigation effort at this time.



6) Monitoring Well Data

Limited groundwater depth data has been obtained for the 38 monitoring wells which are present throughout the project area. Measurements August and December 2016 indicate that groundwater depth ranges from 2-11 feet below the surface. Groundwater depth in the area of the proposed wetland mitigation appears to be approximately 5-7 feet below grade.

7) Cross-Section of Existing Seasonal Water Levels

Limited groundwater level data was made available from the existing array of groundwater monitoring wells. These data and their accompanying groundwater elevation contour maps suggest that groundwater is shallowest in the northern portion of the project area.

8) Results of Models Used

This section does not apply to the project area.

9) Nutrient Inputs and Outputs, including N, P, pH, TSS, DO, etc.

This information cannot be reasonably obtained.

f. Existing Dominant Vegetation

1) Community Structure (e.g. Vegetative Layers, Canopy Stratification)

Several vegetative communities are present throughout the PSA; each community has been characterized based on Edinger et al. (2014). The communities identified included Successional Forest, Successional Shrubland, Mowed Lawn, Mowed Lawn with Trees, Paved Path, Urban Vacant Lot, Brushy Cleared Land, and Floodplain Forest.

Successional Forest

Three (3) areas of Successional Forest were identified within the PSA. These areas are linear in nature and appear to be associated with the former Genesee Canal bed. The floor of the Successional Forest communities contains trash and debris, especially within the former canal bed. Dominant plant species within the Successional Forest areas included grape (*Vitis* sp.), poison ivy (*Toxicodendron radicans*), quaking aspen (*Populus tremuloides*), white willow (*Salix alba*), tree of heaven (*Ailanthus altissima*), staghorn sumac (*Rhus typhina*), eastern cottonwood (*Populus deltoides*), and the invasive common buckthorn (*Rhamnus cathartica*), Norway maple (*Acer platanoides*), black locust (*Robinia pseudoacacia*), tatarian honeysuckle (*Lonicera tartarica*), and Japanese honeysuckle (*Lonicera japonica*).

Successional Shrubland

Several areas within the PSA were classified as Successional Shrubland; these areas are all located along the east side of the PSA, between the Genesee Riverway Trail and the Genesee River. Staghorn sumac, grape, dogwoods (*Cornus* sp.), blackberry (*Rubus* sp.), crown vetch (*Securigera varia*), and the invasive tartarian honeysuckle were observed as the dominant species in these areas.



Mowed Lawn/ Mowed Lawn with Trees

Mowed Lawn and Mowed Lawn with Trees communities occupy multiple areas in close proximity to the Genesee Riverway Trail. These mowed areas are dominated by various grasses, dandelion (*Taraxacum officinale*), clover (*Trifolium* sp.), and English plantain (*Plantago lanceolata*). The invasive mugwort (*Artemisia vulgaris*) is common at the edges of the existing paved Genesee Riverway Trail, especially in the areas occupying the former railroad bed. Norway maple and black locust are the dominant trees, where present.

Paved Path

The areas characterized as Paved Path consist of the existing Genesee Riverway Trail, and are generally located parallel to the Genesee River. No vegetation is present in these paved areas.

Urban Vacant Lot

A small area classified as Urban Vacant Lot is situated along the western boundary of the PSA, just north of Flint Street, in the central portion of the study area. The dominant plant species inhabiting this area included tree of heaven, grape, tartarian honeysuckle, sycamore maple (*Acer psuedoplatanus*), and blackberries.

Brushy Cleared Land

Land classified as Brushy Cleared Land is located along the western boundary of the PSA near the southwestern corner. This area appears to have been logged in the recent past; stumps and woody debris are prevalent. Dominant plant species in this area included boxelder (*Acer negundo*), tree of heaven, colts foot (*Tussilago farfara*), black raspberry (*Rubus occidentalis*), and the invasive garlic mustard (*Alliaria petiolata*).

Floodplain Forest

Floodplain Forests comprise the remaining portions of the PSA, occupying the majority of the southern end. The Floodplain Forests were characterized by a dominance of eastern cottonwood, black walnut (*Juglans nigra*), boxelder, poison ivy, and the invasive common buckthorn (*Rhamnus cathartica*), tartarian honeysuckle, black locust, and Norway maple.

2) Wetland Indicator Status of Dominant Species

The shallow emergent marsh communities present throughout the project area are generally dominated by Canada rush (*Juncus canadensis*, OBL), fowl bluegrass (*Poa palustris*, FACW), whitegrass (*Leersia virginica*, FACW), bulrush (*Scirpus* sp., OBL), and cattail (*Typha* sp., OBL). The scrub-shrub swamp communities that were delineated within the project area are primarily dominated by red osier dogwood (*Cornus alba*, FACW), white willow (*Salix alba*, FACW), box elder (*Acer negundo*, FAC), and purple loosestrife (*Lythrum salicaria*, OBL). The dominant species observed within the forested wetlands included black willow (*Salix nigra*, OBL), green ash (*Fraxinus pennsylvanica*, FACW), eastern cottonwood (*Populus deltoides*, FAC), silver maple (*Acer saccharinum*, FACW), red osier dogwood, common buckthorn (*Rhamnus cathartica*, FAC), poison



ivy (*Toxicodendron radicans*, FAC), horsetails (*Equisetum* sp., undetermined), purple loosestrife, and grape (*Vitis* sp., undetermined.)

3) General Age and Health of Existing Wetlands

Insufficient information is available to accurately estimate wetland age. No detailed studies of wetland health have been conducted. It is possible that these wetlands are diminished in health and/or functionality due to the area's history of disturbance and contamination.

4) Native/Non-Native/Invasive Status

Invasive species including purple loosestrife, black locust, common buckthorn, Norway maple, mugwort, tree of heaven, tartarian honeysuckle, Japanese honeysuckle, garlic mustard, and Japanese knotweed were observed within the project area. Coltsfoot (*Tussilago farfara*) has also been noted. Although not listed as invasive in New York State, it is recognized as invasive in Connecticut.

g. Existing Soils

1) The USDA Soil Conservation Service Soil Survey identifies the soils in the project area as Urban Land. This classification is used for a variety of disturbed and filled areas, so characteristics are undocumented.

A geotechnical report was prepared by Terracon in support of the BOA project. This report generally describes the upper layers of on-site soils as follows:

- 0.1-0.5 feet from surface – topsoil; dark brown with significant organic matter.
- 0.5-14 feet from surface – in-place fill; mixture of sand, silt, and gravel with occasional pockets of clay/clayey silt.

This available information suggests that the existing soils may not be ideal for wetland creation. As the design of this mitigation site progresses, additional studies such as infiltration testing will likely be warranted. If infiltration rates are too high, it will be difficult to maintain adequate wetland hydrology. Highly-permeable soils could be excavated and backfilled with low-permeability clay soils. Or, need for a liner could be evaluated and incorporated into the design.

2) Identification of any Contaminants

The project area has a history of heavy industry and historic contamination. See Section 5.5.1.b for a discussion of hazardous waste and contaminated materials concerns.

5.5.2 Compensatory Wetland Mitigation Site

a. Location

1) Coordinates

The approximate center coordinates of the wetland mitigation site are latitude 43.13473° and longitude -77.62323°.



2) Written Location Description

The proposed wetland mitigation site will be located on-site, in the southwest portion of the project area (Map 12).

3) Section, Block, Lot, Township/City/Village, County

The mitigation site is located in the City of Rochester, Monroe County, New York (Map 12). No easements or right-of-way acquisitions will be required.

4) Hydrologic Unit Code

The mitigation site is situated within the Lower Genesee Watershed. The eight-digit hydrologic unit code for the watershed is 04130003.

5) Project Location within the Watershed

The mitigation site is located within the northeastern most portion of the Lower Genesee River watershed, nearly at the discharge to Lake Ontario.

6) Site Photographs and Photo Location Map

Site photographs and a photo location map were previously provided in the June 2017 Wetland Report.

b. Site Information

1) Describe Type and Purpose of Work at the Mitigation Site

The details of the mitigation site work will be developed as the project design progresses.

2) Description and Quantification of Aquatic Resource Size, Type, Functions and Services that will be Impacted at the Mitigation Site

No wetlands or streams are in the vicinity of the proposed mitigation. The nearest wetland, Wetland D, is approximately 100 feet west of the mitigation area. The mitigation area is also partially within the 100-year floodplain (Map 13). The construction of the mitigation area is anticipated to provide a small net benefit to flood attenuation.

3) Describe the proposed Temporary and Permanent Impacts to the Aquatic Environment

Temporary and permanent impacts to aquatic resources are not anticipated as a result of the construction of the wetland mitigation area as currently designed. One design alternative not thoroughly assessed may include a hydrologic connection to Wetland D. In this alternative, a small permanent impact to Wetland D would occur.

4) Surrounding Land Use

Mitigation is proposed within the same project area as the impact areas. Refer to Section 5.5.1.b for a description of the surrounding land use.



5) Impairment Status and Impairment Types of Aquatic Resources

Aquatic resources do not currently existing at the proposed mitigation site.

6) Percent Agriculture, Forested, Wetland, Developed, etc. Cover Types within the Mitigation Area

The 1.103-acre proposed mitigation area is entirely forested.

7) Size/Width of Natural Buffers

The proposed mitigation site is situated immediately adjacent to parcels slated for future development to the north. To the south, east, and west, development is proposed to be minimal, mostly consisting of paved trails and landscaping. Natural forested areas are proposed to remain to the west, beyond the paved trail.

8) Current Owner(s)

The City of Rochester is the current owner of the property that would be used to construct the project and compensatory mitigation site. No easements or acquisitions of right-of-way will be required.

9) Existing Wildlife Usage

The proposed compensatory wetland mitigation area is in the same project corridor as the proposed impact areas. Reference Section 5.5.1.b for a discussion of the existing wildlife uses.

10) Known or Potential Cultural Resources

Reference the discussion of cultural resources in Section 5.5.1.b.

11) Historic and Current Land Use

Reference the discussion of historic and current land use in Section 5.5.1.b.

12) Known Listed Hazardous Materials Sites

Reference the discussion of hazardous materials in Section 5.5.1.b.

c. *Watershed*

1) Description of Landscape Connectivity

Land cover within the watershed is predominantly urban and suburban. Rural communities are located within the upper portions of the watershed. Urban development and agriculture dominate the watershed, with little contiguous habitat throughout. Therefore, the degree of landscape connectivity within the watershed is considered to be low.

2) Describe Aquatic Resource Concerns in the Watershed

See Section 5.5.1.c for a discussion of the watershed resource concerns.



3) Documentation of Local Coordination

As stated above, correspondence with the NYSDEC, USFWS and SHPO have not yet been conducted at this stage of the project.

d. *Wetland Classification and Functional Assessment*

1) Classification of the Wetland

The intent of the compensatory mitigation is to construct a wetland that is comprised of a combination of shallow emergent marsh, shrub swamp and floodplain forest communities. The hydrology will be characterized by groundwater fluctuations resulting in standing water and/or saturation of the soils, which will be present for extended periods especially early in the growing season. The wetland will meet the classifications of PEM1E, PSS1E and PFO1E per the classification system developed by Cowardin, et al (1979). This classification code indicates that the wetland will be in the palustrine class of aquatic habitats (P), feature an emergent marsh (EM), scrub/shrub (SS) or forested (FO) covertype, consisting of persistent vegetation or broad-leaved deciduous vegetation (1), and experience a seasonally flooded/saturated (E) hydrologic regime.

2) Assessment of the Functions and Services of the Constructed Wetland

The constructed wetland will aim to replace and enhance the functions lost due to impacts to on-site wetlands. These functions will be identified, assessed, and incorporated into the final design of the mitigation site.

The created wetland will possess characteristics common to shallow emergent marsh, shrub swamp and floodplain forest communities in New York State (Edinger 2014) and similar to the wetlands that were impacted within the project area.

e. *Existing Hydrology*

1) Delineation of All Waters On-Site

No wetlands or streams currently exist in the vicinity of the proposed mitigation site.

2) Water Budget and Hydroperiod

Wetland mitigation will be performed on-site. Preliminary hydrographs for a representative dry year, median year and wet year were prepared. Some significant contributing factors such as soil infiltration are lacking, and so these hydrographs have not been included. Preliminary infiltration rates have been roughly estimated based on the texture of the existing soils. Infiltration testing is recommended to be performed to obtain relevant data; these hydrographs should be refined as this data becomes available.

3) Presence and Effect of Tidal Waters, Spring High Tide, Mean High Water and Mean Low Water Elevations

No influences are anticipated from tides or seasonal high waters. Although the site is adjacent to the Genesee River, a berm precludes overflow to the proposed mitigation site.



4) Watershed Area

The mitigation site is located in the Lower Genesee River watershed which is 1,070 square miles in size.

5) Location, Installation and Use of Monitoring Wells

Reference Section 5.5.1.e for a discussion of the existing monitoring wells. No additional monitoring wells are proposed.

6) Monitoring Well Data

Limited monitoring well data was provided. This, and potentially additional monitoring well data will be utilized to determine the hydroperiod of the compensatory mitigation wetland. If additional well data becomes available it should be evaluated and included in later versions of this report. At this time, it is not anticipated that groundwater will be available for utilization in the wetland mitigation area.

7) Nutrient Inputs and Outputs, including N, P, pH, TSS, DO, etc.

No data is readily available at this time and inputs and outputs cannot be reasonably estimated.

f. Existing Dominant Vegetation

1) Reference Section 5.5.1.f for a discussion of the existing on-site vegetation.

2) Wetland Indicator Status of Dominant Species

Reference Section 5.5.1.f for the wetland indicator statuses of the on-site dominant species.

3) General Age and Health of the Existing Wetlands

Insufficient information is available to determine an accurate estimation.

4) Native/Non-Native/Invasive Status

Reference Section 5.5.1.f for a discussion of the invasive species noted in the project area.

g. Existing Soils

1) Reference Section 5.5.1.g for a discussion of the existing soils.

2) Identification of Any Contaminants

Reference Section 5.5.1.b for a discussion of the contamination and hazardous materials concerns at the site.



5.6 MITIGATION WORK PLAN

5.6.1 Construction

a. *Mitigation Area Plan*

The limits of the proposed wetland mitigation area are shown on the Wetland Mitigation Plans, Maps 14-17. The provided concept plans show “future development” within the area of proposed mitigation. It is anticipated that the mitigation wetland and/or future plans can be refined as the project progresses.

b. *Timing of Mitigation*

The mitigation plan is currently in a preliminary stage. As the project design is finalized, impacts to on-site wetlands can be determined and permitted. A timeline of construction activities, including wetland planting, will be developed at that time. If agreed upon by the USACE in the conditioning of the permit, creation of the wetland mitigation site will commence concurrent with the construction of the BOA improvements project.

c. *Existing and Proposed Elevations and Slopes*

A preliminary schematic of elevations and slopes are shown on the Wetland Mitigation Grading Plan, Map 16. The intent of the proposed mitigation design is to excavate the mitigation area to low enough elevations as to maintain a sufficient amount of water to support the targeted shallow emergent marsh, shrub swamp and floodplain forest wetland communities.

d. *Describe Plans for Establishing Micro-topography*

Micro-topography will be developed through use of rough grading of the subsoil.

e. *Plan Showing Proposed Contours*

Preliminary designs of contours of the mitigation site are depicted on the Wetland Mitigation Grading Plan, Map 16.

f. *Representative Cross-section(s)*

Cross sections will be developed during a later design phase as the proposed topography is finalized.

g. *Description of Construction Methods (e.g. equipment to be used)*

Construction equipment such as dump trucks, pick-up trucks, a track hoe, bulldozer and a variety of handheld tools shall be used to construct the wetland mitigation site. The proposed work will involve excavation, potential placement of wetland soils, stabilization of soil, and plantings.

h. *Construction Schedule*

1) Expected Start and End Dates of Each Construction Phase

The construction schedule has not yet been determined at this stage of the project.



2) Expected Date for As-Built Plan

As-built plans will be provided upon completion of the wetland mitigation construction.

i. Water Handling Plan

The construction of the proposed project will not involve pumping, fluming or diverting flowing water or standing water except as necessitated by storm events during seeding establishment or to necessitate any repair work to the wetland.

j. Erosion and Sediment Control Plan

An erosion and sediment control plan will be developed to avoid/minimize the potential for indirect impacts such as sedimentation and/or toxins from work and staging areas to other resources such as the Genesee River.

k. Planting/Seeding Schedule

A planting/seeding schedule has not yet been developed, and will occur as the project design progresses.

l. Environmental Monitor/Manager

A qualified engineer, landscape architect, or other qualified professional will oversee and execute the project plans and specifications and will direct field modifications as necessary.

5.6.2 Planned Hydrology

a. Proposed Water Budget and Hydroperiod

See Section 5.5.2.e.

b. Changes to Watershed Area

The proposed project will temporarily reduce the amount of wetlands found in the Lower Genesee River Watershed which is part of the Lake Ontario Watershed. A preliminary estimate of impacts suggests 0.545 acres of wetland may be impacted by the proposed BOA project. The proposed mitigation site totals 1.103 acres. Upon completion of construction activities, there will be an overall increase of 0.558 acres of wetland in the Lower Genesee River Watershed and ultimately the Lake Ontario Watershed.



TABLE 2 - WETLAND AREAS AND ESTIMATED PROJECT RELATED IMPACTS

Federal Wetland Unit	Approximate Wetland Area within PSA (acres)				Presumed Impacts (acres)		
	Shallow Emergent Marsh	Scrub-Shrub Wetland	Forested Wetland	Total	Shallow Emergent Marsh	Scrub-Shrub Wetland	Forested Wetland
A	0.019			0.019	0.019	0	0
B		0.043		0.043	0	0.043	0
C			0.364	0.364	0	0	0.364
D	0.274			0.274	0	0	0
E			0.078	0.078	0	0	0.078
F			0.041	0.041	0	0	0.041
Total (Acres)	0.293	0.043	0.483	0.819	0.019	0.043	0.483
Total Presumed Impact to Wetlands (acres)					0.545		
Proposed Mitigation Ratio 2:1							
Mitigation Goal for Jurisdictional Wetlands (acres)					0.038	0.086	0.966
Total Mitigation Goal (acres)					1.090		
Total Mitigation Proposed (acres)					1.103		

c. *Plan Showing Locations of Monitoring Wells or other Gauges that will be Used to Determine the Water Level Fluctuation during the Monitoring Period*

Two (2) water observation wells (OVR-122 and OVR-124) are currently within the proposed mitigation site. If removal of these wells is needed to facilitate construction, they will be reestablished. These can be used to obtain wetland hydrology data during the post-construction monitoring effort, though groundwater contributions are thought to be unlikely at this point.

d. *Predicted Seasonal Water Levels*

See Section 5.5.2.e.

e. *Proposed Changes with Potential to Affect Model Results*

Modifications may be made during the monitoring period if determined necessary and authorized by the USACE.

f. *Explanation of Factors and Decisions Determining Proposed Mitigation Site Grading and Planting Plan*

The final design site grading and planting plan have not yet been developed. Final proposed grades will be designed to incorporate a varied topography. Deeper areas will be included which will ideally remain inundated or saturated throughout the year. Higher, shallower areas will get seasonal influxes of hydrology but will also dry out periodically.



The seeding will provide the mitigation area with a good diversity of plant species possessing a wide tolerance of hydrologic regimes. Mulch should be used to help keep the seed on-site, increase soil temperature and help retain soil moisture. Nursery grown stock will provide the root and propagule sources necessary for the mitigation area to successfully develop into a combination shallow emergent marsh, shrub swamp and floodplain forest wetland community. The species and proposed planting densities will be selected to ensure the development of good habitat structure in a variety of canopy layers for wildlife cover, refuge, feeding and nesting. Proposed plant species will be chosen on the basis of their existence within impacted wetlands, ability to provide good habitat structure, commercial availability, adaptability to fluctuating conditions, aesthetics, and/or value as a wildlife food source.

g. Explanation of Likelihood of Mitigation Success, Based on Proposed Hydrology

An updated hydrologic analysis should be performed for the mitigation area in order to demonstrate that sufficient hydrology exists to support the compensatory mitigation wetland. A preliminary analysis indicates that sufficient hydrology may be a limiting factor in the success of this site. Measures to overcome this may be undertaken, such as capturing and diverting runoff, or utilizing clay soils or a liner to minimize infiltration losses. These and other measures will be explored as the design progresses.

5.6.3 Planned Vegetation

a. List of Native Hydrophytes (e.g. Wetland Plants) using Scientific Names and Regional Indicator Status (Include Seed Mix Composition)

The mitigation area will be planted with the native hydrophytic species to be determined as the project progresses.

b. Sources of Native Plant Species, Stock Type, Plant Age(s)/Size(s)

Sources of plant stock will be explored as the project design progresses.

c. Plant Zonation/Location Map

Plantings will occur in several zones, dependent on which community is ultimately desired; emergent, scrub-shrub, or forested. Vegetative communities are shown on Map 17.

d. Plant Spatial Structure (e.g. Quantities, Densities)

A planting table identifying species, quantities, and densities will be developed.

e. Community Structure (e.g. Vegetative Layers, Canopy Stratification)

These details will be depicted on the final design plans.

f. Expected Natural Regeneration from Existing Seed Bank, Plantings and Natural Recruitment

The wetland area will be constructed on excavated subsoil and reworked topsoil that is stripped from the proposed mitigation site; the potential for 100 percent natural regeneration from an existing seed bank seems unlikely. It is possible that topsoil from the existing on-site wetlands may



be used in the mitigation area. A seeding and planting plan is expected to result in diverse vegetative communities. It is intended that the plantings within each created community will self-regenerate. The need for modifications, including the need for replacement of failed plantings will be determined during the annual post-construction monitoring events.

Several invasive species, including some hydrophytic invasives, are present in the project area. As such, potential measures should be considered to prevent the invasive species from colonizing in the newly constructed wetland mitigation site. If the seeding and planting plan is successful, there will be less opportunity for invasive species to colonize underperforming areas. If invasive species are found to inhabit the mitigation site in unacceptable amounts, physical or chemical measures will have to take place in accordance with the conditions of the permit authorization.

g. Use of Mulch

This will be explored as the project design progresses.

h. Wildlife Plan

Providing wildlife food and habitat will be explored as the project progresses.

i. Herbivore Browse Control Plan

Herbivory will be considered as the project design is progressed.

j. Consideration of Other Abiotic Factors

This will be considered as the project design progresses.

5.6.4 Planned Soils

a. Source of the Soils

If further studies of the on-site soils indicate that they can be used successfully in wetland creation, outside soils may not be required. If outside soils are required to be imported, they could potentially be sourced from the existing on-site wetlands to be impacted or another off-site source. Soils should be clean and free of invasive species to the greatest extent practicable.

b. Erosion and Soil Compaction Control Measures

Soils may need to be intentionally compacted to decrease infiltration rates.

5.6.5 Planned Habitat Features

The more valuable wetlands are complexes of communities that provide a wide diversity of vegetative species. A diversity of herbaceous and woody species will be utilized to increase the wildlife value of the mitigation site. For example, species will be selected which provide high quality food and/or cover for song birds, small mammals and some waterfowl.



5.6.6 Planned Buffer

An upland buffer is not being proposed for the mitigation site due to the physical constraints of the project design and adjacent parcels.

5.6.7 Other Planned Features – Interpretive Signs, Trails, Fence(s), Etc.

As part of the BOA park and open space plan, this area will serve as an interpretive feature. Specific features such as signs and fences are yet to be designed.

5.7 SITE PROTECTION AND FINANCIAL ASSURANCES

The site is currently owned and will remain under the ownership of the City of Rochester. Appropriate legal and financial assurances will be secured during final site design and approval.

5.8 MONITORING PLAN

5.8.1 Responsible Parties and Their Role

a. *Site Owner*

It is anticipated that The City of Rochester as the site owner will be responsible for the monitoring, maintenance, modification and restoration of the wetland mitigation area that is created pursuant to this plan.

b. *Easement Owner*

No easements are required for this project.

c. *Monitor*

It is anticipated that the City of Rochester will contract a wetland mitigation monitor. The details of wetland monitoring will be determined during final site design and approval, and will be conditions of the USACE authorization.

5.8.2 Monitoring Plan Information

a. *Identification of Monitoring Measures that will Promote Achievement of the Performance Standards*

The goals of this mitigation plan have not yet been finalized. These goals will be determined by the functions/services lost and the aesthetic/educational goals of the BOA project. Measurable performance standards will be conditions of the USACE authorization.

After construction of the site, information obtained during monitoring by qualified personnel will identify the need for any intervention, such as the need for reinforcement plantings, control of nuisance vegetation, etc. Monitoring reports documenting the inventoried site information will be submitted to the USACE for the required period, which is assumed to be 10 years.

Wetland creation, in essence, is the act of creating a palustrine community in an area where the local edaphic and physiognomic conditions dictate the presence of a terrestrial community. Therefore, not all contingencies can reasonably be predicted, assessed and addressed with



appropriate solutions. In the event that performance standards have not been met at the end of the imposed monitoring period, coordination will occur with the USACE to determine the appropriate steps to achieve a satisfactory level of performance.

b. Quantitative Data to be Collected and Reported (e.g. As-Built Drawings)

Following construction, the as-built drawings will be filed as a record copy with the regulatory agencies and shall be used as the basis for monitoring the site by the project monitor. The monitoring report shall include the results of the field observations and recommendations for remedial actions and analysis as necessary.

Quantitative goals have not yet been established for this mitigation site. Typical goals often include minimum coverage percentages of hydrophytes and maximum coverage percentages of invasive species.

c. Monitoring Schedule, Frequency, Duration, Monitoring Locations (including Transect Locations on Map)

The monitoring effort will be developed and approved by the USACE during the final design. Details on the method, timing, frequency, and location of monitoring efforts will be determined. It is likely that annual monitoring will be required within each established community (emergent, scrub-shrub, and forested).

5.8.3 Functional Assessment

Currently the mitigation site functions as an upland floodplain forest. The compensatory mitigation site is expected to replace the aquatic resource functions/services unavoidably lost or adversely affected by proposed construction activities associated with the BOA project. Construction techniques based on the best available natural resource data for the mitigation site will be utilized to create the desired wetland community types and the targeted functions/services.

5.8.4 Monitoring Report Submission Plan

A plan for submitting monitoring reports will be included in the final monitoring plan. A typical submission plan includes annual reports over the duration of the monitoring period.

5.9 MAINTENANCE AND ADAPTIVE MANAGEMENT PLAN

The maintenance and adaptive management plans are yet to be developed. These items will be progressed as the project design continues. Consideration will be given to various potential challenges including invasive species, planting mortality, lack of hydrology, and others.



6 Maps

Exhibit 1 – Map of Vacuum Oil Brownfield Opportunity Area and Corn Hill

Map 1 – BOA Boundary

Map 2 – Vacuum Oil BOA Preferred Parks, Open Space, and Public Waterfront Concept Master Plan

Map 3 - Flood Zones

Map 4 – Master Plan with 100-Year Floodplain

Map 5 – Ownership

Map 6 – Option 2A Fill Option South of Flint Street

Map 7 – Option 2B Full Protection North of Flint Street

Map 8 – Option 2C Partial Protection North of Flint Street

Map 9 – Vacuum Oil Drainage Area Plan

Map 10 - Concept Stormwater Management Plan

Map 11 – Vacuum Oil Concept Utility Plan

Map 12 – Project Study Area Location Map

Map 13 – Wetland Overview Map

Map 14 – Wetland Impact Area Plan

Map 15 – Wetland Mitigation Site Existing Conditions

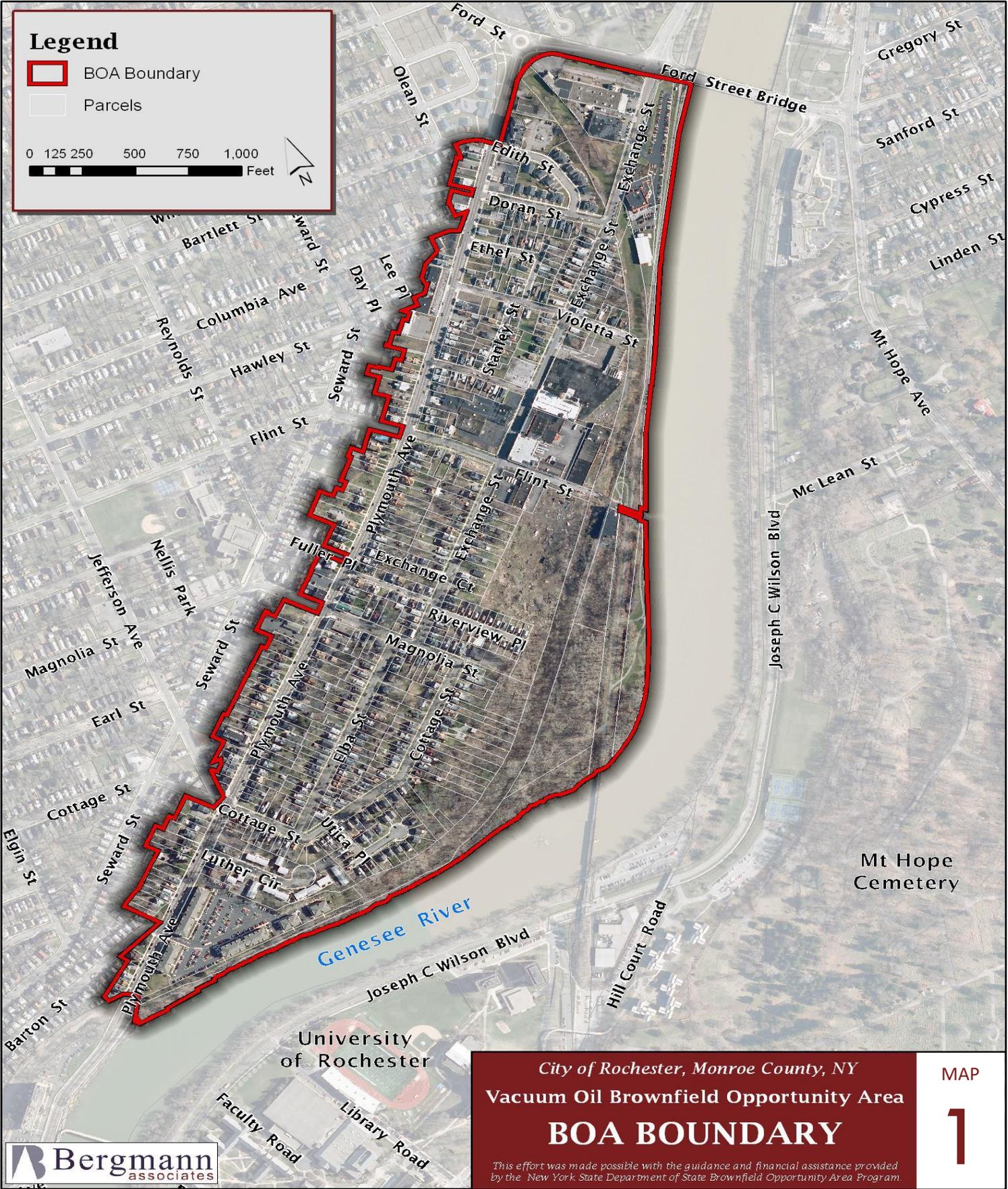
Map 16 – Wetland Mitigation Grading Plan

Map 17 – Wetland Mitigation Planting Plan

Legend

-  BOA Boundary
-  Parcels

0 125 250 500 750 1,000 Feet

Map designed by Bergmann Associates, Inc.

City of Rochester, Monroe County, NY

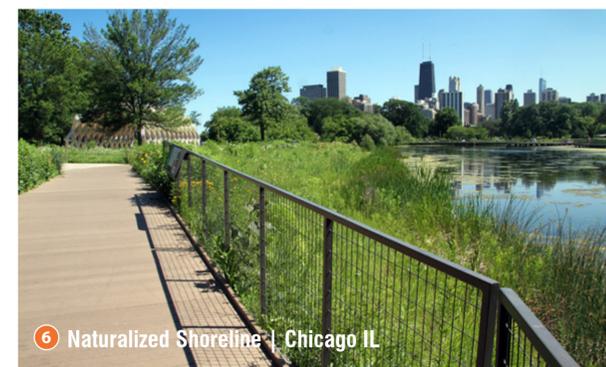
Vacuum Oil Brownfield Opportunity Area

BOA BOUNDARY

This effort was made possible with the guidance and financial assistance provided by the New York State Department of State Brownfield Opportunity Area Program.

MAP 1

VACUUM OIL BOA PREFERRED PARKS, OPEN SPACE, AND PUBLIC WATERFRONT CONCEPT MASTER PLAN



Legend

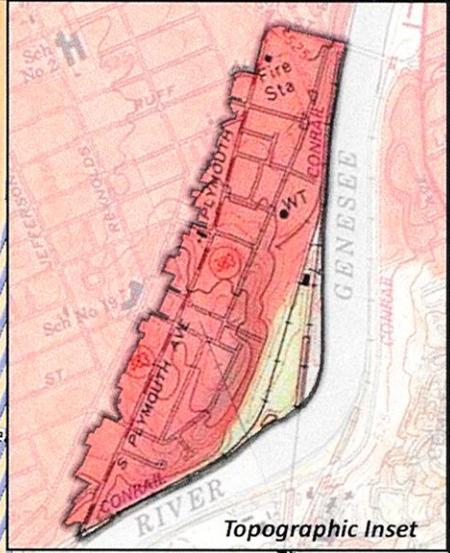
 Federally Regulated Wetlands

Flood Zone Hazard Areas

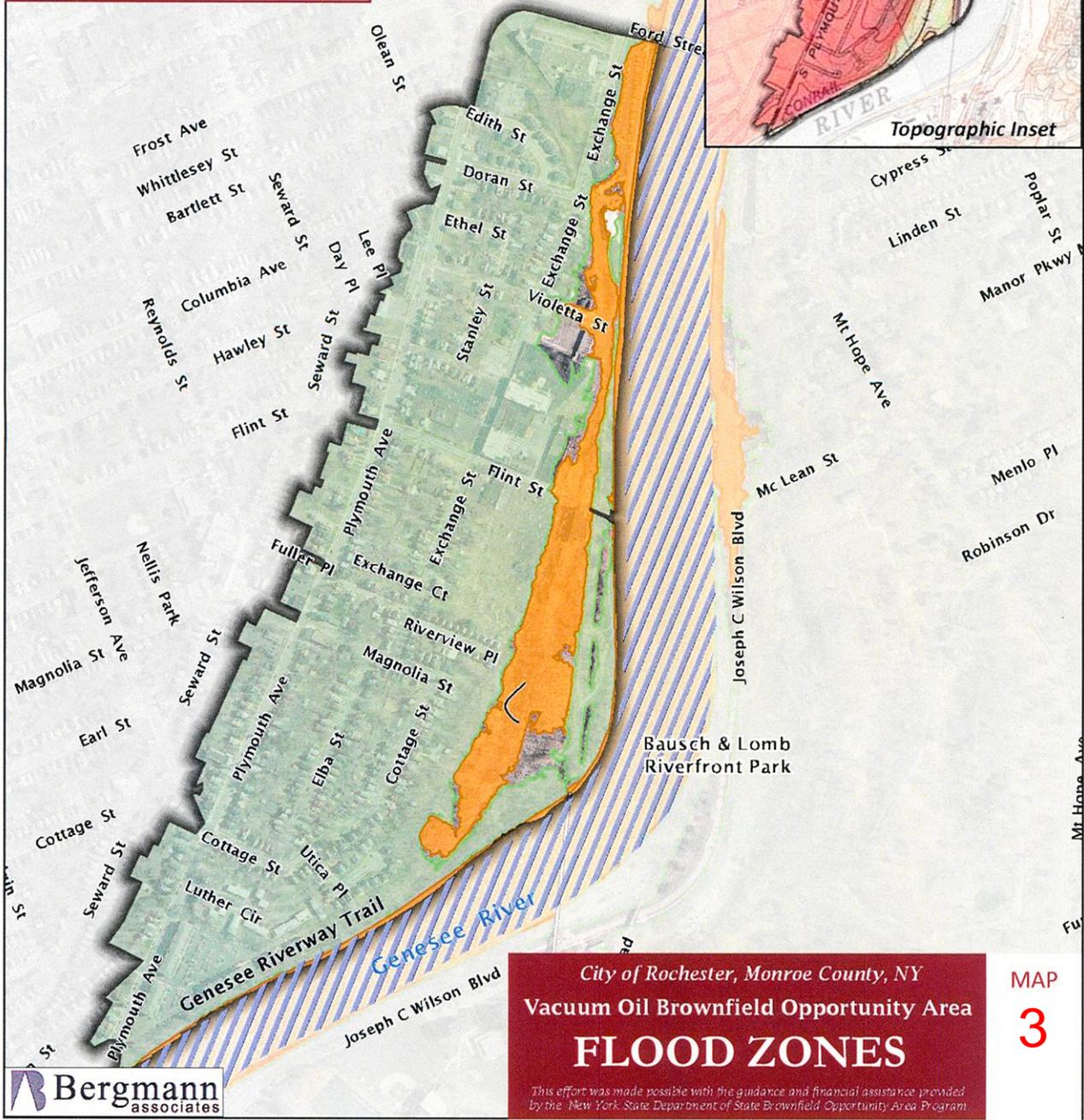
 AE - 100-year floodplain

 X - 100 to 500-year floodplain

0 137.5275 550 825 1,100
Feet



Topographic Inset

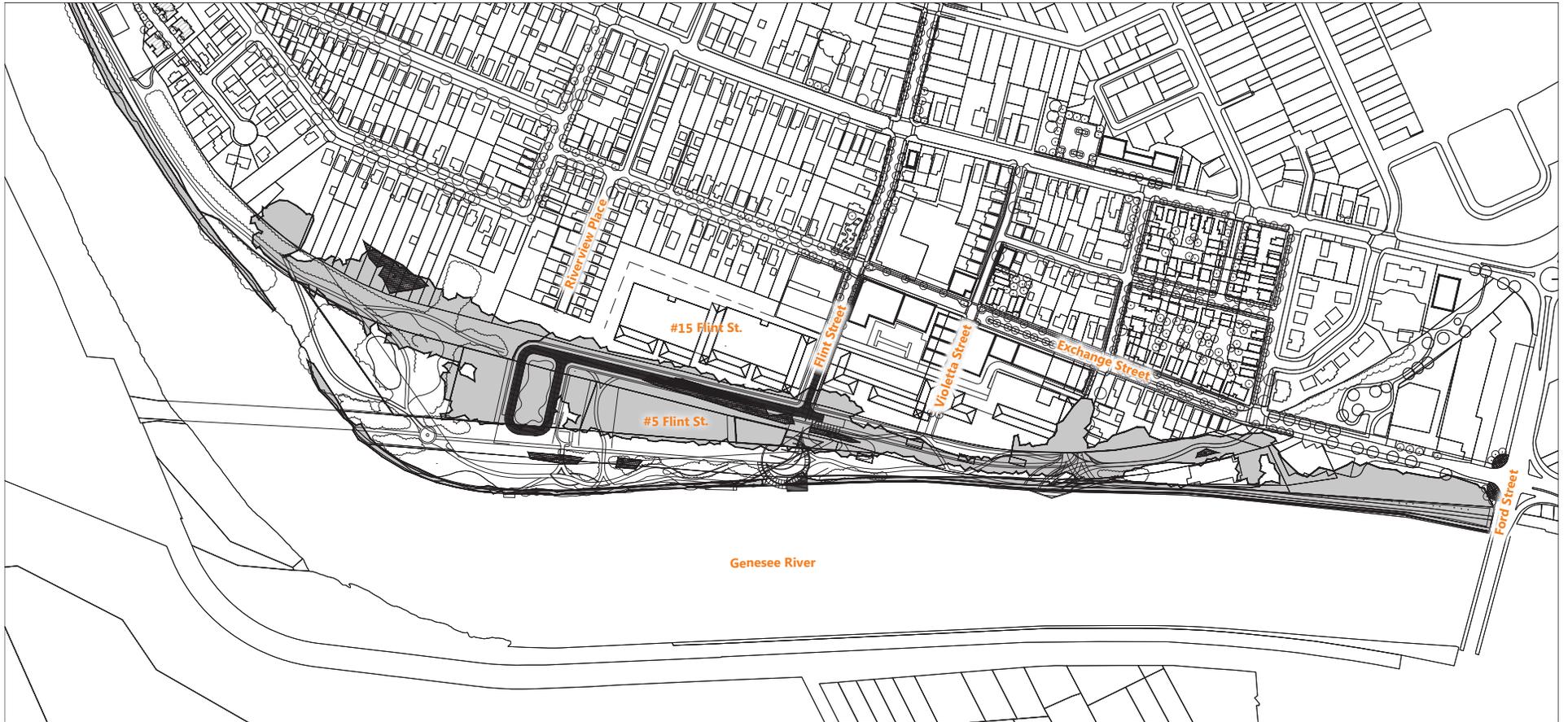


City of Rochester, Monroe County, NY
Vacuum Oil Brownfield Opportunity Area
FLOOD ZONES
This effort was made possible with the guidance and financial assistance provided by the New York State Department of State Brownfield Opportunity Area Program.

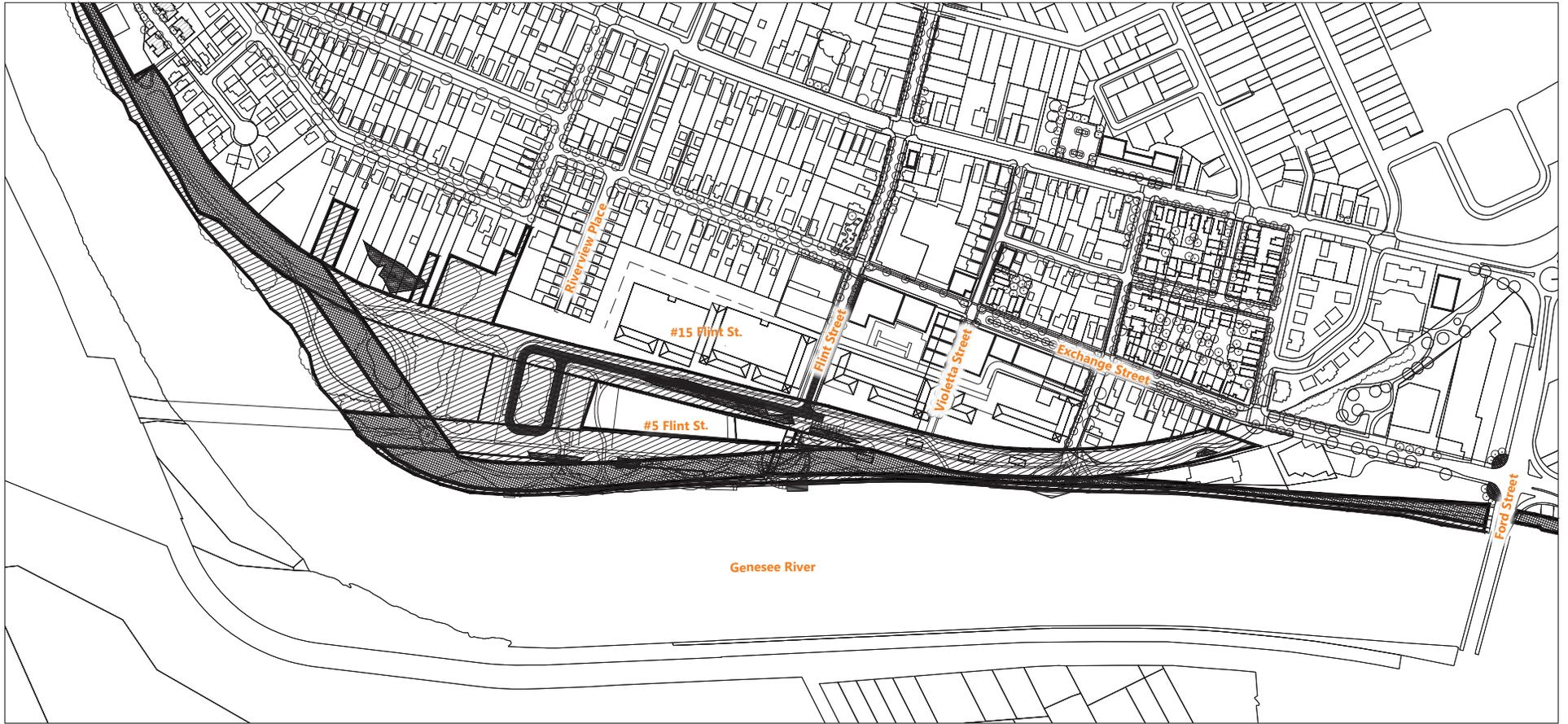
MAP
3



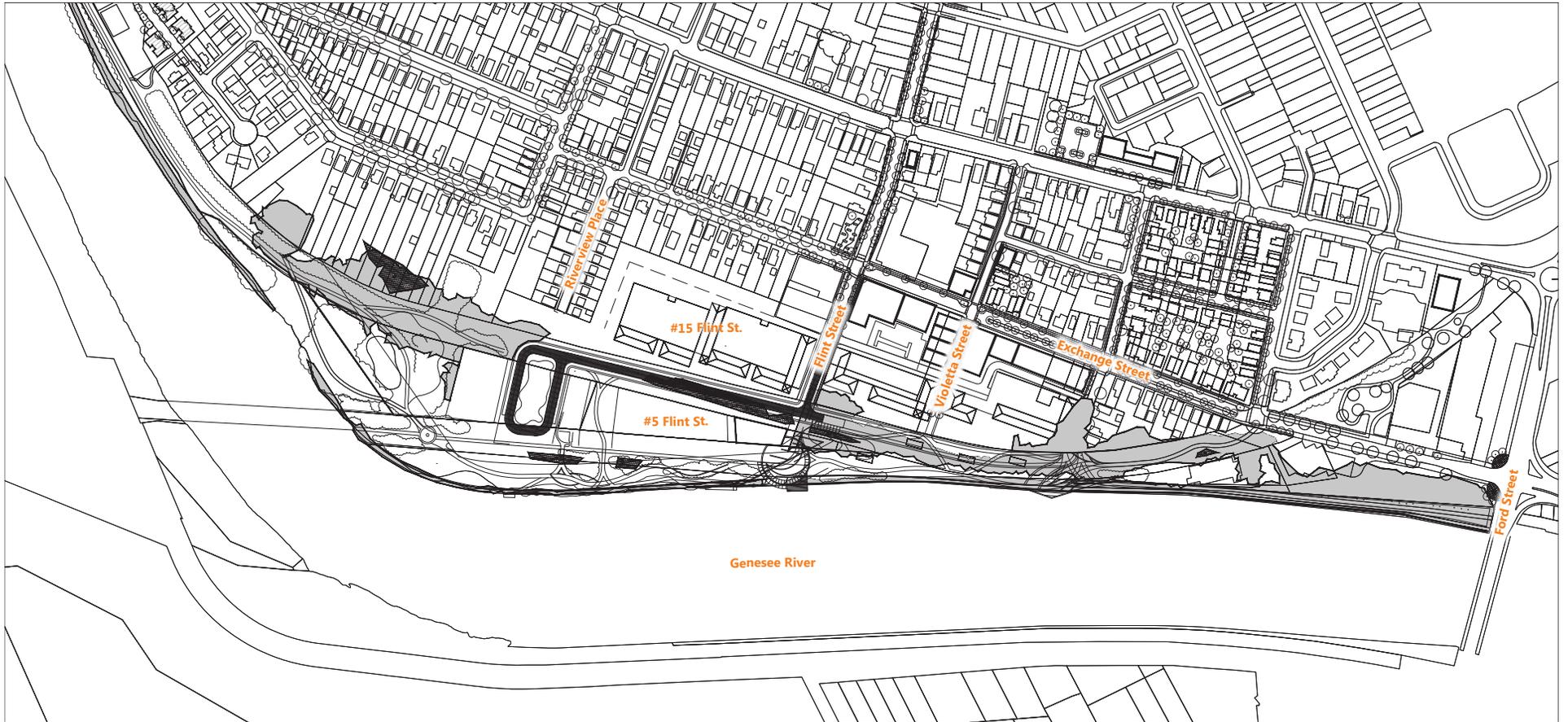
Map designed by Bergmann Associates, Inc.



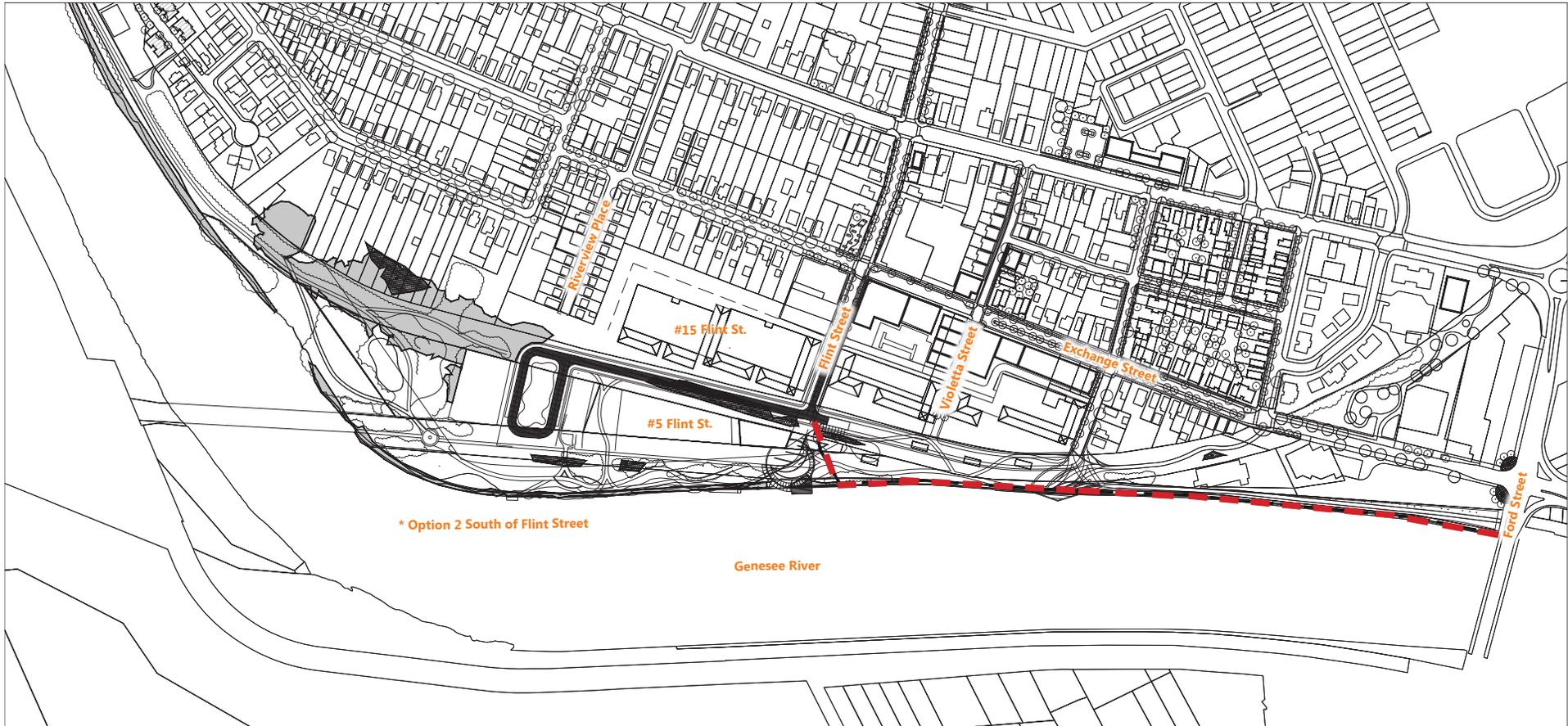
- 100-Year Floodplain
- Wetlands



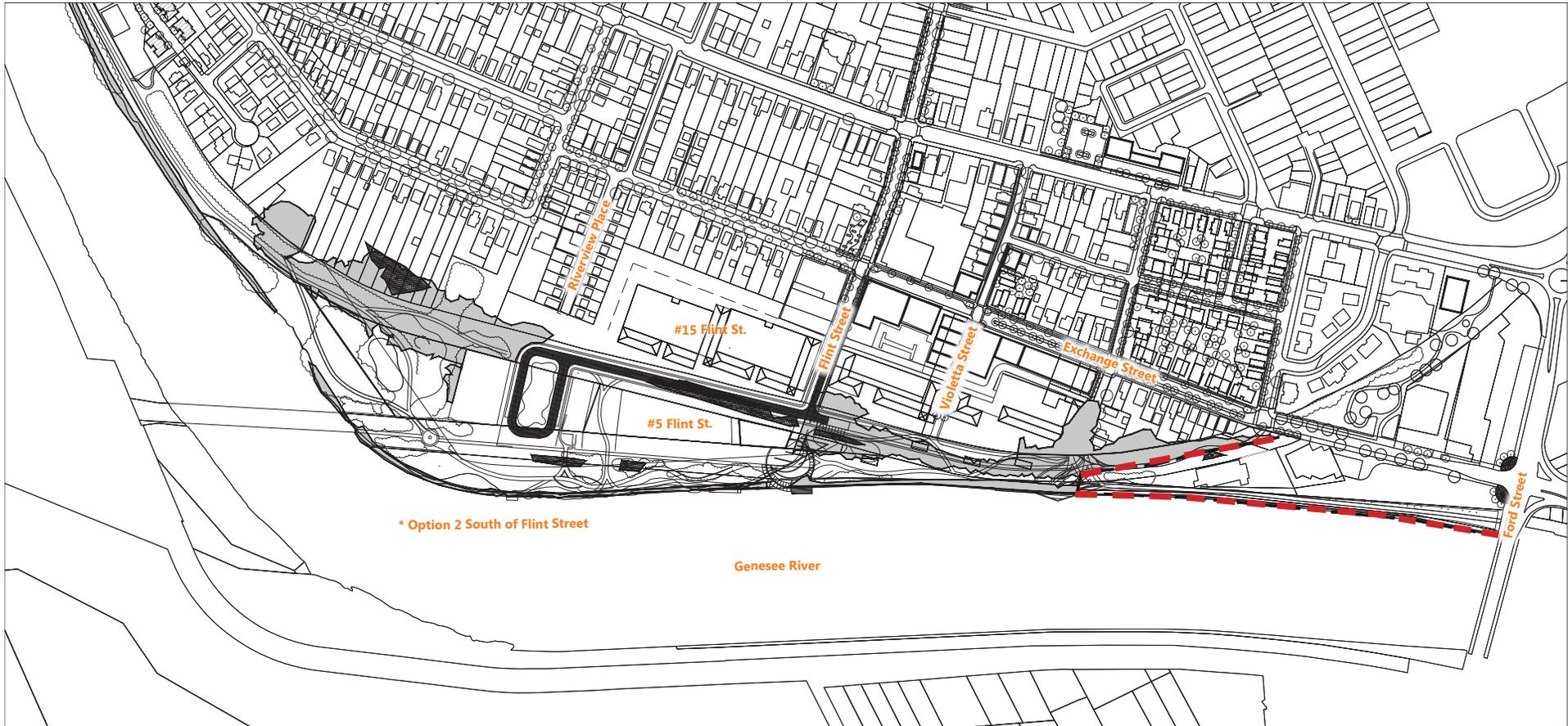
-  Wetlands
-  Private Ownership
-  City or State Owned
-  Parkland



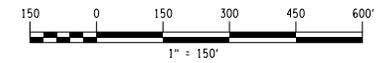
- 100-Year Floodplain
- Wetlands

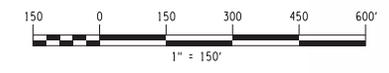
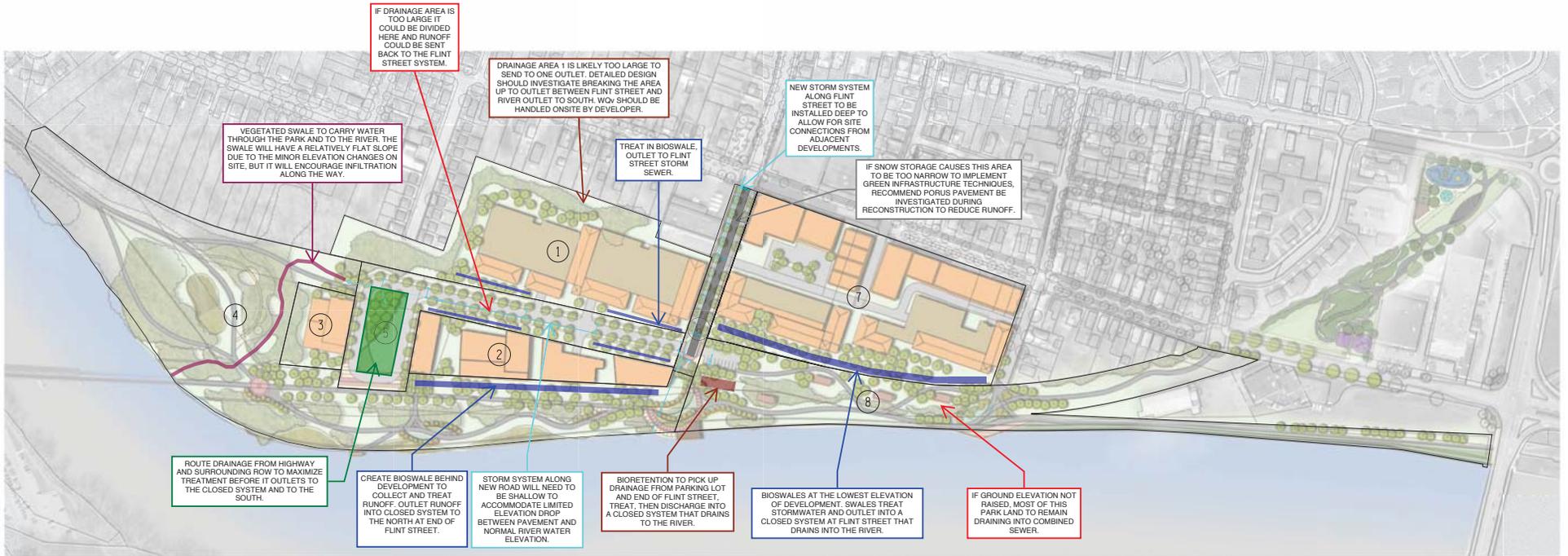


-  100-Year Floodplain
-  Wetlands
-  Levee or Wall System

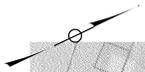


- 100-Year Floodplain
- Wetlands
- Levee or Wall System



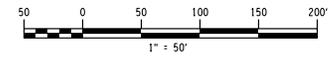


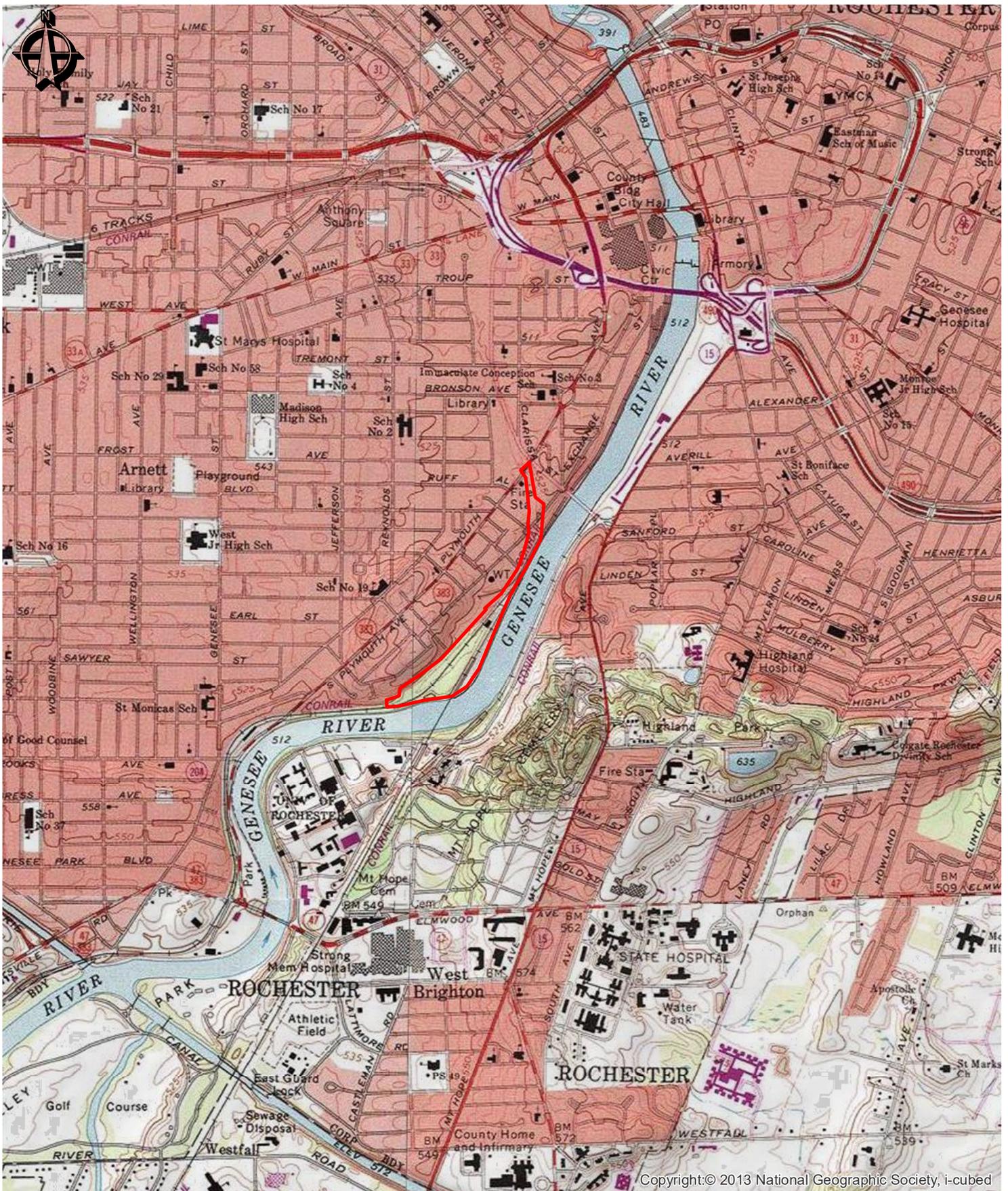
VACUUM OIL CONCEPT STORMWATER MANAGEMENT PLAN



LEGEND:

- EXISTING WATERLINE: — W —
- PROPOSED WATERLINE: — W —
- EXISTING OVERHEAD ELECTRIC: — OE —
- PROPOSED OVERHEAD ELECTRIC: — OE —
- EXISTING SANITARY SEWER: — SA —
- PROPOSED SANITARY SEWER: — SA —
- EXISTING GAS LINE: — G —
- PROPOSED GAS LINE: — G —
- EXISTING STORM SEWER: — ST —
- PROPOSED STORM SEWER: — ST —
- EXISTING UTILITY REMOVAL: - - - - -
- EXISTING CITY PROPERTY: - - - - -





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<p>Legend</p> <p> Project Study Area</p>	<p>PROJECT STUDY AREA LOCATION MAP MAP 12</p>	 <p>Consulting, Engineering & Land Surveying, P.C.</p>
<p>County Coverage: Monroe</p>	<p>Brownfield Opportunity Area South Genesee River Corridor City of Rochester, New York Monroe County</p>	 <p>1 inch = 2,000 feet 1:24,000</p>

County Coverage: Monroe

Quad Coverage: Rochester East and Rochester West

Client Name: City of Rochester

Path: E:\2014\14409 Vacuum Oil BOA\Graphics\Environmental\GIS\14409 Project location map.mxd



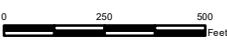
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend	
	Project Study Area
	SCE Wetlands
	NWI Wetlands
	NYSDEC Wetlands
	Ephemeral Tributary

Wetland Overview Map **MAP 13**

Brownfield Opportunity Area
 South Genesee River Corridor
 City of Rochester, New York
 Monroe County

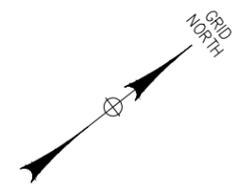



 1 inch = 475 feet
 1:5,700

County Coverage: Monroe

Quad Coverage: Rochester East and Rochester West

Client Name: City of Rochester



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 DRAFTED BY: XXX
 CHECKED BY: XXX
 DESIGNED BY: XXX
 DESIGN SUPERVISOR: XXX

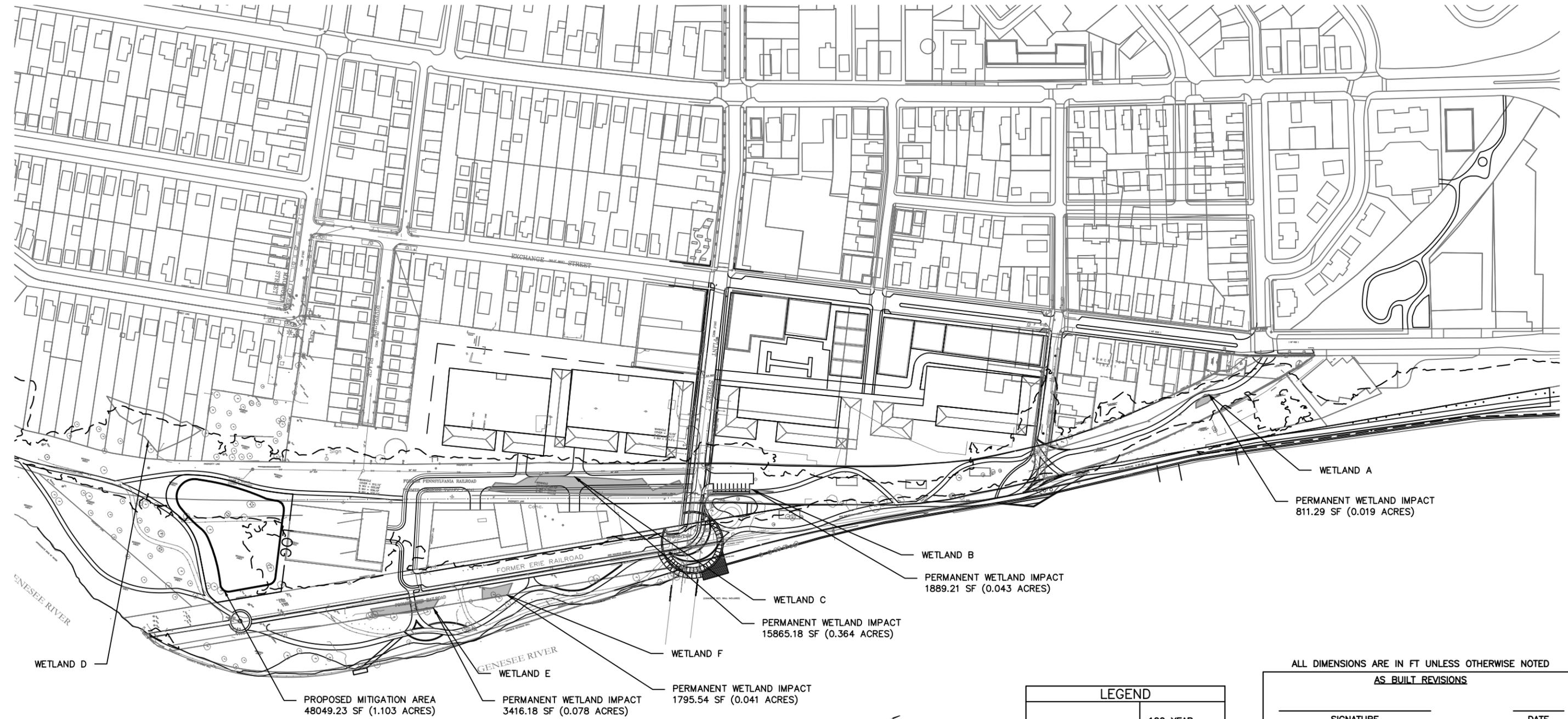


TABLE OF WETLAND IMPACTS				
NAME	MAP CODE	TYPE	AREA (SF)	AREA (ACRE)
WETLAND A	PEM	FRESHWATER EMERGENT WETLAND	811.29	0.019
WETLAND B	PSS	FRESHWATER SHRUB WETLAND	1889.21	0.043
WETLAND C	PFO	FRESHWATER-FORESTED WETLAND	15865.18	0.364
WETLAND E	PFO	FRESHWATER-FORESTED WETLAND	3416.18	0.078
WETLAND F	PFO	FRESHWATER-FORESTED WETLAND	1795.54	0.041

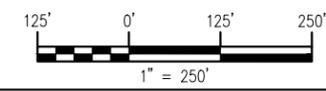
LEGEND

---	100 YEAR FLOODPLAIN
■	WETLAND IMPACT AREA

ALL DIMENSIONS ARE IN FT UNLESS OTHERWISE NOTED
AS BUILT REVISIONS

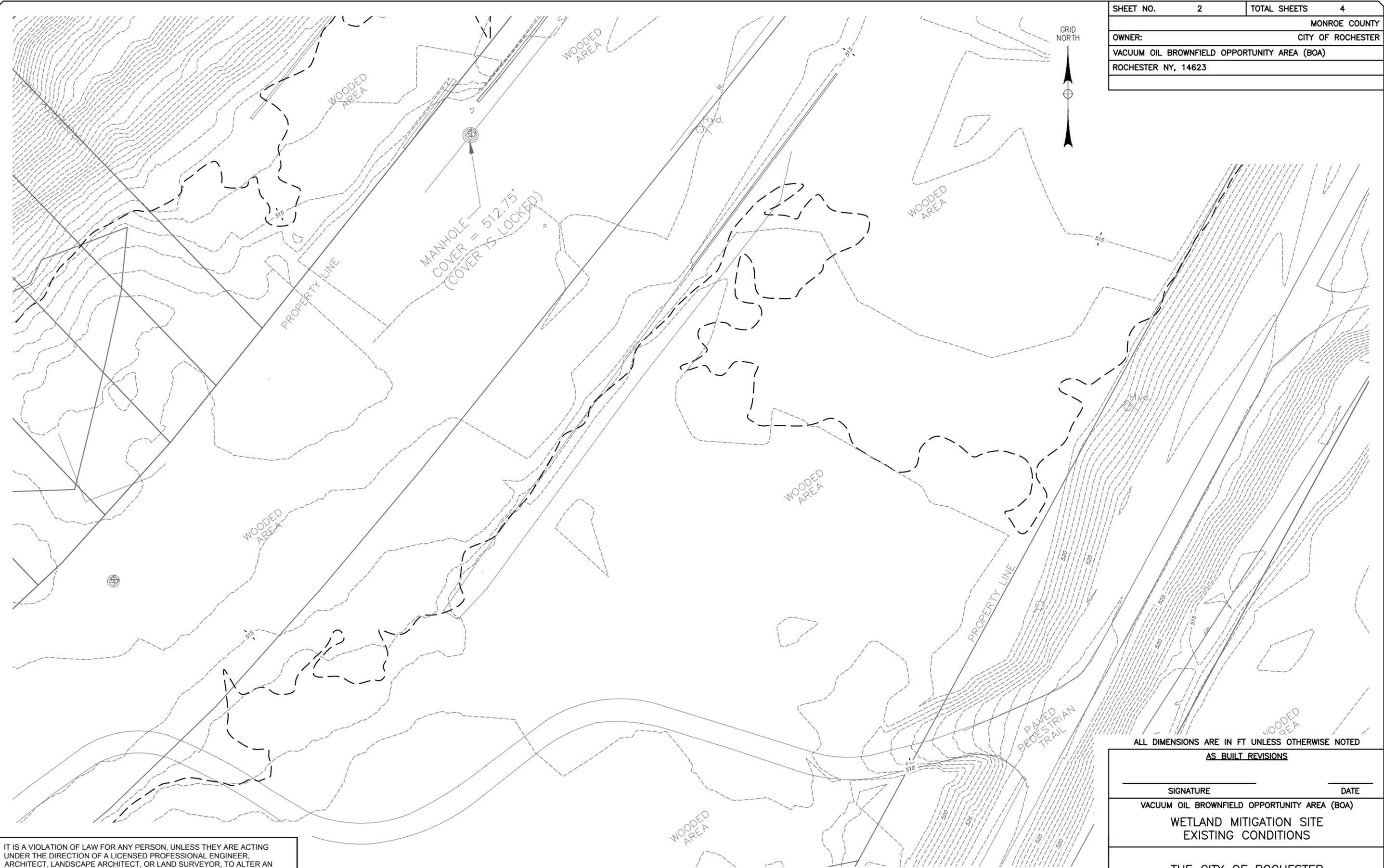
SIGNATURE	DATE
VACUUM OIL BROWNFIELD OPPORTUNITY AREA (BOA)	
WETLAND IMPACT AREA PLAN	
THE CITY OF ROCHESTER	
MAP 14	DATE MAY 2019
DRAWING NO. FIGURE 1	

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.



SHEET NO.	2	TOTAL SHEETS	4
MONROE COUNTY			
OWNER: CITY OF ROCHESTER			
VACUUM OIL BROWNFIELD OPPORTUNITY AREA (BOA)			
ROCHESTER NY, 14623			

CHECKED BY: XXX
 DRAFTED BY: XXX
 CHECKED BY: XXX
 DESIGNED BY: XXX
 DESIGN SUPERVISOR: XXX



MANHOLE
COVER = 512.75'
(COVER IS LOCKED)

ALL DIMENSIONS ARE IN FT UNLESS OTHERWISE NOTED
AS BUILT REVISIONS

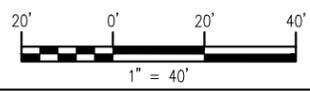
SIGNATURE	DATE
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VACUUM OIL BROWNFIELD OPPORTUNITY AREA (BOA)
WETLAND MITIGATION SITE
EXISTING CONDITIONS

THE CITY OF ROCHESTER

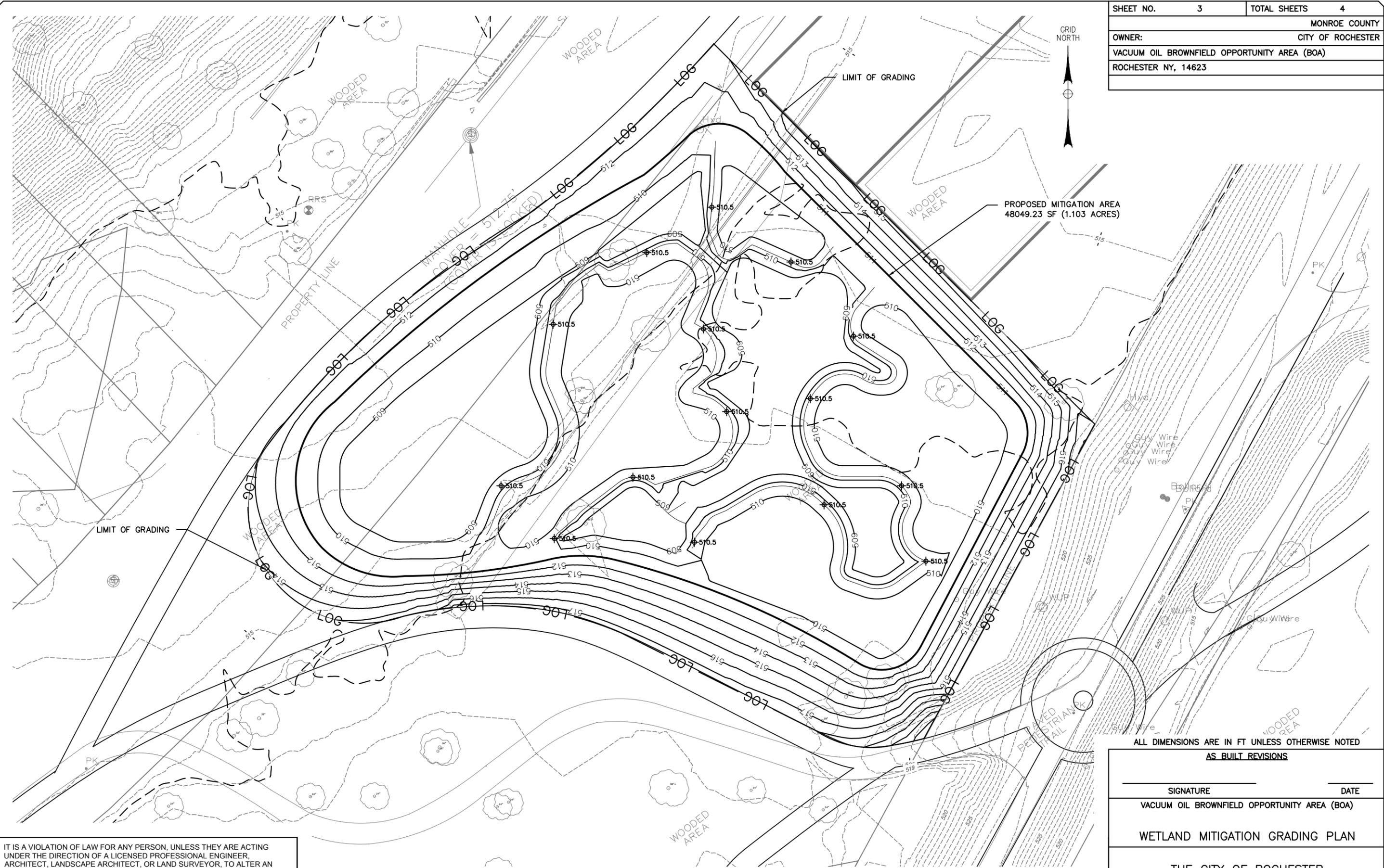
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

LEGEND	
	100 YEAR FLOODPLAIN



MAP 15	DATE MAY 2019	DRAWING NO. FIGURE 2
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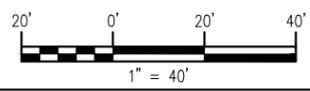
ALL DIMENSIONS ARE IN FT UNLESS OTHERWISE NOTED

AS BUILT REVISIONS

SIGNATURE	DATE
VACUUM OIL BROWNFIELD OPPORTUNITY AREA (BOA)	
WETLAND MITIGATION GRADING PLAN	
THE CITY OF ROCHESTER	

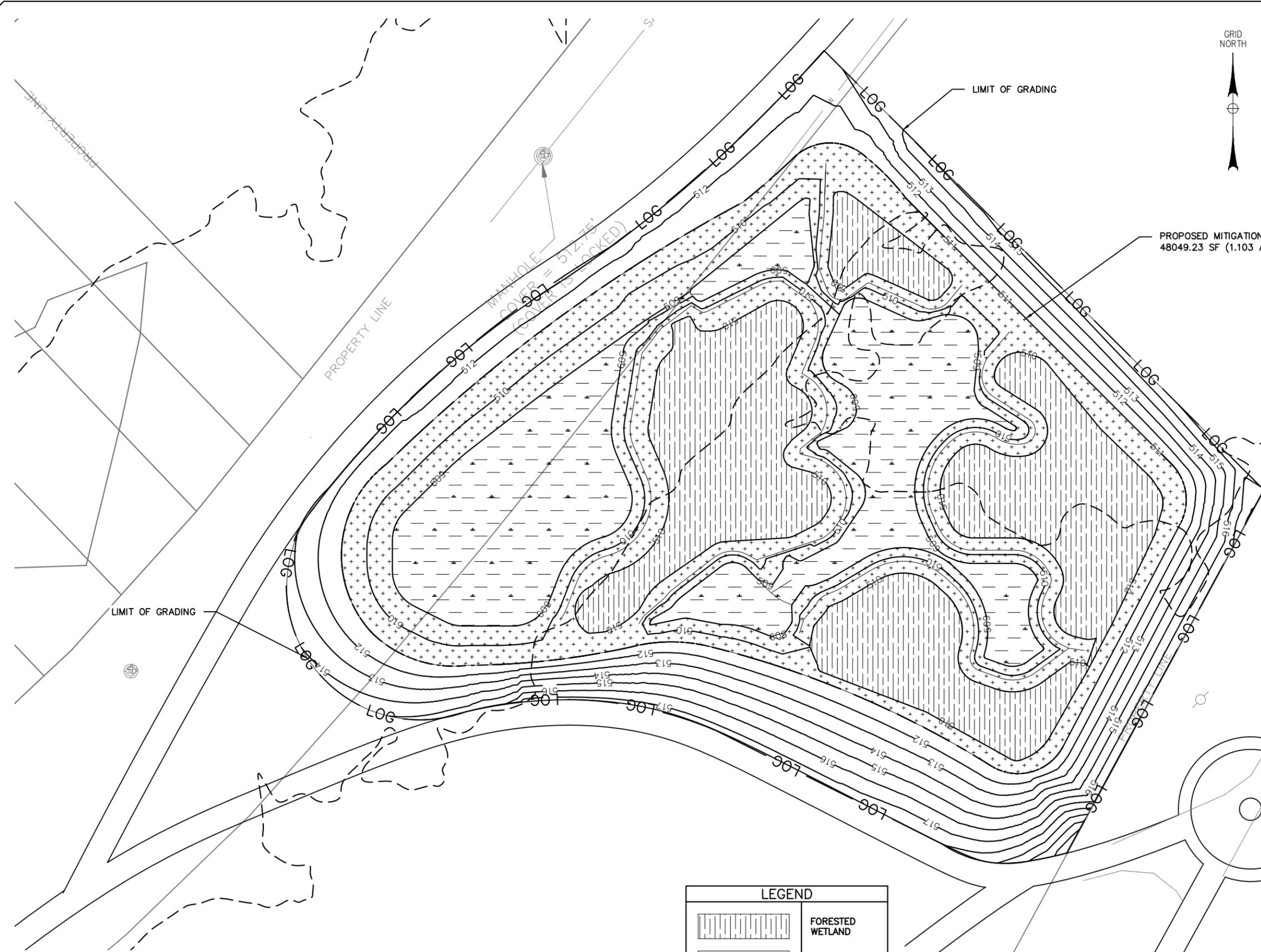
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

LEGEND	
	100 YEAR FLOODPLAIN





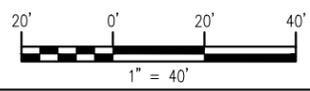
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 DRAFTED BY: XXX
 CHECKED BY: XXX
 DESIGNED BY: XXX
 DESIGN SUPERVISOR: XXX



PROPOSED MITIGATION AREA
48049.23 SF (1.103 ACRES)

ALL DIMENSIONS ARE IN FT UNLESS OTHERWISE NOTED

LEGEND	
	FORESTED WETLAND
	EMERGENT WETLAND
	SCRUB/SHRUB WETLAND
	100 YEAR FLOODPLAIN



AS BUILT REVISIONS	
SIGNATURE	DATE
VACUUM OIL BROWNFIELD OPPORTUNITY AREA (BOA)	
WETLAND MITIGATION PLANTING PLAN	
THE CITY OF ROCHESTER	
MAP 17	DATE MAY 2019
DRAWING NO. FIGURE 4	

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.



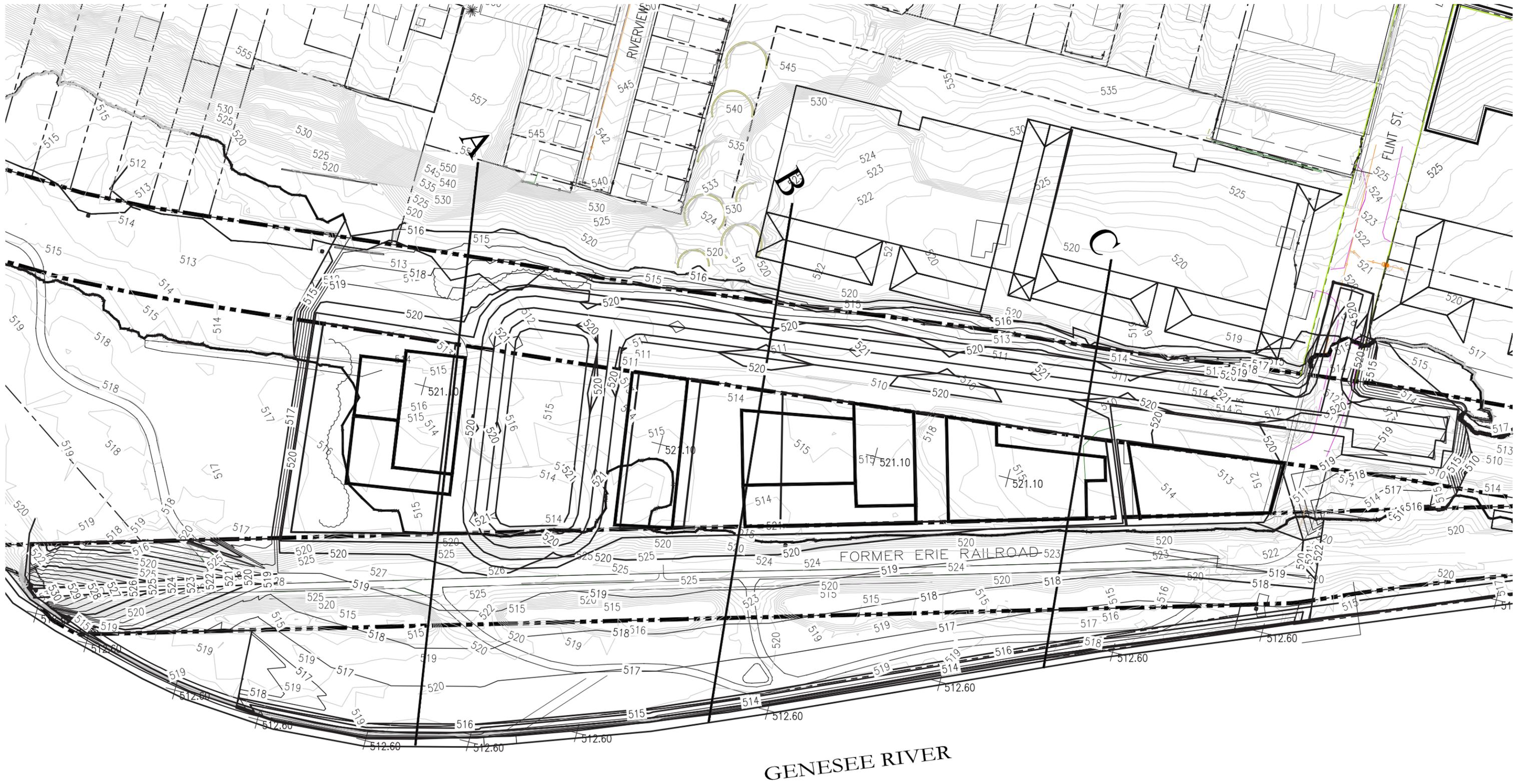
7 Appendices

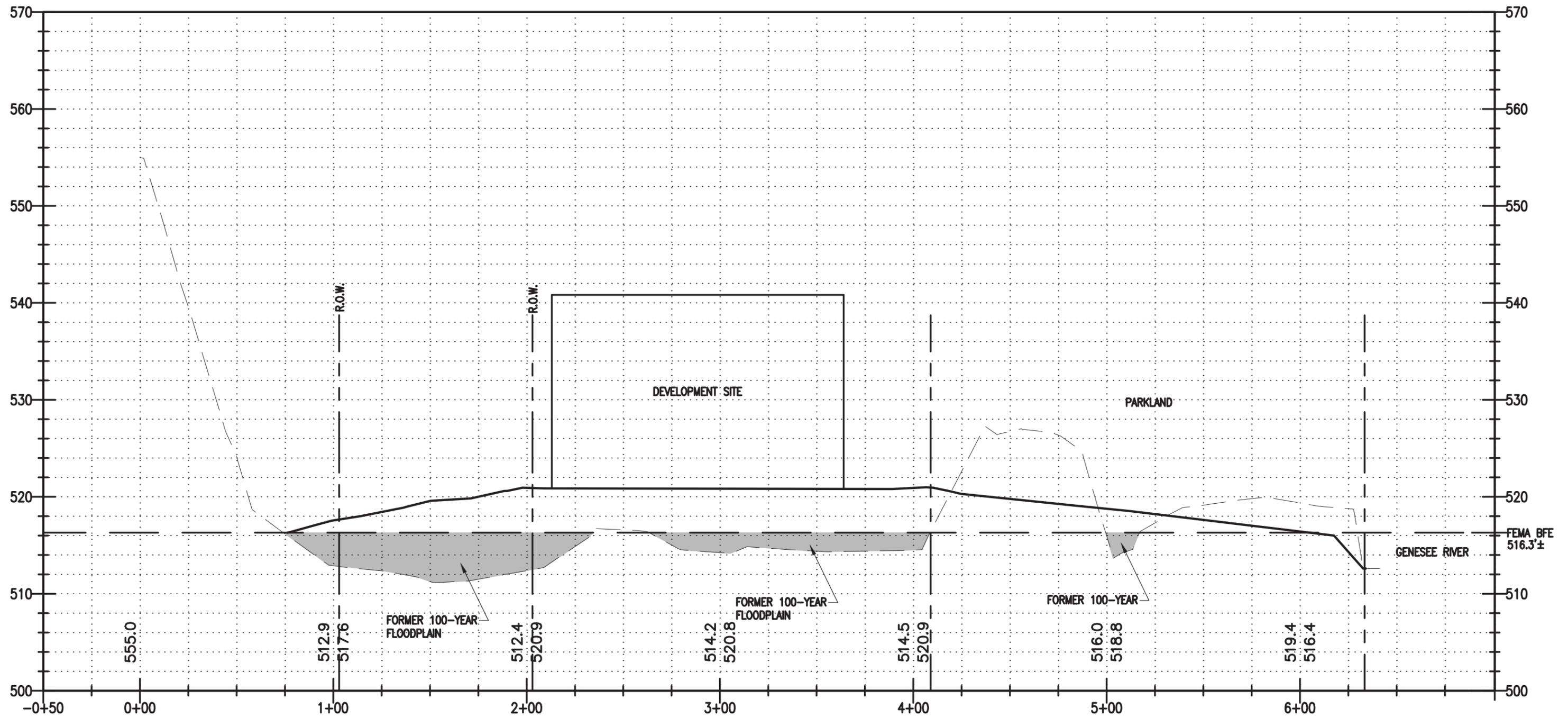
- A. OPTION 2A – FILL OPTION SOUTH OF FLINT STREET PLAN, SECTIONS AND EARTHWORK CALCULATIONS
- B. PROPOSED NEW ROAD DRAINAGE PROFILE
- C. FLINT STREET DRAINAGE PROFILE



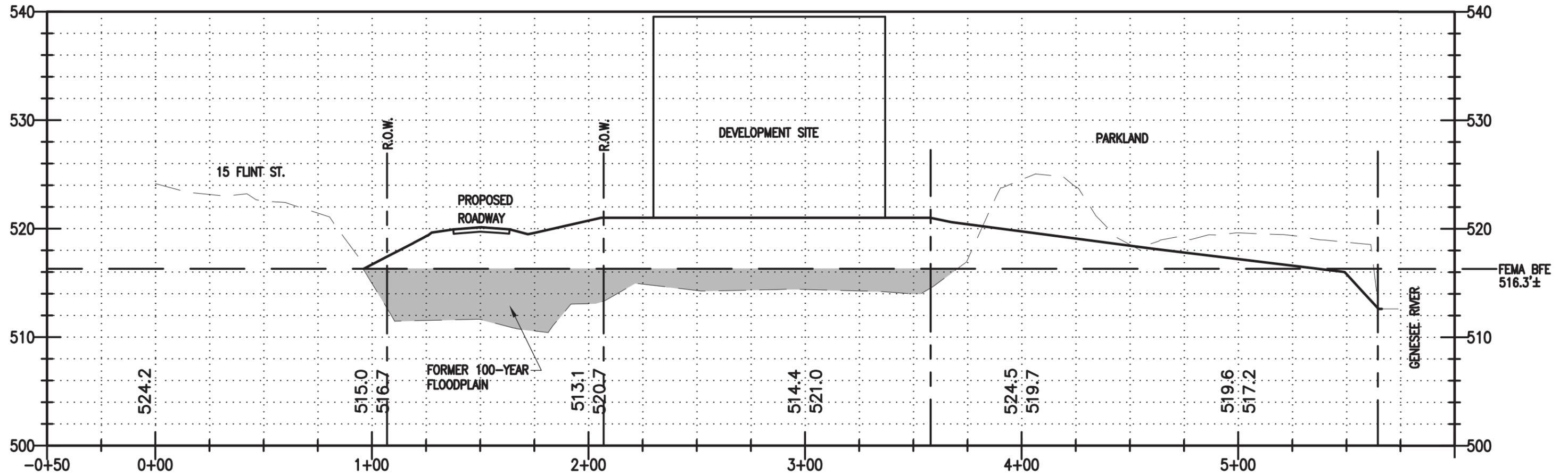
APPENDIX A

OPTION 2A – FILL OPTION SOUTH OF FLINT STREET PLAN, SECTIONS AND
EARTHWORK CALCULATIONS

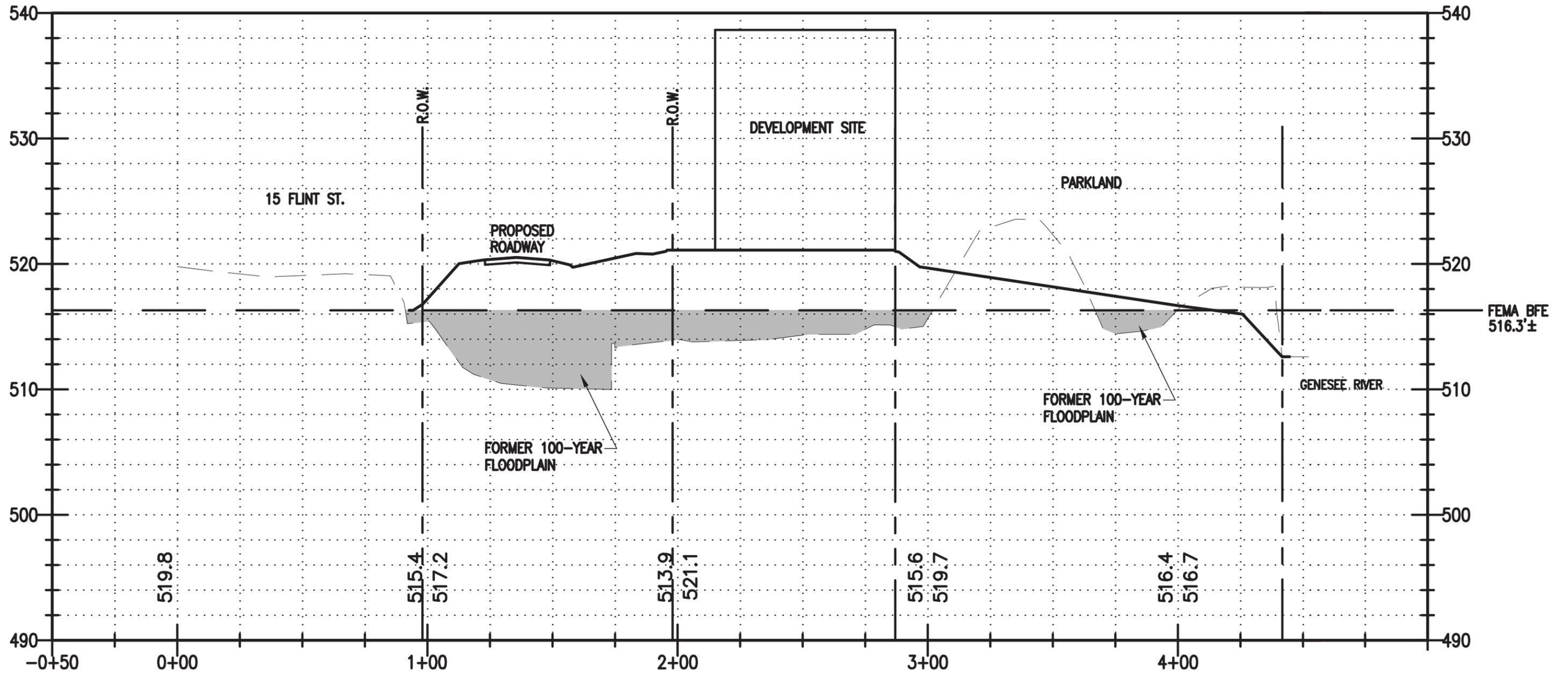




Cross Section 'A'
 1" = 10' Vertical
 1" = 50' Horizontal



Cross Section 'B'
 1" = 10' Vertical
 1" = 50' Horizontal



Cross Section 'C'
 1"=10' Vertical
 1"= 50' Horizontal

Cut/Fill Report

Generated: 2019-04-30 14:45:47

By user: tbolt

Drawing:

J:\Current Projects\Rochester, City of\010140.00 CITY OF ROCH - STEP 3 BOA\8. DWGS\CIVIL\3d\test copies\J:\Current Projects\Rochester, City of\010140.00 CITY OF ROCH - STEP 3 BOA\8. DWGS\CIVIL\3d\test copies\Drawing2-NEW_1_13208_7628-recover.dwg

Volume Summary							
Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
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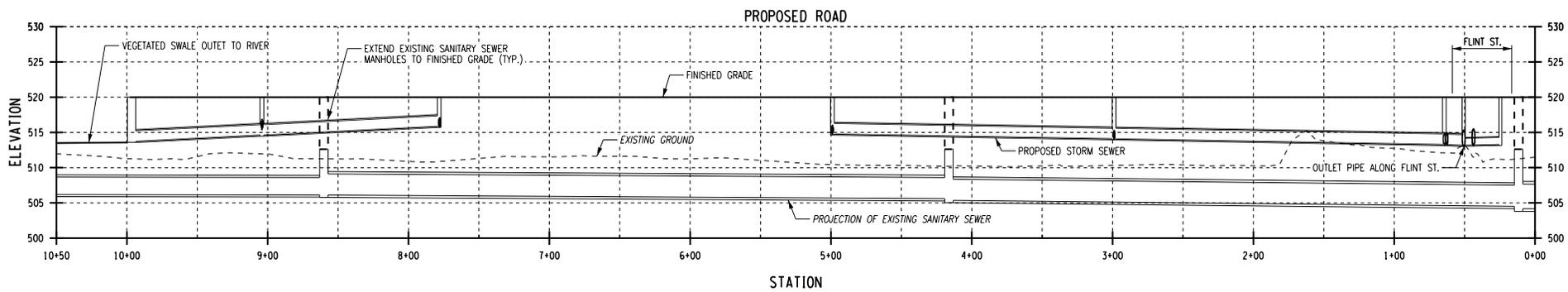
Totals				
	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	538918.72	20439.45	77314.23	56874.78<Fill>

* Value adjusted by cut or fill factor other than 1.0



APPENDIX B

PROPOSED NEW ROAD DRAINAGE PROFILE





APPENDIX C
FLINT STREET DRAINAGE PROFILE

FLINT STREET UTILITY PROFILE

