horizons Engineering Inc.

PROPERTY EVALUATION REPORT
Kidder - Cleveland Conservation Land
New London, New Hampshire

KIDDER-CLEVELAND CONSERVATION LAND

PROPERTY EVALUATION REPORT

NEW LONDON, NEW HAMPSHIRE

OCTOBER 2017

Project No. 17838

Horizons Engineering, Inc.

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APPENDICES

1. INTRODUCTION & PURPOSE

Horizon's Engineering, Inc. has been retained by the Town of New London Conservation Commission to evaluate two parcels of land in New London, NH. The two parcels are Tax Map Lot 074/047/000 and Tax Map Lot 073/083/000, herein referred to as Pleasant Street-East (27 acres) and Pleasant Street-West (19.2 acres), respectively.

The Town of New London Conservation Commission asked the Engineer to complete a wetland delineation and evaluation of the contributing watershed areas for the sites and provide recommendations for stormwater management and potential uses for the properties. Publicly available information was compiled, such as Light Detection & Ranging (LIDAR) topography, ortho (aerial) imagery, and StreamStats Reports for both parcels. StreamStats is used to provide information regarding the contributing watershed area and determine peak runoff flow rates for various storm events. A delineation of jurisdictional wetlands on the parcels was completed and wetland areas are depicted in Appendix A, Figure 1.

Using the information collected, the following report outlines the potential uses for the properties and any known issues related to storm events. Potential ideas for stormwater treatment and/or detention devices, if needed, are discussed with a focus on conceiving ideas that will be practical as well as educational for the public.

2. EXISTING CONDITIONS

2.1 DESCRIPTION OF LAND

The project Site is comprised of a 27 acre parcel (Pleasant Street -East) and a 19.2 acre parcel (Pleasant Street-West). The Site is predominantly wooded and mostly comprised of jurisdictional wetlands and some sections are fairly wet. The East and West parcels are both located on either side of Pleasant Street in New London, about 0.2 miles from Main Street and close to the town center. Currently, both parcels are owned by the Town of New London.

The West parcel, located on the West side of Pleasant Street has approximately 615' of road frontage. The land is relatively flat and is a fairly wooded area. In the North corner of the parcel, the Red Brook originates and flows into Pleasant Lake. Based on a wetland delineation completed in September 2017, approximately 16.2 acres within the 19.2 acre parcel is jurisdictional wetlands (see Appendix A – Figure 1). The West parcel also includes a series of trail networks comprising the Kidder-Cleveland-Clough trail network. The trails include boardwalks and a bridge to help navigate the wet sections. According

to StreamStats and NH GRANIT, Red Brook originates in the narrow corridor between the two larger areas on the West parcel. Red Brook reportedly experiences annual flooding in the west parcel area which is further exacerbated by the beaver dams located at the north end of the parcel.

The East parcel has approximately 544' of combined road frontage. The parcel is 27 acres and is primarily woodlands with no developed areas within the property. The terrain for this parcel, based on the LIDAR topography available through NH GRANIT, mostly consists of approximately 5% slopes, with a large area towards the East edge of the parcel, outside the delineated wetlands, with slopes that are roughly 8%. The southern half of the property is mostly jurisdictional wetlands, however, much of the area north of the wetlands is sloped and dry. There is an additional wetland 'pocket' located on the East side of the parcel. The East parcel slopes towards Pleasant Street, and on to the West parcel which becomes relatively flat after crossing Pleasant Street.

The East parcel abuts a senior housing building, housing properties located along Cottage Lane and a few residential properties located along Gould Road to the south. The East parcel also abuts seven (7) residential properties located off of Birch Acres Road to the north and three (3) properties to the east, along Seamans Road.

The West parcel abuts land owned by Spring Ledge Farm to the north/northwest, Kearsarge Elementary School to the west along Cougar Court, WFK Ice House Foundation to the south along Pleasant Street, and residential properties to the east.

2.2 ZONING DISTRICT

The East Parcel is located in three different zoning districts; R1 (Urban Residential), R2 (Residential) and Commercial. Approximately, the north half of the parcel is Residential and the southern half is split between Commercial (west) and Urban Residential (east). The West parcel includes 16.2 acres currently under conservation easement and a 3 acre section at the southern end of the parcel zoned commercial (see Appendix B for a copy of the 2017 New London Zoning Map).

Town of New London Zoning Ordinance (Amended March 14, 2017) Summary

R1 (Urban Residential) & R2 (Residential) Permitted Uses

- Single-family or two-family dwelling
- Municipal buildings and public schools
- Farm and garden activities
- Forestry in accordance with Best Management Practices
- Accessory Building / Accessory Uses
- Essential Service

C (Commercial) Permitted Uses

- Any use permitted in the Residential District
- Lodging Houses, Apartments, hotels, Inns, motels
- Shops, restaurants (except drive-in or drive-thru)
- Greenhouses or florist shops
- Business or professional offices and banks
- Essential Services

Overview of Frontage, Lot Depth and Setback Requirements for Zoning Districts

Zone District	Frontage	Lot Depth	Yard/Setback Requirements		
	Road		Front	Rear	Side
R-1 w/ water & sewer	100 ft.	100 ft.	25 ft.	15 ft.	15 ft.
R-1 w/o water & sewer	150 ft.	-	25 ft.	15 ft.	Min 20 ft. for one side; Aggregate 50' for both sides
R-2	150 ft.	-	25 ft.	-	Min 20 ft. for one side; Aggregate 50' for both sides
Commercial	MIN. = to width of structure.	-	30 ft.	-	10 ft.

Wetlands Conservation Overlay District Summary

The Zoning Ordinance describes the boundaries of the Wetlands Conservation Overlay District described as follows:

- Wetlands, which include, but are not limited to, Swamps, Marshes and Bogs
- Prime wetlands as designated as such by their size, fragility, and uniqueness. The Philbrick-Cricenti Bog, the Low Plain Wetland, and the Goosehole Marsh meet these criteria and are recognized by the New Hampshire Wetlands Board, thereby receiving special consideration by the Wetlands Board. The boundaries of Prime Wetlands are determined by the jurisdictional boundaries of the Wetland as defined herein.
- Wetlands buffers as specified in Paragraph G. Wetlands Buffers.

(A) Permitted Uses of Note:

- Forestry-Tree farming using Best Management Practices
- Cultivation & harvesting of crops according to recognized soil conservation practices

- Wildlife Refuges
- Parks and recreation uses
- Conservation and nature trails
- Dry hydrants or fire ponds

(B) Special Provisions:

- No septic tank or leach field may be constructed closer than 100 feet to any Wetland whenever excessively well-drained soils with rapid permeability are encountered, otherwise 75 feet shall govern;
- Any fill of Wetlands for erection or construction of any Structure or Building which may be permitted following a public hearing for a Special Exception shall be offset through the creation of a new Wetlands equal in area to those sections being filled. The creation of new Wetlands shall be on the same site and within the same surface drainage sub-watershed as where the Wetlands are proposed to be filled.

(C) Wetlands Buffers:

- 200 feet from Wetlands designated at prime Wetlands by RSA 482-A:15 and referenced in Section B(2) (Philbrick-Cricenti Bog, the Low Plain Wetland, and the Goosehole Marsh);
- 150 feet from all Wetlands which adjoin or are connected to a prime wetland; and
- 100 feet from the boundary of Wetlands designated for protection on the New London Streams and Wetlands Protection Map dated March 13,2001. ("The Wetlands delineated on the New London Streams and Wetlands Protection Map are based on the National Wetlands Inventory Maps of Wetlands and the most important Wetland complexes in the community to preserve as determined by the New London Conservation Commission. This map shows the general location of Wetlands as defined by this Ordinance. The boundary of the Wetland on a specific site must be delineated by a qualified professional must be delineated by a qualified professional acceptable to the NH Wetland Board.")

3. CONTRIBUTING WATERSHED

3.1 OVERVIEW & DESCRIPTION

According to GRANITVIEW and StreamStats, Red Brook originates in the West Parcel and discharges into Pleasant Lake with a contributing watershed of approximately 0.32

square miles. The watershed area for both the East and West parcels includes the entire width of Pleasant Street from Main Street to the intersection with Jobs Seamans Acres/Birch Acres Road. This watershed area extends south to Seamans Road and north to include Spring Ledge Farm land and an additional roughly 0.25 miles stretch of area along the east side of Little Sunapee Road. In general, most of this area is comprised of the Kidder-Cleveland Conservation Land and the East Parcel which is fairly wooded. The northern end of the watershed area includes Spring Ledge farmland and mostly open fields further north along Little Sunapee Road. The southern end of the watershed area includes a section of the Colby-Sawyer College campus and the Cottage Lane housing complex. The remaining watershed area to the south/south-east is primarily commercial properties along Main Street, Kearsarge Elementary School along Cougar Court and residential properties situated on Pressey Court/Sawyer Lane (see Appendix A – Figure 2 for Watershed Areas Exhibit)

Stormwater originating on the Colby-Sawyer campus is generally conveyed by catch basins and pipes to a point just north of Cottage Lane. Stormwater is then conveyed under Seamans Road by three separate culverts that discharge near the Colby-Sawyer parking lot. From there, water flows via open channels to the wetlands in the southern corner of the East Parcel. Similarly, water flowing from the north/north-east ends of the East parcel, partially flows to the wetlands 'pocket' located on the East parcel, but mostly appears to flow west, navigating down the sloped terrain, underneath Pleasant Street via a culvert and collects in the wetlands located on the West parcel.

Water flowing from the watershed area on the East side of Little Sunapee Road also flows down the terrain to the wetlands located on the West parcel. Water collecting in the West Parcel wetlands collects and is the origin of Red Brook. The Red Brook, a perennial stream, flows approximately 1 mile northeast, and discharges at the north end of Pleasant Lake. Red Brook is the one of the larger tributaries to Pleasant Lake.

The following is a summary of pertinent StreamStats data for the watershed areas for both parcels regarding storm event flow rates: (see Appendix D for complete Stream Stats Reports for the East and West parcels)

Watershed Area Statistics	East Parcel	West Parcel
Drainage Area (sq. miles)	0.10	0.32
June to Oct. Gage Precipitation (inches)	18.2	18.2
Percent Wetlands	0.19%	11.00 %
Percent Land Covered by Coniferous Forest	18.68%	16.50%
Percent Mixed Forest	16.21%	10.84%
Mean Basin Slope	4.59%	3.44%

Peak-Flow Statistics	East Parcel	West Parcel
2 Year Peak Flood (ft^3/s)	5.94	8.9
5 Year Peak Flood (ft^3/s)	11	15.9
10 Year Peak Flood (ft^3/s)	15.6	22
25 Year Peak Flood (ft^3/s)	22.6	30.9
50 Year Peak Flood (ft^3/s)	28.7	38.6
100 Year Peak Flood (ft^3/s)	36.2	47.9

In recent years, several significant changes have affected the watershed areas for the two parcels. Along Cottage Lane, six (6) duplexes were constructed circa 2012. The drainage for this complex is serviced through a closed drainage system comprised of catch basins and pipes, which discharge directly to the wetlands in the East parcel. There does not appear to be any stormwater detention or treatment provided on the site. Much of this area along Cottage Lane is characterized as impervious surfaces, consisting of parking and six housing duplexes, each with a building footprint of roughly 2,300 square feet.

Another recent change to the watershed area includes a 32-unit senior housing complex, located on Tax Map 73 Lot 91, located along Pleasant Street, on the South side of East Parcel. This area includes a 15,000 square foot building footprint and a parking area which abuts the East parcel. The site appears to have a drainage detention feature along the north side of the parking lot.

4. POTENTIAL USES & STORMWATER CONSIDERATIONS

4.1 POTENTIAL DEVELOPMENT OPTIONS

The following is a summary of the potential uses for both the East and West parcels based on the site conditions, local ordinances, and state regulations. While the West parcel does not offer many development opportunities, there is approximately a 3-acre section zoned commercial at the southern end of the parcel, located along Pleasant Street. This portion of the West parcel presents a few opportunities for development. This area offers an opportunity to create trailhead parking for the Kidder-Cleveland-Clough trail network. Within the 3-acre section, a roughly 0.5-acre area is not classified as jurisdictional wetlands and may be an ideal area to construct a small parking area. In addition to parking, this area could offer the opportunity for visitors to learn about the Kidder-Cleveland Conservation Land itself and additional efforts and topics related to conservation by means of educational kiosks. Kiosks could also be added along the existing trails throughout the West parcel to highlight areas of interest.

An additional parcel, identified as Tax Map 74, Lot 48 and currently owned by the Town of New London, could also serve as a potential trailhead parking area for the Kidder-

Cleveland trail network. This area, is approximately 0.6 acres, but wetlands existing on and around the parcel and also a 100' wetlands buffer surrounding the wetlands would make trailhead development difficult. However, this area may qualify for a Special Exception under the New London Zoning Ordinance Article XIII, section F if the wetlands impact in this area is offset through the creation of additional wetlands in the same site and within the same surface drainage sub-watershed. This area may offer potential for educational components, such as bioretention area and "rain gardens" as well.

The 3-acre section also presents an opportunity for resale as a small commercial lot. The Zoning Ordinance does not require a minimum lot area or minimum road frontage for commercial subdivisions. The subdivision, however, would require a series of applications and approvals at the town and state level. Profits from such a resale could provide additional funds to help manage the conservation land.

The remaining, approximately 16.2 acres on the West parcel is primarily jurisdictional wetlands area. Ultimately, the most appropriate use for this land is conservation. As of present, the Kidder-Cleveland-Clough trail network only travels along the northern edge of the parcel. This leaves a large portion in the southern half of the parcel to potentially expand upon the existing trail network, and could add roughly 0.25 miles of trail if the existing trail were to branch off and create a loop along the southern border of the parcel and return to Pleasant Street. This could allow visitors to explore more of the conservation land, while not causing a major impact to the wetlands area. It should be noted that such work may require a Minimum Impact Wetlands permit, according to Env-Wt 303.04 for 'Construction or maintenance of trails'.

The East parcel is currently undeveloped woodland, and the trail networks on the West parcel could potentially extend across the East parcel and connect to the Colby Sawyer College Area. This could substantially increase the number of trails in the Kidder-Cleveland-Clough trail network and continue to attract more visitors. A major benefit to conserving the land in the East parcel, is the ability to limit the development of the area, and subsequently the additional runoff created from impervious surfaces. Any additional stormwater runoff could lead to additional contributions of untreated stormwater to Pleasant Lake and could compound the flooding experienced on the West parcel due to beaver activity.

A conceptual site plan was created for the East parcel in 2005 (see Appendix C). This conceptual site plan includes an approximately 20,000 square foot community center, two (2) playing fields and associated parking. While this site plan could potentially be pursued, it would require several key adjustments to meet current local ordinances. The community center would need to be shifted north, approximately 100' to accommodate

the wetlands buffer requirement set forth in the Town of New London Zoning Ordinance. This would further reduce the proposed parking. Potentially, the East parcel could accommodate one playing field with parking and not encroach on the 100' wetlands buffer. The sloped terrain of the East parcel would require significant earthwork and likely retaining walls to reasonably construct the proposed playing fields and parking envisioned. Any vehicular access from Pleasant Street would require a wetland impact for crossing.

4.2 STORMWATER DETENTION & TREATMENT OPTIONS

If the construction of trailhead parking is pursued, stormwater runoff from the pavement or gravel surface could be directed to a bioretention basin or other low-impact development treatment feature. This area would treat the runoff from the parking area flowing to the wetlands located on the West parcel. An educational component could also be incorporated to highlight an example of one of the many methods to treat stormwater runoff.

The East parcel does not present many, if any, opportunities to treat stormwater runoff. The wetlands on the southern half of the parcel extend essentially right to the property boundary which abuts developed areas along Cottage Lane and the senior housing site. Without the necessary wetlands permits, it is not allowable to detain or treat runoff in jurisdictional wetlands areas. Similarly, since wetlands constitute much of the borders of the West parcel, there is little potential to treat or detain stormwater which flows into the parcel from surrounding areas.

The northern half of the East parcel, outside of the jurisdictional wetlands and 100' wetlands buffer, could potentially serve as an area to treat stormwater. However, the contributing areas for this area are largely undeveloped, so little to no gain would be realized with a feature in this location. According to StreamStats, the watershed area for the East parcel is included in the watershed area for the West parcel. Using the Seasonal Flow Statistics Flow Report, which reports statistics for the flow (ft^3/s) of water for different times of the year, and comparing the results for both parcels, approximately 30% of the water flowing through the West parcel and forming the Red Brook appears to originate from stormwater runoff coming from the East parcel. If runoff from the East parcel could be better managed, it may reduce the impact of annual flooding on the West parcel. Unfortunately, all of the contributing areas with impervious surfaces and more concentrated runoff are off site to the south and east. As discussed, the jurisdictional wetlands abut the property line in these areas which eliminates the possibility of providing treatment on the site. Any detention or treatment of these areas would need to take place upstream in the watershed on others' property.

5. CONCLUSION

In general, jurisdictional wetlands constitute the majority of the West parcel. This parcel does not appear to be a good candidate for any substantial development. Aside from the 3-acre section, zoned commercial, located at the southern corner of the parcel, the remainder of the parcel is wetlands. The 3-acre commercial area possesses a few options for development including trailhead parking, educational kiosks or small building, or subdivision and resale. Also to note, the parcel identified as Map 74, Lot 48 could serve as a parking area, but may require Zoning Board Approval and a Wetlands permit. All-in-all, trailhead parking for the KCC trail network is feasible and the best use for the West parcel land appears to be a combination of conservation easement and trailhead parking. Within the wetlands, there may be an opportunity to substantially add to the existing trail network and provide further educational components.

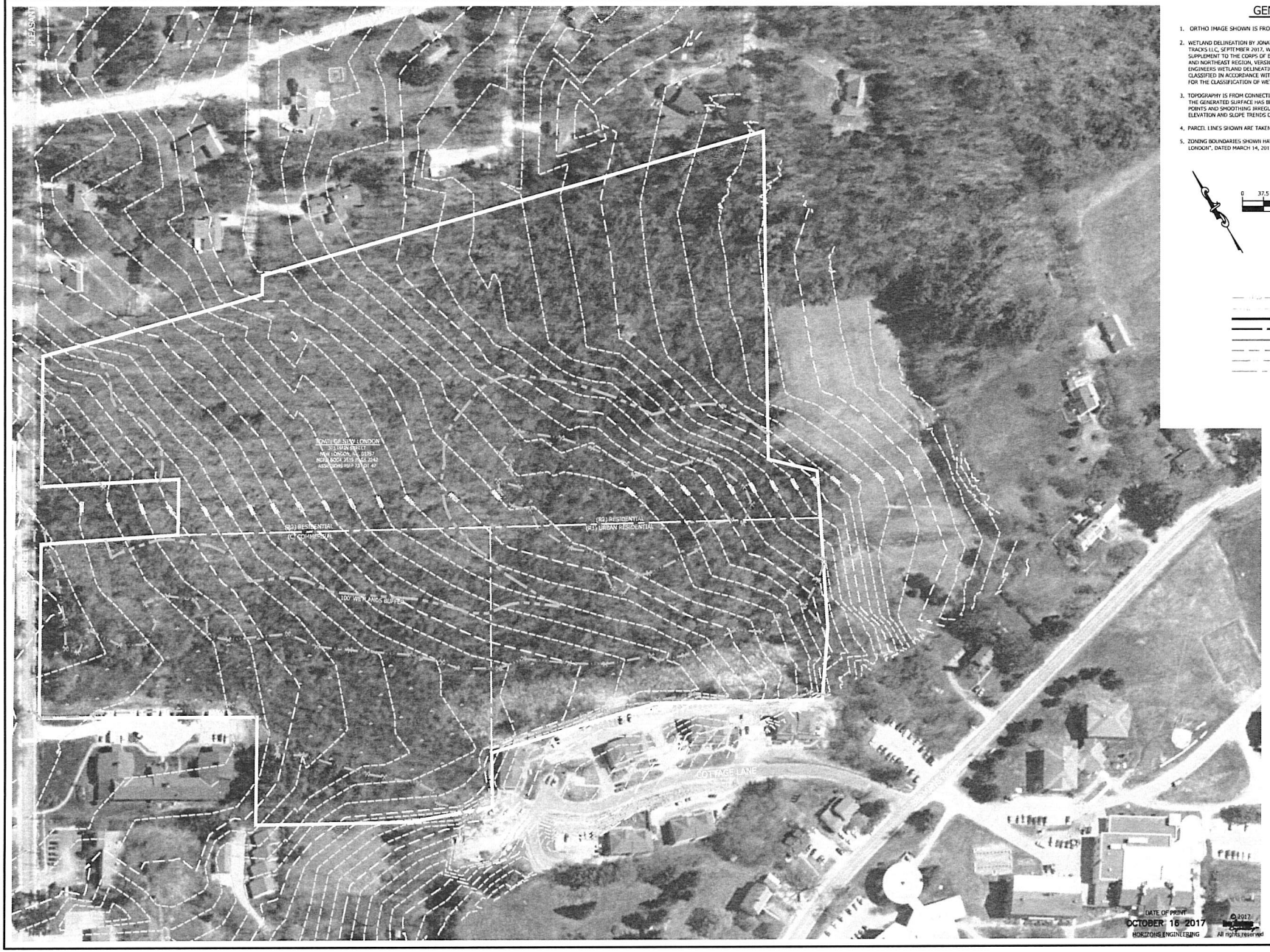
The East parcel may allow for the development proposed in the conceptual site plan for the 'Kearsarge Lake Sunapee Community Center'. However, there are many obstacles to overcome and adjustments that would be required. The parcel is viable for residential or commercial development by ordinance. However, the parcel's development potential is encumbered by wetlands and the associated buffer.

The East parcel offers the opportunity to limit development and prevent additional stormwater from potential impervious surfaces from contributing to flooding experienced on the West parcel. Upland areas on the East Parcel would be excellent for the expansion of the existing trail network on the West parcel which could provide greater connectivity between the Colby Sawyer College Area and the Kidder-Cleveland Conservation land. Educational kiosks could also be installed along trails and provide information about the land and conservation efforts in the New London area.

APPENDIX A

Figures

Figure 1 – Existing Conditions Plan
Figure 2 – Watershed Areas Exhibit
Figure 3 – USGS Exhibit



GENERAL NOTES

1. ORTHO IMAGE SHOWN IS FROM NH GRANITVIEW, 2015.
2. WETLAND DELINEATION BY JONATHON SISSON, CERTIFIED WETLAND SCIENTIST OF BEAVER TRACKS LLC, SEPTEMBER 2017. WETLANDS ARE DETERMINED ACCORDING TO THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH-CENTRAL AND NORTHEAST REGION, VERSION 2.0, ERDC/EL HR-21-1, JANUARY 2013 TO THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1. WETLANDS ARE CLASSIFIED IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE USFWS "METHODOLOGY FOR THE CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS", 108/
3. TOPOGRAPHY IS FROM CONNECTICUT RIVER LIDAR DATASET (2015), OBTAINED VIA NH GRANIT. THE GENERATED SURFACE HAS BEEN EDITED BY INTERPOLATING DATA BETWEEN THE SURFACE POINTS AND SMOOTHING IRREGULARITIES IN THE SURFACE, TO BETTER PRESENT THE ELEVATION AND SLOPE TRENDS ON THE SITE.
4. PARCEL LINES SHOWN ARE TAKEN FROM NH GRANIT, ACCESSED SEPTEMBER 2017.
5. ZONING BOUNDARIES SHOWN HAVE BEEN APPROXIMATED USING THE "ZONING MAP OF NEW LONDON", DATED MARCH 14, 2017.

0 37.5 75 150 300

SCALE IN FEET

LEGEND

- MAJOR CONTOURS
- MINOR CONTOURS
- PARCEL BOUNDARY
- ZONING LIMITS
- WATERSHED BOUNDARY
- TRAIL NETWORK
- WETLANDS
- 100' WETLANDS BUFFER

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NEW LONDON CONSERVATION COMMISSION

KIDDER-CLEVELAND CONSERVATION LAND

NEW LONDON, NEW HAMPSHIRE

EXISTING CONDITIONS EAST PARCEL

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: OCT. 2017	PROJECT #: 17838
ENGIN'D BY: -	DRAWN BY: CEW
CHECK'D BY: WTD	ARCHIVE #: H-___

SHEET 1 OF 3

GENERAL NOTES

1. ORTHO IMAGE SHOWN IS FROM NH GRANITVIEW, 2015.
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0 37.5 75 150 300

SCALE IN FEET

LEGEND

- MAJOR CONTOURS
- MINOR CONTOURS
- PARCEL BOUNDARY
- ZONING LIMITS
- WATERSHED BOUNDARY
- TRAIL NETWORK
- WETLANDS
- 100' WETLANDS BUFFER

DATE OF PRINT
OCTOBER 16 2017
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EXISTING CONDITIONS
WEST PARCEL

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: OCT. 2017	PROJECT #: 17838
ENGN'D BY: -	DRAWN BY: CEW
CHECK'D BY: WTD	ARCHIVE #: H-___

SHEET 2 OF 3

LEGEND

- MAJOR CONTOURS
- MINOR CONTOURS
- PARCEL BOUNDARY
- ZONING LIMITS
- WATERSHED BOUNDARY
- TRAIL NETWORK
- WETLANDS
- 100' WETLANDS BUFFER

0 100 200 400 800

SCALE IN FEET

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WATERSHED AREA EXHIBIT

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: OCT 2017	PROJECT #: 17838
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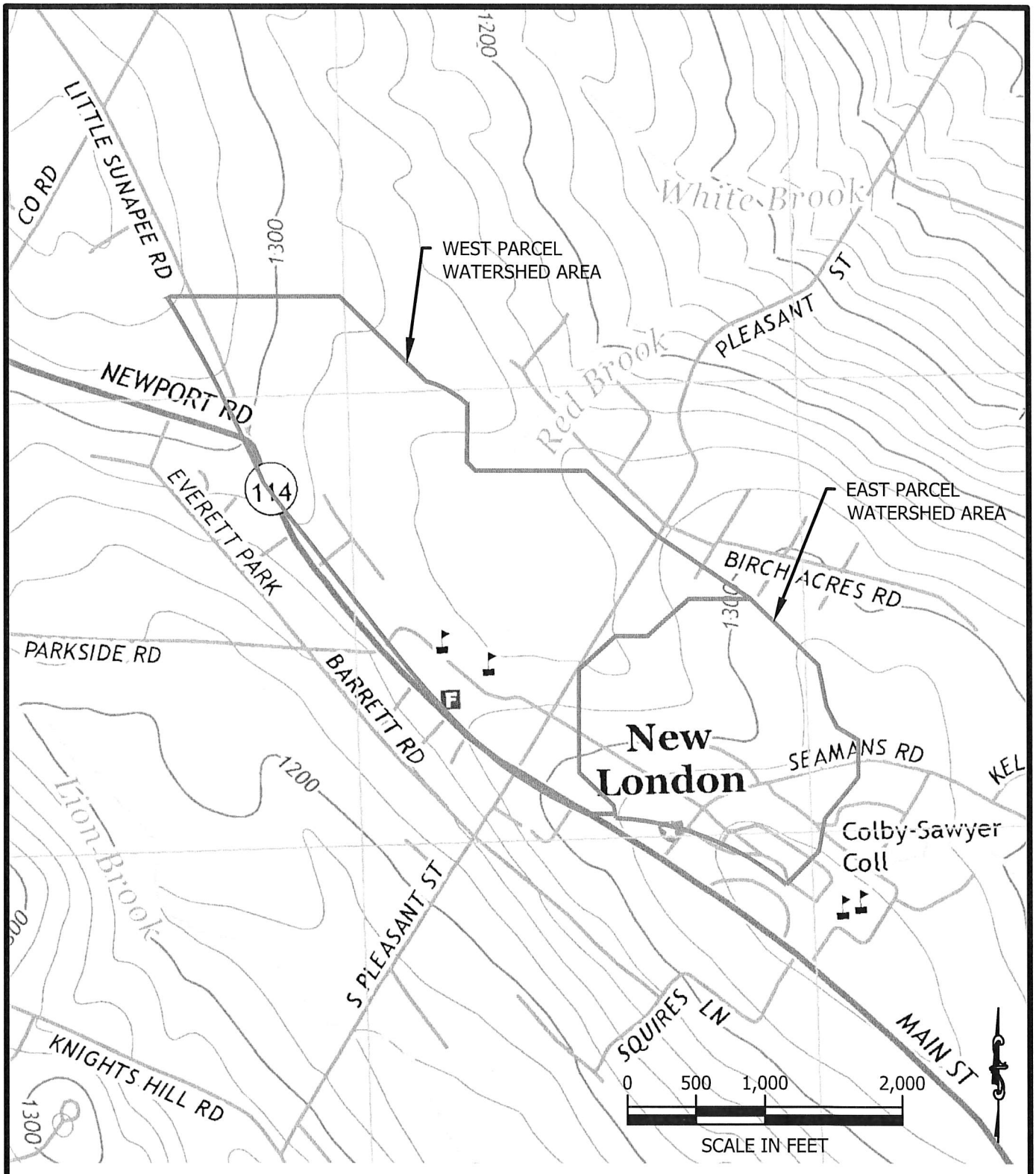
CHECK'D BY: WTD	ARCHIVE #: H-___

SHEET 3 OF 3



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NEW LONDON, NEW HAMPSHIRE

USGS EXHIBIT

PROJECT #:	17838
ENGIN'D BY:	-
DRAWN BY:	CEW
DATE:	10/12/2017

APPENDIX B

2017 TOWN OF NEW LONDON ZONING MAP

ZONING MAP
OF

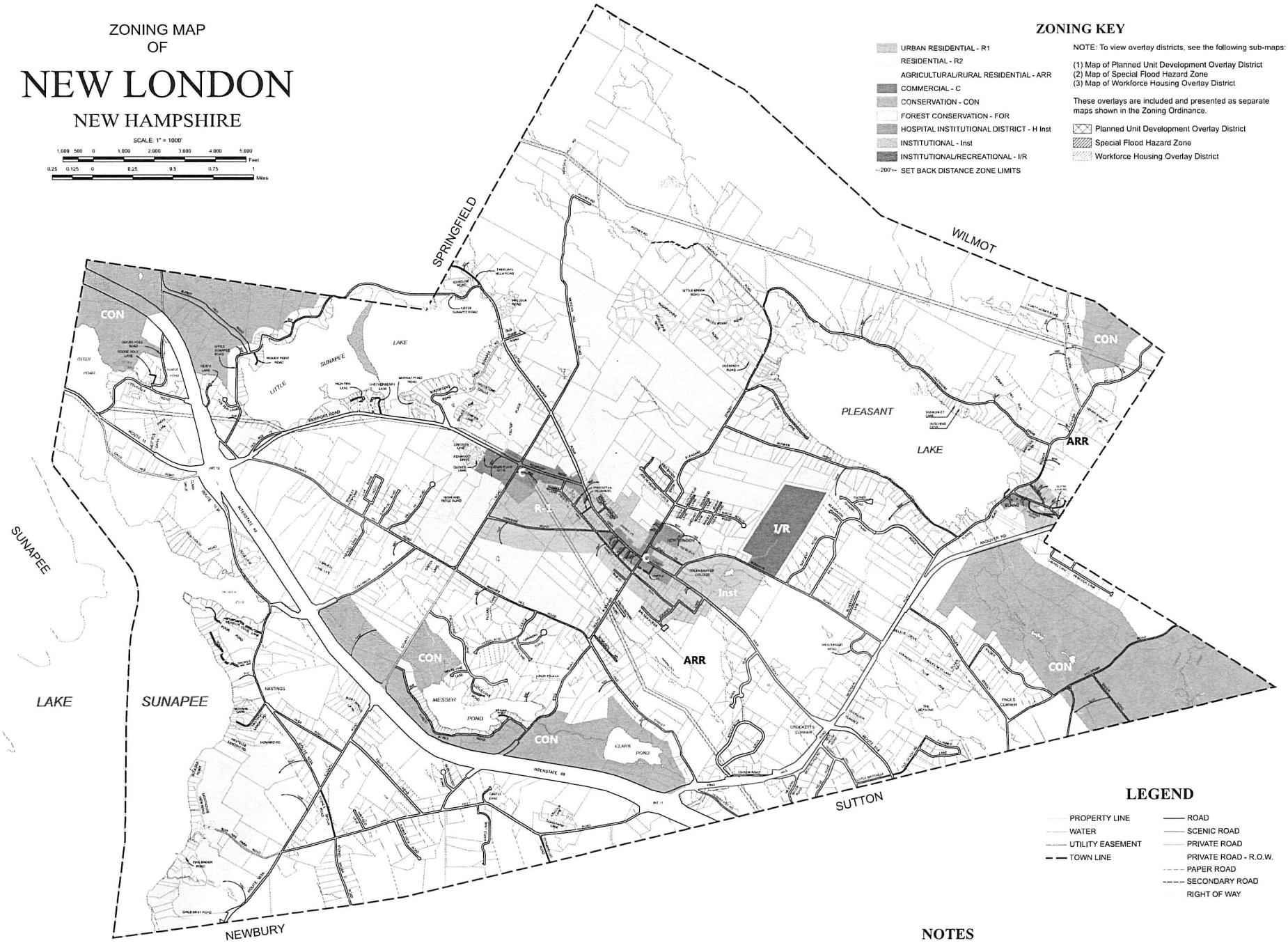
NEW LONDON

NEW HAMPSHIRE

SCALE: 1" = 1000'

1,000 500 0 1,000 2,000 3,000 4,000 5,000 Feet

0.25 0.125 0 0.25 0.5 0.75 1 Miles



ZONING KEY

- URBAN RESIDENTIAL - R1
- RESIDENTIAL - R2
- AGRICULTURAL/RURAL RESIDENTIAL - ARR
- COMMERCIAL - C
- CONSERVATION - CON
- FOREST CONSERVATION - FOR
- HOSPITAL INSTITUTIONAL DISTRICT - H Inst
- INSTITUTIONAL - Inst
- INSTITUTIONAL/RECREATIONAL - I/R
- ~200'+- SET BACK DISTANCE ZONE LIMITS

NOTE: To view overlay districts, see the following sub-maps:

(1) Map of Planned Unit Development Overlay District
(2) Map of Special Flood Hazard Zone
(3) Map of Workforce Housing Overlay District

These overlays are included and presented as separate maps shown in the Zoning Ordinance.

- Planned Unit Development Overlay District
- Special Flood Hazard Zone
- Workforce Housing Overlay District

LEGEND

- PROPERTY LINE
- WATER
- UTILITY EASEMENT
- TOWN LINE
- ROAD
- SCENIC ROAD
- PRIVATE ROAD
- PRIVATE ROAD - R.O.W.
- PAPER ROAD
- SECONDARY ROAD
- RIGHT OF WAY

NOTES

THIS MAP IS BASED ON THE TOWN OF NEW LONDON PROPERTY MAPS PREPARED IN 1975 BY HITMAN & HOWARD INC. DIGITIZED IN 1999 BY CAI TECHNOLOGIES.

ZONING SOURCE DATA
ZONING MAP OF NEW LONDON AS PREPARED BY STATE OF NEW HAMPSHIRE D.R.E.D DATED APRIL 1975. FROM U.S.G.S BASE MAP. ALL DIMENSIONS MEASURED FROM CENTERLINES OF HIGHWAYS AND BOUNDARY LINES.

- REVISED BY KEARS-WOODLING, FEBRUARY 1976
- RE-DRAWN BY TOWN OF NEW LONDON, NH MARCH 2009
- REVISED BY CAI TECHNOLOGIES APRIL 2015
- REVISED BY UPPER VALLEY LAKE SUNAPEE REGIONAL PLANNING COMMISSION APRIL 2016

ITS INTENDED FOR REFFRENCE AND PLANNING PURPOSES ONLY.

PROPERTY LINES CURRENT TO APRIL 1, 2016
ZONING BOUNDARIES CURRENT TO MARCH 14, 2017

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APPENDIX C

'CONCEPTUAL SITE PLAN', DATED 2005

KEARSARGE LAKE SUNAPEE COMMUNITY CENTER

CONCEPTUAL SITE PLAN

Sheerr McCrystal Palson Architecture, Inc.

October 11, 2005

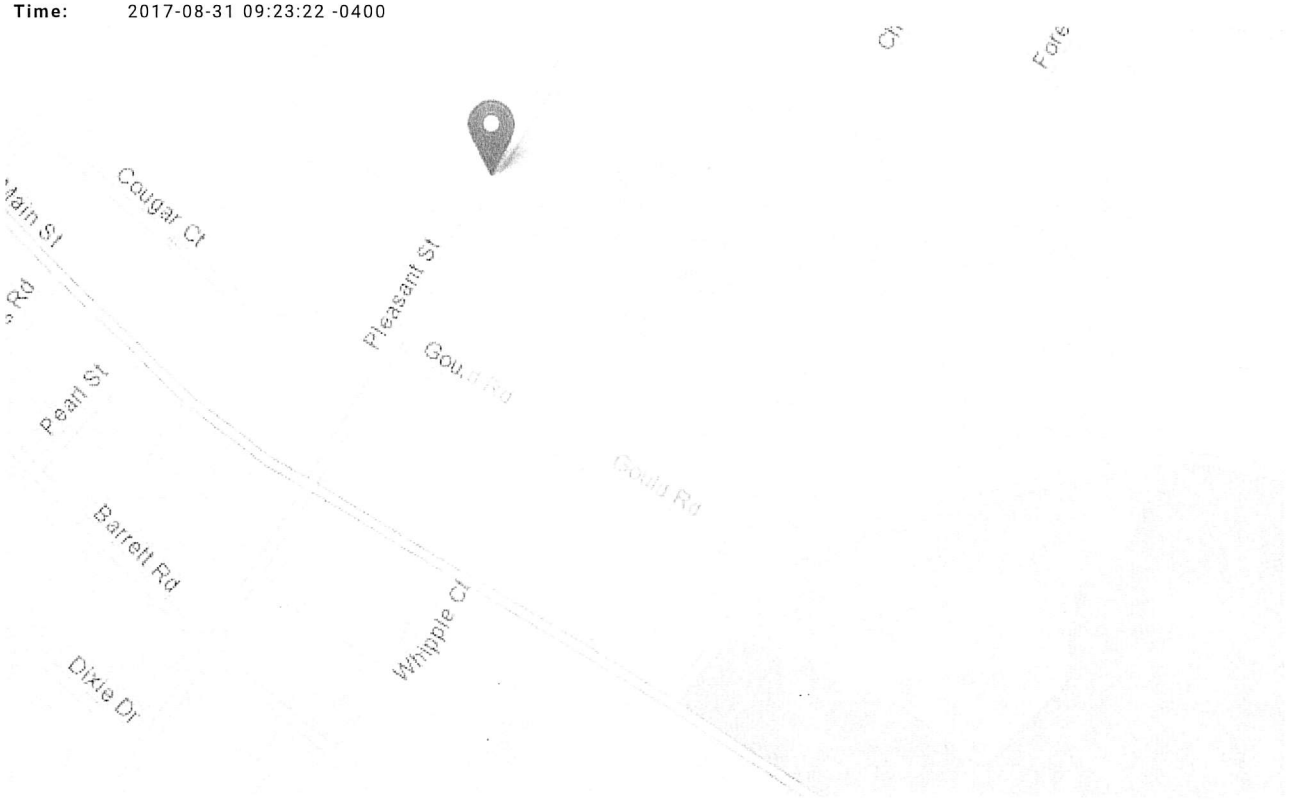
0 250

APPENDIX D

STREAM STATS REPORTS

StreamStats Report - East Parcel

Region ID: NH
Workspace ID: NH20170831092233435000
Clicked Point (Latitude, Longitude): 43.41682, -71.98279
Time: 2017-08-31 09:23:22 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.1	square miles
CONIF	Percentage of land surface covered by coniferous forest	18.6796	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	7.4	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	4.589	percent
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	16.2078	percent
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.2	inches
TEMP	Mean Annual Temperature	44.24	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	60.404	degrees F
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	18.2	inches

Parameter Code	Parameter Description	Value	Unit
ELEVMAX	Maximum basin elevation	1341.978	feet
SNOFALL	Mean Annual Snowfall	85.132	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	7.83	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	42.6	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	42.7	inches
MINTEMP_W	Mean winter minimum air temperature over basin surface area	13.152	degrees F
APRAVPRE	Mean April Precipitation	3.688	inches
WETLAND	Percentage of Wetlands	0.1877	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	199	feet per mi
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	37.8	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	14.4	percent

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.1	square miles	3.26	689
CONIF	Percent Coniferous Forest	18.6796	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	7.4	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	4.589	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	16.2078	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.2	inches	6.83	11.5
TEMP	Mean Annual Temperature	44.24	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	60.404	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	1341.978	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit

Statistic	Value	Unit
Jan to Mar15 60 Percent Flow	0.0517	ft^3/s
Jan to Mar15 70 Percent Flow	0.0423	ft^3/s
Jan to Mar15 80 Percent Flow	0.0376	ft^3/s
Jan to Mar15 90 Percent Flow	0.027	ft^3/s
Jan to Mar15 95 Percent Flow	0.0212	ft^3/s
Jan to Mar15 98 Percent Flow	0.0181	ft^3/s
Jan to Mar15 7 Day 2 Year Low Flow	0.0372	ft^3/s
Jan to Mar15 7 Day 10 Year Low Flow	0.0183	ft^3/s
Mar16 to May 60 Percent Flow	0.157	ft^3/s
Mar16 to May 70 Percent Flow	0.125	ft^3/s
Mar16 to May 80 Percent Flow	0.104	ft^3/s
Mar16 to May 90 Percent Flow	0.0805	ft^3/s
Mar16 to May 95 Percent Flow	0.0636	ft^3/s
Mar16 to May 98 Percent Flow	0.0462	ft^3/s
Mar16 to May 7 Day 2 Year Low Flow	0.0586	ft^3/s
Mar16 to May 7 Day 10 Year Low Flow	0.03	ft^3/s
Jun to Oct 60 Percent Flow	0.00792	ft^3/s
Jun to Oct 70 Percent Flow	0.0054	ft^3/s
Jun to Oct 80 Percent Flow	0.0038	ft^3/s
Jun to Oct 90 Percent Flow	0.00212	ft^3/s
Jun to Oct 95 Percent Flow	0.00124	ft^3/s
Jun to Oct 98 Percent Flow	0.00111	ft^3/s
Jun to Oct 7 Day 2 Year Low Flow	0.00254	ft^3/s
Jun to Oct 7 Day 10 Year Low Flow	0.000534	ft^3/s
Nov to Dec 60 Percent Flow	0.109	ft^3/s
Nov to Dec 70 Percent Flow	0.0817	ft^3/s
Nov to Dec 80 Percent Flow	0.0623	ft^3/s
Nov to Dec 90 Percent Flow	0.0387	ft^3/s
Nov to Dec 95 Percent Flow	0.0226	ft^3/s
Nov to Dec 98 Percent Flow	0.0123	ft^3/s
Oct to Nov 7 Day 2 Year Low Flow	0.0579	ft^3/s
Oct to Nov 7 Day 10 Year Low Flow	0.0221	ft^3/s

Seasonal Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.1	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.5	23.1
TEMP	Mean Annual Temperature	44.24	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	0.0392	ft^3/s
70 Percent Duration	0.0247	ft^3/s
80 Percent Duration	0.012	ft^3/s
90 Percent Duration	0.00488	ft^3/s
95 Percent Duration	0.00256	ft^3/s
98 Percent Duration	0.00131	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.1	square miles	3.26	689
TEMP	Mean Annual Temperature	44.24	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.00231	ft^3/s
7 Day 10 Year Low Flow	0.000466	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PREG_03_05	Mar to May Gage Precipitation	9.2	inches	6.83	11.54
CONIF	Percent Coniferous Forest	18.6796	percent	3.07	56.18
SNOFALL	Mean Annual Snowfall	85.132	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.46	23.11
TEMP	Mean Annual Temperature	44.24	degrees F	36.05	48.69
MIXFOR	Percent Mixed Forest	16.2078	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	7.83	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	42.6	inches	37.44	75.91
PRECIPOUT	Mean Annual Precip at Gage	42.7	inches	35.83	53.11
MINTEMP_W	Mean Winter Min Temperature	13.152	degrees F	0.8	19.88

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SEe	SEp
GW_Recharge_Jan_to_Mar15	4.79	in	14.5	15.5
GW_Recharge_Mar16_to_May	8.32	in	11.7	12.4
GW_Recharge_Jun_to_Oct	3.66	in	25.2	26.5
GW_Recharge_Nov_to_Dec	3.38	in	15.2	15.8
GW_Recharge_Ann	19.9	in	12	12.4

Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019,

67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.1	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.688	inches	2.79	6.23
WETLAND	Percent Wetlands	0.1877	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	199	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
2 Year Peak Flood	5.94	ft^3/s
5 Year Peak Flood	11	ft^3/s
10 Year Peak Flood	15.6	ft^3/s
25 Year Peak Flood	22.6	ft^3/s
50 Year Peak Flood	28.7	ft^3/s
100 Year Peak Flood	36.2	ft^3/s
500 Year Peak Flood	56.3	ft^3/s

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

StreamStats Report - West Parcel

Region ID: NH
Workspace ID: NH20170830144534506000
Clicked Point (Latitude, Longitude): 43.42023, -71.98500
Time: 2017-08-30 14:46:19 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.32	square miles
CONIF	Percentaqe of land surface covered by coniferous forest	16.4957	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	7.44	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	3.437	percent
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	10.8429	percent
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	9.2	inches
TEMP	Mean Annual Temperature	44.24	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	60.404	degrees F
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	18.2	inches

Parameter Code	Parameter Description	Value	Unit
ELEVMAX	Maximum basin elevation	1341.978	feet
SNOFALL	Mean Annual Snowfall	85.069	inches
PREBC_1112	Mean annual precipitation of basin centroid for November 1 to December 31 period	7.83	inches
PRECIPCENT	Mean Annual Precip at Basin Centroid	42.7	inches
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	42.6	inches
MINTEMP_W	Mean winter minimum air temperature over basin surface area	13.196	degrees F
APRAVPRE	Mean April Precipitation	3.682	inches
WETLAND	Percentage of Wetlands	11.0038	percent
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	124	feet per mi
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	39	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	15.5	percent

Seasonal Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.32	square miles	3.26	689
CONIF	Percent Coniferous Forest	16.4957	percent	3.07	56.2
PREBC0103	Jan to Mar Basin Centroid Precip	7.44	inches	5.79	15.1
BSLDEM30M	Mean Basin Slope from 30m DEM	3.437	percent	3.19	38.1
MIXFOR	Percent Mixed Forest	10.8429	percent	6.21	46.1
PREG_03_05	Mar to May Gage Precipitation	9.2	inches	6.83	11.5
TEMP	Mean Annual Temperature	44.24	degrees F	36	48.7
TEMP_06_10	Jun to Oct Mean Basinwide Temp	60.404	degrees F	52.9	64.4
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.5	23.1
ELEVMAX	Maximum Basin Elevation	1341.978	feet	260	6290

Seasonal Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Seasonal Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit

Flow-Duration Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.32	square miles	3.26	689
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.5	23.1
TEMP	Mean Annual Temperature	44.24	degrees F	36	48.7

Flow-Duration Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
60 Percent Duration	0.139	ft^3/s
70 Percent Duration	0.0888	ft^3/s
80 Percent Duration	0.0452	ft^3/s
90 Percent Duration	0.0196	ft^3/s
95 Percent Duration	0.0107	ft^3/s
98 Percent Duration	0.00581	ft^3/s

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Low-Flow Statistics Parameters [Low Flow Statewide]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.32	square miles	3.26	689
TEMP	Mean Annual Temperature	44.24	degrees F	36	48.7
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.5	23.1

Low-Flow Statistics Disclaimers [Low Flow Statewide]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Statewide]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.00985	ft^3/s
7 Day 10 Year Low Flow	0.00236	ft^3/s

Low-Flow Statistics Citations

Flynn, R.H. and Tasker, G.D.,2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p. (http://pubs.water.usgs.gov/wrir02-4298)

Recharge Statistics Parameters [Groundwater Recharge Statewide 2004 5019]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PREG_03_05	Mar to May Gage Precipitation	9.2	inches	6.83	11.54
CONIF	Percent Coniferous Forest	16.4957	percent	3.07	56.18
SNOFALL	Mean Annual Snowfall	85.069	inches	54.46	219.07
PREG_06_10	Jun to Oct Gage Precipitation	18.2	inches	16.46	23.11
TEMP	Mean Annual Temperature	44.24	degrees F	36.05	48.69
MIXFOR	Percent Mixed Forest	10.8429	percent	6.21	46.13
PREBC_1112	Nov to Dec Basin Centroid Precip	7.83	inches	6.57	15.2
PRECIPCENT	Mean Annual Precip at Basin Centroid	42.7	inches	37.44	75.91
PRECIPOUT	Mean Annual Precip at Gage	42.6	inches	35.83	53.11
MINTEMP_W	Mean Winter Min Temperature	13.196	degrees F	0.8	19.88

Recharge Statistics Flow Report [Groundwater Recharge Statewide 2004 5019]

PIl: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SEe	SEp
GW_Recharge_Jan_to_Mar15	4.87	in	14.5	15.5
GW_Recharge_Mar16_to_May	8.39	in	11.7	12.4
GW_Recharge_Jun_to_Oct	3.87	in	25.2	26.5
GW_Recharge_Nov_to_Dec	3.49	in	15.2	15.8
GW_Recharge_Ann	20.3	in	12	12.4

Recharge Statistics Citations

Flynn, R.H. and Tasker, G.D.,2004, Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire, U.S. Geological Survey Scientific Investigations Report 2004-5019,

67 p. (http://pubs.usgs.gov/sir/2004/5019/)

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.32	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	3.682	inches	2.79	6.23
WETLAND	Percent Wetlands	11.0038	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	124	feet per mi	5.43	543

Peak-Flow Statistics Disclaimers [Peak Flow Statewide SIR2008 5206]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

Statistic	Value	Unit
2 Year Peak Flood	8.9	ft^3/s
5 Year Peak Flood	15.9	ft^3/s
10 Year Peak Flood	22	ft^3/s
25 Year Peak Flood	30.9	ft^3/s
50 Year Peak Flood	38.6	ft^3/s
100 Year Peak Flood	47.9	ft^3/s
500 Year Peak Flood	71.8	ft^3/s

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)