3.0 ENVIRONMENTAL SETTING, IMPACTS, MITIGATION

3.1 Geology, Soils, and Topography

3.1.1 Existing Conditions

Geology

The project site is underlain by sedimentary rocks of the upper Devonian mapped as the lower Walton formation of the Soynea Goup. This bedrock is described as consisting of shale, sandstone and conglomerate. Bedrock outcrops are present on-site mostly in the upland western portion of the property. The bedrock surface and bedding planes are nearly level with the ground surface. No prominent or unique geologic features such as large outcrops or boulders were observed on-site. No rock walls were observed on the property.

Overlying the bedrock over the majority of the site is glacial till consisting of variable texture, poorly sorted clays, silts and sand. In the south-eastern portion of the site, outwash sand and gravel deposits overlay the bedrock. These deposits are located in a buried river channel now occupied by the Sheldrake Stream, exiting the southern end of Pleasure Lake.

Topography

The topography on the property is primarily gently sloping with areas of moderate slope in the eastern portions of the site, sloping downward from Park House Road to the Sheldrake Stream. Portions of the site surrounding the existing hotel and development near Heiden Road are fairly level, as well as the south central portion of the site on both sides of the Sheldrake River. There are no areas of prominent or unique topographic features on the property other than these moderately sized hills. The topography on the property is not unlike the local topography in the surrounding area. The topography surrounding the site is characterized by moderate sized rolling hills and valleys. The local topography is shown in Figure 3.1-1, Local Topography.

Elevations on the site range from a high point of approximately 1370 feet above sea level on the hillside in the northeastern portion of the property opposite Park House Road, to a low point of approximately 1,174 feet at the southern edge of the property in the flood plains of Sheldrake Stream. On-site topography and slopes are shown in Figure 3.1-2, Slopes Map.

Soils

The soils on the site were identified using the soil classifications of the United States Department of Agriculture (USDA) Soil Conservation Service (SCS), as described in the Soil Survey of Sullivan County, 1989. The Property contains fifteen (15) soil types, as listed below:

- Arnot-Oquaga complex (AoC & AoE),
- Fluvaquents-Udifluvents (Fu),
- Neversink and Alden soils (Nf),
- Oquaga very channery silt loam (OeB),
- Oquagao-Arnot complex (OgC),
- Palms Muck (Pa),
- Scriba Loam (ScB),
- Scriba and Morris loams (SeB),
- Swartswood gravelly loam (SrB),

- Udorthents, smoothed (Ud),
- Wallington silt loam (Wa),
- Wayland silt loam (Wd),
- Wellsboro & Wurtsboro soils (WIC),
- Wurtsboro loam (WuB, WuC).

The distribution of the soil types on the property is shown on Figure 3.1-3, Soils Map. The soils are listed in the approximate percent of area mapped on the site, from the largest percentage of soils (Wellsboro & Wurtsboro soils (WIC), at approximately 37 percent of the site to Swartswood gravelly silt loam (SrB & SrC), which occupies less than 1 percent of the site.

The characteristics of each of the soil series identified on this property are described below generally in the order of their prevalence on the Property.

Wellsboro and Wurtsboro soils (WIC)

This soil unit is described by the USDA SCS Soil Survey of Sullivan County as very deep, moderately well drained soils. The total acreage of the map unit is approximately 40 percent Wellsboro soils, 40 percent Wurtsboro soils, and 20 percent other soils. The slopes range from 0 to 15 percent. The water table is perched above the fragipan, approximately 60 inches below the ground surface, in late fall to early spring. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity in both soil types is moderate. Surface runoff is medium or rapid. The depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is not defined as a hydric soil by the USDA Natural Resources Conservation Service (NRCS).

Wellsboro and Wurtsboro soils are mapped from the northern portion of the property through the central portion of the property to the southern boundary of the property, as shown on Figure 3.1-3, Soils Map.

Wurtsboro loam (WuB and WuC)

The Wurtsboro loam is described as very deep and moderately well drained, by the Soil Survey of Sullivan County. Slopes range from 3 to 8 percent. The water table is perched above the fragipan in late fall and early spring at approximately 60 inches below the ground surface. Permeability is moderate to a depth of 26 inches below the ground surface and slow below that depth. The available water capacity is moderate while the surface runoff is medium. Depth to bedrock can be found at more than 60 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Wurtsboro loam soils are mapped on shallow slopes in the western portion of the property, as shown on Figure 3.1-3, Soils Map.

Oquaga very channery silt loam (OeB)

This soil unit is described as a moderately deep and well drained to excessively well drained soil. Slopes range from 3 to 8 percent. The water table is not usually found above the bedrock in this soil unit. Permeability is moderate. The available water capacity is low to moderate while the surface runoff is medium. The depth to bedrock, commonly red shale, can be found at 20 to 40 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Oquaga very channery silt loam soil is mapped on the east and west sides of Park House Road, as shown on Figure 3.1-3, Soils Map.

Neversink and Alden soils (Nf)

This soil unit is a very deep and poorly drained or very poorly drained soil that forms in glacial till in level areas. Slopes range from 0 to 3 percent. The water table is at or near the ground surface from late fall to midspring. Permeability is moderate in the surface and subsurface layers and slow in the subsoil and the substratum. Available water capacity is moderate while the surface runoff is slow or very slow. The depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is defined as a hydric soil by the USDA NRCS.

Neversink loam soils are mapped in wetland areas in the southern portion of the property, as shown on Figure 3.1-3, Soils Map.

Oquaga-Arnot complex (OgC)

The Oquaga-Arnot complex soils range from moderately deep to shallow and well drained to somewhat excessively drained, depending on soil type (either Oquaga or Arnot). The unit is comprised of approximately 50 percent Oquaga soils, 35 percent Arnot soils, and 15 percent other soil types. Slopes range from 8 to 15 percent (OgC) and 15 to 25 percent (OgD). The depth to water table is not found above the bedrock in Oquaga soils and is perched above the bedrock for periods in the spring in the Arnot soils. Permeability is moderate for both soil types. The available water capacity is low or very low in both soil types and the surface runoff is rapid within both soil types. Depth to bedrock can be found at 20 to 40 inches below the ground surface in Oquaga soils and 10 to 20 inches in Arnot soils. This soil complex was not defined as a hydric soil type by the USDA NRCS.

The Oquaga-Arnot complex is mapped in slopes in the eastern portion of the property, as shown on Figure 3.1-3, Soils Map.

Udorthents (Ud)

This soil unit consists of disturbed soils and areas of earthy material. Slopes range from 0 to 15 percent. This soil units characteristics such as permeability, depth to water table, water capacity, and surface runoff differ greatly from one area to the next due to do the disturbed nature of the soil. Generally the depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Udorthents soils are mapped in the west central portion of the property above the Sheldrake Stream, as shown on Figure 3.1-3, Soils Map.

Scriba and Morris loams *(SeB)*

This soil unit is a very deep and somewhat poorly drained soil that is formed in glacial till. Slopes range from 2 to 8 percent. The depth to water table can be found more than 6 feet below the ground surface. The permeability is moderate in the surface layer above the fragipan and slow or very slow in the fragipan. Depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Scriba and Morris loam soils are mapped in the west central portion of the property, as shown on Figure 3.1-3, Soil Map.

Scriba loam (ScB)

The Scriba loam soil unit is a nearly level, very deep and someone poorly drained soil found in flat areas of glacial till. Slopes range from 0 to 3 percent. The depth to water table can be found more than 6 feet below the ground surface. The permeability is moderate to slow in the surface layer above the fragipan and slow or very slow in the fragipan. Depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Scriba loam soils are mapped in the southwest corner of the property, as shown on Figure 3.1-3, Soil Map.

Arnot-Oquaga complex (AoC & AoE)

This soil complex is a moderately drained, nearly level to moderately steep or steep soils. It can consist of 45 to 50 percent Arnot soils, 35 to 40 percent Oquaga soils, and 15 percent other soil and rock outcrops. The slopes range from 0 to 15 percent (AoC) and 15 to 35 percent (AoE). The water table for Arnot soils can be perched above the bedrock during brief periods in the spring but is normally found more then 6 feet below the ground surface. The water table for Oquaga soils is not found perched above the bedrock. Permeability is moderate in both the Arnot and Oquaga soils. The available water capacity is low or very low in Arnot soils and is moderate in Oquaga soils. Surface runoff is rapid in Arnot soils and is medium in Oquaga soils. The depth to bedrock can be found at a depth of 10 to 40 inches below the ground surface in Arnot soils and 20 to 30 inches below the ground surface in Oquaga soils. This soil unit is not defined as a hydric soil by the USDA NRCS.

Arnot-Oquaga complex soils are mapped on the hillside east of Park House Road, as shown on Figure 3.1-3, Soils Map.

Fluvaquents-Udifluvents complex (Fu)

This soil complex is described by the Soil Survey as very deep and excessively drained to very poorly drained. Slopes range from 0 to 5 percent. The soil consists of approximately 45 percent Fluvaquents, 40 percent Udifluvents, and 15 percent other soil types. Characteristics such as depth to water table, permeability, available water capacity, surface runoff and depth to bedrock are not supplied for this soil complex. However, the soil survey does indicate that this soil complex is subject to frequent flooding and stream scour, streambank erosion, and shifting of soil deposits. This soil complex is defined as a hydric soil type by the USDA NRCS.

Fluvaquents-Udifluvents complex soils are mapped along the Sheldrake Stream in the northern portion of the property, as shown on Figure 3.1-3, Soils Map.

Palms Muck (Pa)

This soil unit is a very deep, level and very poorly drained soil. Slopes range from 0 to 3 percent. The water table is at or near the surface from late fall to late spring. Permeability is moderate in the organic layer, and moderate or moderately slow in the mineral layers. The available water capacity is high while the surface runoff is very slow or ponded. The depth to bedrock can be found more the 60 inches below the ground surface. This soil unit is defined as a hydric soil by the USDA NRCS.

Palms Muck soils are mapped within the north-central location of the property, as shown on Figure 3.1-3, Soils Map.

Wallington silt loam (Wa)

This soil unit is described as very deep, nearly level, somewhat poorly drained soil on old lake plains and stream terraces. Slopes range from 0 to 3 percent. The seasonal high water table is perched above the dense subsoil at a depth of approximately 0.5 to 1.5 feet below the ground surface. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is moderate while the surface runoff is medium. Depth to bedrock can be found more then 60 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Wallington silt loam is mapped on the stream terrace in the eastern portion of the property, as shown in Figure 3.1-3, Soils Map.

Wayland silt loam (Wd)

The Wayland soil unit is described as a nearly level, very deep very poorly to poorly drained soil formed in recent alluvium of silt and very fine sand, in areas along streams. Slopes range from 0 to 3 percent. The seasonal high water table is found at approximately 0.5 feet in fall, winter and spring. Permeability is moderate in the surface layer and slow in the subsoil. The available water capacity is high while the surface runoff is slow. Depth to bedrock can be found at more than 60 inches below the ground surface. This soil unit is not defined as a hydric soil type by the USDA NRCS.

Wayland soils are mapped in a small area at the southern edge of the property, as shown on Figure 3.1-3, Soils Map.

Soil characteristics for individual soils mapped on the site are provided in Table 3.1-2, below. Also tabulated are the degree and kind of soil limitations that may affect typical building site development. This information has been compiled from data in the SCS Soil Survey of Sullivan County. Development limitations are considered *slight* where soil properties are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties are less favorable for the indicated use and special planning, design or maintenance may be needed to overcome or minimize the limitations; and *severe* if soil properties require special design and would necessitate increased costs to construct and maintain.

Table 3.1-1
Soil Characteristics and Limitations

Soil Series	**Hydrologic Group[1]**	**Permeability (in./hr.)**	**Erosion Factor**	**Potential Limitations for:**		
			K[2]	**Local Roads and Streets**	**Buildings without basements**	**Shallow excava-tions**
Wellsboro and Wurtsboro soils **(WIC)**	C	--Wellsboro-- 0.6-2.0 (0-23" deep) 0.06-0.2 (23-66" deep) --Wurtsboro-- 0.6-2.0 (0-26" deep) 0.06-0.2 (26-60" deep)	0.24 to 0.28	Moderate/ Severe: frost action, wet-ness.	Moderate: wetness.	Severe: wetness.
Arnot-Oquaga complex **(AoC & AoE)**	C/D	-----Arnot----- 0.6-2.0 (0-16" deep) ----Oquaga---- 0.6-2.0 (0-34" deep)	0.17 to 0.24	-----AoC----- Severe/ Moderate: depth to rock, frost action. -----AoE---- Severe: slope, depth to rock.	-----AoC---- Severe/ Moderate: depth to rock. -----AoE---- Severe: slope, depth to rock.	------AoC------ Severe: depth to rock. ------AoE------ Severe: depth to rock, slope.
Swartswood gravelly loam **(SrB)**	C	0.6-2.0 (0-26" deep) 0.06-0.6 (26-60" deep)	0.20	-----SrB----- Moderate: wetness, frost action.	----SrB---- Moderate: wetness.	------SrB------ Moderate: wetness.
Scriba loam **(ScB)**	C	0.6-2.0 (0-6" deep) 0.06-0.2 (6-18" deep) 0.06-0.2 (18-60" deep)	0.2 to 0.28	Severe: wetness, frost action.	Severe: wetness	Severe: wetness
Scriba and Morris loams **(SeB)**	C	0.6-2.0 (0-20" deep) <0.2 (20" and deep-er)	0.20 to 0.24	Severe: wetness	Severe: wetness	Severe: wetness
Neversink and Alden soils **(Nf)**	D	---Neversink--- 0.6-2.0 (0-5" deep) 0.06-0.2 (5-60" deep) -----Alden----- 0.6-2.0 (0.12" deep) 0.2-0.6 (12-33" deep) 0.06-0.6 (33-61" deep)	0.20 to 0.37	Severe: wetness, frost action ponding.	Severe: wetness, ponding.	Severe: wetness, ponding.
Oquaga very channery silt loam **(OeB)**	C	0.6-2.0 (0-34" deep)	0.20	Moderate: depth to rock, frost action.	Moderate: depth to rock.	Severe: depth to rock.

Table 3.1-1
Soil Characteristics and Limitations

Soil Series	Hydrologic Group[1]	Permeability (in./hr.)	Erosion Factor	Potential Limitations for:		
			K^2	**Local Roads and Streets**	**Buildings without basements**	**Shallow excava-tions**
Oquaga-Arnot complex **(OgC)**	C	----Oquaga---- 0.6-2.0 (0-34" deep) -----Arnot----- 0.6-2.0 (0-16" deep)	0.17 to 0.23	-----OgC----- Moderate: slope, depth to rock, frost action..	----OgC---- Moderate/ Severe: slope, depth to rock.	------OgC------ Severe: depth to rock.
Palms Muck (Pa)	A/D	0.25-0.45 (0 to 22" deep) 1.45-1.75 (22 to 60" deep)	Not provided	Severe: Ponding, frost action	Severe: Ponding, low strength	Severe: Ponding, excess humus
Udorthents **(Ud)**	See description of the map unit for composition and behavior characteristics of the map unit.					
Wallington silt loam **(Wa)**	C	1.2-1.5 (0-16" deep) 1.5-1.8 (16-33" deep)	0.49 to 0.64	Severe: Wetness.	Severe: wetness.	Severe: Wetness, caving cutbanks.
Wayland silt loam **(Wd)**	C/D	0.2-2.0 (0-7" deep) 0.06-0.2 (>7" deep)	0.43	Severe: Wetness, flooding	Severe: Wetness, flooding.	Severe: Wetness, flooding.
Wurtsboro loam **(WuB & WuC)**	C	0.6-2.0 (0-26" deep) 0.06-0.2 (26-60" deep)	0.28	Moderate: wetness, frost action.	Moderate: wetness.	Severe: wetness.
Fluvaquents-Udifluvents **(Fu)**	See description of the map unit for composition and behavior characteristics of the map unit.					

[1] Hydrologic groups are used to estimate runoff from precipitation; they range from high infiltration (A) to low infiltration (D).
[2] Erosion Factor K indicates susceptibility to sheet and rill erosion (expressed in tons/acre/year). K values range from 0.05 to 0.69 (0.05 being least susceptible).
Source: Soil Survey of Sullivan County, New York, USDA SCS

As noted in Table 3.1-2, the SCS identifies these soils as possessing potential limitations for development of local roads and streets, buildings and excavations due to their characteristics. Such limitations require planning consideration prior to development. The presence of these constraints does not mean the land cannot be developed, nor are they a rating of construction potential. The ratings reflect the difficulty and relative costs of corrective measures that may be necessary (e.g. erosion controls or other drainage improvements) for development. The limiting characteristics of these soils may be overcome through careful project planning, design and management.

The soils mentioned above have moderate to severe limitations associated with them for the construction of local roads, buildings without basements, and shallow excavations for utilities. Construction in these soils will require grading, filling and trenching, as well as provisions to provide temporary dewatering or drainage to limit the potential effects of frost action or wetness in soils. Further site specific soils testing will be required for the design of stormwater management facilities.

3.1.2 Potential Impacts

Topography Impacts

Impacts to slopes are directly related to the potential for soil erosion during construction. A plan that shows areas of grading in steep slopes is shown in Figure 3.1-2 Slopes Map. An analysis was also conducted for steep slopes per the Environmental Assessment Form completed for the property. The site disturbance and grading is proposed in generally all sections of the property, corresponding to the four major residential loop roads: north of the existing hotel, directly east of the hotel, and in the eastern portion of the property, east of the Sheldrake Stream, but west of Park House Road. The total area of steep (>20%) slopes on the project site is approximately 7.70 acres, or 4% of the total project area, which is uncharacteristic for properties in the southern Catskill Mountains region. The total area of proposed steep slope disturbance by construction is minimal, approximately 0.36 acres, or 4.1% of the total steep slopes area and less than 0.1% of the total project area of 196 acres.

The access roads and proposed residential sites were designed to match the site's topography, avoiding areas of steep slope or slopes greater than 20 percent. Therefore, impacts to topography and slopes has been minimized through the project design. Steeper slopes would be impacted, as shown in Figure 3.1-2 Slopes Map, in small areas primarily where roads cross areas of slope. A residential loop road crosses an area of steep slope directly north of the existing hotel. A second area of slope disturbance occurs in the roadway accessing the residences from Park House Road on the east side of the Sheldrake Stream.

Exposing soils on steep slopes during construction increases the potential for erosion in the short term. This potential impact would be offset by adherence to soil erosion and sedimentation control practices described in the site specific Erosion Control Plan and Section 3.1.3 below. Following construction (long term), soil erosion on the property is expected to be minimal since developed areas would be stabilized with lawn and landscaping, and storm water management features would be fully functional.

Soil Impacts

Grading and recontouring of soils is required for the construction of roads, building sites, recreational areas, and the stormwater management facilities. Areas of proposed grade changes for the project development are shown on the attached site Grading Plan. The total area of grading or site disturbance on-site for the proposed project is estimated to be approximately 64.2 acres. Therefore, approximately 132.7 acres of the project site (approximately 67 percent) would remain undisturbed.

The impacts to soils associated with this work are temporary in nature, relating to erosion potential. All areas of disturbed soil not converted to impervious surface would be graded, seeded and landscaped, including the storm water management basins.

The proposed grading, roadway and residential construction occurs on those soil types most prevalent on the property, including: Wellsboro and Wurtsboro soils WIC), Wurtsboro loam (WuB and WuC), and Oquaga very channery silt loam (OeB). The Wellsboro and Wurtsboro soils WIC), Wurtsboro loam (WuB and WuC) are described as having moderate to severe limitations for construction due to potential wetness and frost action. The Oquaga very channery silt loam (OeB) has limitations due to shallow depth to bedrock. These soil limitations can be addressed through appropriate engineering and construction methods, including the installation of proper roadway and foundation drainage. Shallow bedrock can be addressed through the building design, or by appropriate shallow rock removal.

Grading plans have been prepared for the four (4) development clusters which indicate proposed cuts and fills at 2 ft. topographic contours for all roadways, home sites, recreation and community facilities, and stormwater management basins (see “Grading and Drainage” drawings No. 1D & E, 2D & E, 3D & E, and 4D & E). All roadways and buildings have been sited to conform with existing topography as much as possible to minimize the required earthwork, while still conforming to standard design criteria (see “Road Profiles” drawings No. 1D & E, 2D & E, 3D & E, and 4D & E).

All sitework will include striping and stockpiling the upper 4 to 8 inches of topsoil. Soil will be stockpiled on-site in areas not proposed for construction and surrounded by silt fence for future use. Considering the common soil types found on the property (Wellsboro, Wurtsboro, Oquaga), it is anticipated that all excess soils excavated during construction will be suitable for on-site reuse as common fill, soil berms, landscaping and roadway subbase. It is not anticipated that any excavated soils or rock will need to be hauled off-site for disposal.

Construction sitework and soil disturbance will be limited to a maximum of 5 acres, as mandated by NYSDEC stormwater regulations (see “Construction Phasing Plan” in the SWPPP, Appendix B). Disturbance areas greater than 5 acres may be permitted subject to NYSDEC written permission. All exposed soil, including stockpiles, must be seeded and mulched if such areas remain undisturbed for 14 days or longer.

Preliminary earthwork quantities have been estimated based upon current grading plans, as summarized in Table 3.1-2 below:

Table 3.1-2
Earthwork Quantities

Area	**Roadways**		**Sitework**		**Total**	
	Cut (c.y.)	Fill (c.y.)	Cut (c.y.)	Fill (c.y.)	Cut (c.y.)	Fill (c.y.)
Cluster 1	3,500	4,500	27,000	15,500	31,000	20,000
Cluster 2	2,500	4,500	11,500	11,500	14,000	16,000
Cluster 3	2,500	4,800	15,500	15,200	18,000	20,000
Cluster 4	3,200	2,500	20,800	14,500	24,000	17,000
Connection Road - Clusters 2 and 3 Multipurpose Buildings.	1,300	900	1,700	1,700	3,000	2,600
Totals	13,000	17,200	77,000	58,000	**90,000**	**75,600**
Source: Glenn Smith, PE, PC, 2011						

The project wide estimated “cut” volume exceeds the estimated “fill” volume by approximately 15,000 cubic yards. This excess material can be utilized onsite as additional fill on roadsides, residential yards and stormwater basin side slopes. It is anticipated that no material will need to be exported from the site.

Bedrock Impacts

The presence of minor bedrock outcrops on portions of the site and the soils types identified on the property indicates that some rock removal will be required for project construction. The majority of the project site lies in areas of Wellsboro and Wurtsboro Loam soils, which exhibit the potential for bedrock at depths of 5 ft. and greater. Two smaller areas of Oquaga-Arnot soils in Clusters 3 and 4 generally exhibit red shale bedrock at depths of between 10 in. and 40 in. below grade. The depth and type of bedrock is further substantiated by the five (5) drilled wells on the project site. Well #3 situated in a bedrock-controlled soil type (Oquaga-Arnot) had red shale bedrock encountered at 3 feet in depth. Wells #1, 2, 4, and 4a are located in Wellboro-Wurtsboro soil type areas (i.e.-“bedrock found 5’ or deeper”), encountered red shale bedrock at depths of 18 ft., 6 ft., 10 ft., and 14 ft., respectively. Gray sandstone bedrock was encountered in all five wells below the red shale layers at depths varying from 8’ to 50’ below grade.

It is estimated that approximately 5,500 cubic yards of rock may require excavation. Approximately 3,100 cubic yards are estimated to be removed during utility trenching with an additional 2,400 yards associated with roadway and community building construction.

Since bedrock in this area generally consists of a friable red shale and/or a gray sandstone, excavation will be performed by mechanical hammers and rippers mounted on hydraulic excavators and/or bulldozers, a common and preferred method currently utilized in Sullivan County. These methods are preferred to avoid the regulatory and safety demands inherent with blasting. In consideration of nearby hotel buildings and homes as well as the proximity to the Pleasure Lake Dam situated within 1,000 ft. of potential rock excavation locations, blasting is not anticipated to be required or used during site development activities.

As noted above, there is not anticipated to be a sufficient volume of bedrock and/or boulders to justify the expense and mobilization of a fixed or portable crusher. All excavated rock, whether chipped, hammered or boulder-excavated will be disposed of on the project site as common fill, roadway base or incorporated into landscaping features. No rock products are proposed to be hauled off-site for disposal or marketing as a construction product.

3.1.3 Mitigation Measures

Soil Erosion and Sediment Control Plan

Erosion and sedimentation would be controlled during the construction period by temporary devices in accordance with the Soil Erosion and Sediment Control Plan developed specifically for the project. The Soil Erosion Control Plan is part of the required Stormwater Pollution Prevention Plan (SWPPP). The plan is required to address erosion control and slope stabilization in accordance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-10-001). Both the SWPPP and the Erosion and Sediment Control plan would be implemented during construction to prevent erosion and sedimentation of on and off-site surface waters as well as to make certain that no increases in peak discharge occur from the proposed construction.

The Erosion and Sediment Control Plan are required to include area of disturbance limitations, criteria and specifications for placement and installation of erosion control devices, and a phasing plan. As part of the NYSDEC SPDES permit no more than five acres of the site would remain unstabilized at one time without permission from the NYSDEC. Temporary erosion control devices include the use of a stabilized construction entrance, silt fencing, as well as temporary sediment basins. It is anticipated that the project will include two construction stabilized construction entrances: one on Heiden Road and a second on Park House Road. The construction entrances would minimize the tracking of soil from the project site onto local roads. Dust control would also occur by spraying water onto dry exposed areas of the site. This would minimize the potential transportation of dust onto adjoining properties.

Although Sheldrake Stream separates development Cluster 3 on the westerly side and Cluster 4 on its easterly side, no construction vehicles or equipment will be permitted to cross that stream during the course of project construction. The only permitted disturbances shall be related to the proposed installation of the 4 inch sewage forcemain and 8 inch waterline between those two clusters. The pipe installation will be completed by trenching across the streambed, and will be subject to the conditions of a NYSDEC stream disturbance permit.

Silt fencing would be installed at the base of all disturbed slopes as well as surrounding each of the soil stockpiling areas. These barriers are used to contain silt and sediment at its source and to inhibit its migration to other areas on-site and off-site by stormwater runoff. They would also be installed around the storm drain inlets, thereby minimizing silt from entering the stormwater collection system. The sediment basins would also act as a temporary erosion control measure. Sediment would periodically be removed from sediment traps, catch basins, and from behind silt fencing, in accordance with the guidance provided in the *New York State Standards and Specifications for Erosion and Sediment Control (2005)* to ensure the proper functioning of these devices.

Permanent stormwater measures would divert stormwater runoff from steep slopes, control/reduce stormwater runoff velocities and volumes, and produce vegetative and structural stabilization. This would be accomplished by converting the temporary sediment basins to the permanent stormwater management ponds, bringing them to their final grade and dimensions, installing the outlet control structures, and stabilizing the basins with vegetation. The primary method of permanent erosion and sediment control, other than the impervious surfaces proposed, would be the vegetation to be established on-site. Vegetation would control stormwater runoff by preventing soil erosion, reducing runoff volume and velocities, and providing a natural filter medium.

<u>Phasing Plan</u>

A Construction Phasing Plan has been developed as required by the NYSDEC Stormwater Pollution Prevention Plan (SWPPP). The Phasing Plan provides specific construction disturbance areas not exceeding a maximum of 5 acres. In the event future development planning and scheduling necessitates an expanded disturbance area exceeding 5 acres, written authorization from NYSDEC will be obtained prior to exceeding that limit. The SWPPP and Phasing Plan are provided in Appendix B.

<u>Blasting Protocol</u>

As indicated above, grading in those limited areas of shallow bedrock will be accomplished by mechanical means and blasting is not anticipated or proposed. If it is determined that blasting is necessary, it will only be carried out in accordance with a site specific Blasting Protocol developed for the project. The Blasting Protocol will be based on State and Town of Fallsburg regulations pertaining to the transportation of the blasting material and the noise regulations respectively. The Blasting Plan would be based on site specific blasting requirements. The Blasting Plan will address the potential impacts to Pleasure Lake Dam (State Dam ID# 163-

1597), which is located north of the project site. Any potential blasting in the northern portion of the site will require coordination with the Town of Fallsburg Building Department and the owners of the dam, the Fallsburg Fishing and Boating Club. A pre-blasting inspection will be completed, if blasting is required in the northern portion of the site.

Best Management Practices (BMPs)

The principle objectives of the Soil Erosion and Sediment Control Plan are the following:

- divert clean surface water before it reaches the construction area;
- control erosion at its source with temporary and permanent soil protection measures;
- capture sediment-laden runoff from areas of disturbance and filter the runoff prior to discharge; and,
- decelerate and distribute storm water runoff through natural vegetative buffers or structural means before discharge to off-site areas.

These objectives would be achieved by utilizing a collective approach to managing runoff, i.e. Best Management Practices (BMPs), as shown on the Erosion Control Plan.

Inspections would be conducted monthly during construction and the first growing season as well on an annual basis to accomplish the following:

1. to remove accumulated sediment and clean out and/or replace the filter gravel bed at the outfall pipe whenever accumulated sediment reaches a volume of 10% of the available basin capacity (based on one half inch of runoff volume from the applicable tributary area).
2. restore any disturbed plant material and restore any eroded embankments.
3. remove accumulated debris within the basin and at outfall structures.

Water Quality Inlets and Storm Drain Inlets

1. Water quality inlets would be cleaned out twice a year to remove any pollutants. All removed material would be taken to a proper treatment facility or approved landfill for disposal.

2. Storm water inlets would be inspected annually for sediment accumulation and other problems, any problems would

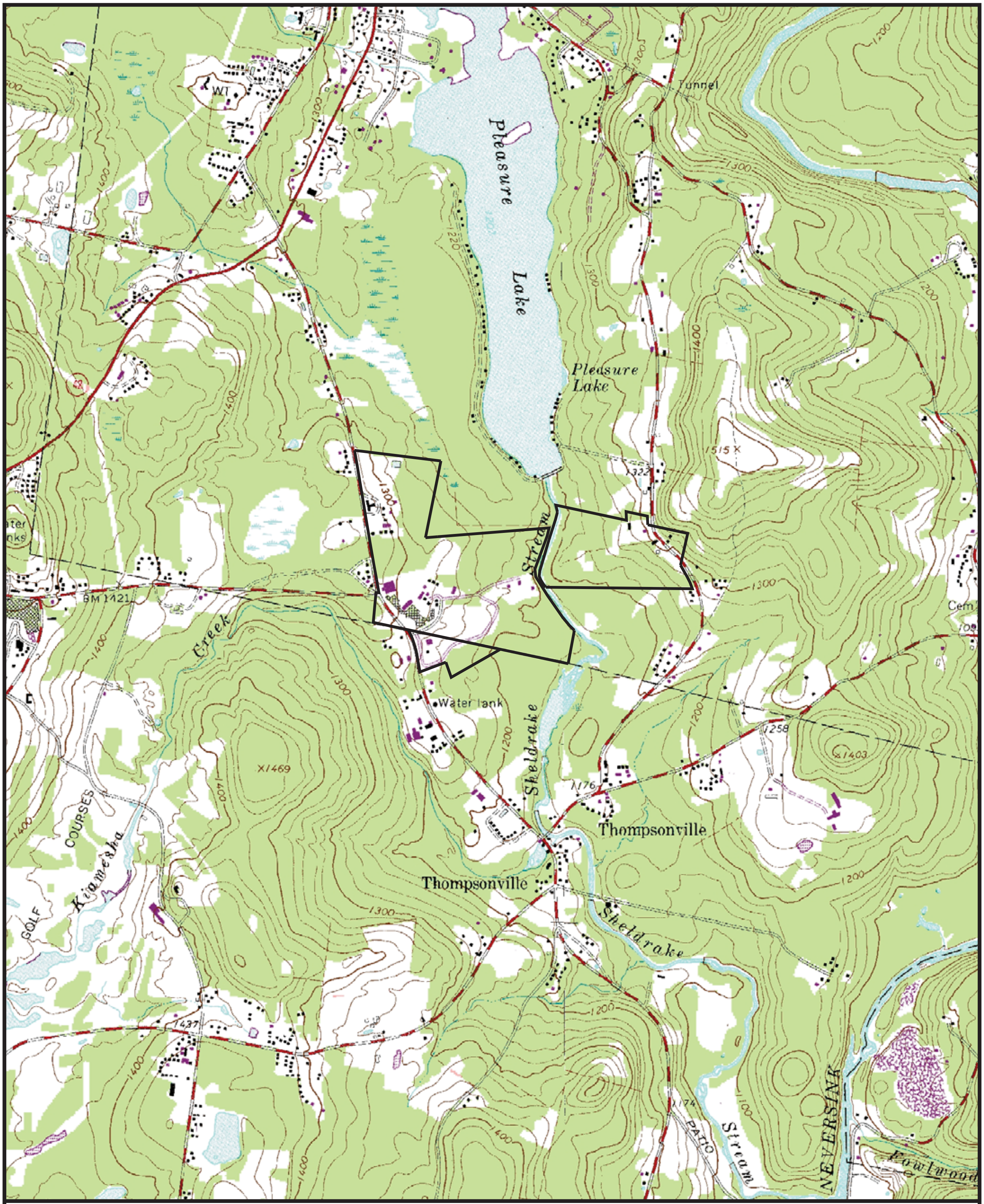
Parking and Roadway Pavements - any parking areas and roadway pavements would be swept on a regular basis during construction to remove accumulated sediment. All collected sediment would be removed and disposed of to an approved area which would not allow re-entrance of silt into the stormwater drainage system.

Vegetative Stabilization

1. All plantings in disturbed areas and which have been finish graded would be inspected after each rain event. Planting or seeding would be conducted to stabilize the soil and to prevent soil erosion. All site plantings and seeding that had been damaged would be restored, wherever possible.

2. If vegetative stabilization has been damaged from storm water erosion, upstream conditions which caused the damage would be corrected. Check dams might be required in drainage ways. Stone outfall aprons may be required at storm water outlets.

With the incorporation of the proposed procedures, protocols and practices, the Proposed Action would not result in significant adverse impacts to soils or topography.



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LEGEND

Site Property Boundary

Figure 3.1-1: Local Topography
Raleigh and Heiden Properties
Town of Fallsburg, Sullivan County, New York
Base Map: USGS 7.5-minute Topographic Map, Monticello Quad, 2000
Scale: 1" = 2000'

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Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418

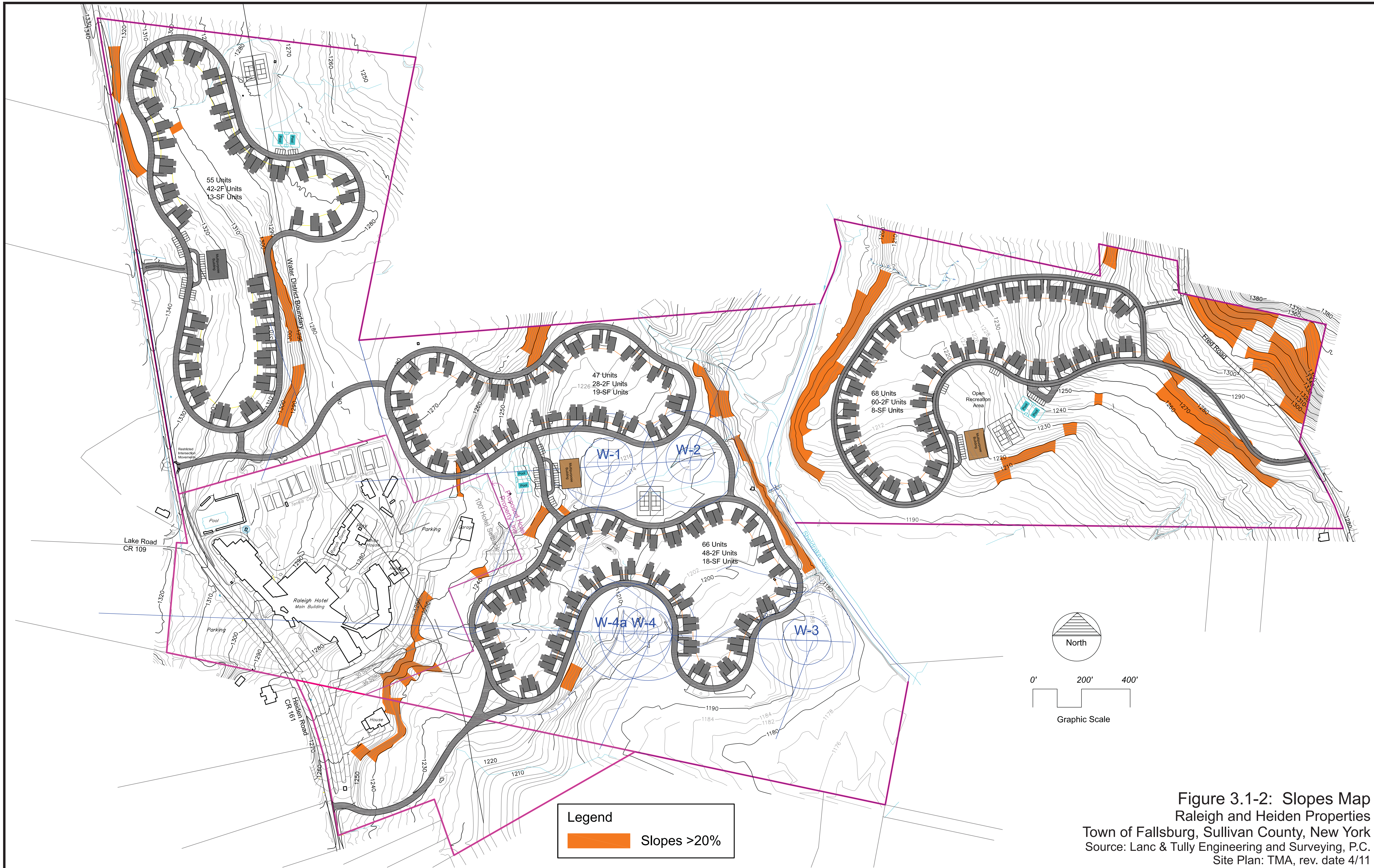
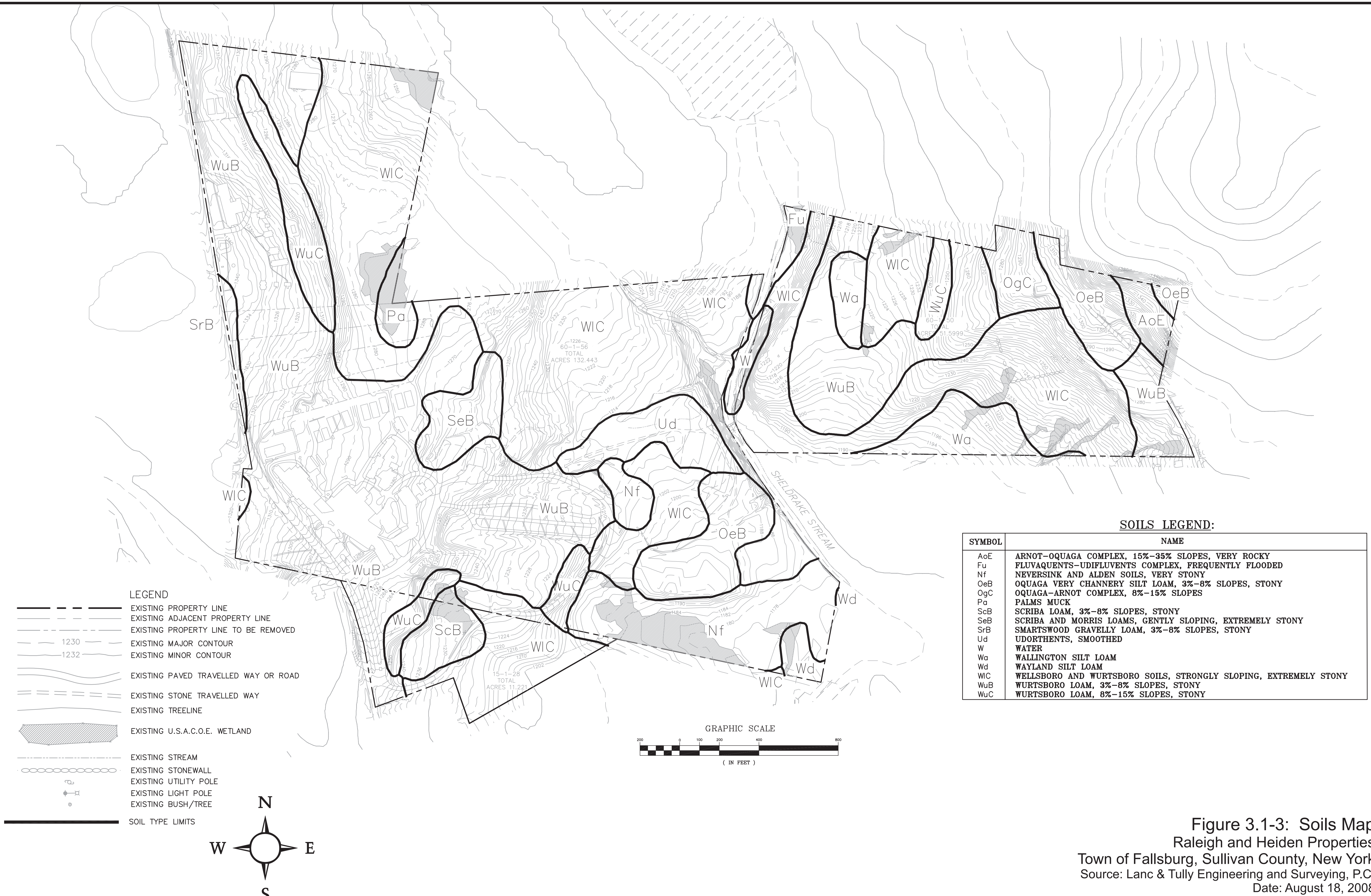


Figure 3.1-2: Slopes Map

Raleigh and Heiden Properties
Town of Fallsburg, Sullivan County, New York
Source: Lanc & Tully Engineering and Surveying, P.C.
Site Plan: TMA, rev. date 4/11
Scale: As shown

File 09038 5/31/11
JS/09038



SOILS LEGEND:

SYMBOL	NAME
AoE	ARNOT-OQUAGA COMPLEX, 15%-35% SLOPES, VERY ROCKY
Fu	FLUVAQUENTS-UDIFLUVENTS COMPLEX, FREQUENTLY FLOODED
Nf	NEVERSINK AND ALDEN SOILS, VERY STONY
OeB	OQUAGA VERY CHANNERY SILT LOAM, 3%-8% SLOPES, STONY
OgC	OQUAGA-ARNOT COMPLEX, 8%-15% SLOPES
Pa	PALMS MUCK
ScB	SCRIBA LOAM, 3%-8% SLOPES, STONY
SeB	SCRIBA AND MORRIS LOAMS, GENTLY SLOPING, EXTREMELY STONY
SrB	SMARTSWOOD GRAVELLY LOAM, 3%-8% SLOPES, STONY
Ud	UDORTHENTS, SMOOTHED
W	WATER
Wa	WALLINGTON SILT LOAM
Wd	WAYLAND SILT LOAM
WlC	WELLSBORO AND WURTSBORO SOILS, STRONGLY SLOPING, EXTREMELY STONY
WuB	WURTSBORO LOAM, 3%-8% SLOPES, STONY
WuC	WURTSBORO LOAM, 8%-15% SLOPES, STONY

Figure 3.1-3: Soils Map
Raleigh and Heiden Properties
Town of Fallsburg, Sullivan County, New York
Source: Lanc & Tully Engineering and Surveying, P.C.
Date: August 18, 2008
Scale: 1" = 400'

File 09038 5/31/11
JS/09038