3.2 Water Resources

This section evaluates the existing and proposed development conditions of surface water, floodplains, wetlands, and groundwater resources located within or in close proximity to the project site. These conditions are evaluated based on mapping provided by the Federal Emergency Management Agency (FEMA), National Wetlands Inventory (NWI), the New York State Department of Environmental Conservation (NYSDEC), and onsite field delineations.

3.2.1 Existing Conditions

Streams and Ponds

The site is located within the drainage basin of Ten Mile River, which flows southeast into the Housatonic River in Connecticut. Within the project site, there are two perennial streams (Amenia/Cascade Brook and an unnamed stream); seven intermittent streams; eight ponds; and 11 wetlands. A perennial stream is a stream that contains water at all times except during extreme drought, while an intermittent stream ceases to flow occasionally or seasonally. For the location of onsite waterbodies, see Figure 3.2-1, "Existing Streams, Ponds, Floodplains, and Wetlands."

Of the two perennial streams onsite, Amenia/Cascade Brook is identified as a NYSDEC Class "C(Ts)" stream. In addition to supporting fisheries and being suitable for non-contact activities, the "Ts" classification indicates that the quality of the water can also support trout populations and trout spawning. Amenia/Cascade Brook enters the project site south of NYS Route 44, traverses along the eastern property boundary and exits the site near the existing site entrance at NYS Route 22. The other perennial stream is an unnamed Class "C" stream that flows through Wetland L/LL located in the east-central portion of the site and eventually flows into Amenia/Cascade Brook at a location off of the project site. All of the intermittent streams onsite are also Class "C" waterbodies. Table 3.2-1 describes each stream.

The eight ponds or open water areas total approximately 10.5 acres and are scattered throughout the site (see Figure 3.2-1, "Existing Streams, Ponds, Floodplains, and Wetlands"). Two of the ponds are located on either side of the entrance driveway off of Route 22 and two are located in the northern portion of the site. The two largest ponds are located within the golf course and are used as water features and for irrigation storage. The remaining two ponds are associated with Wetland J, just west of the largest onsite pond.

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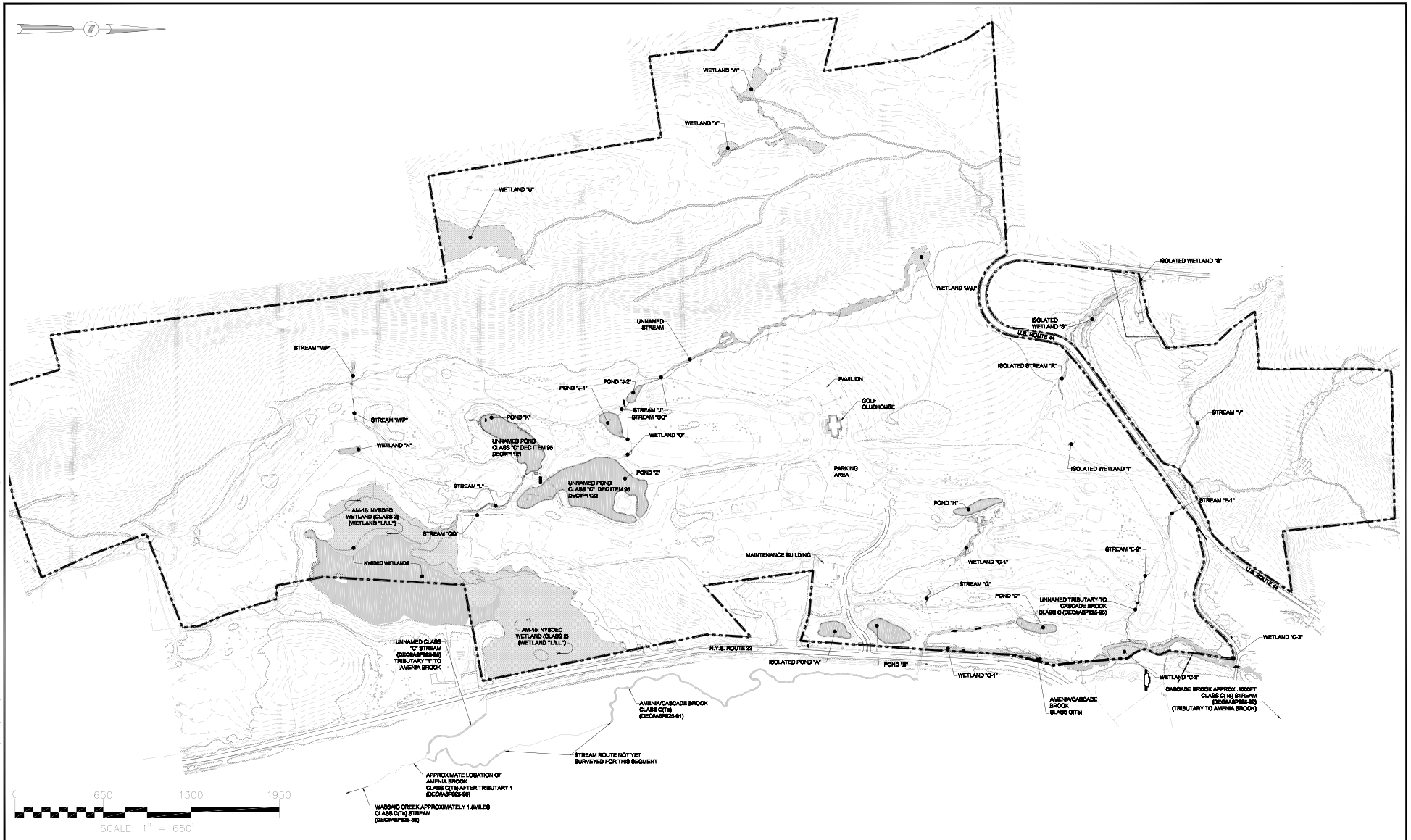

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THE Chazen COMPANIES

Silo Ridge Resort Community

EXISTING STREAMS, PONDS, FLOODPLAINS AND WETLANDS

Town of Amenia, Dutchess County, New York

1"=650'

Figure 3.2-1

JOB NUMBER: 10454.00

Table 3.2-1 Stream Characteristics

Stream Name	Intermittent (I)/ Perennial (P)	Class	Width	Bank Height	Substrate
Amenia/Cascade Brook	P	C(Ts)	10 to 12 feet	3 to 6 feet	Silt to boulders
E1, E2	I	C	1 to 3 feet	0.5 to 1 foot	Silt to sand
G	I	C	2 to 4 feet	0.5 to 2 feet	Silt to cobble
J/OO	I	C	2 to 6 feet	1 to 6 feet	Silt to boulders
L	P	C	3 to 6 feet	1 to 3 feet	Silt to cobble
M/P	I	C	2 to 4 feet	0.5 to 3 feet	Silt to cobble
QQ	I	C	1 foot	0.5 feet	Silt to sand
R/S*	I	C	2 to 5 feet	1 to 6 feet	Silt to bedrock
V	I	C	3 to 8 feet	2 to 6 feet	Silt to bedrock
* Stream R/S is isolated because it flows into Wetland I, which is isolated. Thus, Stream R/S is not subject to Army Corps of Engineers (ACOE) regulatory review.					

Table 3.2-2 provides the acreage of each pond. The ACOE identified that Pond A was not subject to regulatory jurisdiction under Section 404 of the Clean Water Act.

Table 3.2-2 Pond/Open Water Characteristics

Pond Name	Acres[17]
A*	0.52
B	0.87
D	0.43
H	0.51
J1 (southeast)**	0.42
J2 (northwest)**	0.15
K	2.06
Z	5.53
Total Acreage	**10.49**
* Pond A is isolated and not subject to ACOE regulatory review. ** These two ponds are included in the area of Wetland J/JJ.	

[17] It should be noted that the acreages presented herein for ponds and wetlands are according to the wetland delineation survey and may differ from those contained in Appendix 9.6, "Wetland Delineation Report," and 9.7.1, "Habitat Assessment Report." This is due to input from regulatory agencies and subsequent changes made to the delineation survey after completion of the reports.

Runoff from the project site currently flows to one of three places. The northern end of the project site drains to the Amenia/Cascade Brook; the entrance roadway off of NYS Route 22 and the immediate surrounding areas drain to existing infiltration ponds located at the site entrance; and the remainder of the project site (central portion, western-southwestern portion) drains to the large wetland (labeled "Wetland L/LL" on Figure 3.2-1) located in the east-central portion of the project site.

W*etlands*

The term "wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

There are 12 wetlands located throughout the project site. Wetland delineations were conducted at the site on May 3, 5, and 6 and November 3, 2005 by representatives of The Chazen Companies (TCC) using the three-parameter approach described in the 1987, *US Army Corps of Engineers' (ACOE) Wetland Delineation Manual*.[18] The wetland boundaries were then surveyed by TCC as presented on the "Map of Wetland Survey" (see Appendix 9.6).[19] The wetlands are identified in Table 3.2-3 below. The total acreage of all surface water on the project site, including ponds, streams, and delineated wetlands, is approximately 47± acres.

An additional wetland delineation was conducted on the 2.2-acre parcel north Route 44 on May 14, 2007. It was determined through that delineation that Wetland S should be expanded slightly. However, this change was not large enough to modify the acreage of Wetland S. Please see the "Wetland Delineation Addendum 1" in Appendix 9.6, "Wetland Delineation Report," for more information about the wetland survey on the 2.2-acre parcel.

NYSDEC Wetlands

NYSDEC wetlands are those lands and waters of the State which meet the definition provided in Subdivision 24-0107.1 of the Freshwater Wetlands Act (Article 24 and Title 23 of Article 71 of the Environmental Conservation Law) and have an area of at least 12.4 acres or, if smaller, have unusual local importance as determined by the Commissioner pursuant to Subdivision 24-0301.1 of the Act and Subdivision 24-0107.1 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR Part 664).

[18] U.S. Army Corps of Engineers. 1987. Wetlands Delineation Manual, Technical Report Y-87-1.
[19] Please note that the Map of Wetland Survey in Appendix 9.6 identifies the largest onsite wetland as "Wetland L," but in all other mapping and text prepared by The Chazen Companies, this wetland is referred to as "Wetland L/LL."

Table 3.2-3 Summary of Onsite Wetlands

Name	Acreage	Regulating Authority
Wetland C-1	1.12	ACOE
Wetland C-2	1.31	ACOE
Wetland C-3	0.02	ACOE
Wetland G-1	0.33	ACOE
Wetland I	0.06	Isolated *
Wetland J/JJ	2.46	ACOE**
Wetland L/LL	26.03	ACOE, NYSDEC (AM-15) NYSDEC Wetland AM-15 located south of cart path ends at Flags L-40/LL-33
Wetland N/O	0.15, 0.04	ACOE
Wetland S	0.34	Isolated*
Wetland U	2.78	Isolated*+
Wetland W	1.30	ACOE+
Wetland X	0.25	ACOE+
Total Acreage	**36.19**	

* Indicates that based on the ACOE's on site inspections, the wetland is hydrologically isolated from waters of the United States and is not regulated under the Clean Water Act pursuant to the US Supreme Court in SWANCC vs. ACOE.

** The acreage of Ponds J1 and J2 is included in this acreage for Wetland J/JJ.

+ These three wetlands are not included in the ACOE wetland delineation survey jurisdictional boundary because they are outside the proposed development limits.

NYSDEC wetlands are mapped on an official freshwater wetlands map pursuant to Subdivision 24-0301.5 of the Act. Each wetland area is identified by the code representative of the United States Geological Service (USGS) topographical quadrant in which the wetland is identified. NYSDEC requires a 100-foot adjacent area, measured horizontally, from the boundary of the wetland.

The NYSDEC *Freshwater Wetlands Map of the Amenia Quadrangle, Dutchess County* indicates the presence of a NYSDEC regulated wetland area, noted as AM-15, located on the project site in the southeast portion of the site (Wetland L/LL). This wetland is identified as Wetland L on the verified NYSDEC jurisdictional wetland map, but it is properly called Wetland L/LL as both wetland lines form the boundary of the NYSDEC wetland. The NYSDEC wetland ends at Flags L-40/LL-33, just south of the existing cart path. From this location northward, the remainder of the wetland is regulated by the ACOE only. The total area of the wetland system located on the project site is 26.03± acres, as identified in Table 3.2-3 above. The southwestern portions of the project site drain to this wetland (see Figure 3.2-1).

The NYSDEC wetland extends off-site to the south, as shown on Figure 3.2-2, "Approximate Extent of Wetland L/LL, NYSDEC Wetland AM-15." NYSDEC Wetland AM-15 is a Class II wetland. There is an additional NYSDEC mapped wetland, AM-16, on the east side of Route 22.

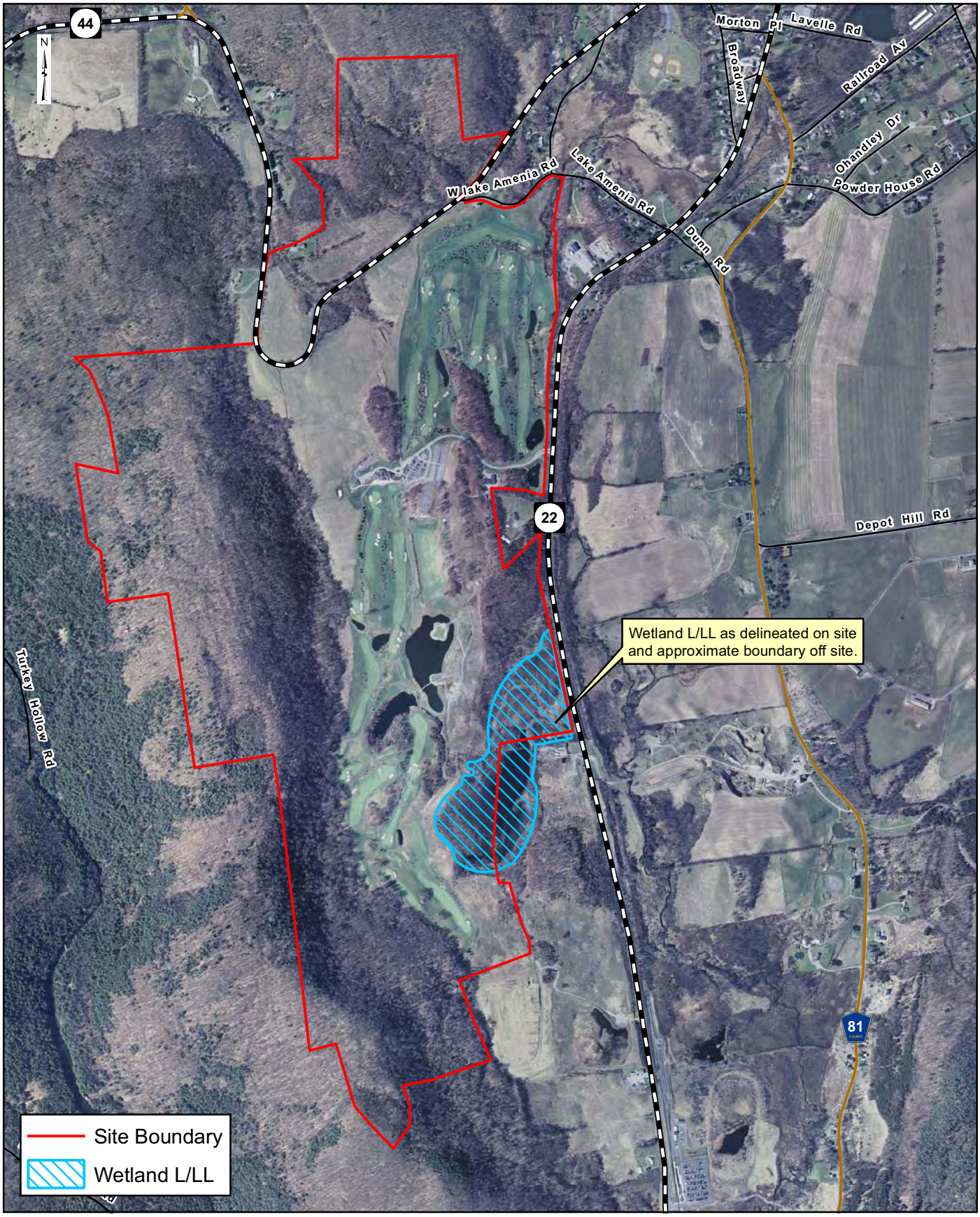
NYSDEC requires a wetland validation to confirm the extent of wetlands and adjoining areas for the wetlands delineated on site. Representatives of TCC have delineated and mapped the limits of the wetland boundary, and the NYSDEC has conducted a site walk over and has verified that Wetland L/LL is a NYSDEC-regulated wetland. TCC has received a signed map from Heather Gierloff of the NYSDEC verifying their jurisdiction. The additional 2.2-acre parcel that was added to the project site does not contain any NYSDEC regulated wetlands.

ACOE Wetlands

The 1990 *National Wetland Inventory (NWI) Map, Amenia Quadrangle*, identifies four wetlands (corresponding to the delineated Wetlands L/LL, K, O and U) within the property. The four mapped wetlands are dispersed throughout the site. The largest is Wetland L/LL in the east-central portion of the site. The ACOE regulates the entire area of Wetland L/LL. To the east of Wetland L/LL are two smaller wetlands, K and O, and Wetland U is located along the eastern border of the property. The NWI map, however, is not a "regulatory map," and does not designate the official boundaries of federal wetlands. For the purposes of regulation under Section 404 of the Clean Water Act (CWA), federal wetlands are only designated by an onsite wetland delineation conducted in accordance to the *US Army Corps of Engineers' Wetland Delineation Manual* (1987).

The ACOE, under Section 404 of the CWA, has jurisdiction over navigable waters [33 CFR 320] plus their tributaries and adjacent wetlands and where the use, degradation, or destruction of such waters could affect interstate or foreign commerce. Under the CWA, the ACOE regulates the discharge of dredged or fill materials into these navigable waters of the US including wetlands (33 CFR 323). Terms used within the CWA indicate the extent of the ACOE's jurisdiction. The terms include "navigable waters" which is defined as "waters of the United States, including the territorial seas" (Section 502(7)) and wetlands.

"Isolated wetlands" are defined as those wetland areas that do not have an identifiable surface water connection to a tributary to navigable waters of the United States. Based on the 2001 court ruling of the Solid Waste Authority of Northern Cook County v. U.S. Army Corps of Engineers 531 U.S. 159 (known as *SWANCC vs. ACOE)*, wetlands that are found to be isolated by the ACOE are not under the regulatory authority of the ACOE.



Silo Ridge Resort Community

Approximate Extent Of Wetland L/LL (NYSDEC Wetland AM-15)

Town of Amenia, Dutchess County, New York

Source:

Drawn by: CLC

1 inch equals 1,333 feet

Figure 3.2-2

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Map Document: (R:\110400-10499\10454.00\GIS\maps\10454_00_WetlandL-LL_8x11.mxd)
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Most of the water and wetlands delineated within the project site have a hydrologic connection to the Amenia/Cascade Brook, a sub-tributary of the Ten Mile River, which eventually connects to the Housatonic River, a water of the U.S. Therefore, these wetlands are regulated by the ACOE with the exception of Pond A and Wetlands R, S, I, and U, which are identified as isolated.

The ACOE made a site inspection of the wetlands on September 12, 2006. During this site walk, Mr. Orzel identified that four wetlands were isolated, specifically Wetlands A, R, S, and I. Following that site walk, minor modifications were made to the wetland delineation map, and this map has been forwarded to the ACOE for issuance of a jurisdictional determination.

Subsequently, the Applicant recently acquired the 2.2-acre parcel north of Route 44. Additional minor wetland areas were delineated on this parcel as part of Wetland S, an otherwise isolated wetland. The change in size of Wetland S was so minor that the acreage of the wetland was not modified. TCC has corresponded with Mr. Orzel regarding this additional delineation and he indicated that he will not need to return to the site to review this area. The revised wetland survey information will be submitted to Mr. Orzel for his review. Furthermore, given that Mr. Orzel has already identified that Wetlands R and S are isolated, the additional wetland area delineated on the 2.2-acre parcel will also be considered isolated.

It should be noted that on June 19, 2006, the US Supreme Court provided a ruling in two wetland cases, combined and known as Rapanos and Carabell v. U.S. Army Corps of Engineers (Case numbers 04-1034 and 04-1384), which was a follow-up decision to the 2001 US Supreme Court decision in SWANCC v. ACOE (2001). The US Supreme Court provided a plurality opinion, and remanded the decision to the Circuit Court for review.

As a result of the US Supreme Court's actions, the Headquarters of the ACOE and the Administrator of the US EPA determined that the ACOE will not provide written jurisdictional letters regarding wetland regulation until internal agency discussions on these issues are resolved. Neither agency has provided a timeframe for this internal discussion process. The ACOE continues to undertake wetland site inspections to field verify wetland boundaries, but will not issue jurisdictional determination letters on sites where wetland field walks have either occurred or are planned. The ACOE is continuing to process both nationwide and individual permit applications, and may verify wetland delineations as part of that process.

Vernal Pools

Wetland U, located up on the ridge in the western portion of the project site, has been identified as a vernal pool. Vernal pools are seasonal water bodies that can

lack connections with other water bodies and typically reach high water levels in spring or fall. Their water source is rain or snow melt, although some can be groundwater derived. They typically form in low points or depressions in the topography, are relatively small (less than 2 acres), and vary widely in the composition of vegetation. The hydroperiod, or period of surface water duration, varies but ranges from about 30 days to more than 1 year (Semlitsch 2000 in Calhoun and Klemens 2002). Due to the periodic dryness, these pools are devoid of fish, a major predator of the amphibian eggs and larvae. Vernal pools are the breeding habitat for pool-dependant amphibians and invertebrates (Calhoun and deMaynadier 2004).

Nevertheless, it is important to recognize that vernal pool-breeding amphibians (both frogs and salamanders) utilize both aquatic and nearby upland habitats for various life functions. Semlitsch (1981, 2000) noted that adult vernal pool amphibians spend less than 1 month in the vernal pool and the rest of the year in the surrounding forested landscape. Therefore, the surrounding upland areas are considered "critical terrestrial habitat" (Calhoun and Klemens 2002). This area is typically characterized as forested habitat (up to 100% canopy closure) with a deep, uncompacted organic litter layer on the forest floor, and coarse woody debris. Using data obtained from various studies which measured the movements of amphibians in the surrounding wooded areas, several authors have identified these surrounding wood lands as "life zones." Changes in forest composition and structure in these "life zones" have been identified as contributing to a decline in amphibian species as well as the destruction of the vernal pool itself (Calhoun and deMaynadier 2004).

For these reasons, it is typically appropriate to provide buffers surrounding vernal pools near proposed development. Several researchers have suggested that the "life zone" extends out as far as 400 feet (Calhoun and deMaynadier 2004). Calhoun and Klemens (2002) have suggested a 750-foot buffer surrounding vernal pools, with a development area of less than 25% within the critical terrestrial habitat area to protect pool breeding amphibians. The project's potential impact on Wetland U, if any, and recommended mitigation measures are described below.

Floodplains

According to the National Flood Insurance Program Flood Insurance Rate map (FIRM), Town of Amenia, New York, Community Panel Number 361332 0006 D, a small portion of the project site (approximately 11.6 acres) located adjacent to the Amenia/Cascade Brook lies within Flood Zone AE, an area of "Special Flood Hazard Area Inundated by 100-Year Flood" where base flood elevations have been determined. All other areas of the site are outside the 100-year floodplain (see Figure 3.2-1).

Stormwater

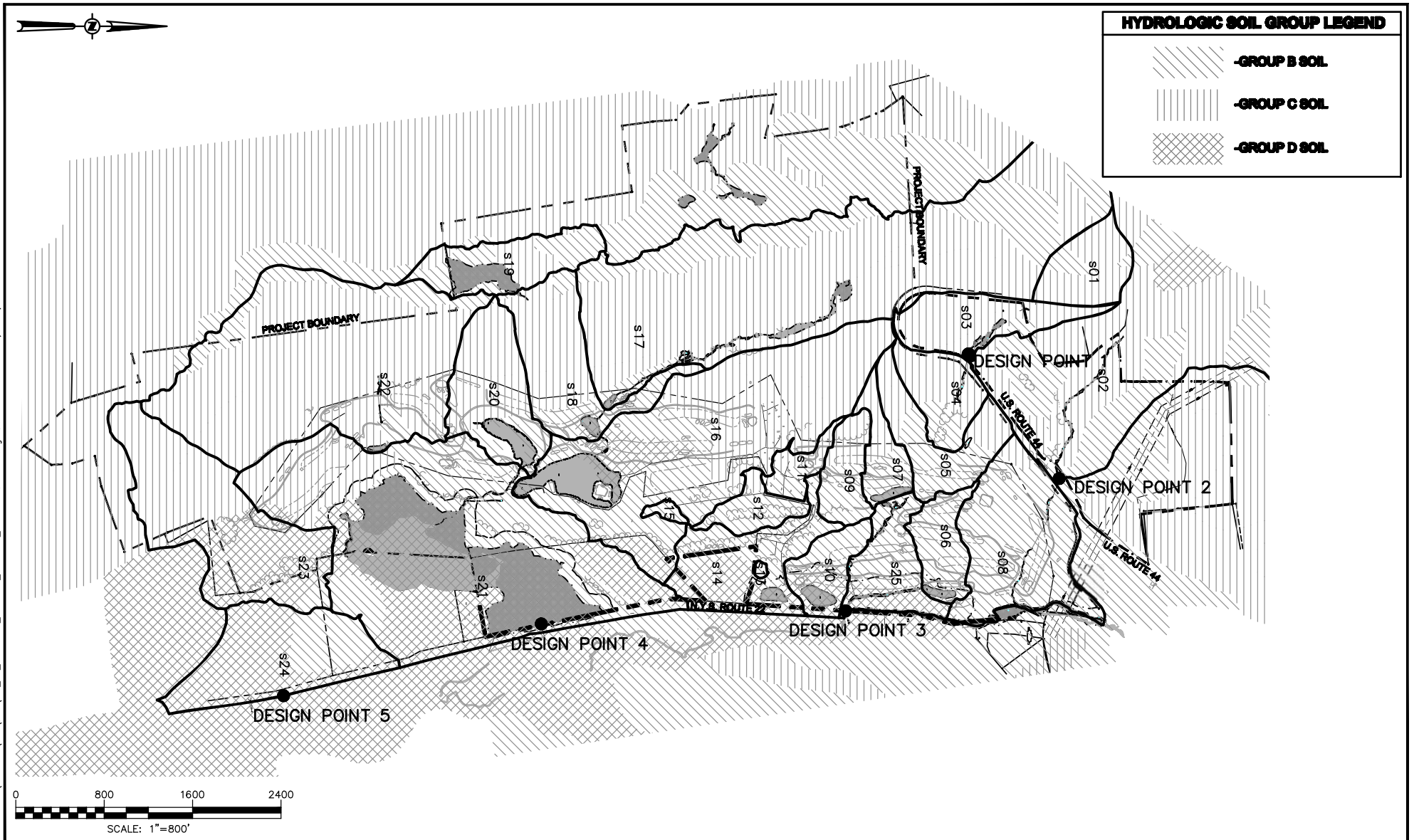
Runoff from the project site currently flows to one of three places: the northern end of the project site drains to the Amenia/Cascade Brook; the entrance roadway off of NYS Route 22 and the immediate surrounding areas drain to existing infiltration ponds located at the site entrance; and the remainder of the project site (central portion, western-southwestern portion) drains to Wetland L/LL in the east-central portion of the project site.

In order to assess the hydrological conditions on the project site and evaluate existing runoff discharges from the site, the watershed that contains the entire project site was examined. This 776±-acre watershed was broken down into smaller watersheds, or subcatchments. The separation of the watershed into subcatchments was dictated by drainage patterns, soil types, ground cover, and topography. Watershed characteristics for each subcatchment were then assessed from United States Geological Service (USGS) 7.5-minute topographic maps, aerial photographs, a field topographic survey, soil surveys, site investigations, and land use maps. The subcatchments are illustrated on Figure 3.2-3, "Pre-Development Watershed Delineation Map."

Computer modeling of the subcatchments was employed to analyze existing stormwater discharge patterns. The analysis is discussed below in Section 3.2.2, "Potential Impacts," while the existing discharge rates (in cubic feet per second) for 2-, 10-, 25-, 50-, and 100-year storm events are presented in Table 3.2-4.

Table 3.2-4 Pre-Development Discharge Rate (cfs)

	2 year	10 year	25 year	50 year	100 year
Design Point (DP)	24 hr storm event	24 hr storm event	24 hr storm event	24 hr storm event	24 hr storm event
1	12.00	29.17	40.11	50.31	54.23
2	25.54	69.51	98.45	125.74	136.27
3	121.33	195.74	249.61	300.14	319.24
4	14.57	26.91	33.57	37.28	38.56
5	16.05	37.09	50.24	62.42	67.08



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THE Chazen COMPANIES

Silo Ridge Resort Community
Proposed Action
PRE-DEVELOPMENT
WATERSHED DELINEATION MAP
Town of Amenia, Dutchess County, New York

1"=800'

Figure 3.2-3

JOB NUMBER: 10454.00

Groundwater

The project site is not located over a primary, principal, or sole source aquifer as per the NYSDEC and the United States Geological Survey (USGS).[20] The depth to the water table varies throughout the site from 0.5 feet to greater than six feet.

The Town of Amenia Zoning Law (adopted July 19, 2007) includes an Aquifer Overlay District, which applies to the entire Silo Ridge project site. The Aquifer Overlay District contains different zones and levels of protection. A majority of the developed portion of the site lies within the Primary Valley Bottom Aquifer (PVBA) district. The balance of the site is within the Upland Aquifer (UA) district. The proposed project's compliance with this Overlay District is described in Section 3.2-2, "Potential Impacts."

The underlying geology in the vicinity of the project site consists of dark slate and schist. Dolomitic marble and varying carbonate and carbonate-rich sedimentary units underlie southern portions of the site. The boundary between the schist and the carbonate formations on the site appears to lie in the vicinity of the existing clubhouse. Statistical well yields from both the schist and the carbonate formations typically fall between 5 to 15 gallons per minute (gpm). Wells encountering major fractures in either formation can collect recharge from broader areas and support higher yields. Surficial geologic sediments cover much of the site's lower-elevation areas. In some areas bedrock rises through these sediments to grade. The surficial geologic sediments include both glacially-deposited silty till and water-washed sandy lake or glacial outwash-type deposits.

Precipitation is the sole source of groundwater recharge in bedrock and sediment aquifer formations on the site. Recharge infiltrates first through soil horizons and passes into or through surficial glacial deposits to enter the bedrock fractures. Excess groundwater eventually discharges from these bedrock and sediment aquifers at onsite streams.

There are currently two onsite groundwater wells supplying water to the existing golf course facility. The primary well is located near the clubhouse and is used to supply water to the clubhouse. This well is able to supply approximately 80 gpm. An additional well is located adjacent to the maintenance building. This well only supplies water to the maintenance building and has a much smaller supply capacity of approximately three gpm. Both of the onsite wells are sufficient for existing water demand.

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[20] NYSDEC Division of Water Technical and Operational Guidance Series (2.1.3), Primary and Principal Aquifer Determinations, Table 1, 1990 and the Atlas of the Eleven Selected Aquifers in New York, USGS in cooperation with the NYS Department of Health, 1982.

Representatives of TCC were retained to evaluate the capacity of a new water system for the project site. During a simultaneous 72-hour pump test of six groundwater wells in 2006, including the existing well used to supply the clubhouse, the wells were able to produce 358 gallons per minute (gpm). The best well (Well PW-2) provided 100 gpm of the total yield, making 258 gpm available to a project with the best well off line. In addition, there was no recorded drawdown that extended beyond the protect site's perimeter in any direction during the test. Please refer to Appendix 9.12, "Aquifer Pumping Test Report," for detailed information regarding pump test performance.

During 2007, TCC conducted a focused follow-up 72-hour pumping test of wells PW-9 and PW-11 to marginally increase the verified wellfield yield. Testing was conducted only in these wells because the 2006 test data suggested that well PW-9 could support more yield and because wells PW-9 and PW-11 were suspected to tap interconnected fractures. During the 2007 test, well PW-9 was pumped at a rate 30 gpm greater than the 2006 selected pumping rate and the prior yield from well PW-11 was maintained. The test was successful and increased the total wellfield yield from 358 gpm to 388 gpm. Well PW-9 was shown to be the highest-yielding well, at 105 gpm, making 283 gpm available to a site project with the best well off line.

Average aquifer recharge on the site is estimated at approximately 330 gpm. Aquifer recharge may drop during drought years by up to 30%, to approximately 230 gpm. Therefore, based on these findings, the tested wells appear capable of supporting continuous yields of up to 283 gpm with the best well off line. All of this yield can be supported by onsite recharge during normal years and up to 230 gpm can be supported during drought years.

Water quality from the groundwater wells was tested for conformance with NYS Department of Health (NYSDOH) drinking water standards. The results indicate that water from four of the six test wells (PW-1, PW-2, PW-4, and PW-5) exceeds drinking water standards for iron, lead, and turbidity. In addition, elevated levels of manganese exceeding NYSDOH standards were identified in water from wells PW-4 and PW-5. Micro particulate analysis (MPA) testing identified well PW-11 as "low-risk" under EPA relative risk ranking guidelines for groundwater under the direct influence of surface water. Re-sampling of well PW-9 and PW-11 during the 2007 pump test identified water from this well as "low risk" for inadequately filtered potential surface water entry into the well. This result is better than the result identified in 2006 and may relate to different seasonal conditions or the additional beneficial flushing received by PW-9 and PW-11 after a second full-length aquifer test.

Complete results of water quality testing are provided in Appendix 9.12, "Aquifer Pumping Test Report." A summary of standard treatment methods for these

contaminants is provided in Section 3.2.2 below; for more detailed information on treatment methods, please see Appendix 9.9, "DEIS Water Supply Report."

3.2.2 Potential Impacts

Impacts to water resources often involve both direct and indirect impacts. Direct impacts could include such things as filling, dredging, or draining a wetland; building in a floodplain; changing the hydrologic and hydraulic characteristics of a watershed; or channelizing a stream. Indirect impacts could consist of the degradation of water quality from stormwater runoff; an increase in runoff volume and/or a reduction in aquifer recharge due to increased impervious surface area; sediment deposition; nutrient enrichment of and pollutant accumulation in wetlands; or a reduction in stream flow due to increased groundwater withdrawal. This section discusses both direct and indirect impacts to water resources from the proposed project.

Streams and Wetlands

Minor direct impacts to 210± linear feet of intermittent Stream QQ are proposed for building fill and grading. Bridges will be designed to span the remainder of onsite streams and avoid any ecologically sensitive areas. Please see the Stormwater discussion below for a description of stormwater flow to streams and onsite waterbodies following construction. The proposed wastewater treatment plant building is located more than 50 feet from Amenia/Cascade Brook; however, there may be some grading within 30 feet of the stream for this facility.

Wetland and stream impacts are illustrated on Figures 3.2-4 and 3.2-5, "Wetland Impact Plans." Direct impacts to onsite wetlands as a result of the proposed project are summarized in Table 3.2-5 below.

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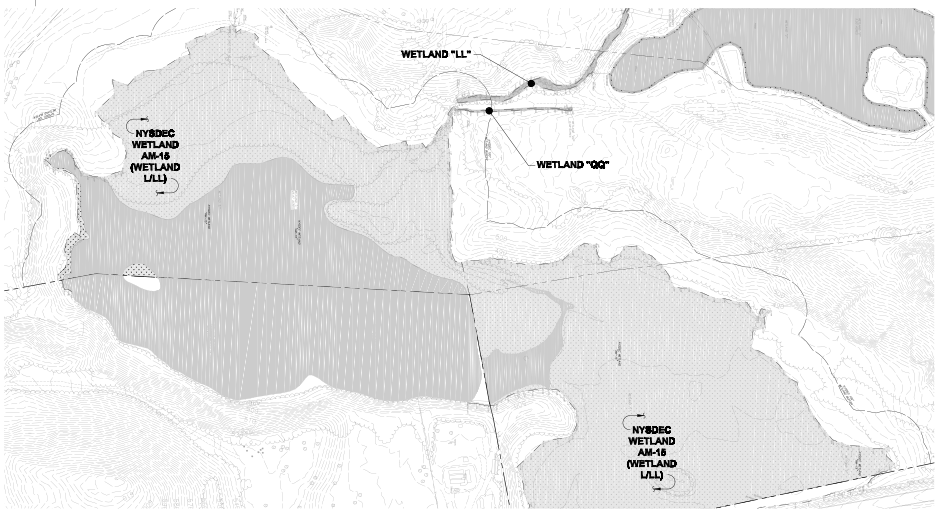
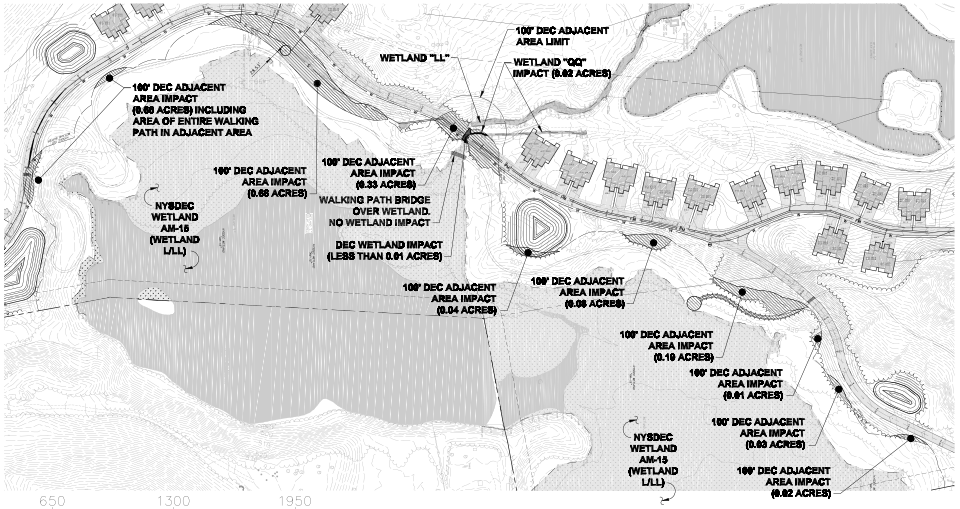


WETLAND AM-16 (WETLAND L/LL) 100-FOOT DEC ADJACENT AREA - WETLAND "LL" & WETLAND "QQ"

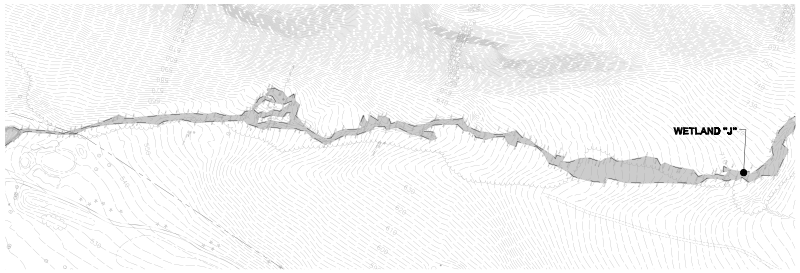


PRELIMINARY DISTURBANCE AREAS TO WETLAND AM-16 (WETLAND L/LL) 100' DEC ADJACENT AREA & WETLAND "QQ"

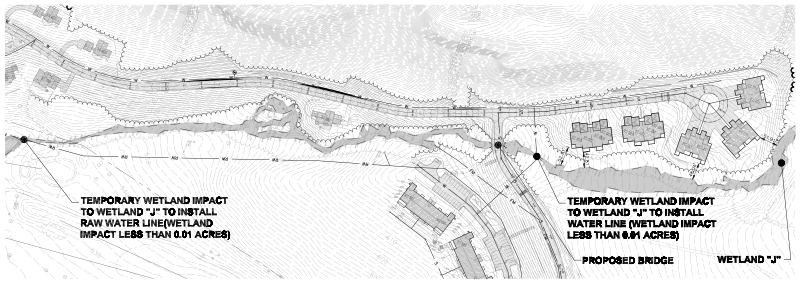
NOTE: THERE ARE NO WETLAND IMPACTS TO WETLAND "LL". THE PURPOSE OF THIS ILLUSTRATION IS TO DEMONSTRATE THE PROXIMITY OF THE PROPOSED DEVELOPMENT TO ADJACENT WETLANDS.

0 650 1300 1950

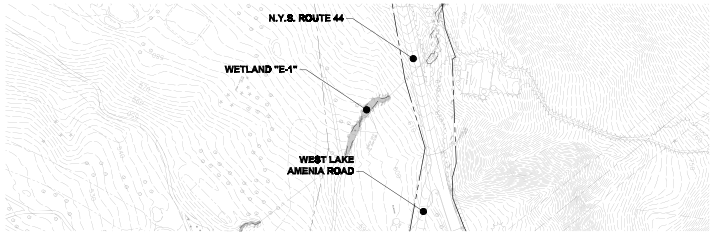
SCALE: 1" = 650'



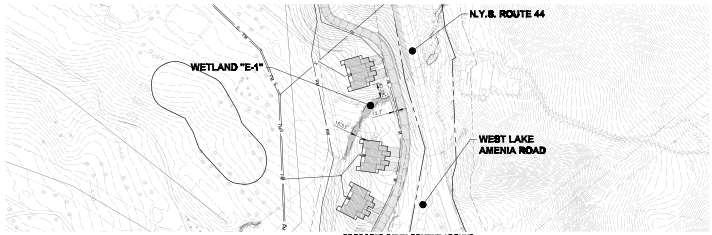
WETLAND "J"



PROPOSED DEVELOPMENT AROUND & OTHER WETLAND "J"



WETLAND "E-1"



PROPOSED DEVELOPMENT AROUND WETLAND "E-1"

NOTE: THERE ARE NO WETLAND IMPACTS TO WETLAND "E-1". THE PURPOSE OF THIS ILLUSTRATION IS TO DEMONSTRATE THE PROXIMITY OF THE PROPOSED DEVELOPMENT TO ADJACENT WETLANDS.

THE Chazen COMPANIES

Silo Ridge Resort Community
Proposed Action

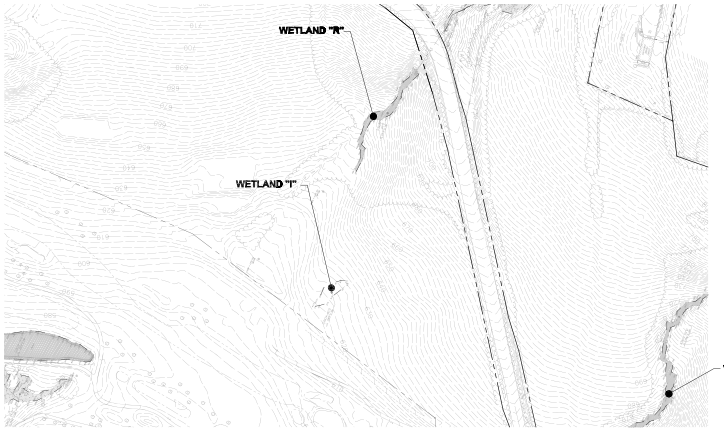
WETLAND IMPACT PLAN

Town of Amenia, Dutchess County, New York

SCALE: 1"=650'

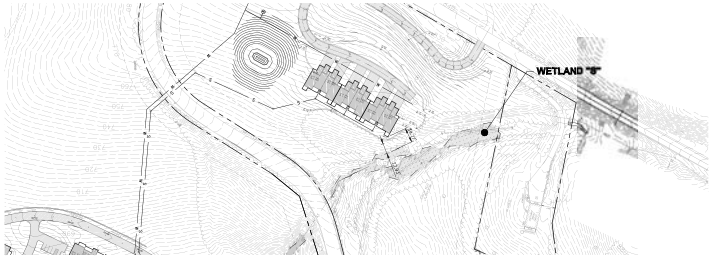
Figure 3.2-4

JOB NUMBER: 10454.00



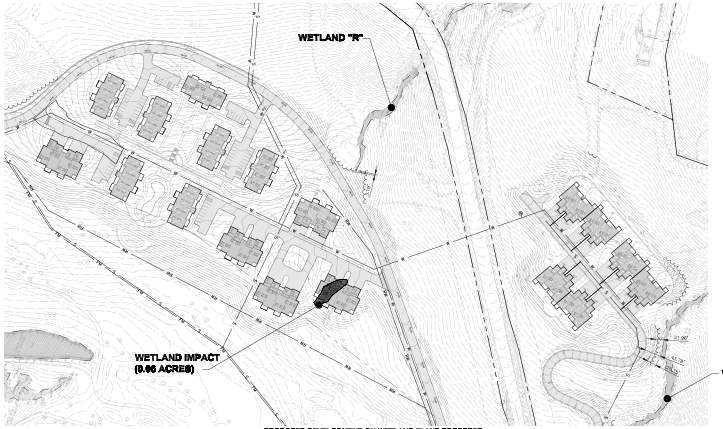
1 3.2-5 SCALE: NTS WETLAND "I", WETLAND "V", AND WETLAND "R"

3 3.2-5 SCALE: NTS WETLAND "S"



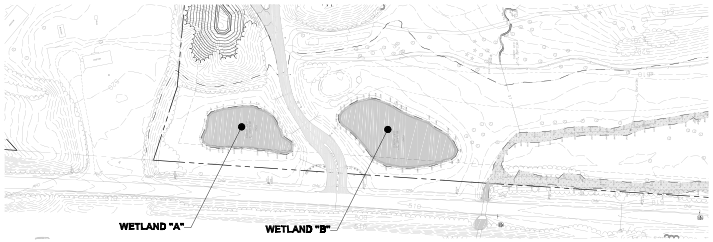
4 3.2-5 SCALE: NTS WETLAND "S"

NOTE: THERE ARE NO WETLAND IMPACTS TO WETLAND "S". THE PURPOSE OF THIS ILLUSTRATION IS TO DEMONSTRATE THE PROXIMITY OF THE PROPOSED DEVELOPMENT TO ADJACENT WETLANDS.



2 3.2-5 SCALE: NTS PROPOSED DEVELOPMENT ON WETLAND "I" AND PROPOSED DEVELOPMENT ADJACENT TO WETLAND "V", AND WETLAND "R"

5 3.2-5 SCALE: NTS WETLAND "A & B"



6 3.2-5 SCALE: NTS WETLAND "A & B"

NOTE: THERE ARE NO WETLAND IMPACTS TO WETLAND "A AND B". THE PURPOSE OF THIS ILLUSTRATION IS TO DEMONSTRATE THE PROXIMITY OF THE PROPOSED DEVELOPMENT TO ADJACENT WETLANDS.

0 650 1300 1950

SCALE: 1" = 650'

THE Chazen COMPANIES

Silo Ridge Resort Community
Proposed Action

WETLAND IMPACT PLAN

Town of Amenia, Dutchess County, New York

SCALE: 1"=650'

Figure 3.2-5

JOB NUMBER: 10454.00

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Table 3.2-5 Wetland Impacts

Impact Location	Activity	NYSDEC / ACOE Wetland	NYSDEC 100 Foot Adjacent Area	ACOE Wetland Only	Isolated Wetland
Wetland I	Building Fill				0.06 acre
Wetland J	Utility Line Temp. Impact			0.02 acre	
Wetland L/LL	Road	0.01 acre			
Wetland L/LL	Grading Road, Detention Basin, Nature Trail		2.02 acres		
TOTAL		**0.01 acre**	**2.02 acres**	**0.02 acre**	**0.06 acre**

Specifically, the project proposes to fill the 0.06-acre Wetland I, an isolated wetland. This filling activity will not be regulated by the ACOE, as Wetland I is isolated and thus is not a Water of the United States regulated under the Clean Water Act. Impacts to Wetland I are associated with the construction of a building. The Proposed Action also involves grading within 39 feet of Wetland S, which is also an isolated wetland, but no impacts to the wetland itself.

There is no federal regulation of wetland "adjacent areas." There are locations on the site where construction is occurring in close proximity to federally regulated wetlands, but there are no impacts to the wetlands themselves. These include:

- A headwall being constructed at the upstream extent of Wetland V,
- Grading located within 21 feet of Wetland V for sideslope of road grading,
- A bridge crossing of Wetland J, and
- Road and building grading within 12 to 15 feet of Wetland E-1.

The project also proposes to impact 0.01 acre of the federally regulated and State mapped NYSDEC Wetland AM-15 (identified as Wetland L/LL on the Wetland Survey), as well as 2.02 acres of its 100-foot adjacent area. These impacts are associated with grading for an access road around the west side of this wetland. There is an existing gravel road on the west side of Wetland L/LL, with steep banks in this area. The impacts to the wetlands and 100-foot adjacent area are mainly associated with the proposed road crossing of a small finger of wetland, and the side slope grading for a new roadway in this area. There is also a small area of grading

associated with the downslope berm of a stormwater detention basin, and a nature trail to the edge of the wetland. The project also proposes temporary impacts of 0.02 acre to Wetland J for a utility line crossing.

Vernal Pools

The proposed development area is well away from Wetland U, the vernal pool on top of the ridge in the western portion of the project site. Therefore, no impacts to the pool would occur. Nonetheless, in an effort to ensure protection of the important breeding habitat for amphibians, a significant buffer has been provided using the criteria described above. Calculations performed by the design engineers indicate that the horizontal distances from the (southern) vernal pool to the proposed limit of disturbance for the proposed development range from approximately 570 feet to 780 feet. While the horizontal separation from the proposed development is adequate for protection, it should be noted that the vertical separation between the vernal pool and the proposed development caused by the steep topography is another significant barrier to migration of amphibians. The vertical drop of approximately 350 feet in topographic relief is an impediment to migration in this area. Although some amphibians might be able to migrate down the slope, it is highly unlikely that they would be able to traverse the slopes back up to the vernal pool.

Therefore, utilizing the above information, a minimum of 500 feet of separation distance is proposed from the development area to the vernal pools on the ridge top. Development will also only occur to the east of the ridge, much in the manner described by Calhoun and Klemens, as occurring in a 25% development area. These protocols should be extremely protective of the ridge line vernal pools.

Also noteworthy is that the buffer proposed for these vernal pools is not imposed by any existing regulations on the Federal or State level. Currently, vernal pools are unprotected in New York State, as well as in many other states. However, in keeping with the goal of minimizing potential negative ecological impacts from the proposed development, the vernal pool and the surrounding forested area will be preserved as proposed above.

Floodplains

No development is proposed within the onsite floodplain area; therefore, no direct impacts to the floodplain are anticipated. Please see the Stormwater discussion below for a description of stormwater flow to streams and onsite waterbodies following construction.

Stormwater

Construction of the proposed project will consist of site grading, roadway grading and paving, installation of a storm drainage system, and construction of water

supply and sanitary sewage collection and treatment systems. Development of the project will create additional impervious areas, which will alter the hydrologic characteristics of the watershed and could have indirect impacts on water resources. The total area of impervious surfaces (e.g. roads, driveways, sidewalks, rooftops) associated with these improvements is approximately 115 acres, or 17±% of the project site. Impervious areas can cause rainfall to rapidly convert into stormwater runoff and can also result in the introduction of additional nutrients and pollutants into surface water resources. These pollutants can be transported by stormwater if adequate preventative measures are not put in place.

A Preliminary Master Stormwater Pollution Prevention Plan (SWPPP) for the Proposed Action has been prepared to support State Environmental Quality Review (SEQR) of the proposed project and is included as Appendix 9.5.1 of the DEIS. Design concepts are provided for stormwater collection and conveyance systems, and water quality and quantity control facilities. This Master SWPPP is not intended to be a final engineering design, as certain detailed aspects of the project are liable to change during the review process. Portions of the design were advanced to substantiate regulatory compliance determinations and to provide input pertinent to the environmental assessment of potential impacts of the proposed project. Final stormwater design will be advanced in support of and during the site plan review process.

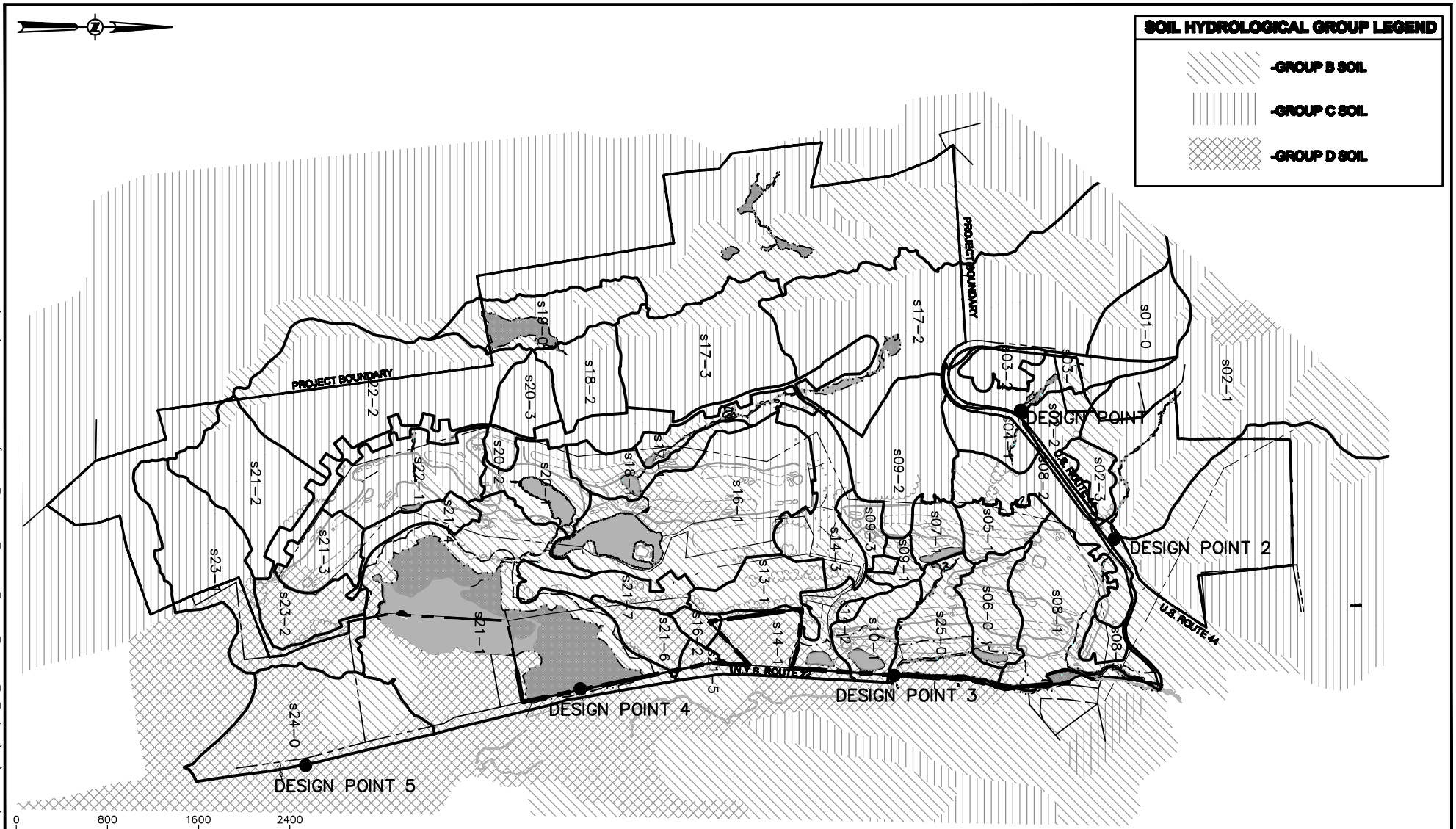
The intent of the Master SWPPP is to provide sufficient documentation for an overall SEQR determination, and to serve as the baseline for the final SWPPP that will be prepared for the proposed development, as approved. The stormwater analysis follows the NYS Standards and Specifications for Erosion and Sediment Control and USDA Technical Release No. 20.

The stormwater analysis is an integral part of the project's natural resource environmental analysis, which takes into consideration existing parameters of site topography, soils, erosion potential, surface waters, their connectivity and water quality, vegetative characteristics, visual resources, and the overall health of the watersheds. Flow projections, modeling, and project design sensitive to stormwater concerns combine to manage stormwater in compliance with current regulations, incorporating engineering design measures to minimize impacts on the site's natural resources through proposed stormwater management facilities discussed in the report. The methodology used to develop this Master SWPPP will be adhered to for the preparation of the project's final SWPPP(s). Stormwater quality and quantity controls designed for this Master SWPPP are preliminary in nature and are intended to demonstrate their location, approximate size, and design concept. Detailed analysis of these practices must be performed, and the design of each practice must be refined as part of the final SWPPP preparation.

Construction-phase pollutant sources anticipated at the site include sediment, vehicle fuels and lubricants, chemicals associated with building construction, and building materials. Without adequate control there is the potential for each type of pollutant to be transported by stormwater, which could then adversely affect water quality. Land development can also have an effect on site hydrology, and the management of stormwater runoff from sites after the construction phase is vital to controlling the impacts of the proposed development on water quality. Impervious areas such as rooftops, roads, driveways, and parking lots can cause rainfall to rapidly convert into stormwater runoff that could cause a number of effects on aquatic systems, and increases in runoff that are not controlled can cause stream bank erosion and floodplain expansion.

Runoff will be captured and released at discharge rates that are less than under pre-development conditions. A hydrologic and hydraulic analysis was performed using computer modeling and an evaluation of the proposed improvements across the subject site. A conventional stormwater management system was developed, consisting of centralized stormwater quantity controls designed to meet the requirements of the "New York State Stormwater Management Design Manual," August 2003 (hereafter referred to as Design Manual).

The plan, for the most part, allows for the maintenance of existing drainage patterns while continuing the conveyance of upland watershed areas. As illustrated in Figure 3.2-6, "Post-Development Watershed Delineation Map," the overall watershed and drainage patterns have remained relatively unchanged between pre- and post-development conditions. The proposed stormwater management system has been designed to attenuate runoff generated during the 1-, 2-, 10-, 25-, 50- and 100-year storm events such that the peak rates realized at the designated design points will not exceed the rates that existed prior to development of the project. It should be noted that all the design points evaluated as part of this Master SWPPP are tributary to Amenia/Cascade Brook. This brook is classified as a NYSDEC Class "C(Ts)" stream indicating that it may support trout spawning.



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THE Chazen COMPANIES

Silo Ridge Resort Community
Proposed Action
POST-DEVELOPMENT WATERSHED DELINEATION MAP
Town of Amenia, Dutchess County, New York

1"=800'

Figure 3.2-6

JOB NUMBER: 10454.00

A portion of this brook is located onsite and is approximately 12- to 15-feet wide with banks 3- to 6-feet high and a water depth that ranges from six inches to four feet. The Amenia/Cascade Brook conveys south to the Wassaic Creek, which discharges to the Ten Mile River and ultimately to the Housatonic River. Descriptions of each of the selected design points are provided below:

- Design Point 1: A low area located adjacent to a utility easement within western half of the north portion of the project site (north of US Route 44). This low area is drained by a 36-inch Corrugated Metal Pipe (CMP) which flows under US Route 44 and discharges back onto the project site south of US Route 44 at the headwaters of Wetland "R". A total of 27 acres drain to this design point in a southeasterly direction.

- Design Point 2: A low area located within the R.O.W. adjacent to US Route 44 at the southeastern side of the northern portion of the project site (north of US Route 44). This low area receives the waters from a NYSDEC Class "C" stream and is drained by a 24-inch reinforced concrete pipe (RCP). This 24-inch RCP flows under US Route 44 and discharges back onto the project site south of Route 44 to Wetland "E-1" & "E-2". A total of 98 acres drain to this design point in a southeasterly direction.

- Design Point 3: The entrance to a 12-foot by 12-foot box culvert located within NYS Route 22 which conveys the Amenia Creek (also known as Cascade Brook) off the project site. This box culvert is located within the R.O.W. adjacent to NYS Route 22 on the eastern project site property boundary. A total of 213 acres drain to this design point in an easterly direction. The receiving water body associated with this design point is Amenia/Cascade Brook.

- Design Point 4: An outlet of "Wetland L/LL" located within the R.O.W. adjacent to NYS Route 22 along the eastern project site property boundary. A total of 489 acres drain to this design point in an easterly direction. The outlet associated with this wetland is a 30-inch reinforced concrete pipe (RCP) which crosses under NYS Route 22 and discharges easterly offsite to a wetland surrounding Amenia/Cascade Brook. After the stormwater traverses through the wetland it eventually discharges into Amenia/Cascade Brook.

- Design Point 5: A low area located within the R.O.W. adjacent to NYS Route 22. This area is off the project site near the southeast corner of the project property. The low area is drained by a culvert pipe, which crosses NYS Route 22, and discharges easterly to a wetland surrounding Amenia/Cascade Brook. After the stormwater traverses through the

wetland it eventually discharges into Amenia/Cascade Brook. A total of 28 acres drain to this design point in an easterly direction.

Table 3.2-6 provides a summary of pre- and post-development discharge rates in cubic feet per second (cfs), taken from Section 7.5 of the Master SWPPP in Appendix 9.5.1. This comparison demonstrates that the overall peak rate of runoff from the proposed site will be less than or equal to that of existing conditions. As a result, the proposed project will not adversely affect adjacent or downstream properties or receiving watercourses in terms of increased flows.

Table 3.2-6 Pre- vs. Post-Development Discharge Rate (cfs)

Design Point (DP)	2 year 24 hr storm event		10 year 24 hr storm event		25 year 24 hr storm event		50 year 24 hr storm event		100 year 24 hr storm event	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	12.00	10.95	29.17	26.58	40.11	36.10	50.31	47.25	54.23	51.27
2	25.54	24.04	69.51	65.20	98.45	92.09	125.74	117.46	136.27	127.33
3	121.33	121.12	195.74	192.28	249.61	242.90	300.14	289.71	319.24	307.06
4	14.57	14.96	26.91	25.67	33.57	32.31	37.28	36.39	38.56	37.64
5	16.05	16.05	37.09	37.09	50.24	50.24	62.42	62.42	67.08	67.08

In accordance with NYSDEC regulations, the proposed stormwater management basin quantity controls have been designed and sized to provide channel protection (Cpv), overbank flood control (Qp10) and extreme flood protection (Qf100). A conventional stormwater management system was developed consisting of centralized stormwater quantity controls designed to meet the requirements of the *Design Manual*. The proposed stormwater management system has been designed to convey stormwater flows off-site via a combination of closed storm sewers, open ditches, stormwater quality and quantity control measures with overflow spillways, thereby preventing erosion and uncontrolled conveyance to down gradient areas. Measures taken to control off-site discharge of stormwater include stormwater management basins and rock outlet protection installed at strategic locations to reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving water body.

Several areas of proposed roadway are located on the project site such that the topography or adjacent constraints make it impractical to locate stormwater quality facilities. Waivers will be requested from NYSDEC for treatment of stormwater runoff from these areas as the site plan review and approval process progresses.

Stormwater runoff from the proposed development will be collected and conveyed to the quantity and quality control systems through a network of catch basins, drainage manholes, high density polyethylene (HDPE) piping, roadside ditches and HDPE culverts which have been designed to convey the 50-year storm event.

The *New York State Standards and Specifications for Erosion and Sediment Control* identifies that no more than five acres of a site may be disturbed at any given time. Construction of the proposed project will involve a golf course, cluster developments, and residential subdivisions with roadways in excess of one mile long. This will require construction to proceed with disturbance of greater than five acres at one time. The NYSDEC allows disturbance of greater than this amount upon receipt of written authorization. Therefore, waivers will be requested from NYSDEC for these areas as the site plan review and approval process progresses. Typically NYSDEC will grant such a waiver provided that reasonable technical justification is provided and that every attempt is made to minimize erosion and establish vegetation as quickly as possible.

With proper construction of proposed stormwater management facilities and maintenance of such facilities in accordance with the requirements of the associated SWPPP, the proposed development will not adversely affect adjacent or downstream properties.

Stormwater Quality

Pollutants and sediment carried by stormwater can have an indirect impact on water resources by degrading the water quality of receiving waters. For example, fertilizers from new lawn areas and material from roadways can affect light levels, dissolved oxygen, and nutrient concentrations in the receiving waters, which over time may decrease water quality. However, the proposed project will implement best management practices (BMPs) for stormwater, which will serve to provide water quality protection to the stream and wetland areas.

A pollutant loading analysis was prepared for the Traditional Neighborhood Alternative, as summarized in Section 5.0 (see also Appendix 9.5.2). This analysis compares the overall pollutant export on the project site under pre- and post-development conditions. The analysis was prepared for the Alternative proposal as opposed to the Proposed Action based on input from the Town's consultants.

BMPs integrated into the engineering design of the project will meet or exceed the requirements set forth in the *Design Manual*. The project's potential pollutant loading impact on downstream properties will be mitigated by treating and attenuating stormwater run-off through the utilization of multiple onsite stormwater management basins. These basins will be designed in accordance with the *Design Manual* and have a combination permanent pool and extended detention capable of treating the required water quality (WQv) volume. As stated in the *Design Manual*, it is presumed that the associated stormwater management basins meet NYSDEC's water quality requirements if designed in accordance with the performance criteria set forth in the *Design Manual*. According to the NYSDEC, extended detention ponds generally remove 60 to 80% of total phosphorus, 40 to 60% of total nitrogen,

80 to 100% of total suspended solids, 40 to 60% of biological oxygen demand, and 40 to 60% of chemical oxygen demand. Therefore, while an increase in the concentration of some pollutants is likely to occur, with the use of appropriately designed stormwater management basins, the proposed project is not expected to have significant adverse effects on the quality of on- or off-site receiving waters.

Design details for the stormwater system and quantification of sediment and nutrient removal will be determined during the site plan stage of the application process. Micropool extended detention ponds and wet ponds have been incorporated into the stormwater management plan to control stormwater quantity and quality. The micropool extended detention pond is an effective means of removing pollutants and will provide a high pollutant removal rate for stormwater runoff by providing gravity settling of sediment, chemical flocculation and biological uptake of pollutants. Wet ponds typically consist of two general components, a forebay and a permanent wet pool. The forebay provides pretreatment by capturing coarse sediment particles in order to minimize the need to remove the sediments from the primary wet pool. The wet pool serves as the primary treatment mechanism and where much of the retention capacity exists.

Additional stormwater quality control measures will be implemented to reduce potential indirect impacts, including erosion and sediment control measures such as the establishment of permanent vegetation for all areas at final grade. These areas will be seeded and mulched within 14 days after completion of the major construction activity. With the construction and maintenance of the proposed stormwater management facilities, no adverse impacts to adjacent or downstream properties are expected.

Groundwater

As with any new development, the proposed project has the potential to create minor changes in groundwater quality due to the addition of impervious surfaces, manicured lawns, and water and wastewater systems. Impacts attributed to roads, rooftops, and lawns will be minimized by proper design, installation, and maintenance of stormwater quality structures. All stormwater quality structures onsite will be designed to meet stormwater quality criteria outlined in the *Design Manual* (see design criteria in Appendix 9.5.1).

Reduction in groundwater recharge and increased surface water runoff that would result from the placement of impervious surfaces (i.e., roads and buildings) and the onsite wastewater treatment plant will be mitigated through the use of detention basins to ensure no increase in runoff from the site. The net loss of groundwater recharge from construction of impervious structures would not be significant with the properly designed stormwater management basins that are proposed. During construction, proper design and mitigation will prevent any runoff from entering a

surface water body. In addition, two proposed stormwater management areas, located upgradient of the Wetland L/LL, will minimize impacts to the wetland by collecting and detaining runoff during storms.

Requirements for land use management in the PVBA and UA districts do not constrain the proposed project. The project meets all general conditions in the proposed Aquifer Overlay District as outlined in §121-15(D) of the Zoning Law; specifically, as described in Appendix 9.12, "Aquifer Pumping Test Report," a water budget was prepared for the project which demonstrates that water consumption will not exceed the estimated natural groundwater recharge. The project will not include burial of heating fuel tanks with a combined capacity of less than 1,100 gallons. A Special Permit application may be required depending on threshold quantities of stored pesticides or herbicides referenced in §121-15(E)(1) and (2). No uses are proposed which are prohibited within the Aquifer Overlay District.

As described in detail in Section 3.13, "Utilities – Water" and in Appendix 9.9, "DEIS Water Supply Report," the proposed water treatment facilities for the project will include particulate filtration, micro-filtration, iron and manganese reduction, lead reduction, and disinfection at a minimum to meet standards established in Title 10NYCRR Subpart 5-1 of the New York State Code of Rules and Regulations, which establishes drinking water maximum contaminant levels and treatment requirements. The treatment system will be maintained and monitored by a New York State licensed water operator with required reporting to Dutchess County Department of Health. The required treatment methods, summarized below, do not generate a significant waste stream; the filters will require periodic disposal but can be disposed of along with regular household wastes.

Particulate Filtration

The NYSDOH requires that turbid groundwater which is not adequately filtered naturally must be provided with additional filtration to remove particulate and biological contaminants. A pressure cartridge filtration system capable of removing all particles larger than 1 micron in size is proposed for the source water in PW-1, PW-2, PW-4, and PW-5 to meet this requirement. This will be achieved using a three-step filtration process consisting of a preliminary filter with a 20-µm nominal pore size, an intermediate filter with a 5-µm nominal pore size, and a final filter with a 1-µm nominal pore size.

Micro-Filtration

MPA testing identified well PW-11 as "low risk" under EPA relative risk ranking guidelines for groundwater under the direct influence of surface water (GWUDI). To be conservative, it is assumed that the NYSDOH will require this well source to comply with provisions of the USEPA's Surface Water Treatment Rule, which

requires 99.9% removal/inactivation of *Cryptosporidium parvum* and *Giardia lambia* cysts, and 99.99% removal/inactivation of enteric viruses. A micro-filtration process and disinfection will be utilized to achieve these levels of removal and inactivation.

Iron and Manganese Reduction

Iron and manganese will be removed from the source water in PW-1, PW-2, PW-4 and PW-5 using conventional treatment methods such as particulate filtration, ion exchange, oxidizing/adsorptive filters (greensand filters), colloidal type filter, or catalytic type filter. The actual treatment may necessitate the combination of several treatment methods to achieve required water quality standards.

Lead Reduction

Lead will be removed from the source water in PW-1, PW-2, PW-4 and PW-5 using conventional treatment methods including particulate filtration, ion exchange, activated carbon filtration, reverse osmosis, or distillation.

Disinfection

Sodium hypochlorite will be used to disinfect the raw water from each well source. A chlorine dose will be introduced into the system to provide a free chlorine residual of 2 ppm (mg/L) at the point of entry into the distribution system. The system will be designed to provide the minimum contact time for inactivation of microorganisms to comply with provisions of EPA's Disinfection Profiling and Benchmarking Technical Guidance Manual.[21]

In general, development of the proposed project is not expected to have significant impacts on water resources. As described in Section 3.13, although additional test wells would need to be explored to ensure adequate water supply for the Proposed Action, a sufficient quantity of water is expected to be available onsite. In addition, the increase in consumptive water use onsite is not expected to have adverse indirect effects on the quantity of groundwater underlying the site or the flow in Amenia/Cascade Brook, and will not adversely affect the Town's available water supply, because of the proposed recycling of wastewater to augment irrigation water supplies for the golf course. This leaves the overall site water budget largely unchanged during dry periods, aside from consumptive losses from the proposed residential and hotel uses, normally judged to be not more than 20% of the potable water delivery, or about 30 gpm on average for the proposed uses. During dry periods, the proposed project is therefore expected to have an overall consumptive impact of an estimated 30 gpm on existing water sources. More than 325 gpm

[21] Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) Disinfection Profiling and Benchmarking Technical Guidance Manual (EPA 816-R-03-004), Environmental Protection Agency, 2003, Washington, D.C.

recharges to site aquifers each day during typical years; 30 gpm consumptive use comprises less than 10% of average recharge (see the "Aquifer Pumping Test Report" in Appendix 9.12).

The significance of this new water use may be considered by reviewing the watershed stream flow at the nearest downstream stream gauge along the Amenia/Cascade Brook. This stream through Wassaic has a median flow of 3,600 gpm, falling to 1,500 gpm less than 30% of the time, to 673 gpm less than 10% of the time, and to 291 gpm on average once every 10 years. The offsite, downstream impact of the proposed project would therefore be less than 1% of median stream flow and approximately 10% of flows experienced during the 10-year statistical drought. The proposed project does not terminate flow in this stream, and normal reduction impacts of less than a few percentage points are not expected to have adverse indirect effects on the stream's biota or normal function.

3.2.3 Proposed Mitigation Measures

Streams and Wetlands

Permits are required for impacts to regulated federal and State waters and wetlands on the site. A joint permit application will be prepared to both the ACOE (for Section 404 permits) and the NYSDEC (for Article 24 Freshwater Wetland Permits, and Section 401 Water Quality Certificate). Both the ACOE and the NYSDEC will review the permit application to ensure that the project complies with their respective permitting requirements, including the need to avoid and minimize impact to wetlands to the maximum extent practical, and, for the ACOE, to compensate for unavoidable wetland impacts.

ACOE Waters and Wetlands

As discussed in Section 3.2.2, minor impacts are proposed to intermittent Stream QQ. Bridges will be designed to span all other onsite streams and avoid any environmentally sensitive areas. With regard to wetlands, direct wetland impacts are confined to 0.03± acre of federally regulated wetlands and 0.06± acre of isolated Wetland I, which is not regulated under the Clean Water Act.

Given this level of impact, the project is likely to be permitted under Nationwide Permit 39. Nationwide Permit 39 regulates impacts to wetlands when the size is less than 0.5 acre. According to 33 CFR 330.1(b), nationwide permits are designed to regulate wetland impacts associated with certain activities with little, if any, delay or paperwork. Compliance with the Nationwide Permit program typically requires submittal of a Pre-Construction Notice that documents compliance with the Nationwide Permit requirements. These include a demonstration that onsite wetland impacts have been avoided and minimized to the maximum extent practicable. In addition, the Applicant must demonstrate that public interest review

factors, such as compliance with Federal Endangered Species Act and the National Historic Preservation Act, have been met.

Prior to issuing a permit for this project, the ACOE must make a determination that the project is not contrary to the public interest, and that the project is compliant with the Section 404(b)(1) Guidelines, including that the project has no net loss of wetland functions from unavoidable wetland impacts. The joint permit application to the ACOE will discuss these issues.

State Waters and Wetlands

Streams

As discussed in Section 3.2.1, "Existing Conditions," the Amenia/Cascade Brook onsite are designated as Class "C(Ts)", while all remaining streams on the site are identified as Class "C." Class "C" streams are not regulated under 6 NYCRR Part 608.2, Disturbance of Protected Streams. As discussed in Section 3.2.2, "Potential Impacts," the only activity within the vicinity of Amenia/Cascade Brook is some grading, approximately 30 feet from the stream, associated with the Wastewater Treatment Plant. Given that there is no activity within the bed or banks of the stream, a stream disturbance permit under 6 NYCRR Part 608.2 should not be required for this work. However, due to proposed grading within 50 feet of the stream, the need for a stream disturbance permit will be confirmed with the NYSDEC.

Section 401 Water Quality Certificate

A permit will be required from the NYSDEC under 6 NYCRR 608.9 for a Section 401 Water Quality Certificate, which is a state permit issued for any project with a federal permit to discharge into a water of the United States as defined under the Clean Water Act. Therefore, the need for a Section 404 Permit from the US Army Corps of Engineers triggers the need for a Section 401 Water Quality Certificate.

An individual water quality certificate will be needed for this project, based on issuance of the 401 Water Quality Certificates on May 11, 2007. The Applicant will need to demonstrate that the project complies with the permit issuance standards at 6 NYCRR 608.8 and 608.9. Typically, demonstration of compliance with the SPDES Phase II requirements for stormwater management, consistent with the proposed stormwater design for this project, is adequate to demonstrate compliance with the regulatory standards of this program.

Freshwater Wetland Act

Under Article 24, and as discussed in Section 3.2.2, there will be 0.01 acre of direct impact to NYSDEC Wetland AM-15 and 2.02 acres of impact to the 100-foot adjacent area of this same wetland, identified as Wetland L/LL on the Wetland Survey. These impacts are associated with the grading of a roadway to partially replace an existing gravel road in the area. In addition, a small portion of a proposed stormwater detention basin berm and a nature trail are located within the NYSDEC 100 foot adjacent area. The NYSDEC Wetland AM-15 is a Class II Wetland.

The Joint Permit Application to the NYSDEC will discuss compliance with the NYSDEC's Article 24 permit issuance standards found at 6 NYCRR 663.5 for a Class II wetlands. The State regulatory program at 6 NYCRR 663.5(g) states that the applicant may suggest a proposal to enhance the existing benefits provided by a wetland or to create and maintain new wetland benefits in order to increase the likelihood that a proposed activity will meet the applicable standards for permit issuance. Mitigation measures will be proposed for this project to ensure, in total, that the project will meet the permit issuance standards of the respective regulatory agencies, and to ensure that the project will not have more than a minimal impact on the environment.

Vernal Pools

As described above, although no development is proposed on top of the ridge in the western portion of the project site, the proposed project will maintain a minimum 500-foot buffer from Wetland U to ensure protection of the vernal pool as amphibian breeding habitat.

Floodplains

As no impacts are anticipated to the onsite floodplain areas, no mitigation measures are proposed. Mitigation measures will be incorporated into the design and maintenance of the stormwater management system to prevent any significant increases in stormwater flow to onsite streams and waterbodies.

Stormwater

Mitigation measures involve preventing soil erosion and sedimentation resulting from stormwater runoff both during and after construction. During construction, this is accomplished by sequencing site disturbance activities to establish erosion controls, minimize disturbed areas, maintain existing vegetation as much as possible, and stabilize newly disturbed areas as soon as possible. Stormwater pollutant controls utilized during construction will include temporary sediment barriers and sediment basins. Stormwater pollutant controls utilized after

construction will include stormwater quality control facilities designed in accordance with the Design Manual.

The site plan has been designed to have minimal post-development impacts on environmental resources, including existing water resources. Proposed stormwater BMPs have been designed in accordance with requirements set forth in the Design Manual. Post-development peak stormwater runoff rates are less than or equal to pre-development conditions. As a result, onsite and offsite receiving waters will not have to assimilate additional runoff over current conditions.

The project's potential pollutant loading impact on downstream properties will be mitigated by treating and attenuating stormwater run-off through the utilization of multiple onsite stormwater management basins. These basins were designed in accordance with the Design Manual and have a combination permanent pool and extended detention capable of treating the required water quality (WQv) volume. As stated in the above-mentioned Design Manual, it is presumed that the associated stormwater management basins meet NYSDEC's water quality requirements if designed in accordance with the performance criteria set forth in the Design Manual.

Erosion control measures will be installed before construction of the proposed development begins. Stabilized construction entrances, silt fences, sediment traps and water quality basins will be constructed to prevent soil erosion, sedimentation in surface water bodies, and tracking of soil onto adjacent roads. All erosion and sediment control structures will be designed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.

Construction-phase pollutant sources anticipated at the site include sediment, vehicle fuels and lubricants, chemicals associated with building construction, and building materials. These pollutants can be transported by stormwater without adequate measures. However, mitigation measures designed to prevent soil erosion and sedimentation will be implemented. During construction, this is accomplished by sequencing site disturbance activities to establish erosion controls, minimize disturbed areas, maintain existing vegetation as much as possible, and stabilize newly disturbed areas as soon as possible. Stormwater pollutant controls utilized during construction will include, but are not limited to, the following:

- Stabilization of construction entrances to reduce the tracking of sediment onto public roadways and permanent traffic corridors to avoid "routes of convenience" that are potentially more detrimental.

- Employment of dust control measures including the use of water trucks to reduce dust generated on site.

- Temporary stockpiling of materials, such as topsoil, in areas away from storm drainage, water bodies and/or courses, and encircled by silt fence barriers to prevent sedimentation.

- Placement of silt fencing, a geotextile filter fabric, along the perimeter of areas to be disturbed to reduce sediment loss.

- Temporary seeding and mulching on all disturbed areas where there will not be construction for longer than 21 days to minimize erosion and sediment loss.

- Placement of stone inlet protection barriers consisting of concrete blocks surrounded by wire mesh and crushed stone around catch basins to keep sediment from entering the catch basins and storm sewer system.

- Installation of erosion control blankets on all slopes exceeding 3:1 to provide temporary erosion protection, rapid vegetative establishment, and long-term erosion resistance to shear stresses associated with high runoff flow velocities associated with steep slopes.

- Installation of stone check dams within drainage ditches to reduce the velocity of stormwater runoff, to promote settling of sediment, and to reduce sediment transport offsite.

- Construction of temporary sediment basins to intercept sediment laden runoff and reduce the amount of sediment leaving the disturbed areas and to protect drainage ways, properties, and rights-of-way.

The proposed project includes long-term stormwater controls in the form of permanent structural and nonstructural management practices that either prevent initial pollutant loadings or detain and treat stormwater to reduce pollutant levels and control the volume of runoff. The SWPPP also includes post-construction inspection and maintenance criteria for permanent stormwater management facilities. The SWPPP and the post-construction inspection and maintenance criteria ensure the long-term effective and efficient operation of stormwater management facilities, thereby minimizing the potential long-term impacts of the proposed development on water quality.

- Construction housekeeping practices will be implemented to help maintain stormwater quality. These measures include:

- Material resulting from the clearing and grubbing operation will be stockpiled up-slope from adequate sedimentation controls.

- Areas designated for equipment cleaning, maintenance, and repair will be protected by a temporary perimeter berm.

- Detergents will not be used for large scale washing (i.e., vehicles, buildings, pavement surfaces, etc.).

- A Spill Prevention and Response Plan will be developed for the site detailing the steps that need to be followed in the event of an accidental spill.

- Construction materials shall be stored in a dedicated staging area designed to minimize the impacts of the construction materials on stormwater quality.

Other pollutant control measures practiced during construction include properly disposing solid waste to avoid incorporation of any solid waste into the stormwater, using approved sanitary facilities during construction, and either retaining water onsite or using water that originates from a public water supply or a private well approved by the Health Department if the water must be discharged from the site.

With respect to the direction of the Final Scoping Document to consider the use of permeable materials onsite, the Master SWPPP has been developed conservatively assuming typical impervious areas (i.e. roadways, patio areas, rooftops, etc). The Applicant is currently considering some use of water-pervious materials such as gravel, crushed stone, open paving blocks or pervious paving blocks for driveways, parking areas, walkways, and patios, which would serve to minimize runoff, as well as increase infiltration.

Groundwater

As discussed above, the proposed project will not adversely affect groundwater supply or quality. BMPs contained with the SWPPP, in conjunction with the golf course's Integrated Pest Management (IPM) Plan and monitoring requirements (see the Natural Resource Management Plan in Appendix 9.11), will ensure the protection of surface water quality and thereby groundwater quality. Proposed monitoring locations are illustrated in Appendix 9.11. The objective of the IPM Plan is to reduce the amount of pesticides applied to the golf course through the use of proper cultural, manual, mechanical, biological, and chemical methods to prevent or remedy unacceptable pest activity. With these plans in place, further mitigation measures are not required.