LETTER - MEMORANDUM

To: Chris Round, Greg Merriam

From: Pete Romano, P.E. and Steve Radloff

Date: April 14, 2014
Revised April 20, 2014

Re: Nevele Redevelopment
Municipal Water Supply and Sanitary Sewer System Investigation

Job #: 31225.00

Appendixes: (A) – Figure 1 – Site Location Map
(B) - Anticipated Water and Sanitary Sewer Demands
(C) – Water System Master Plan – Figure 3.3.1
(D) – Barton & Loguidice – Water System Improvement Letter, April 9, 2014
(E) – Sanitary Sewer System Master Plan – Figure 3.5.1
(F) – Barton & Loguidice – Sanitary Sewer System Improvement Letter, April 9, 2014

In support of the proposed redevelopment of the Nevele Resort and Casino Redevelopment (hereinafter referred to as the "project site"), The Chazen Companies (Chazen) has completed an investigation of the existing municipal water supply and sanitary sewer systems adjacent to the project site. As part of the investigation of both the municipal water supply and sanitary sewer systems, Chazen conducted an on-site survey, held conversations with the Village of Ellenville Water and Sewer Department and the Village of Ellenville Designated Engineers Barton & Loguidice, and conducted document research. A summary of the findings of the investigation, as well as the proposed development's potential effect on the existing systems are presented below.

For reader convenience, the body of this letter report is separated into the following items: project description, municipal water supply system investigation, sanitary sewer system investigation, and conclusions.

1. Project Description

The project site is located in the Town of Wawarsing, Ulster County, New York. Nevele-R LLC (the "applicant") is proposing redevelopment of the former Nevele Grande Resort & Country Club as a destination gaming resort to be renamed the Nevele Resort, Casino & Spa. The 564± acre project site is located east of Route 209 and Nevele Road and south of Nevele Drive/Arrowhead Road in the Town of Wawarsing, Ulster County. The site is comprised of two tax parcels identified on the Town

of Wawarsing Tax Map as parcel numbers 91.1-1-13 (37.7 acres) and 91.1-1-6.1 (526.9 acres). Development of the site will be primarily focused within the existing developed area.

The Project will restore the Nevele to its former prominence as the anchor property for the eastside Catskills resort region and will include adaptive reuse of several existing structures and facilities, the construction of new facilities, and demolition of on-site structures to accommodate construction of planned new facilities. The casino will total 300,200 square feet with 70,000 square feet assigned to gaming and 230,200 square feet being devoted to uses and amenities that support gaming. Elements for the resort, in addition to the casino, include: hotel buildings comprising 446 keys/units, a spa and fitness center, banquet and meeting rooms, cabaret lounge and night club, several different types of restaurants, and extensive recreational facilities including an ice arena, swimming pool, squash courts, tennis courts, and 18 hole golf course. In addition, a total of 2,000 parking spaces are proposed, of which 1,380 are proposed to be housed within a three story parking garage.

A location map of the site has been provided in Appendix A as Figure 1.

2. Anticipated Domestic Water Supply Demand

The anticipated average daily domestic water demand from the proposed development was calculated by correlating water supply to wastewater generation. Using Table 3 of the NYSDEC Design Standards for Wastewater Treatment Works, 2014, expected hydraulic wastewater loading rates were correlated directly to anticipate average daily domestic water demand. It is noted that water demand is typically 10 percent higher than the purely domestic daily hydraulic wastewater loading when consideration is given to water that does not reach the sewer (i.e. boiler, sprinklers, etc.). As mandated by Section 15-0314 of the Environmental Conservation Law, plumbing facilities in new and renovated buildings must use water-saving fixtures and, therefore, a 20 percent reduction in water demand can be taken. The anticipated average daily domestic water demand for the Nevele Resort & Casino will be 162,523 GPD or 0.162 MGD.

See Appendix B for detailed water usages and corresponding average day demands.

3. Municipal Water Supply System Investigation

Existing Water Supply

The Village of Ellenville's public water system is operated by the Village of Ellenville Water Department and services the Village as well as out of district water customers. Water is supplied from four sources including one surface water supply (North Gully Reservoir) and three groundwater well supplies (Fallsview well, Harris wells, and Center Street well). Existing well locations and existing water supply infrastructure are illustrated in Appendix C as Figure 3.3.1

The Project site is currently served by the Village of Ellenville Water System via an existing 8" DIP Water Main that traverses the Honors Haven property (north of the site). A utility easement benefitting the Village permits this utility to cross the Honor Haven property.

In an April 9, 2014 correspondence from the Village's engineering consultant Barton & Loguidice, D.P.C (B&L) the "Village has a total permitted capacity and operating capacity of 1.71 million gallons per day (mgd) and 0.75 mgd respectively with the largest well out of service. A copy of this correspondence is provided in Appendix D.

The Village engineer indicates that "According to the 2013 Water Billing Reports provided by the Village, the total amount of water billed for the year was 96,471, 154 gallons (264,305 gpd) and the annual water produced estimated as 193,000,000 gallons (529,000 gpd). The Village has estimated that the system has 50% unaccounted for water due to numerous water main breaks throughout the year. The 3 month summer (2013) average billed to customers was recorded as 0.299 mgd." Therefore, considering the 2013 annual water produced (0.529 mgd) the Village currently has a reserve operating capacity of 0.221 mgd (0.75 mgd – 0.529 mgd) with the largest permitted source out of service.

Water Distribution System

As per the Village of Ellenville Facilities Plan dated August 2012, there are two service pressure zones in the distribution system. The low service zone consists of the majority of the water system and covers elevation 500-feet above sea level (ASL) and below. The high service zone covers elevation 500- to 690-feet ASL and is supplied via a booster pump station along Westwood Avenue. This booster pump station increases pressure from 30 psi to 120 psi.

The Village storage system includes four standpipe tanks- Eastview, Eastview Heights, Jean Street and North Gulley WTP tank. Currently the Eastview storage tank is out of service due to lack of water turn over and its remote location with respect to the rest of the distribution and storage system. Even without the Eastview storage tank remaining out of service, the existing storage capacity in the Village is 1.25 million gallons.

No improvements or extensions to the Village system are required as part of the project in order to meet the estimated average daily demand for the Nevele. The existing 8" DIP Water Main that traverses the Honors Haven property within an existing utility easement will remain in place and will continue to service the Project (see Figure 3.3.1). The existing 8-inch water main will have sufficient capacity to service the proposed project given the fact that this main provided adequate service to the previous Nevele Hotel Resort which had a greater average daily water demand than that of the proposed project. The Nevele, the facility will remain as an out of district user of the Village of Ellenville public water supply system.

4. Sanitary Sewer System Investigation

Anticipated Hydraulic Loading

It is estimated that the total wastewater flow from the project will be 0.148 MGD. This estimate is based on the methodology of the NYSDEC – Design Standards for Intermediate Sized Wastewater Treatment Systems – March 5, 2014, which contains wastewater flow rates for various land uses. Since the proposed casino project is comprised of several uses, such as gaming positions, restaurants, hotel, retail, spa, pool, golf and conference, the wastewater flows for each use were estimated using Table B-3 of the associated NYSDEC design standard and then flow from all users were totaled for the project.

See Appendix B for anticipated hydraulic loading calculations and corresponding average day demands.

Existing Wastewater Conveyance System

The Nevele is located outside of the Village of Ellenville Sewer District. The existing Nevele Resort treats its wastewater on site at a private wastewater treatment plant (WWTP) owned by the Nevele.

Existing Nevele Wastewater Treatment Works

The WWTP is located north of main access drive and along east side of the Sandburg Creek. A SPDES permit (NY-010 0048) allows for the point source discharge of up to 175,000 GPD of treated effluent to the Sandburg Creek. Wastewater from the various Nevele facilities is collected and conveyed through a series of gravity sanitary sewer collection pipes which ultimately discharge into the WWTP. See Appendix E – Figure 3.5.1 for location of the existing Nevele WWTP.

The existing Nevele wastewater treatment works is a secondary treatment plant constructed circa 1968. The plant is comprised of, in order of flow, an influent structure, primary clarifier, a pump station for dosing the trickling filter, the trickling filter, secondary clarifier, chlorine contact tank and ultimately an outfall. A sludge pump is located within the control building which draws sludge from the clarifiers and transfers it to an aerobic digester. Blowers for the digester are also located within the control building. Digested sludge is drained from the digester and discharged to sludge drying beds where it is allowed to dewater via gravity and the dried solids are removed for disposal. An isolated portion of the control building contains chlorination equipment.

In April of 2012, The Chazen Companies completed a preliminary assessment of the Nevele WWTP. The plant is not currently operating and due to significant deterioration of the concrete tank structures and flooding damage to the control building, it was determined that this plant would need to be substantially, if not full rebuilt in order to function as intended. Based on these findings, it is anticipated the plant will be decommissioned in conjunction with the proposed project. As such the associated SPDES permit will be closed and terminated accordingly.

Village of Ellenville Wastewater Treatment Works

Wastewater within the Village of Ellenville is collected and conveyed through a series of pipes which is ultimately treated at the Ellenville WWTP before discharged into the Sandburg Creek. The Village of Ellenville WWTP is located along Hoar Street at the northern end of the Village at the east of Sandburg Creek. In early 2014, improvements to the Ellenville WWTP were completed which increased its treatment capacity. These improvements included the installation of new flow metering equipment, construction of a new preliminary treatment building, installation of new vortex grit removal system, construction of a triplex influent pump station, two continuous flow sequencing batch reactors (SBR), new equalization basin, new aeration equipment, open channel UV disinfection system, two aerobic sludge digesters, three sludge drying beds, and building and electrical improvements. See Appendix E – Figure 3.5.1 for location of the Village of Ellenville WWTP.

In an April 9, 2014 correspondence from the Village's engineering consultant Barton & Loguidice, D.P.C (B&L) a "review of the sewer treatment capacity indicates that the WWTP is operating at a permitted capacity of 1.1 mgd and experiences normal dry weather of 0.3 mgd and wet weather flows 0.5 mgd. " A copy of this correspondence is provided in Appendix F

Planned additional improvements will increase plant capacity from 1.1 MGD to 1.4 MGD as demand warrants. The sequencing batch reactors (SBR), digesters, EQ basin, UV channel and sludge drying beds are capable of modular expansion of the WWTP. The influent gravity sewer and preliminary treatment channels and wet wells have been designed for a mean flow of 1.4 MGD. The continuous flow SBR's are also capable of being modified by increasing the aeration rate and changing the duration of the process sequences to allow an increase in capacity from 1.1 MGD to 1.4 MGD.

Wastewater from various portions of the Village is collected and conveyed through a series of gravity sanitary sewer collection pipes which ultimately discharge into the WWTP. These pipes are a combination of vitrified clay and PVC and vary in sizes from 8- to 24-inches in diameter.

Sanitary Sewer System Alternatives

Alternative 1 – On-Site Treatment (unlikely)

This alternative, although very unlikely, would involve the continued handling and disposal of wastewater on-site. Commensurate with previous Nevele operations, a series of collection pipes would convey effluent to the existing Nevele WWTP where it would be treated and ultimately discharged into Sandburg Creek.

As previously noted, the total permitted capacity of the existing Nevele WWTP is 0.175 mgd and the anticipated wastewater flow is estimated to be 0.148 mgd. Therefore, the existing Nevele WWTP has the available capacity to treat effluent generated from the proposed project.

The Nevele WWTP has not been operational since the Nevele closed its doors a number of years ago; therefore, during the design phase of this project a detailed operational assessment of the wastewater process system will be completed. This assessment will document the current condition of the plant along with a detailed plan of design modification and improvement to ensure the plant can adequately treat wastewater in accordance with the SPDES permit discharge limitations.

Wastewater from the various Nevele facilities will be collected and conveyed through a series of new PVC gravity sanitary sewer collection pipes which will ultimately discharge into the onsite WWTP. This new conveyance system will be designed and tested in accordance with the NYS Building Code and "Recommended Standards for Wastewater Facilities" (Ten State Standards).

Alternative 2 – Connection to the Village of Ellenville (preferred)

This alternative would involve a connection to the Village of Ellenville wastewater works. All wastewater from the various Nevele facilities will be collected and conveyed through a series of new PVC gravity sanitary sewer collection pipes which ultimately will discharge into a sanitary sewer pump station located on the Nevele property. This sanitary sewer pump station will be owned, operated and maintained by the Nevele.

Wastewater from the pump station would be conveyed via an HDPE forcemain to the Village of Ellenville sanitary sewer collection system within Nevele Road. Approximately 4,000-linear feet of force main will be directionally drilled along Arrowhead Road which will include an insulated, heat trace aerial crossing mounted to the Sandburg Bridge. At the intersection of Arrowhead and Nevele Roads, the force main will traverse north along Nevele Road finally discharging to an existing 8-inch gravity sewer main owned by the Village.

During the design phase of this project a detailed hydraulic analysis of the existing Village collection and conveyance system will be completed. This analysis will consider the proposed project flows and pump rates in context to the Village's conveyance system along with the physical condition of the existing collection system. Improvements to the Village's conveyance system will be designed in accordance the NYS Building Code and "Recommended Standards for Wastewater Facilities" (Ten State Standards).

Under this alternative, a single story 10' x 12' concrete operations building would be located near the pump station wet well and vault. The material and architectural style of this building would match the Nevele façade. This building will contain pump electrical equipment and instrumentation along with proper HVAC systems to control building climate. A back-up generator and automatic transfer switch will be incorporated to maintain power in the event of a power outage. An access drive designed to accept truck traffic will be provided in support of operations/maintenance of the pump station.

Considering the wet weather flow of 0.5 MGD at the Ellenville WWTP, adding the proposed project's estimated total wastewater flow of 0.148 MGD would increase the flow to the WWTP to 0.648 MGD. This would be below the WWTP's current operating capacity and leave a reserve capacity of 0.452 MGD for potential new wastewater flows.

5. Conclusions

Water Supply

The existing Village of Ellenville public water system has sufficient treatment, storage, and pumping capacity to satisfy the anticipated combined water demand of the Water District and the proposed Project. No adverse impacts on the Village's water distribution system are anticipated. Existing transmission facilities, currently serving the site (8" water main) are adequate to address domestic water demands.

As noted within, the total operating capacity of the Village's existing water system with the largest permitted source out of service is 0.75 mgd. The anticipated domestic water supply demand of the Nevele Resort is estimated to be 0.162 mgd. Therefore, considering the 2013 annual water produced by the Village (0.529 mgd), the total water demand of the system under the build condition would be 0.691 mgd.

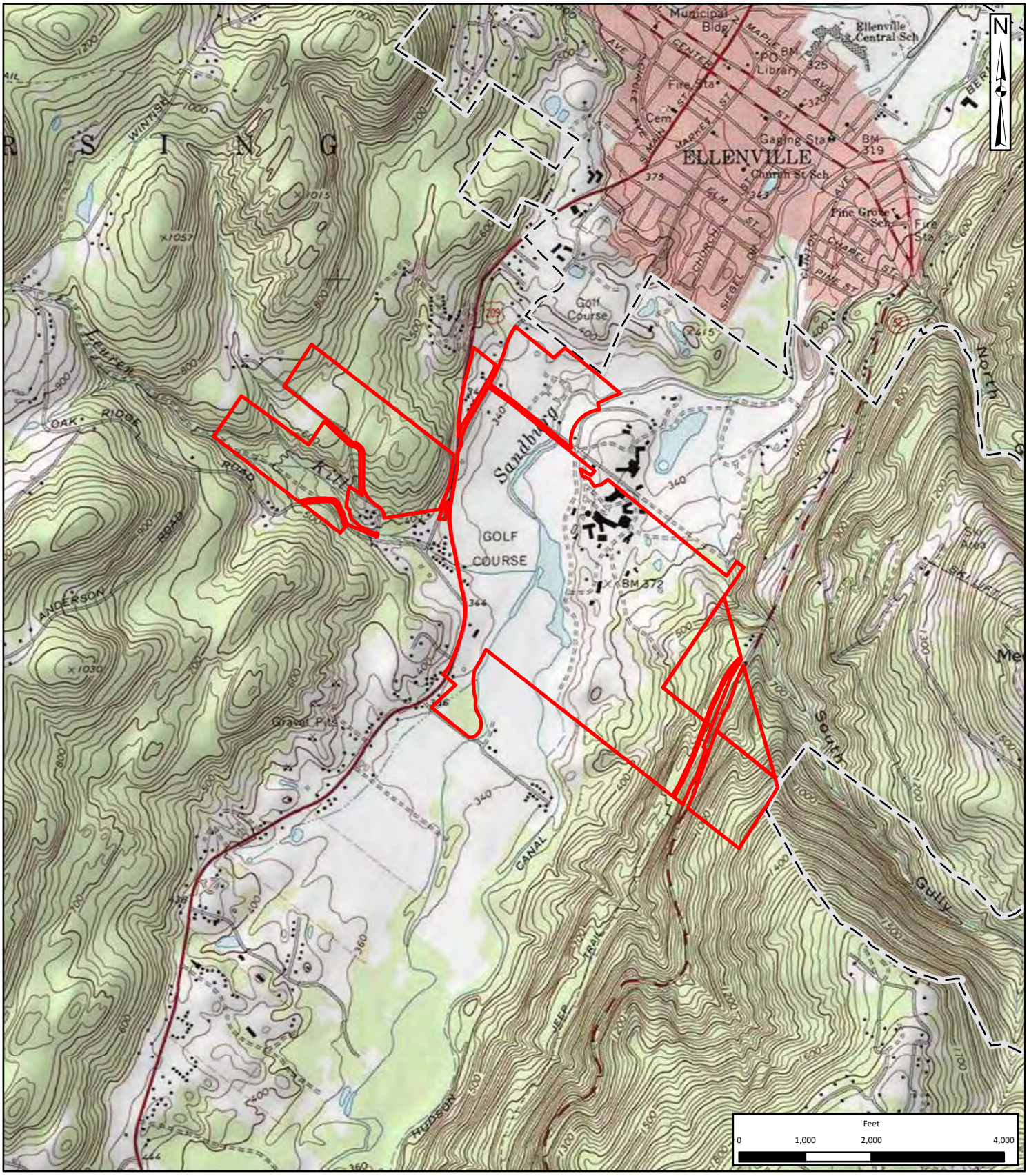
Existing Average Day Demand	0.529 mgd	
Nevele Resort Demand	0.162 mgd	
Total	**0.691 mgd**	**< 0.75 mgd**

Sanitary Sewer Supply

Based on the condition of the existing Nevele WWTP it is anticipated this plant will be decommissioned in conjunction with the proposed Project. Accordingly, the associated SPDES permit will be closed and terminated.

Based on the existing capacity of the Village's WWTP and the estimated flow resulting from the Project, there is sufficient capacity for wastewater to be treated by the Village's WWTP. Improvements may be necessary to the wastewater collection system off site to enable the conveyance of the wastewater from the Nevele to the Village.

Appendix A - Figure 1 – Site Location Map



THE Chazen COMPANIES
ENGINEERS/SURVEYORS
PLANNERS
ENVIRONMENTAL SCIENTISTS
LANDSCAPE ARCHITECTS

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375 Bay Road, Queensbury, NY 12804
Phone: (518) 812-0513

Nevele Resort, Casino and Spa Redevelopment Project

Site Location Map

Arrowhead Road, Town of Wawarsing - Ulster County, New York

Drawn:	GHM
Date:	01/16/2014
Scale:	1:24,000
Project:	31225.00
Figure:	XX

Path: R:\3\31200-31299\31225_00_Nevelle\GIS\maps\31225_00_SiteLocation_8x11.mxd

Appendix B -Anticipated Water and Sanitary Sewer Demands

Nevele Resort, Casino & Spa - Build-to Program v. 5 March 18, 2014

Projected Sewer Demands based on NYSDEC Table 3

Use	Size/No. of Units	Hydraulic Loading (GPD)		Average Day Demands (GPD)
Total Area (SF)				
Gaming	70,000	0.3	Casino	21,000 GPD
Hotel (Keys)				
Suites	61	110	Hotel	6,710
Deluxe Room	78	110	Hotel	8,580
Standard Room	307	110	Hotel	33,770
Restaurants-bars (seating)				
Steakhouse & Bar (2,700 sf)	121	35	Ordinary Restaurant	4,235
Coffee Shop (4,530 sf)	191	20	Lounge, Bar	3,820
Grab and go (800 sf)	58	25	Fast Food Restaurant	1,450
Food Hall (5,000 sf)	180	50	24- Hour Restaurant	9,000
Supper Club (within Nightclub)	250	35	Ordinary Restaurant	8,750
Noodle Shop (2,500 sf)	90	35	Ordinary Restaurant	3,150
Seasonal (pool, golf, etc)	436	35	Ordinary Restaurant	15,260
Bars (seating)				
Center casino bar	48	20	Lounge, Bar	960
Lobby Bar	84	20	Lounge, Bar	1,680
Seasonal (pool, golf, etc)	258	20	Lounge, Bar	5,160
Service Bars	3	20	Lounge, Bar	60
Entertainment (seating/capacity)				
Cabaret lounge (2,400 sf)	92	5	Concert Hall/Arena/Assembly Hall/Theater/Stadium/Skating Rink	460
Nightclub (8,500 sf)	500	5	Concert Hall/Arena/Assembly Hall/Theater/Stadium/Skating Rink	2,500
Retail Shops (sf)				
Golf (pro shop at golf course	4000	0.1	Shopping Center/Grocery Store/Department Store	400
Spa (within spa)	1200	0.1	Shopping Center/Grocery Store/Department Store	120
Sundries	1200	0.1	Shopping Center/Grocery Store/Department Store	120
Amenities (sf)				
Pool & bar	12000	0.3	Casino	3,600
Ice arena/outdoor events	30000	0.3	Casino	9,000
Event & meeting rooms	7800	0.3	Casino	2,340
Spa	10000	0.3	Casino	3,000
Child Care	10800	0.3	Casino	3,240
Fitness	3300	0.3	Casino	990
Stables	5000	0.3	Casino	1,500
Arcade	800	0.3	Casino	240
Tennis Court Clubhouse - 8 courts	1800	0.3	Casino	540
18-hole course & practice areas	136	20	Country Club & Golf Courses	2,720
Employee Headcount (units)				
Full time Employees	2070	15	Casino	31,050
		Total Average Day Flow		185,405 GPD
		Total Average Day Flow w/ 20% Reduction		**148,324 GPD**

Nevele Resort, Casino & Spa - Build-to Program v. 5 March 18, 2014

Projected Water Demands based on NYSDEC Table 3

Use	Size/No. of Units	Hydraulic Loading (GPD)	Assumed Type of Use	Average Day Demands (GPD)
Total Area (SF)				
Gaming	70,000	0.3	Casino	21,000 GPD
Hotel (Keys)				
Suites	61	110	Hotel	6,710
Deluxe Room	78	110	Hotel	8,580
Standard Room	307	110	Hotel	33,770
Restaurants-bars (seating)				
Steakhouse & Bar (2,700 sf)	121	35	Ordinary Restaurant	4,235
Coffee Shop (4,530 sf)	191	20	Lounge, Bar	3,820
Grab and go (800 sf)	58	25	Fast Food Restaurant	1,450
Food Hall (5,000 sf)	180	50	24- Hour Restaurant	9,000
Noodle Shop (2,500 sf)	90	35	Ordinary Restaurant	3,150
Supper Club (Within Nightclub)	250	35	Ordinary Restaurant	8,750
Seasonal (pool, golf, etc)	436	35	Ordinary Restaurant	15,260
Bars (seating)				
Center Casino Bar	48	20	Lounge, Bar	960
Lobby Bar	84	20	Lounge, Bar	1,680
Seasonal (pool, golf, etc)	258	20	Lounge, Bar	5,160
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Entertainment (seating/capacity)				
Cabaret lounge (2,400 sf)	92	5	Concert Hall/Arena/Assembly Hall/Theater/Stadium/Skating Rink	460
Nightclub (8,500 sf)	500	5	Concert Hall/Arena/Assembly Hall/Theater/Stadium/Skating Rink	2,500
Retail Shops (sf)				
Golf (pro shop at golf course	4000	0.1	Shopping Center/Grocery Store/Department Store	400
Spa (within spa)	1200	0.1	Shopping Center/Grocery Store/Department Store	120
Sundries	1200	0.1	Shopping Center/Grocery Store/Department Store	120
Amenities (sf)				
Pool & bar	12000	0.3	Casino	3,600
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Spa	10000	0.3	Casino	3,000
Child Care	10800	0.3	Casino	3,240
Fitness	3300	0.3	Casino	990
Stables	5000	0.3	Casino	1,500
Arcade	800	0.3	Casino	240
Tennis Court Clubhouse - 8 courts	1800	0.3	Casino	540
18-hole course & practice areas	100	20	Country Club & Golf Courses	2,000
Employee Headcount (units)				
Full time Employees	2070	15	Casino	31,050
		Subtotal		184,685 GPD
		Total Average Day Flow w/ additional 10%		203,154 GPD
		Total Average Day Flow w/ 20% Reduction		**162,523 GPD**

Appendix C - Water System Master Plan – Figure 3.3.1

LOCATION MAP
SCALE: 1"=2500'

SITE LEGEND:

- EXISTING PROPERTY LINE (GIS TAX PARCEL DATA)
- PROPOSED WATER MAIN
- PROPOSED SEWER FORCEMAIN
- PROPOSED LOW PRESSURE SEWER
- PROPOSED SEWER MAIN
- PROPOSED WASTE WATER PUMP SATION

PBW ARCHITECT
Government Center Building 2, Elting Court, 5th Floor Ellenville, NY 12428
3710 Grant Drive, Suite H, Reno, NV 89509
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Peter Wilday Architect
New York License # 035776

NEVELE
RESORT CASINO SPA
One Nevele Road
Ellenville, New York 12428

SITE PLAN

THE Chazen COMPANIES®
Engineers/Surveyors
Planners
Environmental Scientists
Landscape Architects
TCC JOB # 31225.02

DRAWN BY	DATE	REVISIONS
AD	04/11/14	
		△ 1
		△ 2
		△ 3
		△ 4
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		△ 6
		△ 7
		△ 8
		△ 9

NEVELE RESORT

WATER & WASTEWATER MASTER PLAN

FIG 3

PRELIMINARY
9/19/2014

Appendix D - Barton & Loguidice – Water System Improvement Letter, April 9, 2014

April 9, 2014

Mr. Chris Round
The Chazen Companies
547 River Street
Troy, NY 12180

Re: (V) Ellenville Water System Improvements Project
Nevele Redevelopment – Municipal Water Supply

File: 924.063.001

Dear Mr. Round:

Barton & Loguidice, D.P.C. (B&L) was retained by the Village of Ellenville to complete an engineering assessment of their water distribution system. The findings of the evaluation were presented in an Engineering Report entitled, "Village Water System Improvements Project, Facilities Plan", dated January 2008, revised August 2012, and evaluated the condition of the existing wells, storage tanks and overall distribution system.

The Village has a total permitted capacity and operating capacity of 1.71 mgd and 0.75 mgd respectively with the largest well out of service. A summary of the Village's water sources is provided below.

SOURCE WATER CAPACITY SUMMARY

Site	Source	Permitted Capacity	Operating Capacity*
North Gully WTP	Surface Water	0.52 mgd	0 mgd
Fallsview Well	Groundwater	0.72 mgd	0.66 mgd
Harris Well No. 1	Groundwater	0.28 mgd	0 mgd
Harris Well No. 2**	Groundwater	0.88 mgd	0.61 mgd
Center Street Well	Groundwater	0.19 mgd	0.09 mgd
TOTAL		**1.71 mgd****	**0.75 mgd****

* - Per Village's Water Department
** - Per NYSDOH, with multiple sources of both Surface Water and Groundwater, the overall capacity rating shall be determined assuming the largest permitted source supply is out of service. The largest permitted source is Harris Well No. 2.

According to the 2013 Water Billing Reports provided by the Village, the total amount of water billed for the year was 96,471,154 gallons (264,305 gpd) and the annual water produced estimated as 193,000,000 gallons (529,000 gpd). The Village has estimated that the system has 50% unaccounted for water due to numerous watermain breaks throughout the year. The 3 month summer average billed to customers was recorded as 0.299 mgd.

It is our understanding that anticipated domestic water supply demand of the redevelopment of the Nevele Resort and Casino project is estimated at approximately 162,000 gpd or 0.162 mgd. The total water demand required of the system would be 0.691 mgd. As noted in the table above, the total operating capacity of the Village's existing system with the largest permitted source out of service is 0.75 mgd.

Existing Average Day Demand	0.529	mgd
Nevele Resort Demand	0.162	mgd
Total	**0.691**	**< 0.75 mgd**

The Village is currently proceeding forward with several construction projects to improve its distribution system and water sources, which will be constructed in the Summer/Fall of 2014. Improvements are proposed at the Fallsview well site to replace the vertical turbine well pumps, which will increase the capacity of the pumps to the permitted capacity. The Village is also beginning hydrogeological investigations to locate a new groundwater well in the Village to increase the available source capacity serving the system. Once these improvements are completed, the Village will be able to serve the Nevele Redevelopment project and its residents even further.

If you have any additional questions on the revisions discussed herein or the proposed project, please do not hesitate to contact our office.

Very truly yours,

BARTON & LOGUIDICE, D.P.C.

Jason A. Ballard, P.E., LEED AP
Managing Engineer

EAU/ojf

CC: Joe Stoeckeler, Jr, Village Manager

Appendix E - Sanitary Sewer System Master Plan – Figure 3.5.1

Appendix F - Barton & Loguidice – Sanitary Sewer System Improvement Letter, April 9, 2014

April 8, 2014

Mr. Chris Round
The Chazen Companies
547 River Street
Troy, NY 12180

Re: (V) Ellenville Water System Improvements Project
Nevele Redevelopment – Municipal Sewer System Evaluation

File: 924.063.001

Dear Mr. Round:

Barton & Loguidice, D.P.C. (B&L) was retained by the Village of Ellenville in a letter agreement dated March 28, 2014, revised April 3, 2014 to provide a limited evaluation or the capacity of their sewer collection and treatment system in relation to the proposed Nevele Resort Redevelopment Project. The analysis included a review of the treatment capacity of the wastewater treatment plant (WWTP), current annual sewer flows, an analysis of the inverted siphon under Sandburg Creek, and a review of the expected collection system capacity based on available existing mapping.

Based on information provided by The Chazen Companies (Chazen), it is our understanding that the proposed development will discharge approximately 163,000 gpd (0.163 mgd). This sewer flow will be conveyed to the Village via a force main at an unknown flow rate to one of two potential connection points to the Village's existing sewer collection system.

A review of the sewer treatment capacity indicates that the WWTP is operating at a permitted capacity of 1.1 mgd and experiences normal dry weather flows of 0.3 mgd and wet weather flows of 0.5 mgd. Based on the projected flows from the proposed redevelopment, the Village has sufficient treatment capacity to accommodate the projected increase in flow from the proposed Nevele Redevelopment. A summary of existing and projected flows are provided in the following table.

Village of Ellenville Nevele Connection to Village Sewer System Sewer System Flows Summary	
Plant Capacity (mgd):	1.10
Existing Wet Weather Flow (mgd):	0.50
Existing Dry Weather Flow (mgd):	0.30
Projected Wet Weather Flow (mgd):	0.66
Projected Wet Weather Reserve Capacity (mgd):	0.44

A limited review of the existing sewer collection system along the proposed conveyance path, identified as Alternate 1 (Connection at Nevele Road) and Alternate 2 (Connection at Pine Street), has been conducted. The analysis calculated the capacity of the siphon under Sandburg Creek based on field measurements and the capacity of the existing gravity sewer lines was based on existing mapping. The following table shows the calculated limiting capacities along each pipe route:

Village of Ellenville
Nevele Connection to Village Sewer System
Limiting Capacities of System

Route Alternative 1: Nevele Road

From Manhole Number	To Manhole Number	Full Pipe Capacity (gpm)	Full Pipe Capacity (cfs)	Full Pipe Capacity (mgd)	Assumed Existing Flows (mgd)	Assumed Proposed Flows (mgd)
199	135	320	0.72	0.47	0.375	0.54
135	134	320	0.71	0.46	0.375	0.54
134	133	340	0.76	0.49	0.375	0.54
133	132	340	0.75	0.48	0.375	0.54
132	209	340	0.76	0.49	0.375	0.54
69	68	460	1.03	0.66	0.375	0.54

Route Alternative 2: Pine Street

From Manhole Number	To Manhole Number	Full Pipe Capacity (gpm)	Full Pipe Capacity (cfs)	Full Pipe Capacity (mgd)	Assumed Existing Flows (mgd)	Assumed Proposed Flows (mgd)
262	261	370	0.83	0.53	0.125	0.29
364	Siphon	490	1.08	0.70	0.125	0.29

For the basis of this analysis, it has been assumed that 75% of the existing flows are from the portion of the existing system served by Route 1 and 25% of the existing flows are from the portion served by Route 2 as described herein.

Based on this analysis, it suspected that projected pipe flows may exceed the pipe capacities as indicated above. It is to be noted, however, that no metering of existing flows or visual inspection of the pipe condition has been completed to date. Therefore, it is imperative that the final design of the force main connections to the existing collection system include a detailed analysis of the existing flow rates, the proposed pumping rates of the proposed project and physical condition of the collection system prior to connection.

In summary, the Village has sufficient capacity at the WWTP to accommodate the proposed redevelopment flows, however a detailed analysis of the existing flows and proposed pumping rates must be considered in order to evaluate the need for potential upgrades to the collection system to accommodate the projected sewer flows.

If you have any questions, please do not hesitate to contact our office.

Very truly yours,

BARTON & LOGUIDICE, D.P.C.

Craig M. Marti, PE
Senior Managing Engineer

CMM/ojf

CC: Joe Stoeckeler, Jr., Village Manager