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## TECHNICAL MEMORANDUM

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# Arantine Hills Specific Plan Amendment No. 3

## Water Supply Assessment Update

PREPARED FOR: Guardian Capital

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### Introduction

The purpose of this memorandum is to provide a summary of the changes to the Water Supply Assessment (WSA) for the Arantine Hills Specific Plan (AHSP) within the City of Corona (City), associated with the AHSP Amendment No. 3. The Amendment No. 3 of the AHSP (referred to as "Project") will include additional proposed land use areas that will generate new water demands. These changes require an analysis to prove there is adequate water supply to meet these additional proposed demands beyond what was provided in the original WSA.

The approved AHSP under Amendment No. 2 ("Approved Plan"), allows for 80,000 SF of commercial use on 10.03 acres. Under the proposed Project, the boundary of AHSP will increase by 17.85 acres. The Project includes 21.67 acres designated for commercial use and 6.21 acres designated for open space. The commercial use designated in the Project includes 134,378 SF of general commercial plus a 135-room hotel. This represents an increase of 54,378 SF (1.248 acres) of commercial space, approximately 24,786 SF of hotel area across 135 rooms (0.569 acres) and 2.96 acres of irrigated open space.

The WSA was submitted in August 2015 and utilized information from the 2010 Urban Water Management Plan (UWMP). Since the original WSA, the City updated their water planning documentation and submitted the 2015 UWMP (approved in July 2016). Therefore, this analysis includes a review of the 2010 and 2015 UWMPs to ensure adequate water supplies exist to serve the expanded areas associated with the Project.

### Project Land Use and Water Demands

The original WSA employed water unit flow factors from the City's Water Master Plan (WMP). The WMP was approved by the City in 2005. Following this same methodology, total demands for the

Project is calculated in gallons per day (gpd) and converted to acre feet per year (AFY) to be consistent with UWMP water supply and demand projections as shown in Table 1.

**Table 1 - Additional Project Demand by Land Use**

Land Use	Additional Acres in Amendment No. 3	Water Unit Flow Factor (gpd/ac)	Total Demand (gpd)	Total Demand (AFY)
General Commercial (GC)	1.82 <sup>1</sup>	1,610	2,930.2	3.28
Open Space (OS)	2.96 <sup>2</sup>	1,000	2,960	3.32
<i>Total Additional Water Demand from Project</i>			<b>5,890.2</b>	<b>6.60</b>
<i>Original Project WSA Water Demand Estimate</i>			<b>710,265.8</b>	<b>795.6</b>
<i>Total New Project Water Demand</i>			<b>716,156.0</b>	<b>802.2</b>
Notes				
<sup>1</sup> General Commercial only includes hotel (135 rooms over 0.569 ac) and commercial building footprints (54,378 sf or 1.248 ac).				
<sup>2</sup> Open Space acreage above only includes irrigated land which represents 2.96 acres of the total 6.21 acres of Open Space associated with the AHSP Amendment No. 3.				

As shown above in Table 1, the original water demands projected in the WSA for the AHSP is 795.6 AFY. With the additional land uses associated with the Project, water demands for the AHSP will increase by 6.60 AFY for a total new AHSP water demand of 802.2 AFY. To determine if the City has the ability to provide water supply to the additional demand from the Project, the new total AHSP water demand is compared to the 2010 and 2015 UWMPs as described below.

### 2010 and 2015 UWMP Supply and Demand Reliability Comparison

As mentioned above, the original WSA utilized data from the 2010 UWMP. Since that time, the 2015 UWMP for the City was approved. Therefore, it is important to compare the findings of the 2010 and 2015 UWMPs along with the additional water demands associated with the Project. Table 2 below shows the supply vs demand reliability calculations from the 2010 UWMP. The grey highlighted rows show the available surplus (supply – demand) in AFY for each scenario: Normal Year (NY), Single Dry Year (SDY), and Multiple Dry Years (MDY).

**Table 2 - 2010 UWMP Reliability Projections**

<b>Normal Year (AFY)</b>					
	2015	2020	2025	2030	2035
Total Supply	71,640	76,272	78,549	76,713	75,192
Total Demand	46,110	43,807	44,424	45,123	45,878
Difference (S-D)	25,530	32,465	34,125	31,590	29,314
Difference % of S	36%	43%	43%	41%	39%
Difference % of D	55%	74%	77%	70%	64%
<b>Single Dry Year (AFY)</b>					
	2015	2020	2025	2030	2035
Total Supply	63,131	67,612	69,517	67,834	66,281
Total Demand	53,826	51,137	51,857	52,673	53,555

Difference (S-D)	9,305	16,475	17,660	15,161	12,726
Difference % of S	15%	24%	25%	22%	19%
Difference % of D	17%	32%	34%	29%	24%
<b>Multiple Dry Years (AFY)</b>					
	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Total Supply	60,115	63,686	64,065	63,343	62,791
Total Demand	53,826	51,137	51,857	52,673	53,555
Difference (S-D)	6,289	12,549	12,208	10,670	9,236
Difference % of S	10%	20%	19%	17%	15%
Difference % of D	12%	25%	24%	20%	17%

Table 3 below similarly shows the supply vs demand reliability calculations from the 2015 UWMP. The grey highlighted rows show the available surplus (supply – demand), denoted as “Difference (S-D)”, in AFY for each scenario: Normal Year (NY), Single Dry Year (SDY), and Multiple Dry Years (MDY).

**Table 3 - 2015 UWMP Reliability Projections**

<b>Normal Year (AFY)</b>					
	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Total Supply	56,396	56,396	56,396	56,396	56,396
Total Demand	39,533	39,514	39,555	39,636	39,636
Difference (S-D)	16,863	16,882	16,841	16,760	16,760
Difference % of S	30%	30%	30%	30%	30%
Difference % of D	43%	43%	43%	42%	42%
<b>Single Dry Year (AFY)</b>					
	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Total Supply	56,396	56,396	56,396	56,396	56,396
Total Demand	47,616	47,486	47,523	47,609	47,699
Difference (S-D)	8,780	8,910	8,873	8,787	8,697
Difference % of S	16%	16%	16%	16%	15%
Difference % of D	18%	19%	19%	18%	18%
<b>Multiple Dry Years (AFY)</b>					
	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Total Supply	56,396	56,396	56,396	56,396	56,396
Total Demand	50,463	51,171	51,986	52,871	53,861
Difference (S-D)	5,933	5,225	4,410	3,525	2,535
Difference % of S	11%	9%	8%	6%	4%
Difference % of D	12%	10%	8%	7%	5%

It is relevant to compare the differences for the Multiple Dry Year (MDY) scenario between the 2010 and 2015 UWMPs as this represents the worst-case scenario as compared to Normal Dry Year (NDY) and Single Dry Year (SDY) referenced above. The MDY from the 2010 UWMP projects a surplus of 6,289 AFY that increases to 9,236 AF from 2015-2035. The MDY from the 2015 UWMP projects a surplus of 5,933 AFY that decreases to 2,535 AFY from 2020-2040. In summary, even in the MDY scenario summarized in the 2010 and 2015 UWMPs, there is always a surplus of water available.

As shown below, in terms of projected water demand capacity/surplus calculated from the 2015 UWMP projections as compared to the demands from the new AHSP of 802.2 AFY, the Project did

not result in a deficit in any scenario. Below in Table 4 are the surplus calculations for each climate scenario from the 2015 UWMP projections minus the AHSP new water demand.

**Table 4 – 2015 UWMP Surplus – AHSP Water Demand**

	2020	2025	2030	2035	2040
Normal Year (AFY)	16,061	16,080	16,039	15,958	15,958
Single Dry Year (AFY)	7,978	8,108	8,071	7,985	7,895
Multiple Dry Years (AFY)	5,131	4,423	3,608	2,723	1,733

As shown above, there is surplus even in the MDY scenario in the 2015 UWMP including the AHSP new water demand. The AHSP's total water demand increased from 795.6 AFY to 802.2 AFY from the Approved Plan to the current Project. The minimum surplus of 2,535 in 2040 (Table 3) in the MDY scenario represents the worst case which is greater than the proposed increase from the Project of 6.60 AFY and the total AHSP new water demand of 802.2 AFY. Therefore, it is reasonable to conclude that there are still adequate water supplies to provide for the proposed Project.

## Conclusion

Overall, in terms of water supply reliability, the water demand from additional commercial and open space land uses associated with the Project are in-line with the conclusion of the original WSA. In the long run, the addition of the Project and the associated water demands to the AHSP do not significantly impact the ability of the water provider to supply water to AHSP in multiple climate scenarios (i.e. Normal, Single Dry, or Multiple Dry Years). Therefore, it can be concluded that there are adequate supplies to serve the AHSP Amendment No. 3 anticipated water demand increases as well as other demands within the City's jurisdiction.