

# ANDAZ RESORT EXPANSION WATER SYSTEM ANALYSIS REPORT

May 18, 2022

## **Project Description:**

The project site is rectangular in shape and encompasses approximately 5.03 acres and is currently undeveloped and vacant. The proposed development for the site includes construction of 10 new villas, ranging in size from approximately 2,145 sq. ft. (2-bedroom) to 4,070 sq. ft. (4-bedroom) with a new private 24-foot wide access drive. Proposed improvements will also include extensions of the private on-site sewer, water and fire lines to provide service to each villa and a proposed stormwater retention basin located at the south side of the site to provide the required stormwater retention volume.

The intent of this water design memo is to identify Average Day Demands, Maximum Day Demand and Peak Hour design flows for the proposed development as well as determine Fire Flow requirements for the proposed hydrant. The existing on-site fire and water loop is private and ultimately connects to public water lines owned and operated by EPCOR Water Arizona Inc.

## **Site Information:**

Assessor's Parcel No.: 174-65-004C

Site Address: 6041 N. Quail Run  
Paradise Valley, AZ 85253

Site Area: 219,027 sq. ft. (5.03 acres)

## **Tie-In to Existing System:**

The proposed water line for this project will tie into an existing 6-inch private water line on the existing resort property, just north and east of the project site. This existing 6-inch line is served by two (2) existing 2" meters and loops through the existing resort property providing domestic service to each existing building.

The proposed fire line for this project will tie into an existing 6-inch private fire line on the existing resort property, just north and east of the project site. This existing 6-inch line loops through the existing resort property and provides fire flow to all fire hydrants and sprinkler systems.

## **Average Daily Demands:**

To determine the Average Day Demands, the following references were used:

- EPCOR Developer & Engineering Guide, 2020.

Currently the site is zoned R-43 (single-family residential) however, as part of the development, the parcel is anticipated to be rezoned to SUP Resort. Given the proposed improvements include the construction of 10 new villas, the proposed usage is assumed to be more closely related to that of single-family residential, therefore the proposed water demands were determined by using the Single Family criteria outlined in the EPCOR Developer & Engineering Guide, as such:

Per the Demands Table under the Design Criteria for Water Systems, the Average Daily Unit Demand for this project is 360 gallons per day per dwelling unit (gpd/DU).

Therefore, the total Average Day Demand is:

$$(360 \text{ gpd/DU}) \times (10 \text{ DUs}) = \underline{\mathbf{3,600 \text{ gallons per day (gpd) = 2.5 gpm}}}$$

### **Maximum Day Demand and Peak Hour Flow:**

In accordance with the Demands Table under the Design Criteria for Water Systems, the Maximum Day peaking factor and Peak Hour peaking factor are as follows:

#### **Maximum Day Demand**

$$\text{Max Day Demand} = \text{ADD} \times 1.8$$

#### **Peak Hour Demand**

$$\text{Peak Hour Demand} = \text{ADD} \times 3.0$$

Therefore, the Maximum Day Demand and Peak Hour Demand are:

$$\underline{\mathbf{\text{Maximum Day Demand} = (3,600 \text{ gpd}) \times 1.8 = 6,480 \text{ gpd} = 4.5 \text{ gpm}}}$$

$$\underline{\mathbf{\text{Peak Hour Demand} = (3,600 \text{ gpd}) \times 3.0 = 10,800 \text{ gpd} = 7.5 \text{ gpm}}}$$

### **Fire Flow:**

In accordance with Section 13-1-6(A) of the current Town of Paradise Valley Town Code, as amended by Ordinance #2022-01, effective April 11, 2022, the minimum fire flow from all hydrants in the Town will be 1,500 gallons per minute.

To verify this required fire flow can be delivered to the proposed hydrant from the existing system, a full water model will be run on the system during the permitting process, utilizing current fire flow test data from existing adjacent hydrants.

### Water System Criteria:

In accordance with the requirements of the EPCOR Developer & Engineering Guide:

- Minimum water pressures shall not be less than;
  - 55 psi static
  - 40 psi at Peak Hour
  - 20 psi at Max Day + Fire Flow
- Maximum pressures in excess of 80 psi will require service line pressure reducing valves.
- Water main velocities for all mains less than 16 inches in diameter shall not exceed ten (10) feet per second.

Please note that this analysis is conceptual in nature to determine the water demand loads associated with the proposed development and identify minimum fire flow requirements and operational criteria. A more detailed evaluation will be provided during the permitting process and closely coordinated with EPCOR Water Arizona Inc. as the water provider. All required plan approvals and permits will be obtained from EPCOR prior to the commencement of construction operations.

