BIOLOGICAL EVALUATION AND IMPACT ASSESSMENT

530 NORTH STATE ROAD BRIARCLIFF MANOR (TOWN OF OSSINING), NY 10510

MAY 22, 2018

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Wetland Biological Evaluation and Impact Assessment
530 North State Road
Briarcliff Manor (Town of Ossining), NY

Introduction

This report was prepared as an ecological evaluation with special emphasis on wetland characteristics, wetland functions and values, potential wetland impacts, and potential wetland enhancement and mitigation measures for the site known as 530 N State Road, Briarcliff Manor, NY. The site was investigated by wetland scientists from Jay Fain and Associates in November 2017 and April/May, 2018 to provide data for this analysis. In addition, resource information from the US Fish and Wildlife Service, Westchester County Geographic Information System, NRCS Web Soil Survey and NYS DEC Environmental Mapper and Natural Heritage Program Diversity Data Base were used as supplemental natural resource information sources.

This report will provide a general description of the existing environmental features of the 530 N State Road site, including underlying geology, and overlying soils and vegetation. Land use history is briefly discussed as it pertains to the nature and extent of vegetation found on the site and as it relates to the character and functional assessment of the on and off site wetland communities. Finally, the wetlands were evaluated for environmental quality (ecosystem services), socio-economic, fish and wildlife and aesthetic and recreational functions and values.

The 530 N State Road site is an approximately 1.0 acre parcel and is currently the site of a commercial facility related to the operations of Bobcat of New York (neighboring property to the north). The property is under sales contract and the contract vendee, Briarcliff Manor Partners, LLC., would like to construct a child day care facility including a 10,000 sq. ft. building, playground and ancillary parking. Part of the facility is proposed in the 50 foot setback to a locally regulated watercourse which is the subject of this application.

Site Description

The 530 N State Road site is located on the east side of N State Road, approximately 500 feet to the south of its intersection of Ryder Road. The site is 1.0 acres in size and is generally rectangular in shape. Currently, the site is developed with a commercial facility related to the operations of Bobcat of New York with the principal building apparently being used for storage

of inventory, paved areas and packed earth. Vegetation is virtually non-existent with the exception of a wooded fringe along the rear (east) of the site.

Topography of the site is generally flat. Elevations on the site range from approximately 324 NGVD along the northern property line to a low of approximately 317± NGVD at the south eastern property corner, where the watercourse exits the site. Consequently slope aspect and general drainage direction is from north to south. Soils on the site are mapped by the NRCS (Fig. 1) as being Leicester Silt Loam. However on-site investigation by a certified soil scientist has shown the site (and surrounding site) to be comprised of HTM, Human Transported Material (formerly Udorthents). The south-eastern corner of the site consists of poorly drained Leicester soils which underlies the watercourse on the site.

Vegetation on the upland portion of site is consistent with the commercial use and consists of mainly weeds and volunteers that may become established from time to time. Vegetation here is sparse. There are no formal landscape plantings.

An earthen berm borders directly to the on-site and off-site water course. Vegetation on the berm is comprised of native trees with a non-native invasive understory. The native trees are dominantly red maples. A significant amount of non–native invasive shrubs and vines have become established here including Winged Euonymus, European Bittersweet, Multi-flora Rose Japanese Barberry and cat briar. The presence of the non-native invasive plants underscores the lengthy and frequent nature of human induced disturbance on the property.

Land Use History

The land use history of a particular site is useful as it gives an indication as to how the previous use and management of a parcel or property has impacted its present use, state or ecological integrity. Altered or managed ecosystems do not necessarily denote diminished function or utility, almost all lands in the northeast have been managed, manipulated or altered in some way in recent history.

To ascertain the land use history of the 530 N State Road site (and surrounding parcels) a chrono-sequence of historical aerials photographs was obtained for the site. The Westchester County GIS system provides convenient and easy access to historic photographs of the site and surrounding areas and illustrates well the changing nature of land use in Westchester.

The first photo available, the 1947 (Fig. A-1) aerial demonstrates that the site and the surrounding properties were reverting agricultural lands . While North State Road itself is present, the parcels fronting on the road are almost all vacant. The lands to the west of what is now N State Road are maintained as open agricultural land, most likely and as grazing lands for cows. Significantly, the lands fronting on N State Road exhibit a pattern of old field vegetation establishment. This is due at least to a partial suspension of agricultural activities. Mapping by the NRCS (then SCS) (Fig. 2) shows the soil type on these parcels then to be Leicester Silt Loam, a somewhat poorly or poorly drained soil. Typically, these lands, being wetter, did not allow early or late season grazing and thus became unprofitable and were abandoned allowing the lands to revert to forest. Surrounding land use to the east is dominated by large open agricultural parcels and to the west by forested lands. Although some residential and estate parcels are evident, the dominant surrounding land use is still agriculture.

By 1976 (Fig. A-2), changes in patterns in local land use are clearly evident. The 530 N State Road parcel has changed significantly – the site is now occupied by a commercial facility and the parcel cleared of any vegetation. The change in the surrounding land use is similar. Commercial building dominated along the N State Road frontage and single family residential use is now dominant in the surrounding environs. Agricultural land use has ceased completely.

The 2004 (Fig. A-3) and 2013 (Fig. A-4) aerials show the continuing nature of change in the region. In 2004 the subject parcel was used as a retail garden center as evidenced by the neat rows of trees and shrubs stockpiled on the site. Also, significant is the development of the parcel abutting to the south. When this parcel was developed the wetland/watercourse complex to the rear of the site was filled and two 48 inch culverts were installed to convey stormwater flows, this is similar to the fate of the watercourse that once traversed the northern border of the subject site which is now culverted from the right-of-way of N State Road to the watercourse at the rear of the project site,

By 2013, the subject parcel was occupied by the present user – Bobcat of New York. The use is ancillary to the sales and service of heavy equipment on the neighboring property to the north.

Wetlands

Wetland Location and Determination

The site was investigated for the presence of regulated wetlands on November 29, 2017 by Jay Fain, PSS, CPESC, CERP (Appendix A). In the Town Ossining "Wetlands" means "All areas that comprise hydric soils and/or are inundated or saturated by surface water or groundwater at a

frequency and durations sufficient to support a prevalence of hydrophytic vegetation". Watercourses are defined as "A running stream of water; a natural stream fed by from a particular or natural sources, including rivers, creeks, springs, runs and rivulets; a stream, usually flowing in a particular direction, though it may not flow continuously....".

In the instance of the 530 N State Road parcel the regulated resource is an intermittent watercourse that traverses the eastern property boundary. The western edge of the watercourse (subject property side) was easily delineated as it is essentially a fill slope that defines the watercourse edge.

The water course edge was field marked with sequentially numbered 1 – 12 orange surveyors tape and subsequently located by the project surveyor for inclusion on the property survey and plan sheets.

Wetland/Watercourse Description

Onsite watercourse- The watercourse on the subject site is approximately 60 feet long by 10 feet in width and consists of a well-defined intermittent watercourse. Due to its small size and isolated nature the watercourse segment does not appear on the National Freshwater Wetlands Inventory Maps (Fig. 3) and as an isolated watercourse is not likely subject to Federal Jurisdiction. However, applying the Federal Wetland Classification System this wetland is classified as: **R4SBC**

R - System: **Riverine**
4 - Subsystem: **Intermittent**
SB - Class: **Streambed**
C –Water Regime: Seasonally Flooded

Flows contributing to the water course originate from a remaining section of stream that extends approximately 100 feet to the north and from twin 48 inch corrugated metal culverts that extent to the west under the subject property, under N State road and continuing to the west. Flows for this watershed originate in Ryder Park and the vast majority of flow to the system originates from this stream branch. Flows leaving the site immediately enter twin 48 inch culverts and remain confined until the system daylights just south of Blue Lantern Road.

The culverting of upstream and downstream portions of the subject property has a number of consequences for the functioning and management of the system. First of all, elimination of former riparian areas and replacement with urbanized surface tend to result in "flashy" hydrology. This means that instead of flows from a particular storm flowing for a period of days, the storm flow washes through in a period of hours, resulting in greater velocity, volume and peaks. Repercussions for management include greater possibility of downstream flooding, increased chances of erosion and subsequent sedimentation, and decreased habitat function due to both of these factors. Erosion and sedimentation is evident along the banks and bed of the N State Road property watercourse.

Vegetation patterns and cover types are also greatly influenced by past management practices. On the N State Road site proper virtually all vegetation has been removed to within a few feet of the edge of the watercourse and what remains is evidence of repeated and frequent disturbance. The only non-native invasive plants remaining are a few red maple trees and a handful of spicebush. Approximately four white pine trees remain from a previous landscape planting. All are in decline.

The remainder and majority of the existing vegetation are non-native invasive plants commonly referred to as ruderals. These plants have an ability to colonize areas and grow quickly outcompeting more desirable native vegetation. On this site this includes trees, shrubs, and herbaceous plants including box elder, multiflora rose, tartarian honeysuckle, Japanese knotweed, Japanese stilt weed, bedstraw, wine berry and *Artemisia* (mugwort).

Wetland Functional Assessment

Wetlands are not regulated necessarily for the intrinsic ecological functions they perform but for the values, largely economic, they provide for society as a whole. Wetland functions can be distinguished from wetland values as functions denote properties (largely ecological) that wetlands naturally provide while values are properties that are valuable to humans. Consequently, while wetland functions are something that can be assessed and quantified by a wetland ecologist, wetland values are more subjective and can be varied according to personal background, discipline and bias. Wetland functions included fish and wildlife habitat, natural water quality improvement, flood storage, shoreline erosion protection, opportunities for recreation and aesthetic appreciation, and natural products for our use. Protecting wetlands can protect our health and safety by reducing flood damage and preserving water quality.

The 7,000 sq. ft. of on-site watercourse has been functionally isolated by the past disturbance history of the site and the surrounding properties including past filling and the culverting of the upstream and downstream watercourse segments. It is worth noting that the NRCS (formerly SCS) had previously mapped this site (Fig. 2) and most of the corridor on either side of N State Road as Leicester silt loam indicating that in the past most of the area may have been wetland. A relict of that resource is still intact between Blue Lantern Road and Chappaqua Road. This activity has severely affected the functioning of the wetland/watercourse segments that remain. The most severe impacts, besides wholesale wetland filling, include habitat alteration in the form of vegetation removal and altered hydrology.

Wildlife habitat has been virtually eliminated on the subject property. There are no vernal pools on site in its immediate vicinity and, therefore, there is no habitat for obligate wetland species. The culverting of the stream and its intermittent nature of the flow virtually eliminates fish habitat. Remaining wildlife habitat is generally suitable for mammals and birds considered to be generalists; however, the patch is too small to be suitable for forest interior birds. Typical wildlife may include deer, raccoons, grey squirrels, etc. The site and its immediate environs do not contain any State, Federal rare, threatened or endangered species.

Water quality improvement is a function of the wetland systems but is not really provided here. Typically, water quality improvement is provided by two mechanisms, physical filtering and biogeochemical cycling. The physical filtering is performed by the lateral sheet flow of water across the ground surface and through the existing vegetation. Similarly, quiescent conditions allow anaerobic respiration to occur and trigger a variety of biochemical responses to occur such as de-nitrification and re-dox reductions. These mechanisms do not occur on this site as flows are concentrated within the existing channel at relatively high velocities precluding any settling or filtering.

Flood storage is not really a function of this wetland/watercourse system because the watercourse has been defined within its channel and little opportunity for floodwater to overflow the stream banks and be stored. However, storm flow conveyance is an important if not vital function of this system and should be considered its primary function.

Recreation and aesthetic value of this system are limited by the fact that these lands are private property and offer few recreational opportunities for the private land owners for wildlife observation and general nature study. However, the relatively dense nature of the existing vegetation provides buffers between the commercial zone and the adjacent residential zone.

Site Development

The 1.0 acre site is currently used for heavy equipment maintenance and storage and is occupied by three small buildings and an existing asphalt parking along the frontage of N State Road. The remainder and majority of the site is bare earth that is under constant disturbance due to the movement of heavy equipment. There is no organized or defined drainage system and currently runoff is directed to earthen leak-offs at the rear of the site and into the adjacent watercourse.

The contract purchasers are proposing to re-develop the site with The Learning Experience – a child day care center. Proposed improvements include a 10,000 sq. ft. building, parking for 36 vehicles and a playground; the playground surface will be constructed from flexi-pave which is pervious.

The proposed development would be constructed to avoid any direct impact to wetlands and/or watercourses. However, construction of The Learning Experience facility would be partially within the Town of Ossining locally regulated 50 foot watercourse setback, but the area of encroachment has been minimized to the maximum extent practical while still allowing for the safe operation of the facility. In addition, vegetated buffers would be created between the urbanized surfaces and the wetlands/watercourse. The buffer areas would be planted with native trees, shrubs and perennials that would enhance the water quality filtering of the runoff from the landscaped areas thereby improving water quality to the receiving waters.

The current site development was done prior to any State or local regulations pertaining to stormwater. Consequently, there is no organized or approved drainage system on the site. The proposed Learning Experience facility must comply with current NYS DEC and Town stormwater management regulations. A Stormwater Pollution Prevention Plan (SWPPP) in accordance with applicable regulations has been prepared by *Jarmel Kizel, Architects and Engineers, Inc.* An underground detention system is proposed that will reduce the peak discharge from the 2 10, 25 and 100 year storm to less than pre-development levels. Surface water runoff quality will be improved by the incorporation of a proprietary oil and grit separator into the stormwater collection system, by the establishment of a minimum 10 foot wide riparian vegetated filter strip along the on–site portions of the adjacent watercourse and by the incorporation of a pervious surface into the playground design. These Best Management Practices will insure that no untreated runoff will exit the site.

Potential Impacts and Mitigation

The National Environmental Policy Act (NEPA) provides a hierarchy to evaluate potential environmental impacts on federally funded projects. According to NEPA potential impacts should be:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

These guidelines were used in planning the 530 N State Road project and as explained above and project impacts have been avoided by protection of regulated resource and minimizing the potential disturbance. Potential impacts and proposed mitigation from construction activity and storm water runoff are discussed below.

1. *Short-term impacts* – During construction, the site can become susceptible to uncontrolled erosion due to the removal of the overlying vegetation and disturbance of the underlying soil. If left unchecked the subsequent deposition of sediments into streams wetland or other aquatic features can have undesirable consequences. To avoid this impact it is important to have a robust Erosion and Sediment Control Plan. Local, State and Federal Law now make this mandatory on all construction sites and frequent inspection and reporting are including by the preparing professional.

Erosion and sediment controls have been comprehensively planned on this site. Site access will be limited to the temporary access road proposed to be constructed. Silt fence will be employed around the perimeter of the construction site and maintained throughout the duration of construction. Excess excavated materials will be removed from site and not stockpiled. Should any excavation need to be dewatered (not likely) a "dirt bag" will be used to filter all pump effluent

2. *Long-term impacts* – Long-term impacts from this development are largely associated storm water impacts. Buffers to wetlands largely function as filters that help renovate storm water before it reaches sensitive aquatic features. Storm water management is being provided by a variety of Best Management Practices. This plan included provisions for storage and treatment of stormwater using underground detention and an oil and grit separator. Among the important components of the plan as relates to wetland protection are:

a) Minimization of the disturbance envelope. Vegetated buffer strips will be incorporated into the existing site design to increase and enhance important watercourse buffers.
b) Use of an underground detention system in accordance with Local and State stormwater regulations to reduce peak flows and improve water quality
c) Maintenance, enhancement and renovation of existing "natural" vegetated buffer to on-site and offsite watercourse.
d) Site Stabilization – The current site largely consists of a non-stabilized soil surface soil surface which is a potential source of erosion and subsequent sedimentation into downstream aquatic resources. The proposed The Learning Experience facility is being planned to stabilize all bare ground surfaces minimizing the potential for erosion.

3. *Mitigation* – Mitigation is an integration of all the measures proposed to plan and design the site. However, in keeping with NEPA hierarchy and the Town's Freshwater Wetlands, Watercourses and Water Body Protection Law a number of measures are bring proposed to mitigate unavoidable activities with the 50 foot watercourse setback.

Currently mitigation consists of three components designed to enhance restore and expand the riparian zone bordering the watercourse that extends along the eastern property line. These include 1) Restoration, Renovation, and Enhancement of the Watercourse Riparian Zone, 2) Incorporation of Pervious Playground Surface to increase effective Riparian buffer and 3) Water Quantity and Water Quality Treatment of Site Generated Runoff.

1. Restoration, Renovation and Enhancement of the Watercourse on Subject Property

   The existing vegetation bordering the on-site watercourse is only a few feet wide and consists almost entirely of non- native invasive plant species (See Wetland/Watercourse Description). In addition, untreated storm water is directed to the watercourse via earthen channels. The Applicant proposes to restore, renovate and enhance is buffer thorough a series of activities. First, the existing non-native vegetation will be removed. While hand removal will be primary removal mechanism, spot treatment with glyphosphate will be necessary for the more aggressive species including Japanese Knotweed and possible multi flora rose. The area will then be regraded to smooth out contours, remove fill piles and eliminate direct runoff discharge to the watercourse. Finally, the affected area will be replanted with a mix of native trees, shrubs and herbaceous plant materials. Deer resistant plant material will also be employed. The minimum depth of the buffer strip will be 10 feet and a maximum of 30 feet.

While the primary objective of the riparian buffer strip is to provide for water quality enhancement, the renovation restoration and enhancement will provide some wildlife value. In addition, the enhanced planting will provide an additional screening buffer between the commercially and residentially zoned properties.

Maintenance of the vegetated buffer zone will be integrated onto the landscape management plan of The Learning Experience center. Maintenance and management will focus on 1) elimination of non-native invasive species that may become established through remnant root stock and the existing seed bank, 2) maintaining viability of proposed plantings and replacement of dead or diseased plants and 3) pruning and removal of overcrowded plants. Replacement of plantings will be for a period of three year after. After the three year period, during which the plants will have become established, maintenance and monitoring will occur on an annual basis. The area is small enough and integral to the design of the whole site that annual monitoring can be integrated into the landscape management plan. No pesticides, herbicides or fertilizers are necessary or proposed.

2. Incorporation of Pervious Playground surface to increase effective Riparian buffer.

An outdoor play area is proposed along the rear of the property. Turf grass is not a realistic option for this area due to the intensive use and multi season use. While an impervious surface could be used, the Applicant has chosen a pervious surface to address safety concerns and to provide an additional measure to increase water quality. It should be noted that this BMP is above and beyond that required to meet the requirements of the NYS DEC SWPPP.

The proposed pervious surface is Flexi-pave- a proprietary product that is the gold standard for pervious pavement. Since this area is not subject to vehicular traffic and plowing, sanding or salting, no maintenance is required.

Integrating the flexi-pave pervious pavement into the project design increases the effective watercourse buffer to approximately 40 feet. The pervious pavement design will allow surface water to infiltrate which is the most effective storm water treatment design. Compared to the existing conditions and coupled with the natural planted riparian buffer, water quality from this site will be greatly enhanced.

3. Water Quantity and Water Quality Treatment of Site Generated Runoff.

   Stormwater runoff from the current site is uncontrolled and untreated. A Stormwater Pollution Prevention Plan has been prepared by the Project Engineer and designed to collect all site runoff and address both water quantity and water quality.

Conclusions

In accordance with Section 105-10 of the *Town Freshwater Wetlands, Watercourse and Water Body* Law, the Applicant has provided mitigation plans that provides for on-site mitigation and substantially improves the functioning both of the existing riparian buffer and the protection of the Town regulated watercourse.

Respectfully Submitted,

Jay Fain

MS, CPSS, CPESC, CERP

Mapping Westchester County

May 3, 2018

Municipal Boundaries

FIGURE A-1 1947

1:2,506

0 112.5 225 450 Feet

JAY FAIN & ASSOCIATES, LLC
Environmental Consulting Services

N

GIS
http://giswww.westchestergov.com
Michaelian Office Building
148 Martine Avenue Rm 214
White Plains, New York 10601

Mapping Westchester County

May 3, 2018

Municipal Boundaries

FIGURE A-2 1976

1:2,506

0 112.5 225 450 Feet

N

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White Plains, New York 10601

Mapping Westchester County

May 3, 2018

Municipal Boundaries

FIGURE A-3 2004

1:1,253

0 55 110 220 Feet

N

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White Plains, New York 10601

Mapping Westchester County

May 3, 2018

Municipal Boundaries

FIGURE A-4 2013

1:1,253

0 55 110 220 Feet

N

GIS

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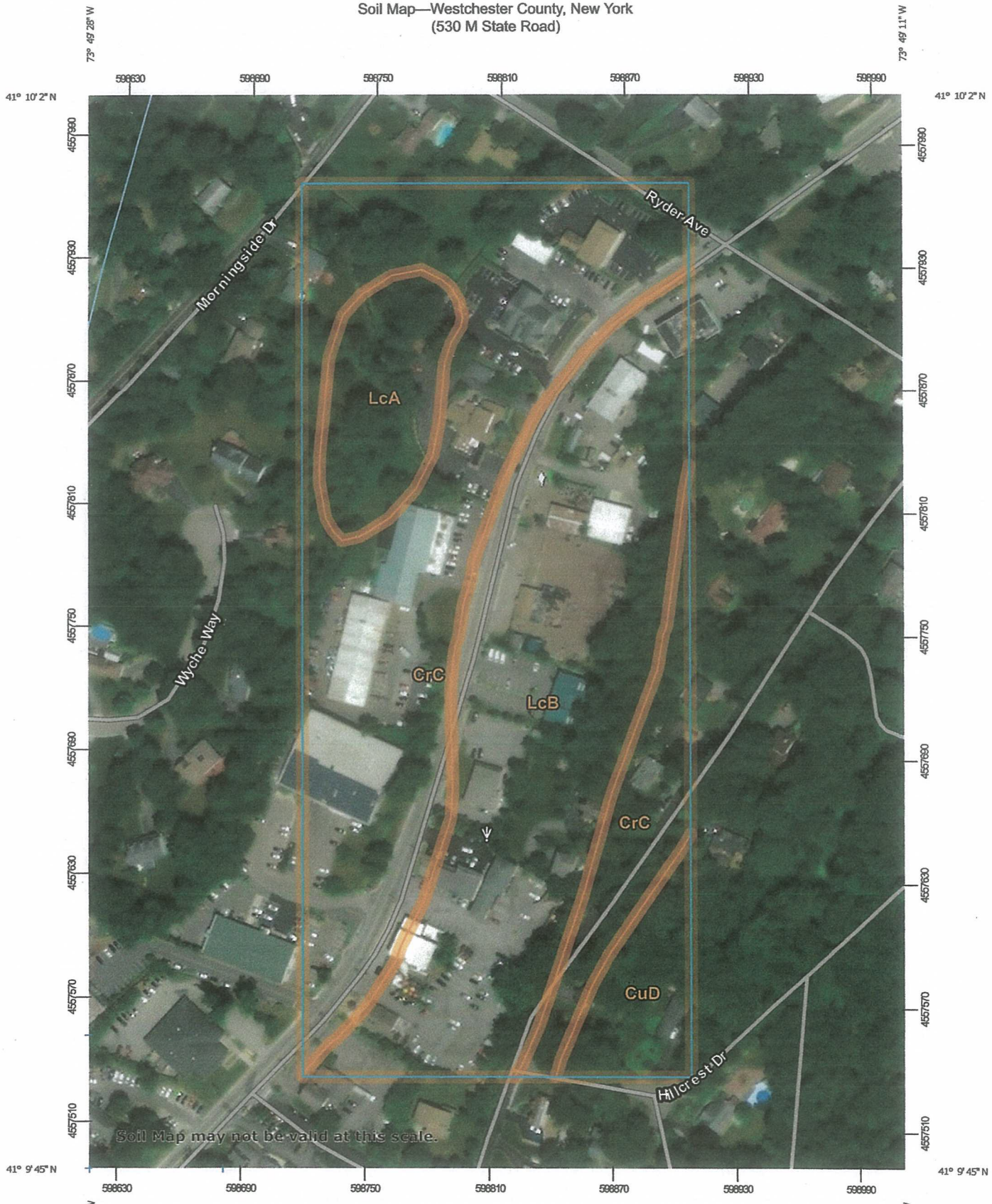
Michaelian Office Building
148 Martine Avenue Rm 214
White Plains, New York 10601

JAY FAIN & ASSOCIATES, LLC
Environmental Consulting Services

Soil Map—Westchester County, New York
(530 M State Road)



Map Scale: 1:2,550 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

FIGURE 2

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Westchester County, New York
Survey Area Data: Version 13, Oct 8, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

FIGURE 2

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	9.9	48.7%
CuD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	1.1	5.3%
LcA	Leicester loam, 0 to 3 percent slopes, stony	1.6	7.8%
LcB	Leicester loam, 3 to 8 percent slopes, stony	7.7	38.2%
Totals for Area of Interest		**20.3**	**100.0%**

FIGURE 2

U.S. Fish and Wildlife Service

National Wetlands Inventory

530 N State Road, Briarcliff Manor

May 3, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

FIGURE 3

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

530 N State Road

May 3, 2018

1:4,514

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

FIGURE 4

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

JAY FAIN & ASSOCIATES, LLC
Environmental Consulting Services

Author: Jay Fain & Associates.
Not a legal document

APPENDIX A

SOILS REPORT

JAY FAIN & ASSOCIATES, LLC
Environmental Consulting Services

Jay Fain
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Victoria Landau
Principal, ASLA

Jason Lepro
Associate, CAD

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SOILS MAPPING & WETLAND/WATERCOURSE DELINEATION REPORT
530 N STATE ROAD, BRIARCLIFF MANOR, NY 10510

PROPERTY LOCATION AND DESCRIPTION:

LAND USE: **Commercial** ACRES: **1.0±**

ADDRESS: **530 N State Road**
Briarcliff Manor, NY 10510

REPORT COMPLETED FOR:

NAME: **Matthew Jarmel, AIA**

MAILING ADDRESS: Jarmel Kizel Architects
42 Okner Parkway
Livingston, NJ 07039

WETLANDS/WATERCOURSE JURISDICTION

The Inland Wetlands and Watercourses Act (Connecticut General Statutes §22a-38) define inland wetlands as "land, including submerged land, which consists of any soil types designated as poorly drained, very poorly drained, alluvial, and floodplain." Water courses are defined in the act as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof."

MAPPING AND DELINEATION METHODOLOGY

Soils analysis, as described in this report, is intended as an inventory and evaluation of the existing soil characteristics on the subject property. A first order soil survey in accordance with the principles and practices noted in the USDA publication *Soil Survey Manual* (1993) was completed at the site. Soil units mapped in the field correspond with those in the USDA publication *Soil Survey of Fairfield County, Connecticut* (1981).

Wetland identification was based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land (e.g. a pond). These and other soil types were identified by observation of soil morphology (soil texture, color, structure, etc.). To observe the morphology of the property's soils, numerous two-foot deep test pits and/or hand borings were completed throughout the site. Transects were located perpendicular to and at representative points along the perceived boundaries of the wetland areas identified on the property. Soil morphologies were observed at soil sampling points along the transects. Sampling began well outside the bounds of the wetland and continued towards it until inland wetland soils were observed. This point on each transect was marked (flagged) with an orange surveyor's tape labeled "Wetland Boundary". The complete boundary of every wetland area is located along the lines that connect these sequentially numbered boundary points.

Intermittent watercourses were delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation. Surveyor's tape, which was labeled "Wetland Boundary" and sequentially numbered, was placed at critical points to demarcate the boundary of each delineated watercourse.

The wetland and watercourse boundaries are subject to change until adopted by local or state regulatory agencies.

DATE AND CONDITIONS AT TIME OF INSPECTION

DATE: November 29, 2017 INSPECTED BY: Jay Fain

WEATHER: Warm, Sunny

SOIL MOISTURE CONDITIONS: ☐ DRY ☒ MOIST ☐ WET FROST DEPTH: N/A SNOW DEPTH: N/A

CERTIFICATION

JAY FAIN, PRINCIPAL, SOIL SCIENTIST

WETLAND/WATERCOURSE IDENTIFIED

FLAG NUMBERS	WETLAND TYPE	SOIL TYPE	COMMENTS
1 - 12	Watercourse	**Sh** – Sunloam	At Rear of Property

SOIL MAP UNITS

Each soil map unit that was identified on the property represents a specific area on the landscape and consists of one or more soils for which the unit is named. Other soils (inclusions that are generally too small to be delineated separately) may account for 10 to 15 percent of the map unit. The mapped units are identified in the following table by name and symbol and typical characteristics (parent material, drainage class, high water table, depth to bedrock, and slope) of each unit are provided. These are generally the primary characteristics to be considered in land use planning and management. A narrative that defines each characteristic and describes their land use implications follows the table. Complete descriptions of each soil map unit can be found in the *Soil Survey of Fairfield County, Connecticut* (1981).

UPLAND SOILS

SOIL		PARENT MATERIAL	SLOPE %	DRAINAGE CLASS	HIGH WATER TABLE			DEPTH TO BEDROCK (in)
SYM.	NAME				DEPTH (ft)	KIND	MOS.	
Ud (*HTM)	Udorthents	Properties and characteristics are variable, as unit consists of soils that have been altered by cutting & filling (>20 inches thick). Additional investigations are required to determine specific characteristics.						
Ur	Urban Land	Properties and characteristics are variable.						

WETLAND SOILS

SOIL		PARENT MATERIAL	SLOPE %	DRAINAGE CLASS	HIGH WATER TABLE			DEPTH TO BEDROCK (in)
SYM.	NAME				DEPTH (ft)	KIND	MOS.	
Sh	Sun loam, extremely stony	Loose Glacial Till	0-3	Poorly Drained, Very Poorly Drained	+1.0 – 0.5	Apparent	Nov. – May	>60

* Current NRCS Classification – HTM – Human Transported Material

SOIL CHARACTERISTICS: DEFINITIONS AND LAND USE IMPLICATIONS

PARENT MATERIAL: Parent material is the unconsolidated organic and mineral material in which soil forms. Soil inherits characteristics, such as mineralogy and texture, from its parent material. Glacial till is unsorted, nonstratified glacial drift consisting of clay, silt, sand and boulders transported and deposited by glacial ice. Glacial outwash consists of gravel, sand and silt, which is commonly stratified, deposited by glacial melt water. Alluvium is material such as sand, silt or clay deposited on land by streams. Organic deposits consist of decomposed plant and animal parts.

A soil's texture affects the ease of digging, filling and compacting and the permeability of a soil. Generally sand and gravel soils, such as outwash soils, have higher permeability rates than most glacial till soils. Soil permeability affects the cost to design and construct subsurface sanitary disposal facilities and, if too slow or too fast, may preclude their use. Outwash soils are generally excellent sources of natural aggregates (sand and gravel) suitable for commercial use, such as construction subbase material. Organic layers in soils can cause movement of structural footings. Compacted glacial till layers make excavating more difficult and may preclude the use of subsurface sanitary disposal systems or increase their design and construction costs if fill material is required.

SLOPE: Generally soils with steeper slopes increase construction costs, increase the potential for erosion and sedimentation impacts, and reduce the feasibility of locating subsurface sanitary disposal facilities.

DRAINAGE CLASS: Drainage class refers to the frequency and duration of periods of soil saturation or partial saturation during soil formation. Seven classes of natural drainage classes exist. They range from excessively drained, where water is removed from the soil very rapidly, to very poorly drained, where water is removed so slowly that free water remains at or near the soil surface during most of the growing season. Soil drainage affects the type and growth of plants found in an area. When landscaping or gardening, drainage class information can be used to assure that proposed plants are adapted to existing drainage conditions or that necessary alterations to drainage conditions (irrigation or drainage systems) are provided to assure plant survival.

HIGH WATER TABLE: High water table is the highest level of a saturated zone in the soil in most years. The water table can affect when shallow excavations can be made; the ease of the excavations, construction, and grading; and the supporting capacity of the soil. Shallow water tables may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

DEPTH TO BEDROCK: The depth to bedrock refers to the depth to fixed rock. Bedrock depth affects the ease and cost of construction, such as digging, filling, compacting and planting. Shallow depth bedrock may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.