



MEMORANDUM

Date: June 1, 2016

RE: Ahwatukee Lakes- Response to Community Stormwater Concerns

Introduction

The purpose of this memo is to address recent drainage and stormwater related concerns and representations regarding redevelopment of the Ahwatukee Lakes property (the Property). This memo consolidates these concerns, including some misconceptions, and responds to them individually. Several of the concerns are centered on the presumption that the entire Ahwatukee Lakes golf course functions solely as a stormwater management system and any alteration to the system would result in dire consequences. While it is true that the system of lakes within the Property helps reduce the amount of stormwater passing through the golf course, there are several methods that can be employed to accomplish this same stormwater management function while being fully compliant with local and regional design standards and criteria.

It is worth noting early on that there is an extensive regulatory framework in place to prevent the potential of adverse drainage impacts as a result of development or redevelopment within the City of Phoenix. This framework, which is primarily administered by the City of Phoenix (the City) and Flood Control District of Maricopa County (FCDMC) provides technical design standards for all land development projects involving extensive review and permitting. Working within the regulatory framework set forth by the City and FCDMC, a drainage system for the Property must technically demonstrate that it provides flood protection equal to or greater than the original Ahwatukee Lakes golf course drainage system. This process ensures that the level of protection from flooding will be maintained prior to any construction or development. Implications that only the existing property conditions can meet these criteria are not accurate.

The following are the primary concerns that have been recognized along with their respective responses:

Concern #1: *Redevelopment of the Property would be done with disregard for drainage standards and regulations and will consequently have a negative impact on drainage conditions in the surrounding community.*

Response:

County and City regulations do not permit flooding to become worse as a result of development. As stated in the FCDMC's Design Manual, "As part of the planning and design process, the engineer must verify that releases from the stormwater storage facility will not adversely impact downstream conditions in terms of both manner and quantity of flow. Conditions such as peak flow, velocity, flow concentration, prolongation of flow and quality of discharge are factors to be considered."

Design regulations, rules, and safeguards are in place to ensure land development is done safely without negatively impacting neighboring properties. Drainage engineers, who are experts in the

industry, will work with The True Life Companies (TTLIC), the City, the FCDMC officials, and the public to ensure that adverse impacts are avoided and conservative design methods are implemented. Once constructed, the floodwater conveyance system will ensure that stormwater runoff will continue to be conveyed through the site safely without negatively impacting residents or its neighbors.

In order for the site to be safely altered, an extensive review process is first conducted by the experts to confirm stringent regulations and standards have been met prior to construction activities. In depth hydrologic and hydraulic studies, analyzing the amount of stormwater approaching and received by the Property, as well as how the flows will be conveyed through the Property, have and will continue to be performed for existing and future conditions, taking into consideration input from the public, identifying hazards and risks determined in the data collection and flood inventory process. The safety and welfare of the community is the primary concern when considering the redevelopment of the Property, no different than any new development.

An area drainage master study (ADMS) for Ahwatukee Foothills is currently being conducted by the FCDMC where existing conditions of the Property and surrounding areas flow conditions were modeled with preliminary results being made available. A detailed study was also recently commissioned by TTLIC to specifically evaluate the existing drainage conditions within the Property and vicinity. Site specific results were compared to the preliminary results of the ADMS and were found to be consistent yielding similar flows entering and exiting the Property. These results will be used as a baseline of comparison moving forward in the redevelopment of the Property. Both of these studies note that the lakes of the existing golf course were originally designed to operate full with only 1 -2-feet of actual stormwater storage capacity. As such, the golf course surrounding the lakes actually has minimal impact on stormwater reduction and the volume conveyed through the Property. The functionality of the existing lake system could easily be replicated with deeper basins requiring a smaller footprint and variations of channel configurations and compositions.

Concern #2: Massive rain storms have become the new norm.

Response:

It is a common misconception that 50 or 100 year storms mean that the events will only occur once every 50- 100 years. The 50 or 100 year storms are actually terms describing statistical probabilities in that the 50 or 100 year storm event have a 1 in 50 or a 1 in 100 (2% or 1% respectively) chance of occurring within a given year. The probabilities take into account historical precipitation from previous years for that particular area so the values are updated regularly.

For reference, current City and FCDMC regulations state that the peak 100-year storm event shall be the basis of design when designing new drainage infrastructure. Precipitation data used in stormwater management design is updated regularly by the National Oceanic and Atmospheric (NOAA) Hydrometeorological Design Study Center taking into account historic and recent rainfall patterns. The new development's design would take into account the most recently published NOAA rainfall data and be applied in accordance with the City and FCDMC standards.

In September 2014, the Phoenix metro area experienced one of the worst rainstorms in its history resulting from a hurricane originating off the western coast of Mexico. This unusual event was brought about by additional moisture and strength from the hurricane added to the typical monsoon weather patterns. Images and videos can readily be found on the internet demonstrating the extent of impacts felt from the rainfall precipitation experienced all over the Valley. The FCDMC indicated that this storm ranged from a 100-1,000 year flood in Ahwatukee meaning that the storm had a statistical 0.1%- 1% chance of recurring within a given year.

Concern #3: *The watershed affecting the Property is immense or unique.*

Response:

The total drainage area coming off the side slopes of South Mountain is approximately 275 acres which is joined by approximately 450 acres of residential area. The stormwater runoff from South Mountain and contributing neighborhoods are currently conveyed upstream and downstream of the Property in a system of manmade channels.

The stormwater entering the Property for the 100-year storm event is estimated to be 650-700 cubic feet per second in the Ahwatukee Foothills ADMS. An engineered channel with a top width of 50 feet, 3-feet deep would be hydraulically sufficient to pass flows safely downstream, consistent with what currently exists upstream and downstream of the Property. For reference, the golf course width perpendicular to flows passing through the Property ranges between 450-1,500-feet.

Considerations for stormwater runoff, generated from nearby mountain slopes have, and always will be, a necessity while developing in the metropolitan Phoenix area. Detailed hydrologic analyses, used successfully for decades, allow the amount of runoff to be quantified so that hydraulic structures can be adequately sized in order to convey runoff safely downstream and protection is provided for adjacent properties. The stormwater generated from the tributary drainage areas off South Mountain and the Property are consistent with adjacent watersheds and the FCDMC ADMS allowing the design of conveyance structures to be built with confidence.

Concern #4: *Channelizing flow through the Property would be dangerous.*

Response:

It is true that restricting water increases a flows velocity and more rooftops and pavement generally equate to additional stormwater runoff. However, as mentioned in response to Concern #3, stormwater runoff from South Mountain and contributing neighborhoods are conveyed upstream and downstream of the Property in channels. In addition, typical engineering techniques are readily implemented to accommodate land use changes that effectively eliminate adverse impacts downstream. City and FCDMC requirements state that flows leaving the developed site cannot exceed flows determined in the existing conditions analysis. This would be accomplished in future development by a variety of methods including channel material selection, grade control, and adding onsite stormwater storage basins to replace the lakes and offset the potential increase caused by the additional impervious area. When designed and implemented properly, these drainage structures will be highly effective in managing stormwater through the Project during storm events as well as being aesthetically pleasing, benefitting the community and not approved without rigorous review by the City.

Concern #5: *Lack of maintenance within the Property has compromised its functionality in the overall drainage system.*

Response:

As discussed previously, the September 2014 rainfall event was unprecedented, creating drainage issues everywhere and inundating most of Phoenix. Much of the critical discussion on the state of the Property's drainage system is specific to how it functioned during the 2014 storm event. Pictures have been circulated showing that onsite drainage infrastructure was overwhelmed, unable to handle the unusual event at various locations. This did not necessarily mean that the existing drainage system was not functioning properly due to a lack of maintenance as the flows were unusual and extraordinary. The integrity of all drainage facilities designed for the 100-year storm were compromised, causing inevitable flood damage and road closures all over Phoenix. Since

acquiring the Property in 2015, TTLC has maintained the land, removing debris and unnecessary vegetation onsite which were obstructing stormwater flows posing potential hazards and will continue to do so into the foreseeable future.

Concern #6: Maintenance activities and modifications to the channel systems upstream and downstream of The Lakes Property have caused adverse impacts to the function of the drainage system.

Response:

Modifications of the drainage channels were performed by outside organizations acting independently and are not within TTLCs' control. Conversely, TTLC has a vested interest in seeing that activities causing adverse impacts are discontinued as any changes upstream directly affect the functionality of the downstream drainage system and create unnecessary maintenance issues. These issues will be addressed prior to and during the design process. However, activities occurring upstream and offsite of the Property are ultimately out of the control of the developer. The Property will continue to be maintained ensuring that impacts from any unanticipated upstream channel modifications do not impact the surround area negatively.