

Appendix C.3

Analysis of Impacts Associated with Wastewater at the Proposed Belleayre Resort



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PROJECT TECHNICAL MEMORANDUM

TO: NYCDEP – OEPA

FROM: EA Engineering, P.C. and its Affiliate EA Science and Technology

SUBJECT: Crossroads DEIS Review – Subtask C.3, Deliverable No. 4
Analysis of Impacts Associated with Wastewater at the Proposed Belleayre Resort
EA Project No. 14112.01

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INTRODUCTION

This Technical Memorandum summarizes the results of Subtask C.3 – Analysis of Impacts Associated with Wastewater as presented in the Draft Environmental Impact Statement (DEIS) for the Belleayre Resort at Catskill Park (Belleayre Resort). This review focused primarily on the adequacy of the proposed wastewater treatment controls to ensure prevention of water quality degradation (NYCDEP 2002). The proposed, privately-owned, wastewater treatment plants (WWTPs) and other wastewater treatment methodologies were reviewed.

WASTEWATER ANALYSIS

Technical analyses of the wastewater systems focused on a review of the following components of the DEIS: Executive Summary; Sections 2 and 5 of the text; Delaware Engineering Plan Sheets 1, 2, 8, 9, and 20 through 29 for Big Indian; Delaware Engineering Plan Sheets 1 through 14 for Wildacres; Appendix 2 (Big Indian State Pollutant Discharge Elimination System [SPDES] permit application [NYSDEC 2003], Wildacres SPDES permit application, and Stream Disturbance and 401 Water Quality Certification permit application); and Appendix 8. These sections were reviewed with respect to the parameters discussed below and specific comments for each parameter are presented.

COMMENTS FOR BIG INDIAN RESORT

Anticipated Flow Capacity

1. In Section 2.1 of DEIS Appendix 8, the estimate of peak instantaneous loading is 6 times the design average flow based on New York State Department of Environmental Conservation (NYSDEC) Design Standards for Wastewater Treatment Works (NYSDEC Design Standards [NYSDEC 1988]). It is not clearly stated whether the value of 520,632

Please note: this document is not a carbon copy of the comments submitted to NYSDEC. Inaccurate pagination has been corrected.



gpd incorporates the 20 percent reduction due to water-saving practices, as specified in Section 15-0314 of the Environmental Conservation Law. The design average loading (after the 20 percent reduction) is 86,772. Multiplying this by 6 equals 520,632 gpd.

2. Several items were listed in Section 1.2 of Appendix 8 as components of Belleayre Resort, however, some appear to be missing from the hydraulic loading estimates in Table 1. These include:
 - The pro shop and locker room—applicant needs to verify that these are included with the golf clubhouse
 - The carriage barn and tennis courts—the applicant needs to verify that these are included with another facility.
3. In addition, the hydraulic loading does not take into account the maintenance shops and locker rooms associated with the WWTP itself. As a gross estimate, these contributions may be similar to the golf maintenance shop (850 gpd), which must be included in the calculations.
4. The hydraulic loading estimate in Table 1 of Appendix 8 specifies a daily flow of 3 gal/day/seat and 200 seats, for a total of 600 gpd for the Ballroom. Table 3 of the NYSDEC Design Standards states that Catering, or Banquet Facilities, should be estimated at 20 gal/day/person for a total of 4,000 gpd for the Ballroom. Because of the significant impact of this error on hydraulic loadings to the WWTP, this must be corrected in the DEIS.
5. Additionally, based on preliminary results of the REMI simulation conducted by RKG for the overall project, the addition of 158 new housing units to the market is projected (Appendix B.4). If this build-out was to occur entirely within the existing boundaries of the Pine Hill Sewer District or was close enough to warrant extension of the District, the Pine Hill WWTP would receive significant additional load. Calculated based on the same criteria used in the DEIS and Table 3 of the NYSDEC Design Standards, this additional load is estimated at approximately 75,050 gpd. As in the previous comment, this must be evaluated in the context of the design and existing capacity of the Pine Hill WWTP and any future impact on the Big Indian WWTP.
6. In Section 1 of the DEIS, there is discussion about the benefits that the Belleayre Ski Center will gain from the project and how this development could significantly increase the number of skiers. Such a projected increase could potentially increase the sewage flow at Belleayre Ski Center, which discharges wastewater to the Pine Hill WWTP. Although not directly affecting the Big Indian WWTP, the DEIS does not address the limited flow from the Belleayre Ski Center to the Pine Hill WWTP that is currently allowed per the Memorandum of Understanding between New York City Department of



Environmental Protection (NYCDEP) and NYSDEC. The Belleayre Ski Center wastewater flow during the 2003 averaged 10,000 gpd. However, during December 2003, there were three peaks as high as 40,000-50,000 gpd. The 1999 NYCDEP/NYSDEC Memorandum of Understanding has a limit on the maximum sewage flow of 35,000 gpd. The other peaks throughout the year 2003 ranged between 20,000 and 25,000 gpd. The DEIS is deficient in not addressing the treatment options for the potential increase in the sewage associated with the increased number of skiers projected at Belleayre Ski Center due to the operation of the Belleayre Resort.

Collection System(s)

1. As shown on Drawings 20 through 24, sewer mains are proposed in some locations at slopes greater than 20 percent. In accordance with Section 33.46 of the Ten States Standards, sewers on 20 percent slopes or greater must be anchored securely with concrete anchors, or equal. This is not addressed on the design drawings.
2. As specified on Page 24 of the NYSDEC Design Standards and Page 20-5 of Ten State Standards, a description of the plans for testing of the sewer system following construction is required. These plans should be provided in the DEIS.

Pumping Systems

1. On Drawing 8, data for the grinder pumps were provided indicating that the pump systems would have 91-gal capacity sumps and 9-gpm capacity pumps at 138 ft total dynamic head. These appear to be adequate for the single dwelling use as proposed for Big Indian. Although grease traps are also shown on Drawing 8, it is unclear if, and where, these will be used. Locations of grease traps must be indicated on drawings and a maintenance schedule provided.
2. Table 7 on Page 23 of the NYSDEC Design Standards requires that back-up grinder pumps be stocked to fulfill the State requirement of 24-hour repair. For example, systems that use between 1 and 10 grinder pumps should stock at least 1 back-up grinder pump. The number of back-ups to be stocked should be specified in the text.
3. The size and capacities of the pumps and wetwells should be evaluated in the DEIS in the context of the increasing loadings over the phased construction period of the project facilities. Any progressive build-out of the wastewater infrastructure through this period must be reflected on the Drawings.

Treatment Technologies and Processes

1. The continuous backwash upflow dual sand filtration units (CBUDSF units [Section 4.4 of Appendix 8], specifically Dual Sand System (DSS) units [Drawing 26]) proposed for the WWTP appear to meet the technology requirements of the system to achieve the intent of the Filtration Avoidance Determination (U.S. EPA 2002); however, the



proposed number of units/capacity is not adequate. The meaning of the note “future” for CBUDSF units (Alternate 4 Drawing 26 of Delaware Engineering Drawings) should be explained; it is not clear whether these units are for future expansion or incremental installation as the WWTP demand increases up to the SPDES permitted flow as the project is developed. NYCDEP feels that the number of units proposed without the “future” units installed does not meet the requirements of the *Rules and Regulations for the Protection From Contamination, Degradation and Pollution of the New York City Water Supply and Its Sources* (Watershed Regulations) (NYCDEP 2002). If the reference to future units is eliminated and the full system with the future units is installed, it will meet the requirements of the Watershed Regulations.

2. The proposed intermittent cycle extended aeration (ICEAS) system (Web site: <http://sanitaire.com/abj/abjinstallations2.asp>; U.S. EPA 1999) was examined and determined to be an appropriate WWTP technology. A number of existing ICEAS systems were reviewed and the proposed vendor specifies in their product information that there are 47 such systems currently in operation in New York. One consideration related to the ICEAS is treatment performance during cold weather. The design should address the possible addition of protective covering of the basins for achieving optimal treatment during the cold weather season; approximately half of the operating systems in New York include cold weather protective covers.
3. The estimated wet sludge and dry sludge production quantities, as well as the expected availability of solid waste disposal facilities, must be presented in the DEIS. The DEIS states that 5,304 gpd of sludge will be produced and the proposed sludge treatment consists of an aeration holding tank with no decant ports. The DEIS does not indicate where this volume would be transported for ultimate disposal and what facility can accept this volume. Delaware County Landfill does not take liquid sludge. New York City-owned WWTPs operating in the vicinity accept septage but could not process this volume per day and do not accept liquid sludge at all. Transport of liquid sludge on the highways in the West of Hudson watershed is not a preferred option. The DEIS must evaluate the potential environmental impact of transport of liquid sludge if this option is proposed. The preferred alternative should incorporate sludge dewatering and drying facilities and holding capacity on the WWTP site.
4. The DEIS states that approximately 2,114 person-years will be involved with the 8-year construction activities. This estimate includes construction of the WWTP. In accordance with Section 11.28(i) of the Ten States Standards, a proposed plan for management of wastewater during construction activities is necessary. Additionally, this plan must be in place prior to the start of construction activities.



System Components (including any modular components)

1. Drawing 28 shows some filtration units as “ghosts” and/or labeled “for future use.” The DEIS is unclear as to the proposed start-up procedure for the WWTP or phasing of operations; however, in order to ensure compliance with the Watershed Regulations, all of the sand filters shown must be installed and placed on-line at start-up. Detailed documentation of the operating procedures must be provided in the DEIS to ensure that the proposed WWTPs will be operated as designed.
2. The standby generators for the WWTPs (Drawing 29) are located outside of the building and are to operate using diesel fuel. If a Spill Prevention Control and Countermeasure Plan is required under Federal and State regulations, such a plan must be addressed in the DEIS. Relocation of the system to an area inside the WWTP building should be evaluated.
3. On Drawing 26, elevations for the Influent Vault - Section View are not provided.
4. On Drawing 27, elevations for the Bubble Aeration Basin Section B-B are not provided.
5. On Drawing 27, the influent line to the sludge basin is not shown on the plan view.
6. On Drawing 28, elevations for Section A-A and Section B-B are not provided.

Potential Siting Concerns

1. Phased construction of the WWTP for low flows must be addressed in the DEIS, since it would take time for Belleayre Resort to be at full build-out and full capacity. As currently planned, construction of the WWTP would occur over Years 1 and 2. It is recommended that the hydraulic loading be presented in phases and operational flexibility be specifically discussed in the DEIS.
2. The DEIS should include an evaluation of the proposed site for the WWTP. As outlined in Section 11.28 (c) of the Ten States Standards, a site evaluation shall be included with the alternatives. As part of the requirements of the site evaluation, factors such as the accessibility and topography of the site, areas for future plant expansion, and preliminary assessment of site availability, along with factors such as cut and fill requirements, depth to groundwater, and potential effects of odors from the WWTP, should be included.
3. For the WWTP, as shown on Drawing 23, consideration should be given to the location, as the proposed location is at the bottom of a steep slope (approximately 20.8 percent), which may pose a problem for stormwater management in this area. Details on the site evaluation and selection process must be provided in the DEIS to confirm that the siting of the WWTP is most appropriate.



4. There is no discussion of possible future expansion of the WWTP. There are statements in the DEIS regarding limits on the site disturbance that will occur, but no discussion about modifying the proposed WWTP for additional capacity.

Treated Effluent Disposal Options

1. Discharge from the WWTP is limited to Birch Creek or the irrigation ponds. The Birch Creek discharge structure should be designed in accordance with Section 55.1 of the Ten States Standards and also the New York State Erosion and Sediment Control Guidelines (New York State Soil and Water Conservation Committee, April 1997). These documents indicate that the outfalls must be constructed and protected against the effects of floodwater, tide, ice, or other hazards to ensure structural stability and freedom of stoppage.
2. Calculations supporting that erosion control has been considered for the effluent discharge at Birch Creek should be provided, since very little detail is included on Drawing 26. For example, on Drawing 26, a Jersey barrier is shown, which is not a coffer dam. Enhancements to the design will be necessary.
3. The effluent pump station shown on Drawing 25 is not detailed. Information regarding the size of the wet well, type of pump, or any other appurtenances are not included, thus, they cannot be evaluated. Details on the pump station, as well as calculations supporting the discharge piping to Birch Creek or the irrigation ponds, should be provided.

Regulatory Permitting Issues

Appendix 2, the SPDES permit application for the WWTP discharge, shows two different discharge flows (86,772 gpd for Outfall 001 to Birch Creek, and 86,722 gpd for Outfall 002) to the irrigation pond. These should be the same at 86,772 gpd, based on a 20 percent reduction of the flow of 108,465 given in Table 1 of Appendix 8.

Appendix 2 does not address the required permitting for the construction phase of the WWTP as specified in New York State, SPDES General Permit for Stormwater Discharges from Construction Activities Permit No. GP-02-01.

Subsurface Treatment or Disposal Groundwater Mounding

Subsurface treatment only applies to the Gatehouse area, as stated in Section 4.4 of Appendix 8. It is feasible and warranted to design a separate subsurface disposal system for the Gatehouse, given its distance from the WWTP. However, it is stated on Pages 4 and 5 of the NYSDEC Design Standards that:

Trenches may be placed on slopes of up to 20 percent, but beds should be limited to sites with slopes no greater than 5 percent.



The proposed site for the Gatehouse absorption field has an estimated slope of 25 percent, as shown on Drawing 24. Therefore, the location of the absorption field must be relocated.

Seasonal Permeability of Soil

The permeability of the soil in the area of the Gatehouse was surveyed in 1979 and then tested again for the Delaware County soil mapping that is currently being compiled. There were 20 test pits and 12 percolation tests done across the Big Indian Resort portion of Belleayre Resort in November 2000 (Section 3.1 of Appendix 8), and the results indicated that the permeability of the soil for the small flow from the Gatehouse may be acceptable.

COMMENTS FOR WILDACRES RESORT

Anticipated Flow Capacity

1. In Section 2.1 of DEIS Appendix 8, the estimated peak instantaneous loading is 6 times the design average. It is not clearly stated whether the value of 674,088 gpd is after the 20 percent reduction due to water saving practices, as specified in Section 15-0314 of the Environmental Conservation Law. The design average loading (after the 20 percent reduction) is 112,348 gpd. Multiplying this by 6 equals 674,088 gpd.
2. The design peak hourly flow for the WWTP flow should be 4 times the design average flow, as required by Chapter 10, Figure 1 in the Ten States Standards, and not 3 times. Therefore, the peak design hourly hydraulic loading would be 449,392 gpd instead of 337,044 gpd.
3. The water supply demand for the Wildacres Resort, Highmount Estates, and Wilderness Activity Center is estimated at 109,308 gpd in the DEIS. This is 22 percent lower than the sewage flow estimated for the same area. Standard engineering practice typically holds that water demand is higher than the sewage flow within a designated developed area. The source of this inconsistency must be evaluated and explained in the DEIS.
4. The hydraulic loading estimate in Table 1 of Appendix 8 specifies a daily flow of 3 gal/day/seat and 700 seats, for a total of 2,100 gpd for the Ballroom. Table 3 of the NYSDEC Design Standards for Wastewater Treatment Works states that Catering or Banquet Facilities should be estimated at 20 gal/day/person, for a total of 14,000 gpd for the Ballroom. This must be corrected in the DEIS because of the potential impact on treatment system sizing and SPDES Permit conditions.
5. Several items were listed in Section 1.2 of Appendix 8 as components of Belleayre Resort, however, some appear to be missing from the hydraulic loading estimates in Table 1 of Appendix 8. These include:



- The locker rooms that are separate from those in the activity center—applicant should verify that these are included.
- The lap pool (separate from the pool/health club and the indoor pool)—applicant should verify that this is included.
- The athletic facilities in the *Activity Center*—applicant should verify that this is included.
- Applicant should verify that the 50 kitchens that are listed as part of the 250-room hotel have been included.
- Applicant should verify that the golf pro shop has been included.

In addition, the hydraulic loading does not take into account the maintenance shops and locker rooms associated with the WWTP. As a gross estimate, these contributions may be similar to the golf maintenance shop (850 gpd), and should be included for completeness in the calculations.

Collection System(s)

1. The projected flows from each source, as shown in Table 1 of Appendix 8, were used to calculate proper sizing for the proposed collection systems. It appears that the length of the wastewater piping between the Wildacres Resort itself and the main force-line (approximately 400 ft) may be under-sized. General wastewater design practice suggests that the velocity of wastewater remains between 2 and 10 ft/sec to prevent settling (occurs if the velocity is less than 2 ft/sec) or scouring (occurs if the velocity is greater than 10 ft/sec) (Metcalf & Eddy 1981). The NYSDEC Design Standards and Ten State Standards state the velocity must be below 15 ft/sec. The initial 350-ft section of piping from Wildacres Resort would reach a peak velocity of 19.2 ft/sec and velocities in the next 50 ft of the main line would reach a velocity of 12.6 ft/sec, both higher than 10 ft/sec. Therefore, larger diameter piping should be considered for these segments.
2. As shown on Drawings 3 through 7, sewer mains are proposed in some locations at slopes greater than 20 percent. In accordance with Section 33.46 of the Ten States Standards, sewers on 20 percent slopes or greater shall be anchored securely with concrete anchors, or equal. This is not addressed on the design drawings.
3. As specified on Page 18 of the NYSDEC Design Standards, a description of the plans for testing of the sewer system following construction are required. This should include the testing methods, such as leakage testing, gravity sewer deflection testing, and manhole vacuum testing. These plans should be provided in the DEIS.



Pumping System(s)

1. The grinder pumps proposed on Drawing 9 and Exhibit E of Appendix 8 were evaluated and the pump size, capacity, and type were determined to be appropriate, except for one location. The area is near the Wildacres Resort itself, where 2-in. piping is proposed from the Resort and Clubhouse. This area could potentially have a flow rate of 19.2 gpm and, at this flow rate, the piping should be at least 3 in. to accommodate this high flow. The referenced manufacturer's specification sheet identifies three different pumps. The specific grinder pump proposed at each location should be identified to allow verification of the proper pipe sizing, since several different sizes are presented in the DEIS.
2. Table 7 on Page 23 of the NYSDEC Design Standards requires that back-up grinder pumps be stocked onsite to fulfill the state requirement of 24-hour repair. For example, in a system with 20-40 grinder pumps proposed as for the Wildacres Resort, 3 back-up grinder pumps should be stocked. The DEIS should specify the number of back-up pumps that will be stocked to meet this requirement.

Treatment Technologies and Processes

Comments on the treatment technologies and processes for Wildacres Resort are the same as those for Big Indian. In summary:

1. The dual sand filtration units (CBUDSF units [Section 4.4 of Appendix 8] or DSS units [Drawing 26]) proposed for the WWTP appear to meet the technology requirements of the system to achieve the intent of the Filtration Avoidance Determination (U.S. EPA 2002) however, the proposed number of units/capacity is not adequate to meet the Watershed Regulations if those units designated "future" are not installed at the time of start-up.
2. The proposed ICEAS system (Web site: <http://sanitaire.com/abj/abjinstallations2.asp>; U.S. EPA 1999) was examined and determined to be an appropriate WWTP technology; however, cold weather protective covering should be evaluated in the DEIS.
3. The DEIS does not indicate where and how disposal of liquid sludge will occur. Delaware County Landfill does not take liquid sludge. New York City-owned WWTPs operating in the vicinity accept septage but could not process this volume per day and do not accept liquid sludge. Transport of liquid sludge on the highways in the West of Hudson watersheds is not a preferred option. The preferred alternative should incorporate sludge dewatering and drying facilities and holding capacity on the WWTP site.
4. A proposed plan for management of wastewater during construction activities is necessary. This plan must be in place prior to the start of construction activities.



System Components (including any modular components)

The WWTP components specified for Wildacres Resort are of the same design and have the same issue as those specified for Big Indian. The DEIS is unclear as to the proposed start-up procedure for the WWTP or phasing of operations; however, in order to ensure compliance with the Watershed Regulations, all of the sand filters shown must be installed and placed on-line at start up. The standby generators for the WWTPs (Drawing 29) are located outside of the building and are to operate using diesel fuel. Relocation of the system to an area inside the WWTP building should be evaluated and a Spill Prevention Control and Countermeasure Plan should be prepared if required by federal regulations.

Potential Siting Concerns

1. Phased construction of the WWTP for low flows should be addressed in the DEIS, since it would take time for Belleayre Resort to be at full build-out and full capacity. As currently planned, construction of the WWTP would occur over Years 1 and 2. It is recommended that the hydraulic loading be presented in phases and operational flexibility must be specifically discussed in the DEIS.
2. The DEIS should include an evaluation of the proposed site for the WWTP. As outlined in Section 11.28 (c) of the Ten States Standards, a site evaluation shall be included with the alternatives. As part of the requirements of the site evaluation, factors such as the accessibility and topography of the site, areas for future plant expansion, and preliminary assessment of site availability, along with cut and fill requirements, depth to groundwater, and potential effects of odors from the WWTP, should be included. As shown on Drawing 6 and considering the proposed wastewater conveyance system and the hydraulic characteristics of this system, the WWTP appears to be situated in an acceptable location. However, as specified, details on the site evaluation and selection process should be provided in the DEIS to confirm that the siting of the WWTP is most appropriate.
3. There is no discussion of possible future expansion of the WWTP. There are statements in the DEIS regarding limits on the site disturbance that will occur, but no discussion about modifying the proposed WWTP for additional capacity.

Treated Effluent Disposal Options

1. The effluent pump station shown on Drawing 8 is not detailed. Information regarding the size of the wet well, type of pump, and any other appurtenances are not included, thus, they cannot be evaluated. Details on the pump station, as well as calculations supporting the discharge piping to the unnamed tributary to Emory Brook or the irrigation pond, should be provided.



2. Discharge from the WWTP is limited to the unnamed tributary to Emory Brook or the irrigation pond. The discharge structure should be designed in accordance with Section 55.1 of the Ten States Standards. It states that the outfalls should be constructed and protected against the effects of floodwater, tide, ice, or other hazards to ensure structural stability and freedom of stoppage.
3. On Drawing 7, the pipe sizing for the discharge to the irrigation pond is not provided.

Regulatory Permitting Issues

Appendix 2 does not address the required permitting for the construction phase of the WWTP as specified in New York State SPDES General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-02-01

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