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RE: HydroQuest Comments on the Proposed Legoland Project DEIS

HydroQuest provides comments below on behalf of the Concerned Citizens for the Hudson Valley relative to Merlin's 11-17-16 Draft Environmental Impact Statement (DEIS) for their proposed Legoland New York Commercial Recreation Facility. Emphasis is placed on the adequacy of information provided in the DEIS regarding whether sufficient empirical data and hydrologic analyses are presented to assure existing Village of Goshen water users, and future users projected under normal 5 to 10-year buildout, an adequate water supply. Because more than half of the Village's current water supply is derived from the Prospect and Green Hill reservoirs, their safe yield must be fully documented under worst case drought conditions. It has not been. Instead, drought conditions repeatedly occur (see, for example, Tyler, Water History Report, 1981) in contrast with engineering calculations that indicate that sufficient reservoir storage exists to ward off potential water shortages (e.g., Corless, Report on Village of Goshen Water Supply, 1977). An example of the reality of the situation was documented by Mayor Mattheus in 2002 in her statement that drought conditions have resulted in only six weeks of water remaining in the Prospect Reservoir. This necessitated activation of an emergency water source (HDR, 2009). **While 2002 is not the worst drought of record, this points out the need for evaluation of reservoir-specific empirical data vs. reliance on engineering based assumptions and calculations.**

Simply put, the DEIS does not provide sufficient information, documentation and analyses upon which to make an informed decision to justify sale of large water quantities to Merlin or any other large water volume development proposal. To grant project approval at this time may result in jeopardizing water availability needed by current Village consumers and those added as part of normal Village growth within 10 years.

Comments provided herein are designed to supplement my HydroQuest affidavit dated December 6, 2016 (Attachment A) and Public Hearing Statement of December 15, 2016 (Attachment B), both of which were submitted into the hearing record on December 15, 2016. By reference, both attachments are meant to be incorporated within public DEIS comments.

Lack of Empirical Hydrologic Data Needed to Document Water Supply Adequacy

To ensure adequate long-term water availability, rigorous evaluation of numerous hydrologic factors is necessary, all requiring detailed empirical data. Detailed information is lacking throughout the DEIS, thus making it impossible to assess the wisdom of selling off what is a projected 27 percent annual increase in water usage above 2015-2016 Village of Goshen water demand for private corporate profit (Attachments A and B). A first attempt to obtain this information was made by Sandra Rothenberger on November 21, 2016 when she submitted a Freedom of information (FOI) request to the Village of Goshen seeking: "*All documents pertaining to the Village and LEGOLAND regarding WATER. From the first discussion to Mayor Roddey announcing \$900,000 deal.*"

The Village agreed to let Ms. Rothenberger and myself view all the requested files in person on November 29, 2016. On this date, a banker's box was provided to us for review and copying. Only a few inches of material were in this box, primarily a copy of the DEIS and a small number of documents, many of which were not responsive to the FOI request. When we specifically asked if there were hydrogeologic and new Crystal Run well data and reports, we were told that there were none. Yet, one of the few items in the box had invoice information documenting the existence of this information which is critical for our hydrologic review and analysis (see discussion in Attachment A). All told, the FOI response was wholly deficient. This resulted in our submission of eleven more FOI requests seeking the missing information originally requested and some additional information. **In the absence of all this information, it was not prudent to enter into a water sale agreement with Merlin or any other large-scale developer, much less have accepted the Merlin DEIS as complete.**

As is documented in Table 1 below, much hydrologic information that should be included in the DEIS is not. Assessment of the vast information deficit in the DEIS is accented within the body of the table, followed by additional discussion and, then, some analysis based on limited information received from the Village.

Table 1. Freedom of Information (FOI) Requests Submitted by Sandra Rothenberger for Critical Hydrologic Information

Freedom of Information Request	Request Date	Response Date	Village Response & HydroQuest Comments	Is Basic Information Needed Prior to Approving Large Volume Water Sales?	Did Village of Goshen Provide All Needed Information?
1) ALL historic and current daily water level records for both Village reservoirs.	12-28-16	01-04-17	Village replied that they had daily water records from only the Prospect Reservoir from 01-01-09 to present (364 pages). No Green Hill Reservoir water level data. Did not provide any pre-2016 data. Ordered 364- page report on 1-05-17. Not delivered yet. Reservoir level information through multiple drought periods (i.e., decades) is critical in resource planning for current and future Village growth. None of the important drought year data was provided. FOI 8) below filed to clarify if additional data exists.	Yes	No. Only provided data for 2016
2) ALL reservoir volume records, historic and current daily.	12-28-16	01-04-17	<i>"The Village does not maintain any record which is responsive to this request."</i> A Village faced with repeated drought situations over many decades must record and maintain critical reservoir volume information for both normal and emergency drought water use planning. Data collection during dry periods is extremely important. FOI 9) below filed to clarify if additional data exists.	Yes	No
3) ALL reports, notices, emails, memoranda, and white papers having any mention or anything to do with drought, drought conditions, water shortage concerns, declarations, emergency or other water volume or shortage issues, potential need for water conservation measures, potential need to link to additional and/or	12-28-16	01-04-17	No information provided in response to FOI request. Instead, clarification was requested regarding the timeframe sought specific to <i>"ALL reports."</i> The time frame of interest is from the time of first use of each of the reservoirs, through added use of Village wells, through 2017. The intent of the FOI request is to obtain key information needed to fully document any and all times of concern regarding water availability. Evaluation of past times of limited or insufficient water quantity can provide a sound basis upon which to make informed water use and sale decisions. For example, in 2002 Mayor Mattheus stated that there is only six weeks of water left in the reservoir. Fact	Yes	No

alternate water supplies, need to find additional water supply, all meeting notes relative to water quantity issues, etc.			and data based information provides a key reality check to <u>predictive</u> reservoir safe yield estimates provided by engineers (e.g., Corless, 1977) and then, most likely used in the NYSDEC – Goshen reservoir water withdrawal permit approval.		
4) ALL streamflow records, historic through present, of water flow into and out of both Village reservoirs.	12-28-16	01-04-17	<i>“The Village does not maintain a record responsive to your request regarding water flow into the Village reservoirs. The Village does maintain records as to what was treated ...”</i> Time period desired requested by Village, albeit “ALL” is inclusive of the entire period of record. FOI 10) below filed to clarify Village request. Ultimately, Village provided treatment records for only 2016 although their response to FOI 1 indicated purchasable data from 2009. Water supply management, especially during periods of drought, should include documentation of all system inputs and outputs.	Yes	No
5) Please provide all Village of Goshen monthly total water use data for the years 1980 to present.	12-30-16	No Response	Only data from 2016 was provided. Analysis of Village water use over time allows for data-based projections of future water use under a steady growth scenario. This information, assessed with requests for large water withdrawals, is valuable in land use and water sale decisions.	Yes	No
6) Please provide all daily, monthly and annual water use data for each Legoland project that was provided to the Village for review prior to approval of the resolution to furnish Legoland applicants with Village water. This should include detailed water usage breakout for all project components.	12-30-16	No Response	No data was provided. Apparently, the Village has not been provided with this essential information but has, nonetheless, entered into a water sale resolution with Merlin. Accepting singular total annual and July water use values provided by a developer without VERY detailed breakout of use for all project components is not prudent.	Yes	No
7) Please provide copies of all reports, memoranda, progress reports, internal reports, field reports, pumping test data, graphs and reports, white papers, etc. that in any way discuss	12-30-16	No Response	This information has not been provided, yet, clearly it exists as is documented in the HydroQuest affidavit of 12-06-16 and invoices. The DEIS contains NO detailed data or information regarding a third Crystal Run well and no documentation seeking a modified Village Water Supply Approval from NYSDEC. Because NONE of this information is provided in	Yes	No

<p>and/or address installation, testing, completion, drawdown and recovery data from testing of both old and the new Village well, inclusive of geologic boring logs and safe yield determinations.</p>			<p>the DEIS, it cannot be considered as additional project needed water supply. The third Crystal Well may be nothing more than a third straw in the same water source. Reliance on an undocumented and un-reviewed water source is not prudent.</p>		
<p>8) Please provide ALL historic water level data (daily, weekly, biweekly, monthly, annual, etc.) for both the Green Hill and Prospect reservoirs inclusive of the entire period of record (i.e., from first use of the reservoirs to present). This data is sought for any and all locations where these records are present. In addition, please provide all reports, draft reports, graphs, memoranda, letters, white papers, etc. that present or reference this data in any and all forms. Beyond this, please provide all letters, memoranda, white papers, etc. that led to the start of reservoir water level monitoring as of January 1, 2009.</p>	<p>1-05-17 Verbally Requested of Orange County Water Authority</p>	<p>Referred to County website & offered to help</p>	<p>Only data from 2016 has been provided to date by the Village. Evaluation of Village water demand over time, not just the current year, is required when assessing water use, water supply system capacity and the risks involved in the sale of large water volumes to a single user.</p>	<p>Yes</p>	
<p>9) Please provide all reports, draft reports, graphs, memoranda, letters, white papers, etc. that present and/or reference known, calculated, projected, and/or measured water volume and/or reservoir capacity information, data, etc. for the Green Hill and Prospect reservoirs throughout the entire Village's history to present.</p>	<p>1-05-17 Verbally Requested of Orange County Water Authority</p>	<p>Referred to County website & offered to help</p>	<p>Some material was provided, some with different Prospect Reservoir volume values, but lacking supportive data. Three days of taking of exact depth measurements was conducted in 1981 (Times Herald Record articles) and was not provided in response to the FOI request. This most important information was not provided by the Village. Empirically supported reservoir depth and volume values allow for science-based assessment of reservoir capacity, especially for drought analysis. This was not provided by the Village.</p>	<p>Yes</p>	

10) Please provide summary sheets documenting the quantity of daily treated water used by the Village of Goshen for the years 1960 to present.	1-05-17 Verbally Requested of Orange County Water Authority	Referred to County website & offered to help	Only data from 2016 has been provided to date by the Village. Evaluation of Village water demand over time, not just the current year, is required when assessing water use, water supply system capacity and the risks involved in the sale of large water volumes to a single user.	Yes	
11) Please provide a list of all records and reports, past and present, broken out by categories of Village records that specifically relate to water (e.g., reservoir levels; reservoir volume; water use; water quantity; water availability; pre-drought and drought conditions; emergency actions; need for supplemental water; well planning; well tests; pumping test reports; aquifer/hydrologic reports).	1-05-17 Verbally Requested of Orange County Water Authority	Referred to County website & offered to help	The Village has not been responsive to important information requests detailed in lower numbered FOI requests that would provide data needed to assess the long-term adequacy of the existing water supply system, especially during repeated drought conditions.	Yes	

Evaluation of all the information requested in the eleven Freedom of Information requests presented in Table 1, inclusive of past times of limited or insufficient water quantity, is needed to provide a sound basis upon which to make informed water use and sale decisions.

Safe Yield of the Prospect Lake and Green Hill Reservoirs

Importantly, the safe yield of the existing surface water supply must be conservatively determined before large water volumes are considered for sale (i.e., Legoland Park facility). The DEIS fails to provide this critical documentation and fails to provide full assessment of available reservoir water during drought conditions.

Specific to the Village of Goshen, the firm of Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) recommended that a more thorough analysis of the system's safe yield be performed to better define its supply capabilities (Orange County, NY Water Master Plan prepared for Orange County Water Authority, 2009).

HDR emphasizes Reservoir Capacity Data Needs (Water Master Plan, page 177):

“Reservoir capacity can be characterized by physical attributes, such as surface area, volume and drainage area. In addition, safe yield can be used to define a reservoir’s capacity. The safe yield from surface sources can be defined as the yield maintainable by a water system continuously throughout a repetition of the most severe Drought of Record, after compliance with requirements for maintaining minimum passing flows³¹. For most existing surface water supply systems in southeastern New York, the streamflows between 1961 and 1966 are the worst-case flow record and therefore the Drought of Record is often considered to have occurred within this period. ... ³¹: It should be noted that basing safe yield on the Drought of Record rather than a more frequent drought (e.g., a 30-year return period), tends to generate a low (conservative) value for safe yield.”

As can be seen in Figure 1 below of Wallkill River daily mean discharge for the years 1964 and 1965, and as is discussed in the HydroQuest affidavit (see Attachment A), low flow and drought conditions may be long lasting. This critical type of water availability assessment should have been conducted prior to entering into a legal agreement to provide water to Merlin and should have been addressed in detail in the DEIS. At this juncture, protection and preservation of the Village of Goshen’s water supply should be predicated upon rigorous assessment of empirical data and analyses not presented in the DEIS. As proposed, the Legoland action may result in a significant adverse environmental impact to Village of Goshen water users. Empirical data and analyses sufficient to protect Village of Goshen water users is wholly deficient from the DEIS.

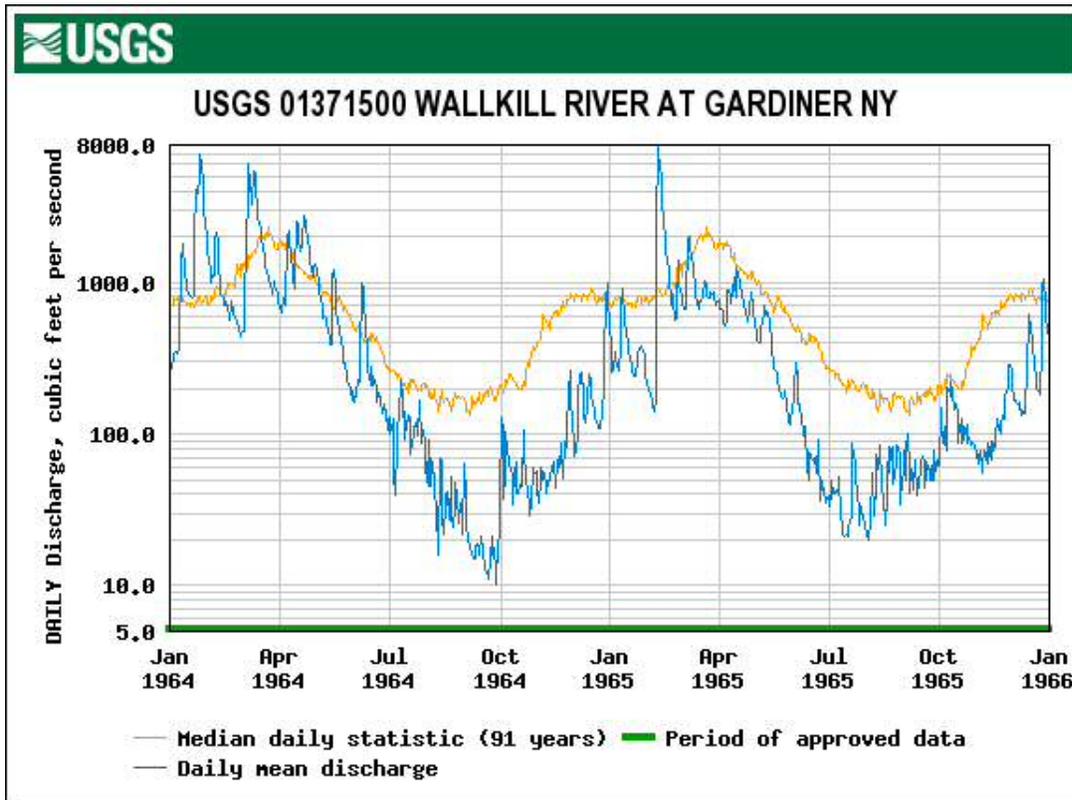


Figure 1. Wallkill River hydrograph for 1964 and 1965.

While Village and Orange County engineering reports do provide water volume/capacity figures for the Village reservoirs, it is important to note that the HDR report does not provide safe yield values for either the Prospect Lake or Green Hill reservoirs (Table 2-5, Water Supply Reservoirs in Orange County, page 80). As discussed in Attachment A, sale of large volumes of Village water should be predicated on an empirically-based drought analysis. This is critically important because the Prospect and Green Hill reservoirs have small watersheds that, during dry times, contribute no continuous or sustained influx of surface water (e.g., the Green Hill reservoir is reported to be dry during drought conditions). Similarly, at times when no surface water flows into the Prospect Reservoir, its safe yield is a function of a number of factors including the volume or capacity of the reservoir, the quantity of water present at any given time, the daily demand (i.e., pumping rate), leakage, evaporation from its surface, and the duration of drought conditions.

Thus, in essence, during dry and drought conditions, the Prospect Reservoir is little more than a large bathtub being drawn down to meet daily demand. During prolonged dry periods, the Village resorts to a Drought Warning Procedure that moves through an Alert Stage, a Warning Stage, and an Emergency Stage. This has, unfortunately, been invoked even with connection to two Crystal Run wells. As Village growth naturally increases, water demand will increase as will increased need to institute the Drought Warning Procedure. The addition of a large-scale development project with major water needs may ultimately result in a lack of available water for existing water consumers.

Clearly, detailed analysis of historic drought conditions, reservoir levels, and water demand are critical elements that must form the hydrologic backbone needed to support any plan or legally-binding agreement to sell off large quantities of limited water supply (i.e., one already plagued by repeated water shortages). In the absence of the complete and meaningful empirical data required to scientifically complete a drought analysis – as can be conducted if and when the Village provides the information sought in Table 1, HydroQuest has taken a first look at what can be gleaned from the only empirical data the Village has provided to date in response to our FOI requests. This is Prospect Reservoir data solely for the 2016 calendar year. By extension, areas identified as being of concern in 2016 are only likely to be of greater concern during periods of extended drought conditions.

Examination of Figure 2 below shows a precipitous drop in Prospect Reservoir level over a 91-day period with a low average pumping rate of 204 gallons per minute (gpm). Had dry conditions continued much longer or if the water demand were substantially higher, as it would be with a large water consumer such as Merlin, the Village would have been in a serious emergency situation. This type of analysis and information is notably absent from the DEIS, thus making project approval and large-volume water sale not prudent without empirical data and analysis. The lack of hydrologic information requested in Table 1 makes it impossible to provide comprehensive, meaningful and scientifically-justified decisions regarding both large-volume water sale or development approval when not knowing whether approvals will adversely impact existing Village water consumers. Categorically, the DEIS fails to provide the data and analyses needed to make informed, reasoned, water sale and project approval decisions.

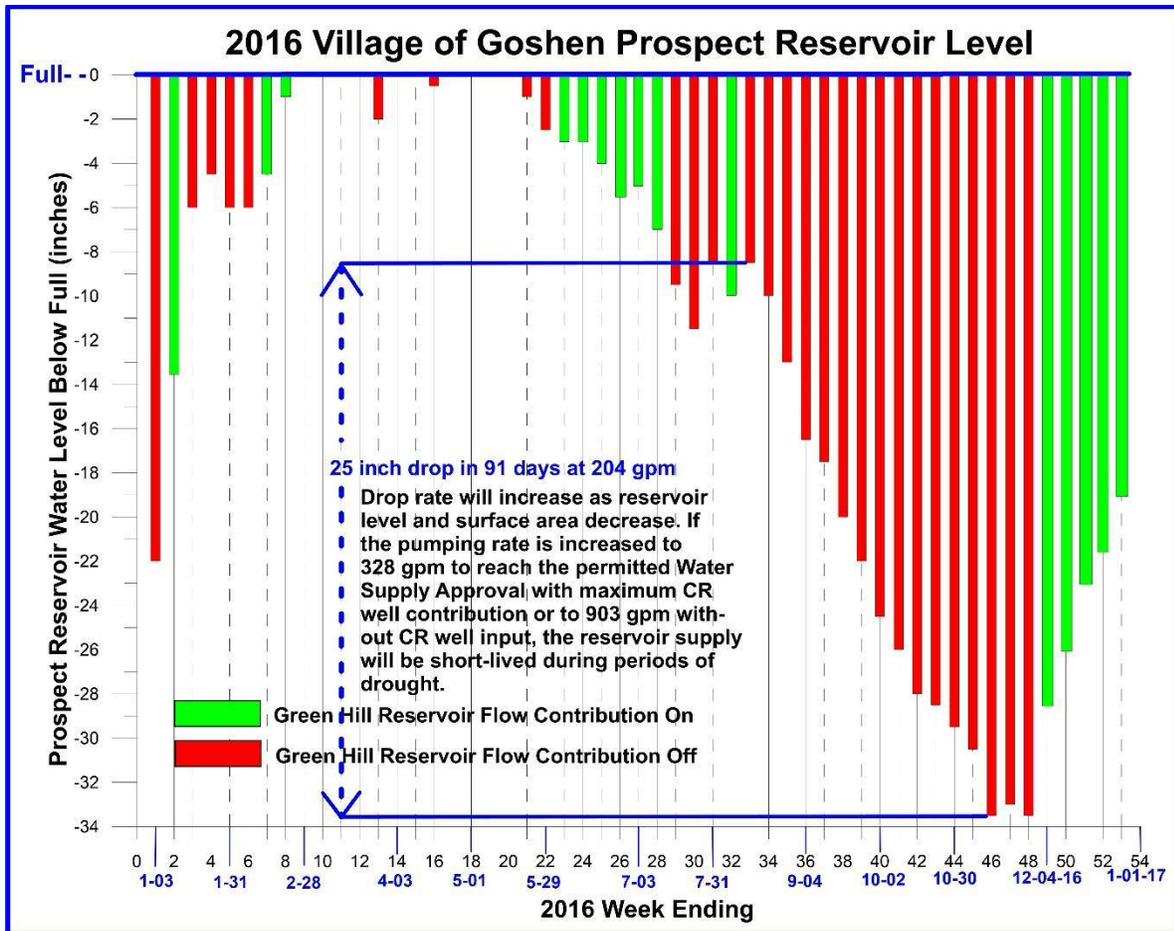


Figure 2. Prospect Reservoir water levels in 2016. The Green Hill reservoir, located off Conklingtown Road, runs into the Prospect Reservoir, located off Lower Reservoir Road, where water is gravity fed into the Village’s Water Filtration Plant before distribution throughout the system. (DEIS, page 56) At times, no flow occurs between the two reservoirs, as indicated by the red bars above (i.e., no surface water replenishment of the Prospect Reservoir occurs).

Figure 2 documents a precipitous drop in reservoir level which occurred from weeks 33 to 46 (8-14-16 to 11-13-16; -8.5 in. to -33.5 in.). During periods of drought, the daily water available may be far less, especially as reservoir levels drop more rapidly with lowered water levels coinciding with less reservoir acreage available for water storage.

Special Condition 1 of the Village Water Supply Approval Permit provides a table of daily allowed Prospect Reservoir water withdrawal rates based on reservoir water level. With maximum 30-day average restrictions based on reservoir level, the allowable maximum single day withdrawal from 0 to 60 inches and from below 60 inches is 1.3 and 1.0 million gallons per day (mgd), respectively. Water withdrawal rates of 1.0 to 1.3 mgd (903 gpm) would be at 3.4 to 4.4 times that depicted in Figure 2 (i.e., 204 gpm or 293,760 gpd). It is likely that these withdrawal amounts are far in excess of the reservoir’s undocumented safe yield. It is easy to envision that the rate of reservoir drop per day associated with these high permitted withdrawal volumes might quickly result in the Village

being placed in an emergency water situation. Similarly, the need to rigorously reevaluate the NYSDEC permitted daily withdrawal amounts stands out, especially during drought conditions when it matters most.

Considering that more than half of the Village's daily water use stems from the Prospect Reservoir, the need to document the relationship between reservoir volume, water demand, reservoir level and hydrologic conditions (e.g., drought) is obvious. Historic and recent concern over reservoir water level and water availability are well founded and, unfortunately, repetitious. **Until such time as water resources are sufficiently abundant that these concerns do not recur, sale of large water volumes to single consumers should be put on hold.**

This realization of potentially rapid reservoir level declines during drought conditions raises serious questions. For instance, how deep is the Prospect Reservoir and has anyone used detailed depth measurements to accurately calculate available/usable reservoir volume? While none of this information is presented in the DEIS or has been provided by the Village in response to FOI requests, 1981 Times Herald Record articles document that three days of taking of exact depth measurements were conducted in 1981. And, then, how does this factor into the determination of the safe yield of this reservoir? These critical questions, all of which may potentially adversely impact existing Village of Goshen water consumers must be answered BEFORE selling large water volumes to Merlin or any other large-scale developer. None of this critical hydrologic information is addressed in the DEIS.

Logically, this line of questioning leads to an assessment of current Village of Goshen water use, additional water need for 5-10 years of normal Village growth, and Legoland water demand. Other than the Farr Engineering letter contained in Appendix E, which provides generalized numbers absent all supporting, empirical, data upon which the Village Board or public might evaluate its veracity, almost no supportive water demand data is provided. Again, the DEIS is wholly deficient in the most important data regarding the water supply of Village residents. Water sale to Merlin and Legoland project approval should not be founded on unsubstantiated water use and availability data.

Many project developments typically provide extensive detail and calculations regarding all aspects of water use. How can it be that Merlin provides a single annual water use value and a singular peak month water use value of another one of their projects in another country and the DEIS is considered complete and of sufficient quality to legally resolve to sell water out from under existing consumers? This is unreasonable, is not based on documented and reviewable science, and should not be accepted as sound basis for project approval or water sale. As a scientist, I am fully aware that important decisions regarding allocation of water resources and people's welfare require data sets that other scientists can analyze with the same methods and can arrive at the same conclusions – that is, the same data can be used by others to obtain reproducible results and conclusions. Here, the DEIS is wholly deficient in ANY of the critically needed hydrologic data – such that the only ones who can possibly draw conclusions are those who wrote the DEIS using unknown and possibly, unfounded, data. From a scientific, Village water supply protection point of view, the best course of action would be to rescind the DEIS and start anew, or a SEIS would be a step in the right direction.

2016 Village of Goshen Water Use

The DEIS provides very limited water use and reservoir capacity values with no supporting documentation. Considering the magnitude of water required to operate the Legoland project, finely detailed water use information should fill a large segment of the DEIS. It does not. This makes assessment of conclusions and water demand values presented impossible for both the Village Board and the public.

The limited information we have been able to obtain from the Village to date in response to FOI requests allows a time-limited look at current water use (not future water use projection or Legoland water use). The data provided covers only 2016. A look at the 2016 water use data shows that the Village of Goshen relies on the water withdrawn from the Prospect Reservoir to a far greater extent than that withdrawn from Crystal Run wells 1 and 2 (Figure 3). This is important because limited or no reservoir water may be available for withdrawal during times of extended drought. It is essential that water supply planning and sale be solidly based on a worst-case drought scenario.

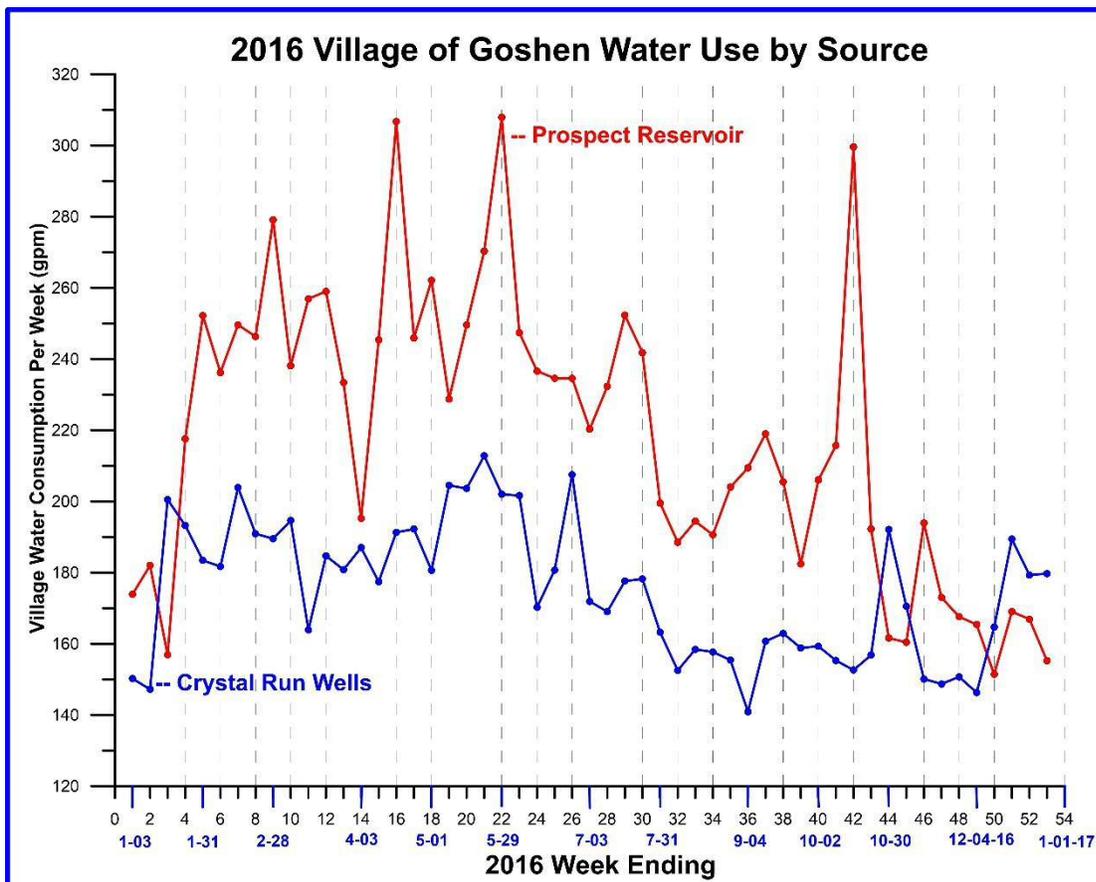


Figure 3. Comparison of Village of Goshen water use by source.

How much water was consumed by the Village of Goshen in 2016 and how does that relate to Goshen's future 5-year additional water need and Legoland project water demand? Side by side examination of 2016 Village water consumption by source is compared with Farr Engineering provided values of future Village water demand and stated Legoland project maximum monthly water demand (Figures 4 to 9).

The various colored bars on the following graphs illustrate:

- Blue bars: The blue bars represent water withdrawn from the Prospect Reservoir summarized on a weekly basis. The quantity of water used continuously throughout each labeled week is equated to an average flow rate in gallons per minute (gpm).
- Magenta bars: The magenta bars represent water withdrawn from Crystal Run wells summarized on a weekly basis. The quantity of water used continuously throughout each labeled week is equated to an average flow rate in gallons per minute.
- Black bars: The black bars represent the total water consumed by the Village of Goshen summarized on a weekly basis. These bars reflect the added total of water consumed from both the Prospect Reservoir and Crystal Run wells (i.e., blue bar plus magenta bar). These bars show total water consumed on a weekly basis equated to an average flow rate in gallons per minute. Note that the highest weekly water consumption occurred during the week ending 5-29-16 when the average flow rate was 510 gpm. The highest average daily flow rate of 611.9 gpm occurred during that same week. Importantly, the black bars and supporting data document that, at times, during 2016 the quantity of water consumed is equivalent to the maximum permitted daily flow rate of 575 gpm from the Crystal Run wells. If, during drought conditions, the Prospect Reservoir had no water availability there would be NO additional water available to provide service to either new water users not online in 2016 (green bars) or Legoland Park (red bars).
- Green bars: The green bars represent the total projected water needed to supply new post-2016 water consumers that require addition to Village water lines coincident with normal Village growth in the next 5 years. These bars reflect consumers that are not yet connected to the Village water system but are projected to need water within 5 years. The value portrayed by the green bars was taken from the Farr Engineering letter of 9-23-16 (Appendix E, DEIS) that provides a projected peak monthly water demand of 12,000,000 gallons. This demand has been equated to gallons per minute for graphic presentation (268.8 gpm). This value is roughly half the permitted CRW water allocation and will be a substantial increase on the Village's already taxed water supply during drought periods.
- Red bars: The red bars represent Farr Engineering's projected peak monthly Legoland water demand equated to gallons per minute for the month of peak demand (179.2 gpm). The graph bars show side by side comparison of both current (2016) Village water use alongside what would be substantial increases above current use.

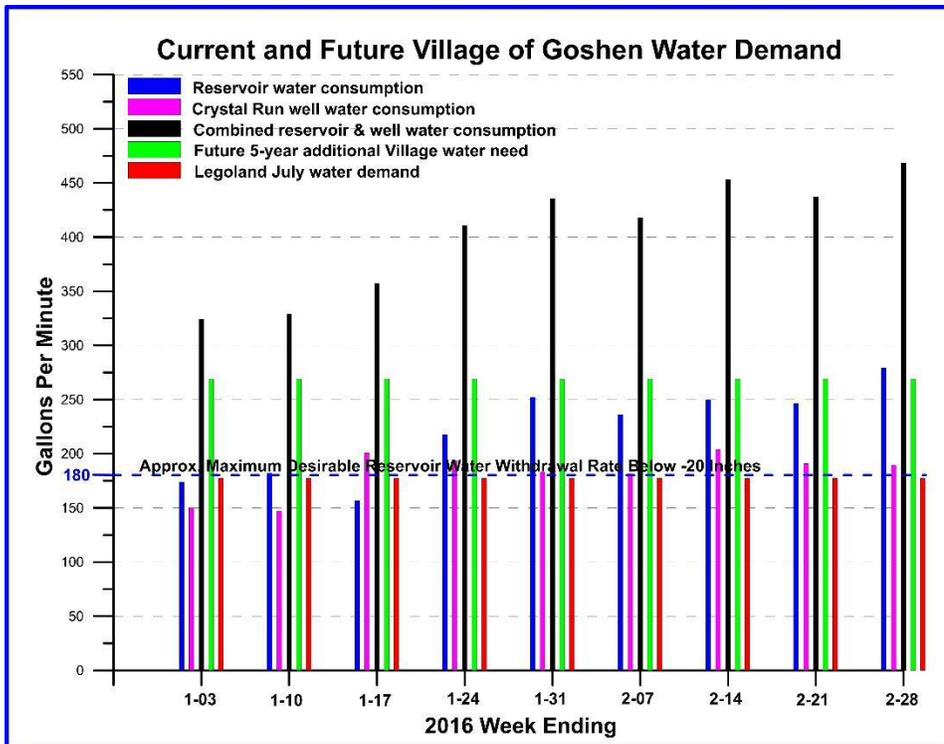


Figure 4. Current and future Village of Goshen water demand – week ending 2-28-16.

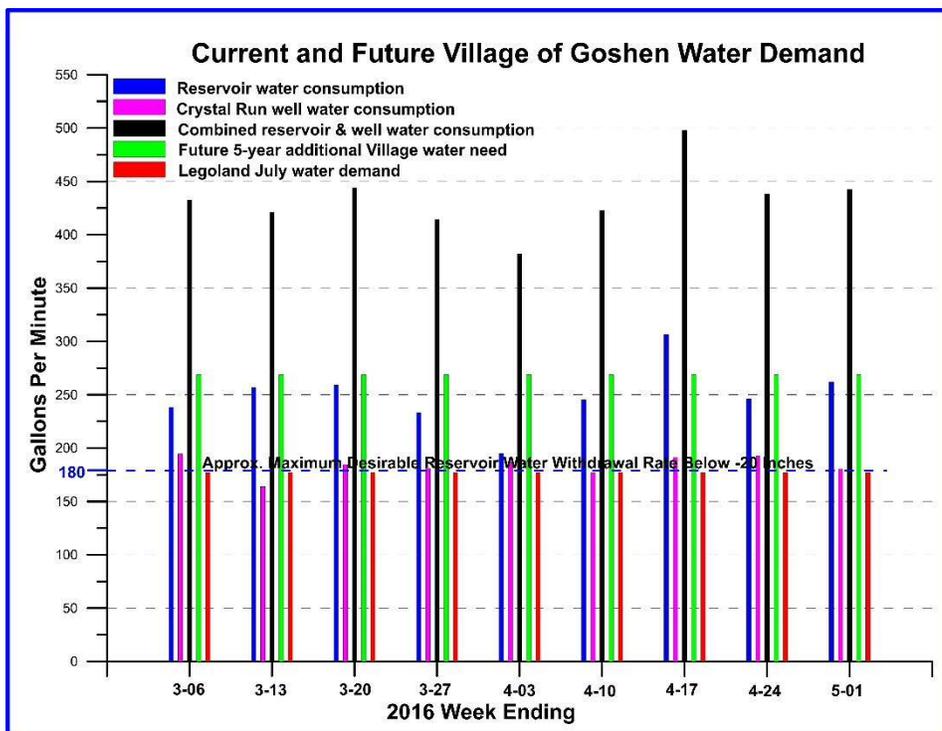


Figure 5. Current and future Village of Goshen water demand – week ending 5-01-16.

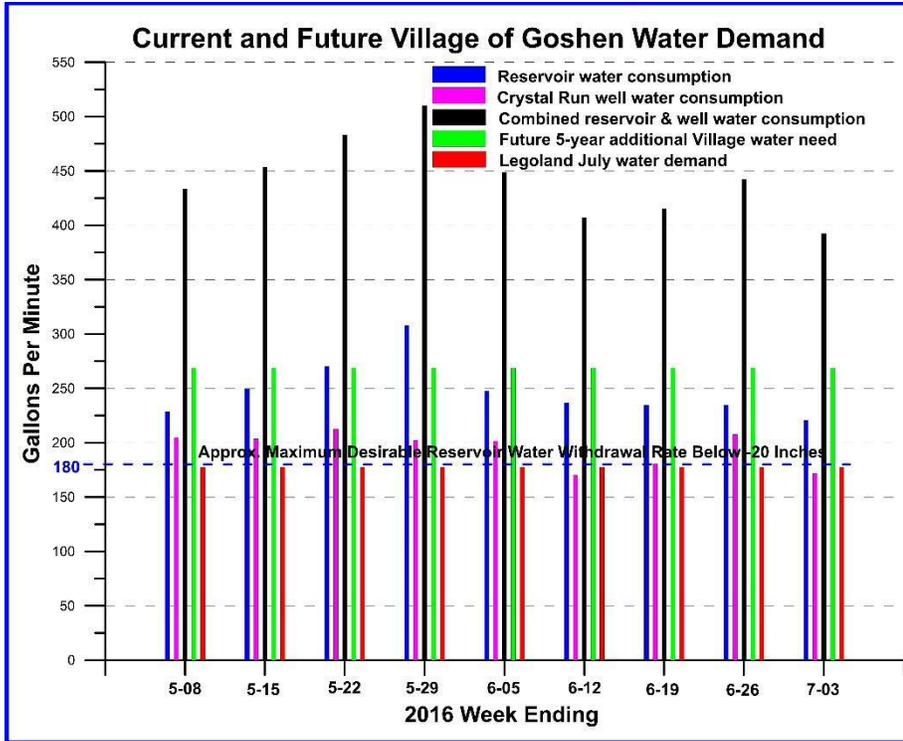


Figure 6. Current and future Village of Goshen water demand – week ending 7-03-16.

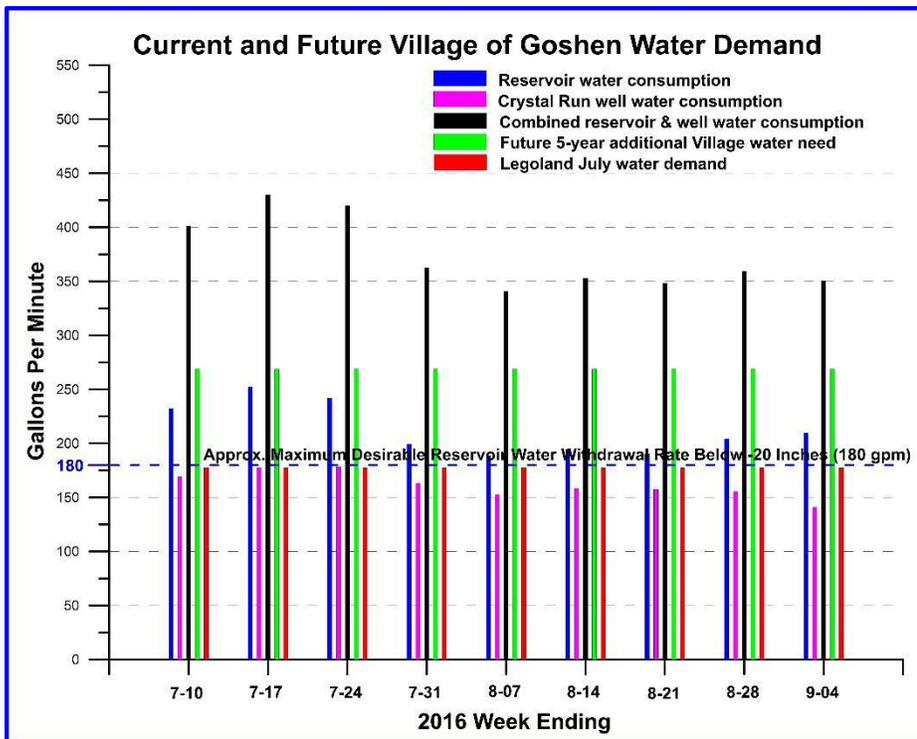


Figure 7. Current and future Village of Goshen water demand – week ending 9-04-16.

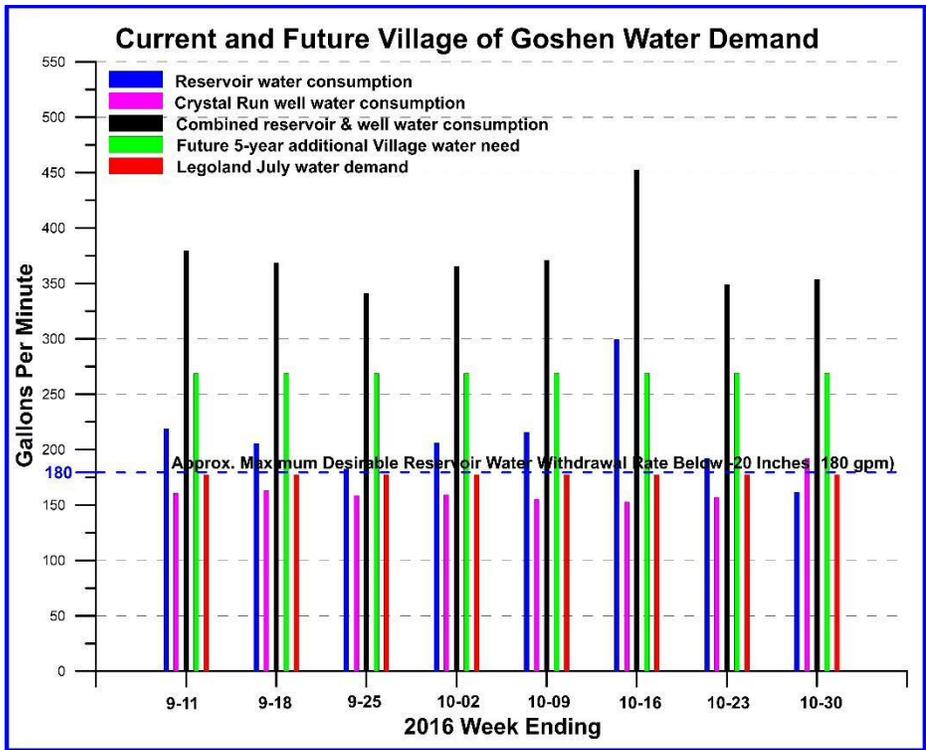


Figure 8. Current and future Village of Goshen water demand – week ending 10-30-16.

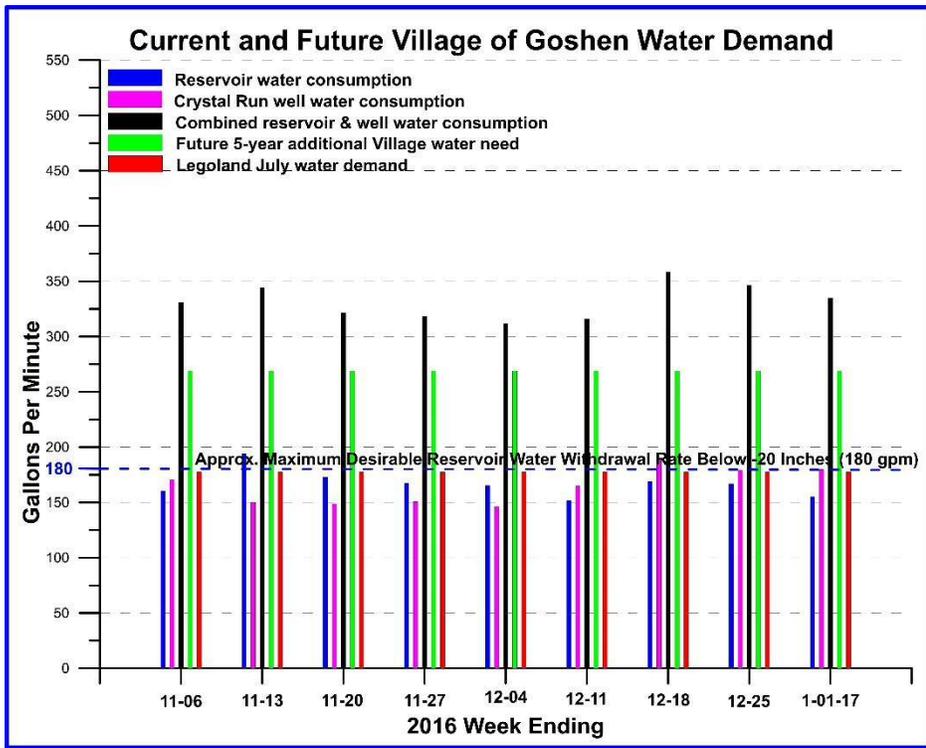


Figure 9. Current and future Village of Goshen water demand – week ending 1-01-17.

Large volume water sale should be based on examination of a worst-case drought scenario. This is the same scenario that led the Village of Goshen to obtain water rights and construct the two Crystal Run wells that are currently in use. Until such time as a comprehensive drought analysis is conducted using empirical data not presented in the DEIS, it would be prudent and in the best interests of current Village water consumers to evaluate water sale based on the premise that during long-term drought conditions no water may be available in the Prospect Reservoir. A case specific example of this situation was documented by Mayor Mattheus in 2002 in her statement that drought conditions have resulted in only six weeks of water remaining in the Prospect Reservoir. Since that time the Village population has increased. Under this likely and realistic scenario, the only water available to the Village during major drought conditions may be from Crystal Run wells. In this case, at least at this time and within the purview of information open for public review, the maximum quantity of water available from the two wells is 575 gpm (828,000 gpd).

Village wells were installed to supplement an inadequate reservoir water supply, presumably due to periods of low rainfall and drought conditions. The two Crystal Run wells that now augment reservoir supplies, even when pumped at about one-third of their capacity (~200 gpm vs. 575 gpm), are not sufficient to stop reservoir level declines associated with water withdrawal. The 2016 data set (Figure 2) indicates that the up-gradient Green Hill Reservoir was either dry or did not have sufficient volume to warrant water transfer to the Prospect Reservoir.

The basis of a cap on the quantity of groundwater withdrawal is a NYSDEC Village Water Supply Approval Permit (WSA Permit No. 3-3330-00222/00001), with an effective date of June 28, 2012. This permit is a consolidation of all prior Village water supply approvals. Specifically, the permit is to:

“Take a combined amount of water of up to 1.3 million gallons per day from Prospect Reservoir, Greenhill Reservoir and Crystal Run Village (CRV) Well Nos. 1 and 2. The CRV Wells are approved for a maximum combined withdrawal of 575 gallons per minute (828,000 gallons per day). Combined withdrawals from Prospect and Greenhill Reservoirs are limited in accordance with Special Condition No.1.”

The DEIS application material fails to provide sufficient hydrologic information needed to establish that existing and future users of Village of Goshen water resources will have adequate water during drought conditions. Review of 2016 Village water use data confirms that current daily water demand would sometimes exceed the June 28, 2012 NYSDEC Village Water Supply Approval (WSA) Permit relative to the approved maximum combined withdrawal of 575 gallons per minute (828,000 gallons per day) from CRV wells if both reservoirs were severely depleted.

Examination of 2016 Village of Goshen water consumption, based on daily water use data presented graphically as daily averages for sequential weeks (Figures 4 to 9), allows preliminary assessment of the maximum available water yield potential of water sources presented in Merlin’s Nov. 2016 DEIS. The highest 2016 daily pumping rate from Crystal Run wells occurred on

October 12, 2016 (370.3 gpm). The highest combined Prospect Reservoir and Crystal Run well daily use in 2016 occurred on Wednesday 5-25-16 with a total daily water use of 611.9 gpm. Thus, under current Village water use conditions, the maximum daily water demand is on the order of 600 gpm (864,000 gpd). This quantity exceeds the maximum permitted WSA amount of 575 gpm without any future Village growth and without the addition of a single high volume water consumer (e.g., Merlin). This is graphically portrayed on Figures 4 to 9. This accents the need to use empirical long-term data to conduct a comprehensive reservoir safe yield analysis. Again, NONE of the needed hydrologic data is presented, discussed or analyzed in the DEIS. Project approval or large volume water sale in the absence of a rigorous drought analysis would not be prudent.

Groundwater and Arcadia Hills Water District

The Legoland project site contains town-owned lots that are improved with wells that supply water to the Arcadia Hills Water District. HydroQuest discusses the hydrogeology of the aquifer in Addendum A. Mistakenly, Merlin concludes in their DEIS that: “*Based on Orange County GIS there are no aquifers underneath the Project Site.*” (Page 8, Table I-1, DEIS and Page 56 DEIS) This statement is completely unfounded and without merit, so much so that it potentially brings all their remaining hydrologic conclusions into question.

The proposed Legoland project site is underlain by fractured graywacke and shale bedrock formations. The wells in the northeastern portion of the site, discussed in the DEIS, are constructed in a bedrock aquifer. Groundwater is present within this aquifer and has been extracted from on-site wells in the past.

The DEIS addresses bedrock wells within this aquifer in a number of locations. For example, page 28 states:

“Two wells which currently exist on parcel 11-1-58 are proposed to be offered for dedication to the Town of Goshen for the benefit of the Arcadia Hills Water District along with a 100’ radius lot surrounding each well. These wells were drilled in 1996 and previously tested in 1999 as part of the investigation for a previously proposed residential subdivision on the Project Site. Wells were preliminarily tested at 15-25 and 50-65 gallons per minute respectively.”

Thus, there is a bedrock aquifer beneath the site, as is common elsewhere throughout New York State and beyond. The DEIS should be revised accordingly.

Regarding the adjacent Arcadia Hills development: “*No study was done to determine if the Village’s water supply system has the capacity to serve this development. These studies would be done by the Town’s Arcadia Hills Water District.*” (Page 58, DEIS) The same is true of the proposed Legoland development where no study was done to determine if the Village’s water supply system has the capacity to serve this development, especially under drought conditions. Nonetheless, a resolution from the Village Board of Trustees was adopted stating that the Village intends to contract with the Project Sponsor to provide water services subject to the completion of

SEQR. This resolution agrees to provide a very large water volume without any documentation in the DEIS or otherwise to justify this action (at least as provided by any empirical data that can be evaluated by hydrologists and engineers). The 5-page 9-23-16 Farr Engineering water supply letter does not provide sufficient data and information for anyone to check, much less agree with their conclusions. If sufficient technical data and information are not provided for other engineers and hydrologists to analyze and use to reach the same conclusion then the data set is incomplete and should not be provided in a DEIS or used as the basis for major water supply allocation decisions.

This agreement should be rescinded until a detailed analysis of reservoir safe yield is completed using historic water level data coupled with empirical data on reservoir capacity, current and projected water demand, meteorological data, evaporation rates, climatic conditions and other hydrologic factors. While the resolution is subject to SEQRA review, it has no justifiable DEIS or data-documented foundation. It was agreed to prematurely and should be nullified.

New Village Well

Merlin has agreed to pay for the construction of a new well placed close to the two existing Crystal Run wells. This is noted in the DEIS:

“A new well is to be constructed on the existing Village well parcel located off Stony Ford Road in the Town of Wallkill. Currently there are two wells and a monitoring well on this property in a fenced enclosure on this site. The Village has hired an independent hydrogeologist and engineer to drill one or more additional wells on this site to supplement the Village’s public water supply. New wells are to be located approximately 200 feet west of the Village’s two existing wells. Testing of potential wells is currently ongoing. The new well and all associated infrastructure will be owned and maintained by the Village of Goshen. The Project Sponsor will bear all costs related to the study, drilling and development of this well.” (Page 27, DEIS)

The DEIS does not provide any detailed information regarding pump testing and safe yield determination for a third Crystal Run well. As such, **potentially available additional water supply is not addressed in the DEIS and therefore, it cannot and should not be considered as part of the DEIS application or as supportive of project approval.** If this information and a third well are meant to be part of the Legoland project approval process, then all testing and analytical details need to be presented to the public for review and comment. Since it has not, anything to do with potential additional water yield cannot be considered as part of the DEIS material. We have requested technical information on this third Crystal Run well (see Table 1, FOI request number 7) but have received nothing to date.

Any determination to approve the new Crystal Run well as part of a Village water source should only be made after detailed hydrogeologic analysis of drawdown and recovery data collected during a 72-hour pumping test. Important questions to address, that are not addressed at all in the

DEIS, include whether the cone of depression from the new well significantly overlaps that of the other two wells and its safe yield.

Any Water Supply Permit modifications require the permittee to submit a separate written application to the NYSDEC, complete with supplemental information as per permit General Conditions 3 and 4. This is not discussed in the DEIS and documentation of aquifer testing. Similarly, discussion of safe yield from the proposed third Crystal Run well is not included in the DEIS. As such, this is **not** part of the DEIS application and any related material is NOT part of the environmental record under review. Its inclusion or consideration in Village water resource planning must be provided for public review and comment in a revamped DEIS or a SEIS.

Legoland Water Demand

Incredibly, the DEIS fails to provide any detailed data and analysis of potential water demand for the numerous components of the proposed Legoland project. Other major development applications provide detailed breakout of all water use for all project components. Here, instead, Merlin provides a few singular water use values they claim are representative of project water demand. The Village Board, the NYSDEC, the public and others have absolutely no way to assess whether the values put forth in the paragraph below are credible and whether they are provided in UK or US gallons:

“To determine anticipated water demand, usage from LEGOLAND Windsor was utilized as a benchmark due to the similar size and seasonal nature of the park. LEGOLAND Windsor is a 150-acre park with approximately 2.2 million visitors per year with two water attractions but no waterpark such as those provided in Florida and California. In 2015 the LEGOLAND Windsor Resort had a combined average water usage for the park and hotel of 176,438 GPD with peak usage in July of approximately 255,394 GPD. By comparison, the month of the least water use was December with a usage of 49,127 GPD. Existing LEGOLAND Parks in California and Florida are not comparable for water usage because both of these parks contain water parks which consume more water than is anticipated to be used at the Goshen Project Site.” (Page 56, DEIS)

There is no possibly way to evaluate the water quantity claimed as needed for the Legoland project. FOI request number 6 requests the technical data required to assess Legoland water demand. No data is provided in the DEIS and, keeping with this, the DEIS should have been rejected. Instead, no questions were raised, and the Village Board unanimously voted to approve a resolution to sell water to Merlin without any supportive data and technical review. This is reflected in the text on page 57 of the DEIS:

“Potable water for the Proposed Action will be provided via the Village of Goshen public water system. On August 8, 2016 the Village Board of Trustees passed a resolution agreeing to provide the Project Site water subject to the receipt of final engineering studies by the Village’s designated engineer, completion of SEQR and

final contractual agreements. This decision was based upon the findings of an independent engineering study which demonstrated that the Village's water supply could provide adequate service to both existing Village water customers and all other potential future system users currently within the Village based on existing zoning (see signed resolution and water supply analysis in Appendix E)."

As discussed above, if sufficient technical data and information are not provided for other engineers and hydrologists to analyze and use to reach the same conclusion then the data set is incomplete and should not be provided in a DEIS or used as the basis for major water supply allocation decisions. Clearly, a revamped DEIS or a Supplemental Environmental Impact Statement is needed.

Wetlands on the Project Site

Merlin has not conducted analyses to fully characterize existing wetland and site hydrology. This is necessary because continuation of the existing wetland ecosystem requires a natural hydrologic flow regime that exactly mimics existing hydrologic conditions (e.g., quantity, variability and timing of recharge). As designed, project construction will almost certainly irreparably harm site wetlands and ecosystems – thereby negating the intent of wetland protection laws.

As proposed, construction of the Legoland project is likely to adversely impact the biologic and hydrologic viability of the large wetland and on-site pond within the northwestern project site area. The size of this wetland may exceed 12.4 acres in areal extent, thus making it eligible for classification as a New York State wetland. The DEIS fails to adequately address shallow groundwater and surficial flow that naturally control the hydrologic functioning of the wetland. Protection of the wetland and its ecosystems requires the natural influx of groundwater baseflow, along with overland flow influx. Substantial physical alteration throughout much of the watershed will change surface and groundwater recharge to the wetland that are needed to make the ecosystem healthy. This will upset the wetland's existing hydrologic, thermal, and chemical balance. Groundwater recharge comes from the small surrounding watershed that is elevationally higher than the wetland into which it flows.

The natural watershed tributary to this northwestern wetland, inclusive of the wetland itself, is some 164.86-acres in areal extent (page 62, DEIS). DEIS figure III-11 depicts this very small watershed tributary to this headwater wetland. Because this recharge area is small, significant alteration within it will almost certainly change the hydrologic fluxes, their quantities and the natural seasonal timing of their arrival. Even a 100-foot buffer in such a small headwater area would not be sufficient to maintain these necessary hydrologic fluxes.

As depicted in DEIS Figure III-12 (post development drainage areas), Figure II-3 (project layout) and on Figure III-6 (cut and fill analysis), the proposed Legoland Park will permanently alter a substantial percentage of the recharge area needed to maintain wetland viability (i.e., alteration of topography by cut and fill, grading, retaining wall construction, impervious areas). Much of the wetland recharge area, exclusive of the wetland itself and buffer area, would be developed. As such, Merlin's statements on pages 63, 41 and 39 of the DEIS are questionable: "*In order to*

*minimize site disturbance and mimic existing drainage patterns, existing topography was held to the greatest extent possible when determining the proposed site grading. ... Wetlands will continue to serve the same function as they currently provide which include habitat areas, drainage areas as well as a physical and visual buffer between the project and adjacent properties. ... **Retaining walls reduce the overall amount of necessary disturbance and allows preservation of the wetland areas and other sensitive areas on the site.***” (emphasis added) Miles of retaining walls ranging up to 56 feet in height and massive site grading with fill elevations of up to 90 feet argue otherwise.

The northwestern, eastern and other on-site wetland’s water budget, water renewal rate, primary production and health depend on natural groundwater and surface water influxes. Planned development (i.e., sub-basin and drainage modification, buildings, grading, roads, paving, utility lines, retaining walls) will disrupt life-giving hydrological fluxes. Merlin has not addressed how they will engineer the site so the natural surface water and shallow groundwater recharge (i.e., in the shallow stormflow zone) that now hydrologically sustain site wetlands and their ecosystems (i.e., species composition and richness, primary productivity, organic accumulation, and nutrient cycling) will remain viable. The storm water design presented in the DEIS will not achieve this.

No engineering associated with the massive nature of the proposed project construction can result in maintaining or mimicking the natural hydrologic fluxes that make site wetlands viable. The DEIS fails to address this critical issue and also fails to address alternate locations where construction would not degrade site wetlands. This should be addressed in a revamped DEIS or a Supplemental Environmental Impact Statement.

Conclusion

The Village Board does not have the hydrologic information needed to make an informed decision regarding existing water adequacy during drought periods or the wisdom of selling large water volumes to single water consumers. They are not in a scientifically defensible position to evaluate the accuracy of the DEIS, much less grant project approval. The lack of adequate answers to each FOI request, both individually and collectively, document the incomplete nature of the DEIS. Thus, either a revamped DEIS or a Supplemental Environmental Impact Statement (SEIS) is needed. In addition, additional time is required by the public to review, analyze and comment on the data provided by the Village in response to the eleven FOI requests filed once it is received. As of the date of this comment letter, we have not received adequate responses to any of the FOI requests.

The lack of important hydrologic information required by the lead agency, by HydroQuest and by the public in order to make an informed decision regarding Village water availability supports and justifies requiring preparation of a significantly upgraded DEIS or, alternately, completion of a SEIS. Because the Village has not been responsive in providing important hydrologic information requested in the FOI requests, AND the information is not provided in the DEIS, HydroQuest reserves the right to supplement the record after the end of the public comment period after such time as we have been provided with material fully responsive to all our Freedom of Information requests.

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF ORANGE

-----X
CONCERNED CITIZENS FOR THE HUDSON VALLEY,
ROBERT BEASLEY, JOAN DONATO, WILLIAM
GREENE, WILLIAM LANDA, JORGE AND CAROL
MALDONADO, KATHERINE AND SALVATORE NERI,
AL AND ANN MARIE ROLO, PETER SCHELLENBERG,
ROBERT AND ELAINE TITO, LAWRENCE AND
GLORIA WHITE, ROBERT AND DONNA WOLFSON,
NICK GALLO,

ARTICLE 78
PROCEEDING

Petitioners.

vs.

VERIFIED PETITION

TOWN OF GOSHEN PLANNING BOARD,
MERLIN ENTERTAINMENT GROUPS,
U.S. LLC, TOWN OF GOSHEN, FINI BROTHERS
CONSTRUCTION,

Respondents.

FOR AN ORDER AND JUDGMENT PURSUANT TO
ARTICLE 78 OF THE CPLR

-----X
PAUL A. RUBIN, being duly sworn, hereby deposes and, under penalties of perjury, states as follows:

1. I am a hydrologist, hydrogeologist, geologist and cartographer with thirty-five years of professional experience. I earned a B.A. degree from the State University of New York at Albany in 1977 and an M.A. degree in geology with a specialty in hydrogeology from the State University of New York at New Paltz in May, 1983. My professional experience includes work conducted for the New York State Attorney General's Office (Environmental Protection Bureau), Oak Ridge National Laboratory (Environmental Sciences Division), the New York City Department of Environmental Protection, and as an independent environmental consultant as President of HydroQuest. My educational background and professional experience are more fully set forth in my Curriculum Vitae, attached as Exhibit A.

2. Within the broad field of hydrology, I have specialized expertise in both surface water and groundwater hydrology. Beyond this, I have specialized expertise in contaminant transport in fractured bedrock, unconsolidated and karst aquifers. I have conducted detailed assessments of streams, wetlands, watersheds, and aquifers for professional characterizations, for clients and as part of my own personal research. I have authored numerous reports and affidavits related to this work and have made presentations to judges, the NYS Assembly, the NYS Senate, and others. In addition, I have published papers and led all day field trips relating to this work at professional conferences.

3. Recently, I have been called upon by the Concerned Citizens for the Hudson Valley (CC4HV) to review the Legoland Draft Environmental Impact Statement and related documents to assess whether sufficient hydrologic material and technical analysis are presented to address the sufficiency of water for both the Village of Goshen and the proposed Legoland development.

4. I submit this Affidavit in my capacity as President of HydroQuest in support of CC4HV's assertion, in part, that the DEIS is so lacking in critical data so as to prevent a proper review. As an experienced professional in the fields of hydrology and hydrogeology, I am unable to formulate any reasoned assessments or conclusions from the material contained in the DEIS. Therefore, this same lack of information will necessarily prevent members of the lead agency from being able to take a "hard look" at the proposed project and the potential impacts associated with it.

5. Specifically, Merlin's and the Village of Goshen's water demand and water availability, as summarized below in a September 23, 2016 Farr Engineering letter, is not founded on empirical data presented and supported in the DEIS:

"Based on our analysis the Village of Goshen with its current available and permitted supply can provide the water requested by the Legoland project and also serve the CURRENT needs of the Village." (page 4)

During periods of drought, it is likely that the permitted water allocation of 1,300,000 gallons per day (903 gallons per minute) may not be available. This is discussed below, as is the premature resolution with Merlin to sell them large water quantities (adopted by the Village Board of the Village of Goshen on August 8, 2016: DEIS Appendix E).

6. Importantly, the DEIS is wholly incomplete relative to documenting water availability and water quantity needed for Merlin Entertainments Group US Holdings Incorporated's (i.e., Merlin, the applicant) Legoland project. The DEIS has insufficient factual support to properly assess either demand for water by Legoland or sufficiency of available surface and groundwater supply. Following the scoping session, Merlin had the responsibility to properly study and document its study of water availability. Merlin failed to do this. As such, the Planning Board again should have rejected the DEIS as incomplete, rather than certify it as complete and ready for public review and comment. The Planning Board's release of the DEIS was premature.

7. Based upon material presented in the DEIS and in a Farr Engineering letter addressed to the Village of Goshen dated September 23, 2016, it is not possible to determine if sufficient surface and groundwater are available to support existing and future water demand for the Village of Goshen and Legoland. Furthermore, additional material that addresses drought conditions and limited water availability indicate that analyses conducted to date on water availability do not correctly factor in known water supply limitations.

8. The DEIS and Farr Engineering letter purport that existing Village water usage from June 2015-June 2016 was 237,000,000 gallons with a July 2015 water usage of 24,000,000 gallons. This July 2015 water usage equates to an average daily water use of 774,194 gallons per day (gpd) or 538 gallons per minute (gpm). No supporting documentation of these values is presented for the 2015-2016 data year or for other water years where water demand may have been higher. As such, it is not possible to assess the veracity of the limited data presented.

9. The Village of Goshen is supplied by a combination of surface water and groundwater. Appendix E of the DEIS states that:

*“The Village of Goshen water supply system consists of two surface water reservoirs and one well field and is permitted by the New York State Department of Environmental Conservation to take a combined amount of water up to 1.3 million gallons per day (MGD). The Prospect Reservoir and Green Hill Reservoir are the main source of water supply for the Village of Goshen Water District. The Prospect Reservoir is located off of Lower Reservoir Road at the site of the Village Water Filtration Plant. The Prospect Reservoir is fed by surface runoff as well as the Green Hill Reservoir, located off Conklingtown Road. The Crystal Run Village (CRV) Well Field is located on Stony Ford Road in the Town of Wallkill and contains two Village owned wells; Well #1 is approved for 275 gpm and Well #2 is approved for 300 gpm. The permitted taking from the aquifer is limited to 0.45 MGD with Well #1 and Well #2 **alternately pumping.**”* (emphasis added)

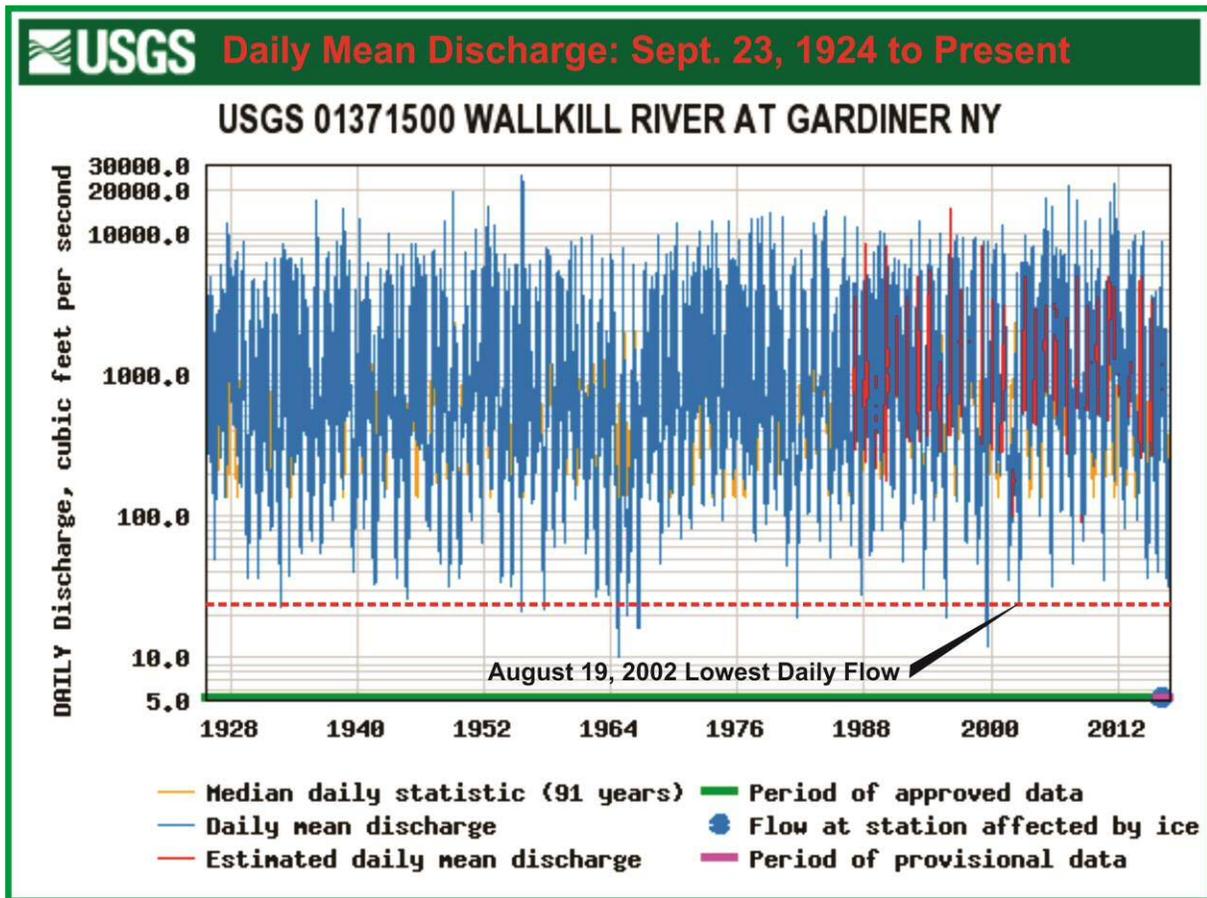
10. The DEIS fails to address the quantity of surface water available in the Prospect and Green Hill reservoirs, much less how much is available during times of drought and the emergency water shortage situations that repeatedly plague the Village. Information not included in the DEIS sheds some light on this. The December 1982 Camp Dresser & McKee *Orange County, New York Water Supply Development and Management Plan Volume II Appendices* document the relatively small drainage areas, reservoir size and storage volumes of the Prospect and Green Hill reservoirs, respectively (i.e., 346 acres, 48 acres, 180 million gallons; 487 acres, 7.4 acres, 50 million gallons). The Camp Dresser & McKee report provides an “*Estimated Yield*” of 0.50 million gallons per day from the combination of these two reservoirs. Apparently, this estimated value does not incorporate an assessment of short or long-term drought conditions that may greatly diminish the quantity of available surface water. Importantly, the DEIS fails to provide analysis of surface water availability during drought conditions. In fact, the DEIS fails to provide any historic or recent reservoir water level and volume figures. As such, it is not possible to document or verify surface water yield potential of either Village reservoir during drought conditions.

11. The DEIS fails to address the Villages’ historic or recent drought conditions and provide a record of all the drought warning stages that have occurred (i.e., alert, warning, emergency). The Town of Goshen’s May 2003 Water Use Alert Policy documents the Town’s recognition of repeated water quantity problems. Documentation of repeated water crises relative to insufficient reservoir water volumes is essential in establishing water availability during short and long-term drought conditions.

12. A revised DEIS is needed to assess reservoir water level and capacity information throughout the period of historic record. This information is needed to assess drought frequency and the reliability of the Village reservoirs during periods of drought. Current and historic data is needed to evaluate whether reservoir water should be factored into water availability calculations during worst case drought scenarios.

13. While the DEIS fails to address low reservoir capacity during periods of drought, water quantity issues are well-documented in the Village of Goshen. For example, a March 16, 2002 New York Times article by Winnie Hu (*A Village Running Dry Hopes It has Struck Water*) states that; *“The village’s main reservoir has only six weeks’ worth of water left in it, and the backup reservoir is already dry.”* Hu discusses the village board’s October resolution banning the use of water from the municipal system for washing cars, watering lawns or any outdoor use with potential fines of up to \$250 and 15 days in jail for the first offense. This is just one of many examples of historic Village of Goshen reservoir drought conditions that persist to this day.

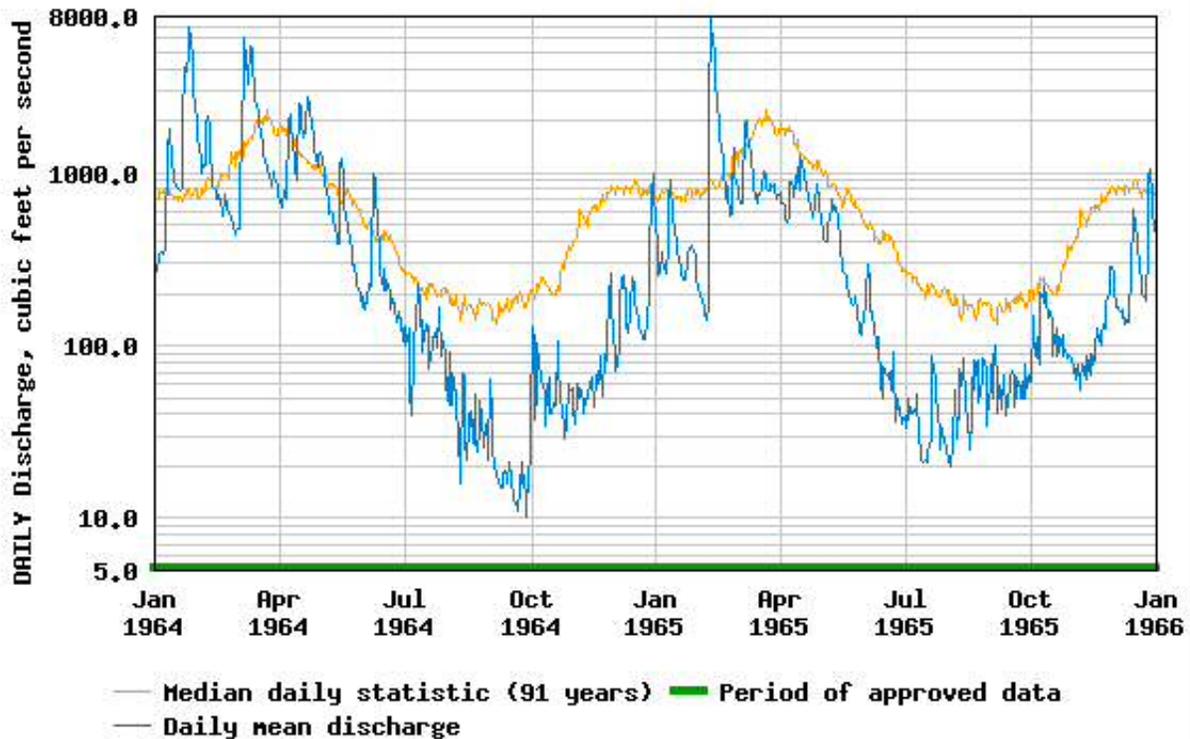
14. Until such time as the DEIS is updated with all historic and current reservoir level and volume data, it is reasonable to conclude that reservoir water deficits have and will continue to occur through time as drought events occur. As a surrogate data source to support this hydrologic fact and the need to conduct a rigorous hydrological drought analysis as part of a revised DEIS, review historic and long-term flow records documented on the Wallkill River at Gardiner (USGS gaging station 01371500) is useful. Because drought conditions are regional in nature, streamflow records provide a predictive tool to broadly assess likely drought conditions in un-gaged locations situated in similar topographic and regional settings. Reference to the graph below that depicts the daily mean discharge of the Wallkill River from September 23, 1924 to December 6, 2016 reveals numerous times of low river flow. Note the low Wallkill River flow of 24 ft³/sec recorded on August 19, 2002, the approximate time when the Village of Goshen’s Prospect Reservoir water level was alarmingly low and when the Green Hill Reservoir was dry. Visual comparison of periods of low river flow on graph with the Village of Goshen’s 2002 drought indicates that numerous similar or worse drought periods have occurred over the last 92 years of record. When population growth over this time period is considered, it is obvious that the small reservoir watershed sizes coupled with repeated drought conditions will likely result in major water deficits in the future (e.g., compare 1964, 1965, 1980, 1994, 1995, and 2001 with 2002; a major NYS disaster declaration was made on 8-18-65 due to water shortages). Hydrologically and statistically, these situations will occur again. The absence of any empirical-based assessment of worst case drought and water demand situations, especially when contemplating the newly signed legal agreement to provide water to Merlin, places existing Village of Goshen water users in jeopardy.



15. An important hydrologic factor to consider when contemplating sale of large volumes of the Village of Goshen's water supply to a corporate entity is the likely duration of drought conditions with an eye toward existing and future buildout water demand. As seen on the Wallkill River daily mean discharge plot below for the years 1964 and 1965, low flow and drought conditions may be long lasting. This critical type of water availability assessment should have been conducted prior to entering into a legal agreement to provide water to Merlin. At this juncture, protection and preservation of the Village of Goshen's water supply should be predicated upon rigorous assessment of empirical data and analyses not presented in the DEIS. As proposed, the Legoland action may result in a significant adverse environmental impact to Village of Goshen water users. Empirical data and analyses sufficient to protect Village of Goshen water users is wholly deficient from the DEIS.



USGS 01371500 WALLKILL RIVER AT GARDINER NY



16. During a Town of Goshen Public Hearing held on August 22, 2002, Dr. Serdarevic bemoaned people riding on the reservoir with an ATV all summer when there was no water. Village residents report observing very low reservoir levels during other years, with estimates of the Prospect Reservoir levels around 40 percent of capacity. All empirical data from Village records of reservoir water levels and volumes should be included in a revised DEIS so that analysis can be conducted regarding reservoir capacity and drought frequency and duration. It is entirely possible that very limited or no reservoir storage may be available during periods of extended drought. In such cases, the Village may be forced to rely solely on groundwater obtained from wells in the Crystal Run Village Well Field. In this event, groundwater availability from the two pre-2016 Crystal Run wells, which must operate alternately to not deplete the aquifer, would only be capable of providing about 56 percent of the July 2015 Village of Goshen metered water usage - only about half of what is needed. Under this worst case scenario, there may not be sufficient water for Goshen's existing infrastructure or for 5 to 10 year Village buildout, much less for Merlin's proposed Legoland project. The DEIS lacks

essential empirical data and rigorous water demand analysis sufficient to evaluate consideration of providing water to Merlin. Clearly, the “hard look” envisioned in SEQRA is not sufficient to conclude that no significant adverse environmental impact may occur that may jeopardize existing Village of Goshen water users.

17. The real potential of drought-plagued Village of Goshen reservoirs being unable to provide even existing water supply demand raises yet another issue associated with public water supply systems - that of system redundancy. For groundwater based public water supplies, the 2012 Edition of *Recommended Standards for Water Works* (aka 10 States Standard), Section 3.2 Groundwater, Sub-section 3.2.1 Quantity, Sub-section 3.2.1.1 Source capacity states:

“The total developed groundwater source capacity, unless otherwise specified by the reviewing authority, shall equal or exceed the design maximum day demand with the largest producing well out of service.”

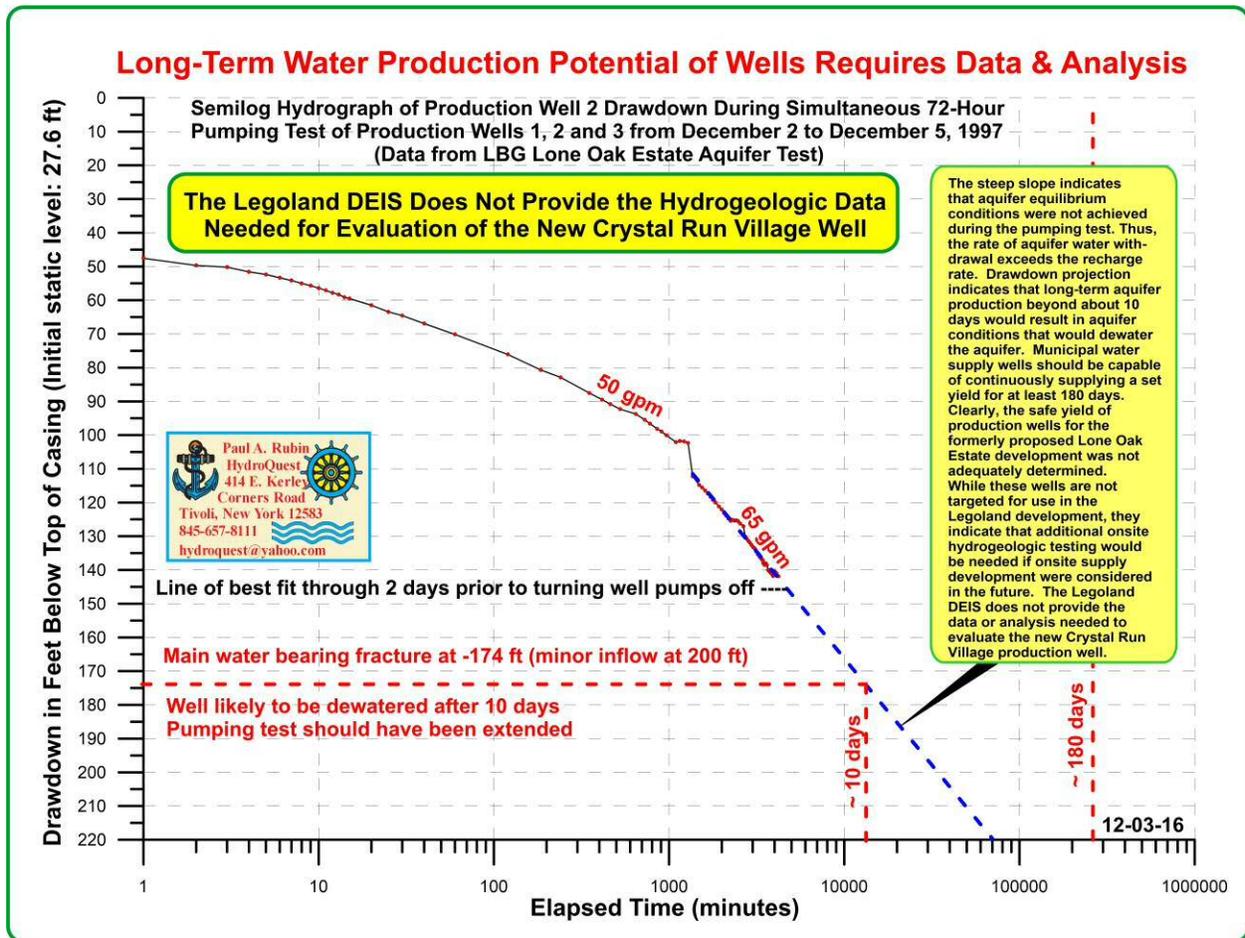
Should both Village of Goshen reservoirs not have sufficient water quantity to augment Village wells during extended periods of drought, it is likely that existing water demand could not be met, even with addition of a third Crystal Run well and without consideration of selling a large water volume to Merlin. Significantly, extended drought conditions may reduce the quantity of groundwater available to wells, which might further impact the Village of Goshen’s water supply. Thus, drought conditions may result in no system redundancy. The very serious nature of a potentially inadequate water supply must be addressed in a revised DEIS. Clearly, no empirical data with complementary analyses are presented in the DEIS that support the sale of large water quantities to Merlin. Any added water availability obtained from the new Crystal Run well is not presented in the DEIS and, as such, cannot be considered as any part of the basis for DEIS completeness or for basis of project approval.

18. As discussed above, the reliability of the two Village of Goshen reservoirs for production of surface water during periods of extended drought is in question. The “*Estimated Yield*” of 0.5 MGD from the two reservoirs as put forth by Camp Dresser & McKee is not rigorously supported. The DEIS does not provide any of the factual, empirical, data required to confidently determine to sell water to Merlin for a high demand water project.

19. Similarly, the DEIS fails to provide any empirical data to support the long-term availability of 275 gpm from alternating use of Crystal Run Village wells. No pumping test drawdown and recovery data, hydrographs and hydrogeologic reports which document the safe

yields of Crystal Run Village wells used by the Village of Goshen is provided in the DEIS. The lack of any geologic and hydrogeologic data supporting reported well yield values of 275 gpm and 300 gpm fails to provide the lead agency and the public with any means of verifying the safe yields of Village wells located near Stony Ford Road in the Town of Wallkill. While this information almost certainly exists in a report somewhere, it is not included in the DEIS - thus making it impossible to evaluate the long-term reliability of the aquifer, even if it is fully capable of sustaining a safe yield of 300 gpm. Therefore, the lead agency and public are not in a position to evaluate this aspect of the Village of Goshen's water supply.

20. It is not prudent to rely on singular, unsupported water use or yield values provided in the DEIS, by Farr Engineering or in dated reports provided in the DEIS. An example suffices to make this critical point. Appendix D of the DEIS (LBG 1999 Well Completion Report, Lone Oak Estates) provides hydrogeologic data and analysis of wells targeted for use in a proposed Lone Oak Estates development. As portrayed in the report, 72-hour pumping test data and arithmetic graphs appear to provide support for project water adequacy from three production wells. Unfortunately, the graphical method used was of a limited nature and failed to plot drawdown data on the standard hydrogeologic semi-log graph used to predict long-term safe yield of wells at 180 days. As seen on the example graph below of Production Well 2, it is highly likely that this production well would have been dewatered after 10 days of continuous pumping, not after 180 days or more. The Village of Goshen cannot afford to find themselves in this situation after approval of the proposed Legoland project. Before the lead agency approves a Merlin Legoland application, it would be prudent to conduct similar analyses of the two pre-2016 Crystal Run wells and the new Crystal Run well. The DEIS fails to provide any of the empirical data needed to conduct the hydrogeologic analyses and to assure Village of Goshen long-term water adequacy before considering selling water to Merlin. Again, the DEIS fails to provide any of this data and, as such, is incomplete and should not have advanced to the public review and comment stage.



21. Failure to construct semi-log plots of drawdown vs. time (used to predict drawdown at 180 days), such as in the above example plot depicting drawdown in Lone Oak Estate Production Well 2 during a simultaneous well pumping test, can lead to false conclusions regarding long-term water availability. In turn, extended use of such wells can lead to permitting development beyond available water resources. Because water availability is vital to the Village of Goshen, detailed hydrogeologic information must be included in a revised DEIS.

22. No geologic or hydrogeologic data and reports are included in the DEIS that address the new Crystal Run Village well and its safe yield, **or whether pumping it will simply draw in groundwater from the same aquifer area as the two existing production wells.** There needs to be data in the DEIS to demonstrate that the new well will not simply be “another straw in the same glass”, pumping out the same water from the same aquifer with overlapping cones of drawdown depression. Hydrogeologic data and analyses are needed in a revised DEIS to confirm that the new well can provide additional capacity. The DEIS states that this new well is

anticipated to be located approximately 200 feet west of the two existing wells (page 57). As discussed above, it is not possible to evaluate water availability in the absence of this information. As such, release of the DEIS was premature and should be rescinded, pending addition of all hydrologic information required to substantiate Village and Legoland project water availability under a worst case drought scenario.

23. Review of Village records on November 29, 2016 showed that substantial boring, soil testing, step drawdown and aquifer testing has been completed on a new Crystal Run Village well, as based on invoices contained in a very limited project file. This third Crystal Run Village well was completed to supplement existing Village water supplies and to, potentially, “...demonstrate that there exists proper means and methods of obtaining sanitary sewer disposal services and potable water to meet the demands of the Project ...that sufficient resources are available to provide the requested services to the Project” (DEIS Appendix E: Village of Goshen Resolution Regarding Water and Sewer and Engineering Reports).

24. Invoice descriptions show that requested files provided in the Village Hall on November 29, 2016 were not complete (e.g., “Report summarizing test well program for CRW wells for Mayor, Trustee and Attorney”; “Water and sewer report to analyze capacity”; “Water and wastewater capacity analyses”; “LL Water taking report modification and updates”; “Finalize water and wastewater reports and distribute”; “Site review of installation of CRV Well 3 and meet with driller and hydrogeologist and issue report”; “Monitoring well installation and geologic logging”; “Final boring logs”; “ASTM D422 Washed Sieve Analysis”; “Grain size analysis”; “Step drawdown data reduction and analysis”; “72 hour aquifer testing data collection”; assorted Miller Hydrogeologic proposals; Crystal Run well maps; CRV Well 3 well construction figure). None of this material was in the box of material provided to Ms. Sandy Rothenberger and myself in fulfillment of her FOI request, yet clearly it exists. All this material should be made available to the public now and should be incorporated into a revised DEIS for distribution and public comment. Its absence from the DEIS shows that the application material was incomplete and should not have been distributed for review. Its omission from the DEIS places the lead agency in a position of not having the factual, empirical, data and analyses needed to assess the reliability of their existing water supply, much less the ability to sell large water volumes to a developer.

25. Not only does the DEIS and related Farr Engineering material fail to provide needed hydrologic and hydrogeologic data and analyses, it seeks to have its reviewers accept at face value Merlin's Legoland water use values as reported from other Legoland projects. No detailed water use values are provided for other Legoland facilities that are needed to substantiate the basis for values provided in the DEIS and the Farr Engineering letter dated Sept. 23, 2016 (RE: Outside Village Water Capacity Request from Legoland (Merlin Entertainments)). Singular annual, peak month and peak month average daily flow values presented provide no means to verify claimed water demand figures. Detailed projections of all water use values throughout the planned development are needed. A large scale project without detailed water use breakout, such as is proposed here, is not acceptable. The DEIS provides no empirical water use values upon which to evaluate the proposal.

26. Furthermore, no detailed breakout of information regarding projected Village of Goshen water use values are presented specific to a 5 or 10 year demand period. Merlin systematically fails to provide critical hydrologic and hydrogeologic data needed to evaluate the adequacy of either existing water resources or the impact of additional project water demand.

27. The current DEIS fails to provide basic information and data required to meaningfully respond to project scoping requirements. This makes undertaking of any serious environmental review impossible. In the absence of the hydrologic information addressed here, neither the lead agency nor the public can rigorously evaluate actual water availability and whether there is or is not sufficient supply to meet existing or future demand. The Village of Goshen's resolution to sell large quantities of water to a private corporation without public input and review of empirical data of the nature discussed in this affidavit was premature.

28. The DEIS fails to provide hydrologic information needed to determine whether the Village's water supply is sufficient to consider high volume sale to a private company. As documented in this affidavit, the Merlin DEIS is incomplete and, as is, failed to provide sufficient empirically-based data to form the basis for entering into a water sale resolution with Merlin to provide a projected 27 percent annual increase in water usage above 2015-2016 Village of Goshen water demand for private corporate profit. Furthermore, hydrologic reports, aquifer test data and information were withheld from the public and were not made available upon FOI request. The DEIS should be rescinded, upgraded with empirical data and analyses

and provided thereafter for public review and comment. Anything less jeopardizes existing Village of Goshen water users.

Paul A. Rubin

PAUL A. RUBIN

Sworn to before me this
6th day of December, 2016

Notary Public



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December 15, 2016

Public Hearing Statement Submitted Into Hearing Record:

My name is Paul Rubin. As a hydrologist and hydrogeologist, I am here tonight on behalf of the Concerned Citizens for the Hudson Valley.

We are concerned that homeowners and businesses will not have sufficient water available for normal water usage during periods of drought, much less the extra 27 percent required to supply the proposed Legoland project. Proof of adequacy of water supply is of paramount importance. The DEIS fails to provide the detailed information required by both the lead agency and the public to assess water adequacy.

While other adverse environmental impacts have the potential of being mitigated, lack of sufficient water supply can cripple Village homes and businesses. One need not look beyond California's epic water supply issues during periods of drought to focus the camera lens closer to home. Scientific proof, complete with comprehensive supporting data, is critically important in order to evaluate whether there is sufficient water available to meet existing and future demands. The DEIS presents no detailed data and analyses to document that there will not be a MAJOR ADVERSE ENVIRONMENTAL IMPACT.

In fact, in all likelihood, based on the repeated drought conditions experienced by the Village - provision of large water volumes to Merlin's Legoland project will result in major water supply deficiencies during periods of drought - when water quantity is most essential. The DEIS fails to provide the needed data and analyses needed to address this critical SEQRA issue.

Simply put, there is not sufficient water quantity data or analysis in the DEIS for the Lead Agency or the public to conduct the coherent analysis needed to formulate science and information-based comment on water supply and demand. Specifically, Merlin failed to provide any detailed, empirical, data to support their unfounded claims that there is sufficient water for:

- 1) Existing Village needs in times of drought when one reservoir is dry and the other is extremely low;**
- 2) Future Village water demands as built out 5 to 10 years in the future;**
- 3) Major water supply demands required for the Legoland development; and**
- 4) Expansion of the Village's existing well field/aquifer. A third well was drilled and tested under the concept that it might provide needed water for Legoland. However, Merlin has provided NO testing data, graphs or analysis of this information. It is not in the DEIS and therefore cannot be considered part of the DEIS application.**

NO data is provided in the DEIS to support singular water demand values as are provided in other major development projects.

Importantly, the Village routinely experiences drought conditions that require warnings and/or water reduction measures. The DEIS fails to address this critical hydrologic situation that repeatedly occurs and fails to provide any hydrologic rationale or data to support selling a high percentage of the Village's finite water supply to a developer in advance of detailed proof of water adequacy. NONE of the data and information needed to conclude that there is sufficient water now to warrant sale to Merlin or to justify entering into an agreed upon Resolution to sell water to Merlin is presented in the DEIS. Neither the Lead Agency nor the public have the detailed hydrologic information needed upon which an evaluation of adequacy of water supply may be made.

Based upon review of historic drought periods throughout the region, as a professional hydrologist, there is reason to believe that the Village's water supply is already stressed during periods of drought – without addition of large volume water users. I address these issues in greater detail in the affidavit I am hereby submitting into the hearing record. In conclusion, the DEIS is incomplete. It does not contain sufficient hydrologic information upon which an informed decision may be made regarding the existing Village water supply, much less potential adverse environmental impacts of major additions to the drought-restricted system. I recommend that the DEIS be rescinded, pending addition of needed hydrologic information and analysis.