3.5.4 Water Resources Comments and Responses

Comment 3.5-1 (Letter 3, John W. Petronella, Environmental Analyst, New York State Department of Environmental Conservation, July 1, 2010): It is indicated in the DEIS that the project will have a stormwater pollution prevention plan (SWPPP) designed in accordance with the NYSDEC SPDES General Permit (GP-0-10-001). The applicant should be aware that a new stormwater design manual is due out soon. Permittees will have six months to start using this new design manual. It is likely that by the time the project sponsor applies for permits for this project, they will have to use the new design manual to be covered under the General Permit. The new manual is significantly different from the current one in that it uses more green infrastructure and infiltration practices. The Department recommends that when the project sponsor refers to the current design manual in the DEIS, they should add "or subsequent revision".

Response 3.5-1: *The Applicant is aware of the new stormwater design manual and will update the project plans to conform to any new requirements applicable to this project prior to submitting plans for approvals.*

Comment 3.5-2 (Letter 3, John W. Petronella, Environmental Analyst, New York State Department of Environmental Conservation, July 1, 2010): Additional comments may be generated on stormwater during review of the SWPPP. Authorization for coverage under the SPDES General Permit is not granted until approval of the SWPPP and issuance of any necessary DEC permits.

Response 3.5-2: *Comments noted.*

Comment 3.5-3 (Letter 3, John W. Petronella, Environmental Analyst, New York State Department of Environmental Conservation, July 1, 2010): Water Supply - According to the information provided in the DEIS, 16 exploratory groundwater wells have been installed and 4 wells have been tested to date for yield (Well P, DD, O and HH). Based upon the above identified total flow rates for these 4 wells (468 gpm), and with the largest producing well out of service (268 gpm), there is sufficient capacity for only the Phase 1 portion of the project (estimated at 268 gpm). According to the Final Scope, section E. Water Resources, wastewater flows by facility and unit type must be estimated and potable groundwater demand and expected yield must be quantified. At this time, a water supply sufficient to accommodate the project at full build out has not been demonstrated. Without this information, potential impacts from groundwater withdrawal and potable well location cannot be completely assessed. The project sponsor should continue with these assessments and demonstrate an adequate water supply and only then will the items in the Scope have been satisfied. Without this information, the Department will be unable to make positive findings statements and issue necessary permits.

Response 3.5-3: *Projected wastewater flows by facility and unit type and potable groundwater demand are indicated in DEIS Appendix M1. Expected well yields for wells in place as of the date of this FEIS are presented in the updated Water Supply Report in FEIS Appendix E (prepared as an addendum to DEIS Appendix M1). The seven water wells proposed to be utilized as sources of domestic water for the development (bedrock Wells FFF, JJJ, HH, TW-3a, TW-5, TW-6 and O) are described in the report, except for Well HH which was reported in the DEIS report. The report shows that the estimated well field production would meet the average and peak day demands for the fully built project, without accounting for the largest well (TW-5) out of service.*

The updated Water Supply Report was provided by the Applicant to NYSDEC, NYSDOH and DRBC for review and comment. No comment was received from NYSDEC or DRBC. In its letter dated January 21, 2011 (included in FEIS Appendix B), NYSDOH outlined its response to four questions raised by the Applicant regarding the necessary water supply:

- *a 330 gallon per day per unit (3 bedroom house) is reasonable for determining residential water demand*
- *a Max Day peaking factor of 1.8 may be used*
- *the "largest well out of service" redundancy stated in the "Ten States Standards" will be required*
- *applications to and plan approvals by the NYSDOH, and actual construction, may be conducted by phase as project build-out progresses. This approach will likely involve periodic agency reviews of the built portions of the project to ensure that adequate water supply will be available as per NYS codes and standards.*

For purposes of SEQR, a water supply sufficient to accommodate initial phases of the project at full build-out has been demonstrated, and potential impacts from groundwater withdrawal from the established wells on-site have been assessed. Based on the water analysis and information provided by NYSDOH, the Applicant believes it has demonstrated that sufficient water supply is available to permit the first phases of the project to be approved and built, and utilizing actual water use data for subsequent phase approvals, the project will mitigate and avoid any potential significant adverse impact resulting from the water supply.

The following mitigation measures are proposed for Lost Lake Resort:

- *Water supply for the project will be permitted on a phase by phase basis after demonstrating adequate supply for full build of that phase and all prior phases using 330 gallon per day per unit for residential water demand and 1.8 peaking factor, with the best well out of service.*
- *Actual water use data from prior developed phases may be considered in subsequent phase permit approvals, subject to the review and approval of the permitting agencies.*
- *Additional on-site wells will be developed if determined to be needed to meet permitting requirements.*
- *Water supply wells proposed for use must be subjected to a 72-hour pump test demonstrating a stabilized yield for at least 6 hours, and must be subjected to Subpart 5 water quality analysis. Any added well must also be evaluated for impacts to off-site wells.*
- *The Applicant will monitor identified off-site wells after the resort wells are in normal operation, if authorized by the private well owner(s). Any impact to any existing off-site private well requiring a response action that is demonstrated to be a result of this project must be mitigated by the Applicant.*
- *Water supply must meet the applicable requirements of NYSDOH, NYSDEC and DRBC to obtain permits prior to final site plan approval by the Planning Board.*

Comment 3.5-4 (Letter 3, John W. Petronella, Environmental Analyst, New York State Department of Environmental Conservation, July 1, 2010): Additional comments on Water Supply may be generated during the Water Supply application process. The project sponsor should also be aware that the Department will not accept an off-site water analysis to justify water use on the subject site.

Response 3.5-4: *Comments noted.*

Comment 3.5-5 (Letter 3, John W. Petronella, Environmental Analyst, New York State Department of Environmental Conservation, July 1, 2010): Wastewater - According to the DEIS, at full build-out using the preferred alternative, the average daily flow (ADF) is 870,335 gallons per day (gpd) and the peak daily flow (PDF) is 2,611,005 gpd. The proposed discharge location is to the Bush Kill (NYS Water Index # D-1-22, Class Bt). The Bush Kill is a head water trout stream that flows through a portion of the Neversink River Unique Area, a highly regarded fishing location and ecologically rich and unique natural area. The average daily flow of the Bush Kill at this location needs to be evaluated to determine what percentage of this flow will be wastewater at each phase and at full build-out, using both the ADF and PDF. Typically, in order to protect trout streams and maintain water quality, a dilution rate of 10-1 stream flow to effluent is needed. This dilution rate at maximum build-out and flow should be demonstrated, or alternative scale proposals may need to be pursued.

Response 3.5-5: *The average daily flow at the location of the Bush Kill where the wastewater treatment plant (WWTP) discharge is proposed was estimated using Streamstats (USGS, 2008), which is a web-based Geographic Information System (GIS) application that enables streamflows at any location to be estimated. For ungaged sites such as the Bush Kill, the program uses regression analysis to relate streamflow statistics computed for a group of selected stream gaging stations (usually within a State) and basin characteristics measured for the stations. The basin size upstream from the WWTP discharge is 8.69 square miles, with a calculated mean annual runoff of 23.7 inches, which converts to an average daily flow of 6,796 gpm (rounded to 6,800 gpm). The percentage of the total flow that will be wastewater at the point of discharge to the Bush Kill for each phase of the development and full buildout is as follows:*

Proportion of Wastewater Flow to Stream Flow							
Phase	Bush Kill Average Daily Flow (2)	WWTP ADF Discharge Cumulative Flow (1)		% of Bush Kill Flow that is Wastewater	WWTP PDF Discharge Cumulative Flow (1)		% of Bush Kill Flow that is Wastewater
	gpm	gpd	gpm		gpd	gpm	
1	6,800	128,545	89	1%	385,635	268	4%
2	6,800	204,745	142	2%	614,235	427	6%
3	6,800	336,285	234	3%	1,008,855	701	9%
4	6,800	475,215	330	5%	1,425,645	990	13%
5	6,800	619,340	430	6%	1,858,020	1,290	16%
6	6,800	759,110	527	7%	2,277,330	1,581	19%
7	6,800	870,335	604	8%	2,611,005	1,813	21%

(1) From Lost Lake DEIS, Appendix K Attachment A
(2) Derived from mean annual runoff of 23.7 inches (Streamstats, USGS 2008) as follows:
23.7 inches/yr x 47,520 (conversion factor) ÷ 1,000,000 = MGD/sqmi = 1.126 MGD/sqmi
basin size is 8.69 sqmi x 1.126 MGD/sqmi = 9.785 MGD
9.785 MGD ÷ 1440 min x 1,000,000 = 6,796 gpm (rounded to 6,800)

The WWTP Average Daily Flow (ADF) of 604 gpm after full buildout represents 8% of the total flow at the discharge point, and the ratio of streamflow to effluent is 11:1. Based on this preliminary estimation only, the Bush Kill water quality should be maintained.

The WWTP Peak Daily Flow (PDF) discharge after Phase 3 of 701 gpm represents 9% of the total flow at the discharge point, and the ratio of streamflow to effluent is 10:1, which should maintain the Bush Kill water quality. Increased WWTP discharge rates thereafter will necessitate some form of storage to allow the WWTP discharge rate to be decreased to an acceptable rate that maintains the Bush Kill water quality. Once it becomes practical based on actual flow, a holding tank will be installed and a portion of the plant effluent will be utilized to irrigate the golf course during the spring, summer and fall, thereby reducing the volume of WWTP effluent to the Bush Kill. During the winter months when irrigation cannot be done, the tank will be used as an equalization basin to reduce peak flows to the Bush Kill to meet the 10 to 1 dilution ratio. This will be accomplished by providing enough storage capacity to meet the average daily flow. The Applicant will initiate construction for such additional tank storage when the actual discharge volume from the WWTP reaches 700 gpm.

An effluent equalization tank to regulate discharge to the stream and to act as a holding tank for the irrigation water is shown on the revised site plans. Ultimate capacity required for the tank is 1,601,280 gallons. This volume is based on the storage necessary to account for the peak flow at full buildout (1,813 gpm) minus the maximum flow allowable (701 gpm) to meet the 10:1 dilution required. The total capacity for the proposed tank

will be 1,691,936 based on a tank size of 120 feet in diameter and 20 feet high. Sufficient land is available as shown by the tank footprint on the preliminary plans.

Calculations that determine the 700 gpm WWTP discharge threshold to achieve 10:1 dilution are based on best available information on stream flow and a conservative full build scenario for the first three phases of development, including approximately 1,000 occupied homes. Post-development monitoring of surface water flow above the WWTP point of discharge is proposed by the Applicant in Phase 3 (or earlier) to establish actual data for design and permitting of subsequent WWTP expansion and effluent storage for irrigation.

It should be noted that there is a discrepancy between the WWTP ADF and PDF anticipated by the Applicant and that of DEC/DOH. Based on data collected by the Applicant and provided to DOH, it is very unlikely that the ADF, or even the PDF, would reach 604 gpm in the foreseeable future. However the Applicant will design for the conservatively high flow rates that are requested, and will perform construction of additional storage when the site development and occupancy demonstrates it is needed, based on the actual flows that occur. This condition is addressed in Comment 3.5-6, wherein the Department intends to base issuance of any wastewater discharge SPDES permit modification(s) on updated project information. Thus, the Department will reserve the ability to limit discharges to the Bush Kill if treatment performance in combination with actual flow volumes is not protective of the stream.

The Applicant also acknowledges that reuse of wastewater for irrigation of the golf course must be consistent with the NYSDEC guidance and policies on the use of land applications of wastewater. The SPDES application for the project phase that includes construction of the proposed effluent tank will include a wastewater reuse management plan for review by NYSDEC.

NYDEC recently commented (February 18, 2011 correspondence) that the wastewater discharge SPDES permit is based on the Bush Kill drought flow (MA7CD/10), and requested that the previous table of proportionate flows showing average flow be updated using the appropriate flow volume. The Applicant is aware that the drought flow should be used for evaluating adequate dilution of wastewater for the Bush Kill stream Class Bt. The waste assimilative capacity (WAC) analysis provided as Appendix K to this FEIS includes a determination for the Bush Kill MA7CD/10 flow, which is 0.9 cfs or 0.582 MGD. Thus, a 10:1 dilution cap of the effluent discharge would limit such to 58,200 gpd. Since the development phasing projects the effluent volume at 128,545 gpd after Phase 1 full build out, the 10:1 dilution ratio is not feasible. In lieu of relying on dilution of treated wastewater, the Applicant will treat the effluent to an appropriate level that will preclude exceeding the assimilative capacity of the Bush Kill during the drought flow condition of 0.9 cfs. The WAC analysis for the project indicates that even at the full build out design average day flow of 0.884 MGD, the assimilative capacity of the Bush Kill is not exceeded by the waste loading. FEIS Appendix K includes the WAC analysis.

Comment 3.5-6 (Letter 3, John W. Petronella, Environmental Analyst, New York State Department of Environmental Conservation, July 1, 2010): Since full project build-out may not occur for many years, the Department will likely require that any SPDES Permit issued for the project will be based upon an approved design flow of the initial phase(s) only, and that permit modifications for subsequent phases will be granted based upon updated project information including documented treatment performance and water conservation practices. An

Engineering Report, plans and specifications would have to be submitted for each phase separately. This may require a revised design flow certification. Additional comments may be generated on waste water during the SPDES application process. The project sponsor should be aware that the Preliminary Effluent Requirements (Table 3.5-5) presented in the DEIS are only preliminary and subject to change during the SPDES application process.

Response 3.5-6: *Comments noted. The Applicant will seek Site Plan and SPDES approvals for this project by phase.*

Comment 3.5-7 (Letter 4, CT Male Associates, July 1, 2010): The DEIS does not demonstrate that there is an adequate supply of groundwater for the whole and complete project as proposed by the Applicant. This demonstration of an adequate water supply, including, but not limited to 72-hour pump tests, needs to be included in the Final Environmental Impact Statement (FEIS). In the absence of making this demonstration, the Applicant should consider reducing the size of the proposed development corresponding to the available water supply.

Response 3.5-7: *A supplemental water supply report has been prepared based on testing of additional wells developed on the project site since the DEIS. The report presented in FEIS Appendix E (prepared as an addendum to DEIS Appendix M1) demonstrates that sufficient water supply is available to permit the first phases of the project to be approved and built, and asserts that there is an adequate supply of groundwater for the whole and complete project. Based on the supplemental hydrogeological data provided in Appendix E, the Applicant has exercised a high level of due diligence at considerable cost towards demonstrating that there is an adequate supply of groundwater for the whole and complete project, despite the fact that the Lost Lake Resort is not expected to be built out in a manner that would result in a house being built on every lot. Based on available data it would appear that there is a sufficient water source from the bedrock formation to provide a community public water supply for the proposed Lost Lake Development, subject to the specific permitting requirements of the NYSDEC and NYSDOH on a phase by phase basis. It is possible that additional wells may be required to make this demonstration. Obtaining permits from the NYSDEC, NYSDOH, and the Delaware River Basin Commission (DRBC) will be required for each phase of development before the Planning Board can issue final site plan approval.*

Refer to further discussion in Response 3-5-3.

Comment 3.5-8 (Letter 4, CT Male Associates, July 1, 2010): Water Supply Report, Recharge Analysis: What is the amount of water used by the other private water wells in the watershed and how does this relate to the available water presented in Table 1?

Response 3.5-8: *The Bush Kill watershed above the Lost Lake Resort property includes approximately 9 square miles of predominantly forested and unpopulated land. Sparse residential development is located along Cold Spring Road, and consists of approximately 13 homes, and the Melody Lake private community located across Cold Spring Road from the northeast corner of the Lost Lake Resort property contains approximately 75 homes. One farm property (Philwold) is located east of the Lost Lake Resort property, north of the intersection of St. Joseph and Cold Spring Roads. An estimate for total groundwater pumped and consumptively used (i.e., not returned to the aquifer) is as follows:*

Cold Spring Road homes: Assuming that the average daily pumping totals about 250 gallons per day (gpd), the total daily groundwater withdrawal is estimated at 3,250 gpd (13 x 250 gpd/home). This is a conservatively high estimate, given that average daily water use per household is generally less than 200 gpd. The Cold Spring Road properties also use on-site septic systems, which results in approximately 90% recycling of all groundwater pumped from on-site wells via wastewater return flows (SRBC, Overview for the Development of Local Water Budgets). Thus, the net consumptive water use at each residential site is estimated to be 25 gpd, with a total consumptive use of 325 gpd (13 homes x 25 gpd).

Melody Lake: This area is served by a community water system and a WWTP that is believed to discharge to the Bush Kill. The daily groundwater withdrawal from the Melody Lake community is estimated at 18,750 gpd (75 homes x 250 gpd/home), with no return flows to the aquifer due to the surface water discharge.

Philwold: No data is available for Philwold, which is known to house animals. In lieu of specific data, it was assumed that all potable water is sourced from a well(s), and wastewater is treated with an on-site septic system; a reasonable estimate for water use is 1,000 gpd, with 300 gpd consumptively used.

The total daily groundwater withdrawal is thus estimated at 23,000 gpd, with a net withdrawal from the aquifer of 19,375 gpd. In comparison to the total daily recharge to the site, as presented in Table 1, the off-site existing water use represents approximately 1% of the estimated daily recharge volume of 1,917,256 gpd. On this basis the off-site water use is a negligible volume of the total available groundwater recharge.

Comment 3.5-9 (Letter 4, CT Male Associates, July 1, 2010): The water well work completed to date has not yet documented the theoretical volume of groundwater available from the site. Does the conservative recharge rate of 25 percent account for periods of drought?

Response 3.5-9: *The conservative recharge rate of 25% accounts for periods of drought, based on a second source for groundwater recharge used by the Delaware River Basin Commission (DRBC). The average annual groundwater recharge for the site was assumed to be the same as for the Upper Devonian-aged Catskill Formation, which is very similar to the bedrock beneath the site in regards to both lithology and structure and climate. The DRBC (DRBC, 1982)[1] reports the average and drought year (i.e., the 10% probability drought) groundwater recharge rates at 940,000 gallons per day per square mile (gpd/sq.mi.) and 680,000 gpd/sq.mi., respectively. Based on the 2,080 acre site, which converts to 3.25 sq.mi., the 10% probability drought year is approximately 2.21 million gallons per day (MGD) (3.25 sq.mi. x 680,000 gpd/sq.mi.). This estimated drought year recharge is about 15% greater than the estimate included in the DEIS, confirming that it accounts for periods of drought.*

Comment 3.5-10 (Letter 4, CT Male Associates, July 1, 2010): Appendix MI, Table 2: The time at which pumping level stabilization occurred in each pumping well should be specific

[1]R.E. Wright and Associates, 1982, "Special Groundwater Study of the Upper Delaware River Basin – Study Area III", Delaware River Basin Commission.

rather than generalized (i.e., >24 hours). Stabilization should be defined within the write up. It would also be helpful to know how many feet of water below the depth of stabilization to better understand how much of the total available drawdown within each well remained.

Response 3.5-10: *Stabilization is defined in accordance with NYSDEC Recommended Pump Test Procedures for Water Supply Applications (August 31, 2005), which is "a water level that has not fluctuated by more than plus or minus 0.5 feet for each 100 feet of water in the well (i.e., static water level (SWL) to bottom of well) over at least a six hour period of constant pumping flow rate." NYSDEC Recommended Procedures also state "The plotted measurements shall not show a trend of decreasing water level." Each of the four wells that were tested in 2009 reached the requisite stabilization, which is summarized below:*

Well	Total Depth (ft)	SWL (ft bgs)	Water Column (WC) (ft)	Allowable Fluctuation (WC÷100x 0.5 ft)	Maximum Drawdown During Test (ft bgs)	Allowable Drawdown Within Permissible Range of Fluctuation	Elapsed Time During 2009 Test that Stabilization Reached	Duration of Pumping After Stabilization Reached
DD	917	5	912	+/-4.5 ft	349.3	344.8	1,860 min.	40.3 hrs
O	1,005	7	998	+/-5.0 ft	90.3	85.3	1,325	49.9 hrs
P	1,005	65	940	+/-4.8 ft	340	335.2	2,000	38.7 hrs
HH	595	5	590	+/-3.0 ft	163.6	160.6	3,230 min.	18.2 hrs

Each of the wells reached stabilization, and for a much longer duration than the 6 hours that is recommended. The plotted well data show no trend of decreasing water levels. The remaining water column in each well after stabilization is as follows:

Well DD - 562 ft
Well O - 912 ft
Well P - 600 ft
Well HH - 426 ft

Comment 3.5-11 (Letter 4, CT Male Associates, July 1, 2010): Water Supply Report: Distance Drawdown graphs would be helpful to understand the impact upon non-pumping monitoring wells during the pumping tests of the selected production wells. The discussion on page 7 of Appendix M1 is confusing. Why are the recorded drawdown in wells CC, P and O during the pump testing of well HH not presented or discussed? Nearly 100 feet of drawdown was experienced at well CC during the pumping of well HH and approximately 20 feet at wells CC and P. The cumulative effects of multiple pumping wells operating at the same time should be evaluated to determine if the pumping rates indicated in the report are in fact long term safe yields for the production wells to be used by the community water system.

Response 3.5-11: *The apparently excessive drawdown at well CC during the pumping of HH is because the wells are within 15 feet of each other, and it represents an atypical aquifer response because the wells share common water-bearing zones. That response is not useful for predicting aquifer drawdown at greater distances.*

In order to evaluate the general drawdown effects, a distance drawdown plot is presented (Figure 3.5-11 at the end of this section) that illustrates the observation well data from the aquifer test for well HH. The plot shows the drawdown observed at the end of the test, when any further aquifer drawdown would be negligible because the pumping

wells had reached stabilization. The plot is useful for evaluating aquifer impacts to other pumping wells and off-site private wells in the area, including two on-site observation wells as no off-site wells were made available to monitor. Well HH is plotted because the aquifer interference was greater than what occurred during the test of wells P, O, and DD and therefore it represents a more conservative, worst case approach.

The plot indicates that aquifer drawdown effects could extend a substantial distance from the pumping well, which in this instance is a projection of approximately 7,000 feet. (It is very unlikely that aquifer drawdown effects could actually propagate that far from any well at the site, due to anisotropy, friction effects, etc.). This response is typical for a bedrock aquifer under confined conditions. The nearest production well is Well O, at a distance of approximately 1,100 feet, where interference drawdown of about 21 feet occurred. Drawdown is additive, so an additional 21 feet of drawdown at Well O would not be a significant effect, since the available water column at Well O after that well reached stabilization is more than adequate to account for the interference. Well P is located a similar distance from Well HH, and had a similar drawdown interference (22 feet), but also has a large available water column after reaching stabilization, so no substantial decline to Well P's sustainable yield is expected. A smaller effect (i.e., less than 22 feet) at well HH would be expected from simultaneous pumping at wells O and P, and the available water column would also be more than adequate to account for the additional interference.

Further well interference and distance drawdown analyses are provided in the latest aquifer test report for production wells at the site, included in FEIS Appendix E.

Comment 3.5-12 (Letter 4, CT Male Associates, July 1, 2010): Well Head Protection: Understanding the cone of influence created by each well during pumping relative to the designation of the wellhead protection area can be practicable for wells that draw from bedrock aquifers. According to the well logs, many of the wells were constructed at locations with bedrock close to ground surface and in close proximity to surface water features. Since water infiltration and movement of groundwater within fractures can be rapid, the protection of the lands surrounding the wells is paramount. As discussed above, the pumping of well HH resulted in influence (i.e., drawdown) upon wells over 1,000 feet away.

Response 3.5-12: *The Applicant agrees that protection at the surface is very important to maintaining the water quality of the groundwater. All of the production wells will meet or exceed the minimum separation distances from potential contaminant sources that are designated by NYSDOH. An evaluation of the potential water quality impacts was included in the DEIS, which concluded that there was no unreasonable risk of contamination to the surface and groundwater of the site due to the proposed development. It is noted that the water-bearing zones that supply the groundwater to the production wells at the site are for the most part very deep, with hundreds of feet of vertical separation from any surface water features. Also, all wells are constructed with thick-wall steel casing that is grouted within bedrock, with a fully grouted annular space. The depth of the water-bearing zones and confined nature of the aquifer, along with the well construction methods in accordance with Health Department standards will provide a substantial barrier to any nearby surficial contaminant release.*

Comment 3.5-13 (Letter 4, CT Male Associates, July 1, 2010): Water Supply Report: The purpose of Table 4 is not understood as the report does not address it in any manner.

Response 3.5-13: *DEIS Appendix M1 Table 4 shows that each well reached stabilization during the last six hours of pumping. The table is repeated below with a column inserted after the well saturation depth that lists the maximum allowable fluctuation, and shows that the actual fluctuation was substantially below the allowable amount.*

Well	Well Saturated Depth (ft)	Maximum Allowable Fluctuation (0.5 ft per 100 ft of saturation)	Water Level Change During Last 6 Hours (ft)
Well DD	912	+/- 4.5	-0.39
Well P	940	+/- 4.8	-0.74
Well O	998	+/- 5.0	-0.06
Well HH	590	+/- 3.0	-0.38

Comment 3.5-14 (Letter 4, CT Male Associates, July 1, 2010): Not all of the wells are suitable for use as a community water supply system, but rather only those wells that have been pump tested above a de minimus level with acceptable water quality are potentially suitable. All of the wells that have been pump tested should be listed. Wells that yield less than approximately 10 gpm should not be included as production wells as connecting such small producing wells into a system would not likely be economically feasible.

Response 3.5-14: *Comment noted; however, the Applicant reserves the right to develop any well that will achieve the required project demand and can be permitted. Wells not to be further used will be properly abandoned in accordance with NYSDEC Policy CP-43, "Groundwater Monitoring Well Decommissioning Policy" to deter the potential for direct contaminant introduction to the bedrock formation.*

Comment 3.5-15 (Letter 4, CT Male Associates, July 1, 2010): The potential impact of groundwater withdrawal to existing off-site private wells needs to be more fully addressed. The conclusions state that future use of the wells will not adversely impact off-site private wells, based on the monitoring well data collected during these tests. This is a stretch in that none of the off-site wells were the subject of monitoring during the pump tests, and as indicated elsewhere in the report, there is no way to know if the water bearing fractures in the test wells are hydraulically connected to the fractures in the private water wells. According to Section 8.0 of Appendix M1, drawdown levels at monitoring wells a third to over one-half mile exhibited drawdown levels of 2.2 to 5.5 feet. Typically, regardless of whether or not in an unconsolidated or bedrock aquifer system, the level of drawdown increases as the distance between the pumping well and monitoring well decreases. Without knowing the distance between the off-site private wells to the pumping wells, as well as the depth of the private wells and depth of the pump settings, this conclusion relative to off-site wells is unsubstantiated.

Response 3.5-15: *The nearest off-site wells relative to well HH lie approximately 3,000 feet away, along Cold Spring Road towards the southeast. As illustrated in FEIS Figure 3.5-11 distance drawdown plot for well HH, the projected drawdown at a distance of 3,000 feet is 10 feet, which would probably not result in any discernible change to the production of a typical residential well. This assumes that the water bearing zones at the off-site wells are in some hydraulic communication with the site production wells; this may not be the case since the on-site wells obtain most of their groundwater from very deep zones, and typically domestic wells are not constructed to such depths. As noted in the comment, without the actual well depths and pump settings of off-site wells, the*

extent of potential impact to off-site domestic wells from future use of the production wells cannot be concluded more certainly. However, unless a neighboring well owner consents to monitoring during a pumping test, the Applicant is unable to provide a more conclusive analysis than the use of the distance drawdown plot for well HH.

Subsequent aquifer testing that included monitoring of two off-site domestic wells is included in the updated water supply report in Appendix E. That analysis concludes that there would be no significant impacts to the nearest off-site domestic wells resulting from groundwater withdrawals from the Lost Lake well field. The drop in water level in one of the monitored wells was approximately 8 feet during the pump test. Based on the information reported for this well, this reduction in water level should be insignificant. As an additional mitigation measure, the Applicant will monitor identified off-site wells after the resort wells are in normal operation, if authorized by the private well owner(s). The results of this private water well monitoring will be provided to the Town Supervisor. If it is determined that a private well is being impacted by the Lost Lake wells to a level that warrants a response action, then the Applicant will be required to remedy the situation.

Comment 3.5-16 (Letter 4, CT Male Associates, July 1, 2010): Appendix U, Evaluation of Lost Lake for Irrigation Water: This appendix presents an analysis for the use of Lost Lake as a source of water for golf course irrigation assuming a 10% probability drought year (one in ten year event). It is recommended that this analysis be done for 5% and 2% probability drought years to better assess a reasoned worst case scenario. Mitigation measures are recommended to be considered for lowering of Lost Lake.

Response 3.5-16: *The 5% and 2% probability drought year precipitation is 32 inches and 31 inches, respectively. For a worst case scenario, the 2% drought year precipitation was modeled because it is nearly the same as the 5%, using the same methodology as described in DEIS Appendix U. To supplement that appendix, Table 4, Lost Lake Water Mass Balance for 2% Probability Drought Year Precipitation (at the end of this section) shows that there would be declines below the referenced full condition during the months of May (-1.2"), June (-2.8"), July (-5.0"), and August (-4.2"). These declines are moderate increases to the mass balance result for the 10% probability drought year precipitation already reported, when declines below the reference full condition occur only in June (-1.3"), July (-3.7"), and August (-3.0"). Thus, the mass balance evaluation for the worst case scenario of a 2% probability drought year is not substantially different, in that the decline below the normal pool elevation of 1,463.9 feet amsl by up to 5 inches is considered a small fluctuation.*

Water levels at Lost Lake and the discharge pool at the base of the spillway were monitored in late summer 2010. Observations during the month of August found that the pool elevation below the spillway declined by up to 8 inches. It is a normal, seasonal condition that the lake surface declines below the spillway and does not discharge any water. This observed decline exceeds the 2% drought year projected decline from irrigation withdrawals by 60%, so the normal condition of decline is substantially greater than the projected decline from drought year withdrawals. During an actual drought condition, the lake decline due to irrigation withdrawals would be substantially less than the projected amount due to the mitigation measures proposed.

The Applicant proposes using Lost Lake surface water for irrigation water, providing that the Lost Lake surface is at least 0.05 foot above the spillway surface (i.e., 0.6-inch). At this height there would still be a discharge from the Lake, and the water storage above

the spillway height would be in the range of 0.8 MG. This trigger level would be determined from a gage accurate to ±0.01 foot installed at the spillway that is monitored and recorded on a daily basis by the golf course superintendent. By implementing this simple procedure there would be no need for any further monitoring or mitigation measures at Lost Lake due to declining lake level.

For those periods when the lake surface is less than 0.05 foot above the spillway, the irrigation system will use groundwater from the supply wells until such time in the future as there is sufficient treated wastewater to use as an alternate source. The maximum irrigation rate is estimated at 0.180 MGD and would occur during July. This equates to a water source of 125 gpm, and would be available as excess daily groundwater production capacity from the potable water system. At such time as there is sufficient volume, use of the treated wastewater for irrigation will reduce or eliminate the need to utilize Lost Lake or groundwater as a source of water for irrigation. Sufficient treated wastewater volume will be available to replace the irrigation demand on surface water or groundwater sometime after Phase 3 of the project is developed and at least 150 houses are occupied.

As part of the water taking permit application, the Applicant will develop a Water Conservation/Drought Management Plan for the golf course (to be part of an overall Turf Management Plan that includes other provisions discussed in the Preliminary Water Quality Management Plan, DEIS Appendix L). The plan will detail the specific actions to be taken during various drought conditions (i.e., drought watch, warning, emergency, and disaster) as declared by NYSDEC for this drought planning region (drought management region II) or DRBC. During a drought emergency condition, further mitigation to reduce water use will include reducing the normal irrigation volume (e.g., to 70% of the average volume applied) and reducing the acreage that is irrigated. In an extreme condition, the turf grass may be permitted to go dormant.

Comment 3.5-17 (Letter 4, CT Male Associates, July 1, 2010): It is recommended that water level monitoring and stream discharge rates of Lost Lake be done during the summer months of July and August. This requirement is recommended to be added to the Preliminary Water Quality Management Plan.

Response 3.5-17: *Data loggers were installed in the Lake and the discharge pool below the spillway in early August through October however the readout from these loggers indicated that they malfunctioned or were tampered with. Based on site observations in this and recent years past, there has been no discharge from the lake, and the pool elevation has remained 0.3 to 0.7 feet below the spillway, indicating that an intermittent lake discharge and pool surface decline below the spillway elevation is a normal condition for Lost Lake. In 2010, lake discharge resumed in the beginning of October.*

Comment 3.5-18 (Letter 4, CT Male Associates, July 1, 2010): There are significant areas of the developed portions of the site that appear to drain to sediment traps and not to permanent stormwater management practices. The plans do not show how the stormwater runoff from all of the proposed impervious surfaces will be treated and detained. Sediment traps are temporary practices which should be used only during construction while disturbance activity is occurring. Incorporating standard permanent stormwater management practices into the design will likely impact the lot layout and possibly the total number of lots.

Response 3.5-18: *The stormwater management design is based on the State requirements for Peak Rate and Water Quantity Control and Water Quality. This is accomplished through a complex system of basins, swales, dry wells, bio-retention areas and other BMPs. We acknowledge that some areas are not collected into permanent basins, rather discharge directly into receiving watercourses. The reason is that the goal of the design is to meet the requirements at specific points where the drainage leaves the site. The requirements are met in some cases by 'over-detaining' certain areas and allowing bypass flows to discharge at times not to disrupt the peak flow rates.*

Comment 3.5-19 (Letter 4, CT Male Associates, July 1, 2010): It is not clear how the stormwater runoff from the road surfaces will be treated. The stormwater pollution prevention plan (SWPPP) indicates that roadside swales are not being used as treatment swales, but the swales discharge to detention basins which do not appear to be providing any treatment. More information should be provided on how the road surface runoff will be treated.

Response 3.5-19: *The intent of the design is to treat road surfaces via sediment forebays, bio-retention areas and in swales with less than 4% slope. More detail can be provided by the Applicant to demonstrate this if specific roadways in question are identified.*

Comment 3.5-20 (Letter 4, CT Male Associates, July 1, 2010): The intended post construction standard treatment practice should be identified on the plans (i.e., ponds, wetlands, dry swales, etc.) based on a review of the soils and slopes.

Response 3.5-20: *Post-construction treatment practices have been selected from the NY State Standards and located on the site in accordance with the conditions stipulated in the Standards where the practice applies and utilizing the State's design criteria that include soils and slope conditions. The practices are identified in the design plans, drainage area maps and/or stormwater report. The Applicant will update the project plans to conform to any new requirements prior to submitting plans for approvals.*

Comment 3.5-21 (Letter 4, CT Male Associates, July 1, 2010): The SWPPP indicates that the stormwater runoff from the roofs will be directed to drywells. Per the NYS Stormwater Management Design Manual, the use of drywells is limited to the treatment/detention of roof runoff only (up to a maximum of 1.0 acre). The plan should show provisions for treating and detaining the runoff from the proposed driveways. More information should be provided on how the runoff from the driveways on each lot will be treated.

Response 3.5-21: *Applicant acknowledges that the use of drywells is limited to the treatment/detention of roof runoff. The impervious cover associated with the driveways is accounted for in all of the design calculations provided in the stormwater management report.*

Comment 3.5-22 (Letter 4, CT Male Associates, July 1, 2010): The 1, 10 and 100 year water levels for each post-construction treatment/detention practice should be included in the section details of the basins/outlet structures.

Response 3.5-22: *The section details of the basins/outlet structures on Sheet 35 of the revised Preliminary Design Plans depict the 1, 10 and 100 year water levels.*

Comment 3.5-23 (Letter 4, CT Male Associates, July 1, 2010): The proposed stormwater basins have 2H:1V (Sheet P1-12) interior slopes. Slopes this steep on the inside of a stormwater basin will be unstable. Since the proposed interior slopes are steeper than 1H:4V, these slopes will require both safety and aquatic benches per the NYS Stormwater Management Design Manual, neither of which are shown anywhere in the plans.

Response 3.5-23: *The section details of the stormwater basins on Sheet 35 of the revised Preliminary Design Plans depict interior slopes of 1V:4H.*

Comment 3.5-24 (Letter 4, CT Male Associates, July 1, 2010): The calculations and plans must clearly indicate that extended detention of the 1-year storm event is provided. There do not appear to be any provisions shown for extended detention.

Response 3.5-24: *Controlling the increase in volume associated with the 1-year storm is accomplished through a series of infiltration techniques. Calculations are provided in sections 3.3 and 8.8 of the draft SWPPP. These techniques will be further refined once the infiltration test results are known.*

Comment 3.5-25 (Letter 4, CT Male Associates, July 1, 2010): Sizing calculations for forebays, sediment traps and sediment basins should be incorporated into the final SWPPP.

Response 3.5-25: *Sizing calculations will be included in the final SWPPP to be submitted for approval.*

Comment 3.5-26 (Letter 4, CT Male Associates, July 1, 2010): Forebays associated with the basins are discussed in the text of the SWPPP but are not shown on the plans. There is a discontinuity between what is discussed in the text of the SWPPP versus what is shown on the plans.

Response 3.5-26: *Forebays have been added to the revised plan sheets.*

Comment 3.5-27 (Letter 4, CT Male Associates, July 1, 2010): Per the details provided, the grates located on the top of the outlet structures are set at the same elevation as the spillway crest and the grates themselves are not modeled in the hydrologic model.

Response 3.5-27: *The modeling does not utilize the spillway as part the primary outlet system. The spillway is provided in the event that the primary outlet is blocked. Therefore, for all design storms, the water level does not reach the spillway or the grates on top of the outlet structures and they are not part of the hydrologic model. The purpose of the grate is simply to prevent large airborne debris and animals from entering the outlet structure.*

Comment 3.5-28 (Letter 4, CT Male Associates, July 1, 2010): Additional soil investigation and testing (groundwater levels, test pit data and percolation data) should be performed at the location of each proposed post construction stormwater management practice. All testing should be done in accordance with the NYS Stormwater Management Design Manual.

Response 3.5-28: *The Applicant intends to perform detailed soil investigations and testing in conjunction with the final design stage of each phase. Since various unforeseen factors may affect the final locations of these facilities, it is premature to perform these tests until more detailed and finite locations can be established. In the*

interim, published values are used for the purpose of this environmental review and these assumptions will be verified or specific conditions accounted for in the final design of each phase.

Comment 3.5-29 (Letter 4, CT Male Associates, July 1, 2010): Regarding the proposed stormwater management practices, there appear to be inconsistencies between what is shown on the plans versus what is described in the SWPPP and the information provided in the Notice of Intent (NOI). These inconsistencies should be eliminated or clarified.

Response 3.5-29: *The draft NOI and draft SWPPP in the DEIS outline the project engineer's initial review of information based on the preliminary designs in the DEIS. Revised Preliminary Design Plans are provided with the FEIS reflecting master plan changes and addressing specific comments on the initial plans. However, the information provided on the project plans, the final SWPPP, and the NOI form will be updated and coordinated for consistency and reflective of any new regulation changes prior to submissions for approval.*

Comment 3.5-30 (Letter 4, CT Male Associates, July 1, 2010): All erosion and sediment control details shown on the plans should be in conformance with the New York State Standards and Specifications for Erosion and Sediment Control ("Blue Book").

Response 3.5-30: *The details located on sheet 34 of the Preliminary Design Plans have been revised to conform to the NY State Standards and Specifications for Erosion and Sediment Control.*

Comment 3.5-31 (Letter 4, CT Male Associates, July 1, 2010): Water Quality Management Plan, Appendix L: Bi-annual post development monitoring of surface water and groundwater is proposed to be conducted by the Applicant. It is recommended that the results of this testing be submitted to the Town and NYSDEC Region 3.

Response 3.5-31: *Reports of the biannual surface water and groundwater sampling results conducted for the purpose of monitoring golf course operations relative to water quality at the site will be used by Lost Lake Resort in golf course management, and will be submitted to the Town (Town Supervisor) and NYSDEC Region 3 (Division of Environmental Permits).*

Comment 3.5-32 (Public Hearing, Mr. Eugene Blabey, June 16, 2010): I haven't seen anything yet that tells me that there is enough water that can pumped to serve not stage one but the entire project over time that you're planning to develop. So I would like state agencies involved in that to look at that.

Response 3.5-32: *Refer to Response 3.5-3.*

Comment 3.5-33 (Letter 4, CT Male Associates, July 1, 2010): Appendix M1, on Page 1, Section 1.0, the second paragraph, 1,246 gpd should read 1,246 gpm.

Response 3.5-33: *Comment noted.*

TABLE 4 - Lost Lake Water Mass Balance for 2% Probability Drought Year Precipitation

	JAN	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	ANNUAL
(1) 1 in 10 Drought Precipitation (inches)	2.4	1.9	2.7	2.7	3.2	3.0	2.5	2.4	2.9	2.4	2.7	2.4	31.1
(2)Average Precipitation (inches)	3.8	3.1	4.2	4.3	5.1	4.8	3.9	3.8	4.6	3.8	4.3	3.8	49.3
Volume Precip Directly into Lake (gal.)	3,160,622	2,604,353	3,548,325	3,607,324	4,273,162	4,020,312	3,320,761	3,211,192	3,868,602	3,194,336	3,598,895	3,177,479	41,585,363
Precip Runoff (gal.) into Lake from Drainage (236 ac.), 21% of total	3,180,042	2,620,355	3,570,127	3,629,488	4,299,417	4,045,014	3,341,164	3,230,923	3,892,372	3,213,963	3,621,008	3,197,002	41,840,875
(3)Evapotranspiration (ET), inches, from lake surface	0	0	0	3	4.9	5.4	5.8	4.9	3.6	2.4			
ET from Lake, gallons				(4,013,489)	(6,555,365)	(7,224,280)	(7,759,412)	(6,555,365)	(4,816,187)	(3,210,791)			
(4) Irrigation water (gallons)				(620,470)	(3,584,180)	(4,628,340)	(5,565,520)	(5,497,580)	(2,980,120)	(1,473,160)			
Water Balance (relative to full condition at spillway)				2,602,853	(1,566,966)	(3,787,294)	(6,663,007)	(5,610,830)	(35,333)	1,724,347			
Change to Lake surface, inches				1.9	-1.2	-2.8	-5.0	-4.2	0.0	1.3			
Change to Lake surface if no irrigation, inches				2.4	1.5	0.6	-0.8	-0.1	2.2	2.4			

(1) equals 79% of normal year

(2) from Rock Hill Station, 1957 thru 2009

(3) from Susquehanna River Basin Commission, Monthly Pond Evaporation Table

(4) Average for years 2005 thru 2009 at Eagle Rock Resort, Hazleton, PA

Total Lost Lake Drainage Area		Lost Lake Area	Area Outside Lake	Irrigated Area
mi^2	acres	acres	acres	acres
0.443	283.52	49.33	236	45

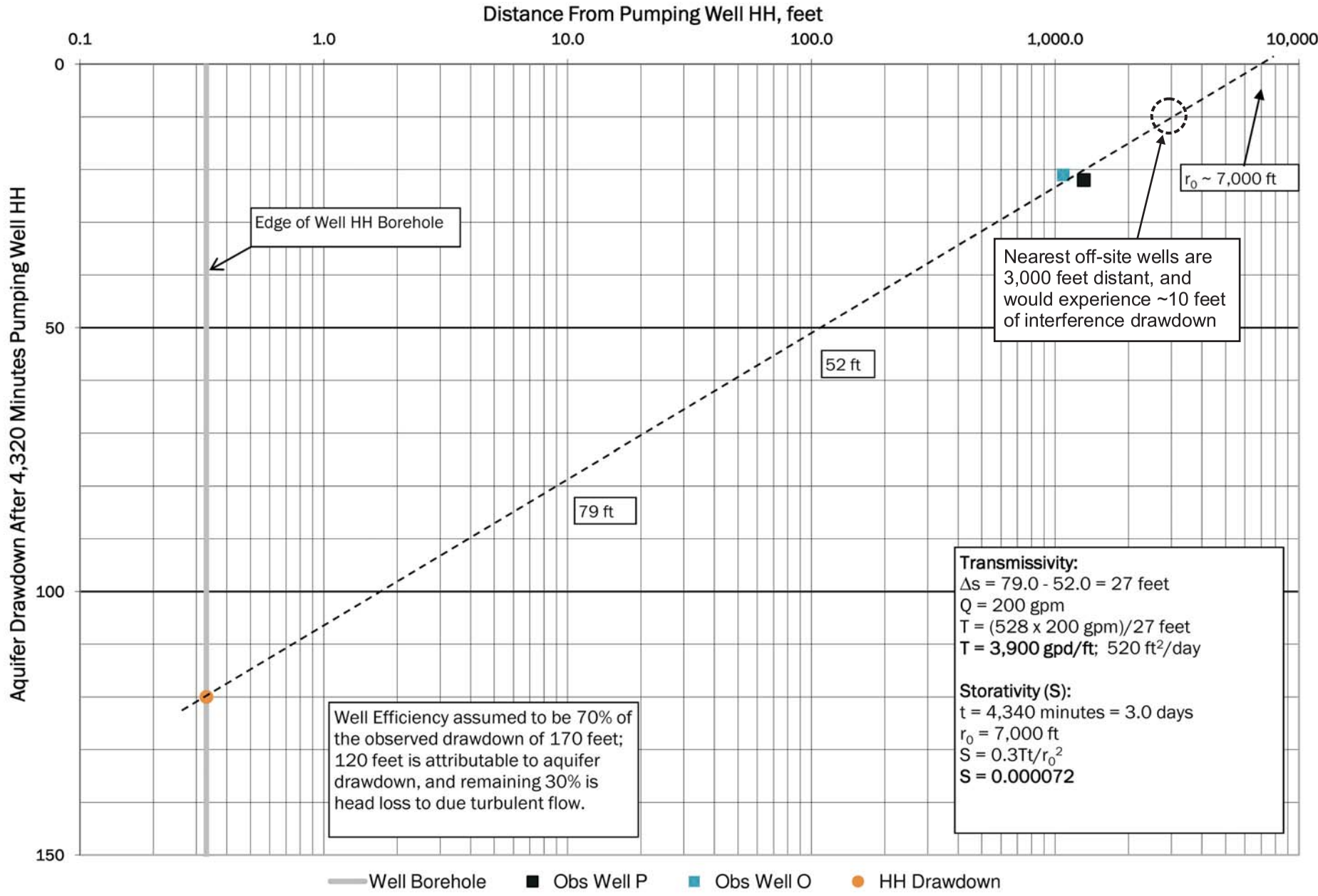

Figure 3.5-11: Distance Drawdown Plot for Well HH
Lost Lake Resort
Town of Forestburgh, Sullivan County, NY
Source: Advantage Engineers, 9/13/10

File 07093 09/14/10
JS/07093