

| MEMORANDUM  |                                                    |
|-------------|----------------------------------------------------|
| <b>TO</b>   | Anita Verma-Lallian, Arizona Land Consulting, LLC. |
| <b>CC</b>   | Darrell Wilson, HILGARTWILSON                      |
| <b>FROM</b> | Chris Einmo, HILGARTWILSON                         |
| <b>DATE</b> | May 23, 2022                                       |
| <b>RE</b>   | Casa Grande Sites<br>Utility Feasibility           |

## General Description

The subject area is comprised of four parcels located within Sections 29 and 32, T6s R6E, located south of Jimmie Kerr Boulevard and west of Trekell Rd, immediately south of the city limits of Casa Grande, Arizona ("City"). At this time the land use is not known, but we assume typical water/wastewater values for industrial development for the purposes of probable utilities.

To estimate the future utility needs and order of magnitude approximation of costs, we have prepared our best estimate of the future water and wastewater layout to serve the subject area based on the existing surrounding utility infrastructure.

## Water Facilities

The subject area is located within the Pinal Valley CC&N of Arizona Water Company ("AWC") but does not currently have water service. Based on GIS mapping (AWC, 2019) and as-built drawings (AWC, 2008), the nearest water facilities are a 6" water line along Chuichu Road, a 16" water line along Earley Road, and a 24" water line along Peart Road.

Water demands for the subject area are estimated to be approximately 521,000 gallons per day or 362 gallons per minute (average daily demand) based on typical industrial demand factors used by AWC for infrastructure planning. Fire flow is assumed to be 2,500 gallons per minute based on typical values for industrial projects in the area with automated sprinklers. Based on these projections and Arizona Water Company system design criteria, we estimate the subject area will require a 16-inch water line.

A looped 16-inch ductile iron pipe is anticipated from the existing dead end of the 16" Earley Road water line to connect with the existing 6" water line on Chuichu Road ("Option 1"). An alternative loop where all connections are 16" or larger is provided ("Option 2") is depicted running from the Early Road water line to the 24" transmission line along the Peart Road water line; however, this option will be more expensive, and tapping connections to transmission lines are generally discouraged. Both options would likely require the installation of a water crossing under the Union Pacific Railroad via steel carrier pipe at Trekell Road.

## Wastewater Facilities

The subject area is located within the Casa Grande Sewer District operated by the City. The nearest sewer line connection shown in the model is the 12" PVC sewer along Florence Street; however, this sewer runs through downtown and shows signs of capacity limitations as it picks up flows from downtown (Sunrise, 2016).



To avoid capacity issues, development will likely require a connection to the existing 15-inch PVC sewer at Thorton Road to the west. This sewer currently extends to the Walmart Distribution Center, and as of the latest model demonstrated under-utilized capacity ( $d/D < 0.50$ , Sunrise, 2016).

Alternatively, a sewer connection along Peters Road running further west to Burris Road has been considered and would likely provide adequate capacity; however based on the latest plans available for the Lucid Motors plant, the sewer extension is within private property and would require extending sewer to Commerce Drive.

We anticipate a 12-inch sewer connection along Peters Road, then running north along Thorton Road to connect to the existing 15-inch sewer. Following the slope of existing ground, this results in an approximate flow velocity of 2.7 feet per second and a  $d/D$  value of 0.54 which are within the City's design criteria. The alternative connection at Commerce Drive (not shown) would provide a feasible alternative but at slightly higher cost due to approximately 1,500 extra feet of sewer.

## Summary

We estimate that the water and wastewater demands of the subject area can be served by new 16-inch water and 12-inch sewer lines, respectively, assuming typical values for industrial developments in the area. Based on our current understanding of the existing infrastructure, it is believed that the water and wastewater systems in the vicinity can absorb the demands of potential development; this will need to be verified with utility coordination and further study.

Engineering design will be required to construct the utility improvements along public streets to provide water and wastewater connections to the subject area. [HILGARTWILSON](#) would be able to provide a proposal for these engineering services upon request.

## References

Arizona Water Company (2019). GIS data provided via correspondence. Phoenix, AZ.

Arizona Water Company (2008). *1-4469/Railroad Crossing Improvements*, construction plans dated 5/13/08, Permit No. 1789-51. Phoenix, AZ.

Sunrise Engineering (2014). *City of Casa Grande: Wastewater Master Plan Update & Interceptor Sewer Modeling*. Mesa, AZ.

## Attachments

- Hydraulic Calculations
- Class 5 Cost Estimate
- Conceptual Facility Map

**HYDRAULIC SUMMARY**

ARIZONA LAND CONSULTING, LLC

Casa Grande, Arizona

May, 2022

Calculated By: CE

Checked By: DW

**Water Demands**

| Average Day |     | Max Day   |     | Peak Hour |       |
|-------------|-----|-----------|-----|-----------|-------|
| GPD         | GPM | GPD       | GPM | GPD       | GPM   |
| 520,725     | 362 | 1,041,450 | 723 | 1,562,175 | 1,085 |

**Water Calculations**

|                         |           |
|-------------------------|-----------|
| Industrial <sup>1</sup> | 1500 gpad |
| Max Day                 | 2.0 x ADD |
| Peak Hour               | 3.0 x ADD |
| Fire Flow <sup>2</sup>  | 2500 gpm  |

**Water Line Sizing - Max Day + Fire Flow**

| Pipe Dia. (in) | Flow Vel. (ft/s) | Headloss per 1000 ft |
|----------------|------------------|----------------------|
| 10             | 13.17            | 54.04                |
| 12             | 9.14             | 22.24                |
| 16             | 5.14             | 5.48                 |
| 24             | 2.29             | 0.76                 |

**Wastewater Generation<sup>3</sup>**

| Average Daily Flow |     | Peak Flow |     |
|--------------------|-----|-----------|-----|
| GPD                | GPM | GPD       | GPM |
| 347,150            | 241 | 1,388,600 | 964 |

**Sewer Line Sizing**

| Pipe Dia. (in) | Flow Vel. (ft/s) | Normal Depth (in) | d/D  |
|----------------|------------------|-------------------|------|
| 10             | 3.94             | 7.70              | 0.77 |
| 12             | 2.74             | 6.50              | 0.54 |
| 15             | 1.75             | 5.80              | 0.39 |
| 18             | 1.22             | 5.40              | 0.30 |

<sup>1</sup>Based on correspondence with Arizona Water Company<sup>2</sup>ICC (2019), assumes automated sprinkler systems.<sup>3</sup>Wastewater Master Plan Update & Interceptor Sewer Modeling, Sunrise Engineering 2014

**COST SUMMARY TABLE**

ARIZONA LAND CONSULTING, LLC

Casa Grande, Arizona

May, 2022

Calculated By: CE

Checked By: DW

**Option 1 - looped connection to 6" line at Chuichu Road**

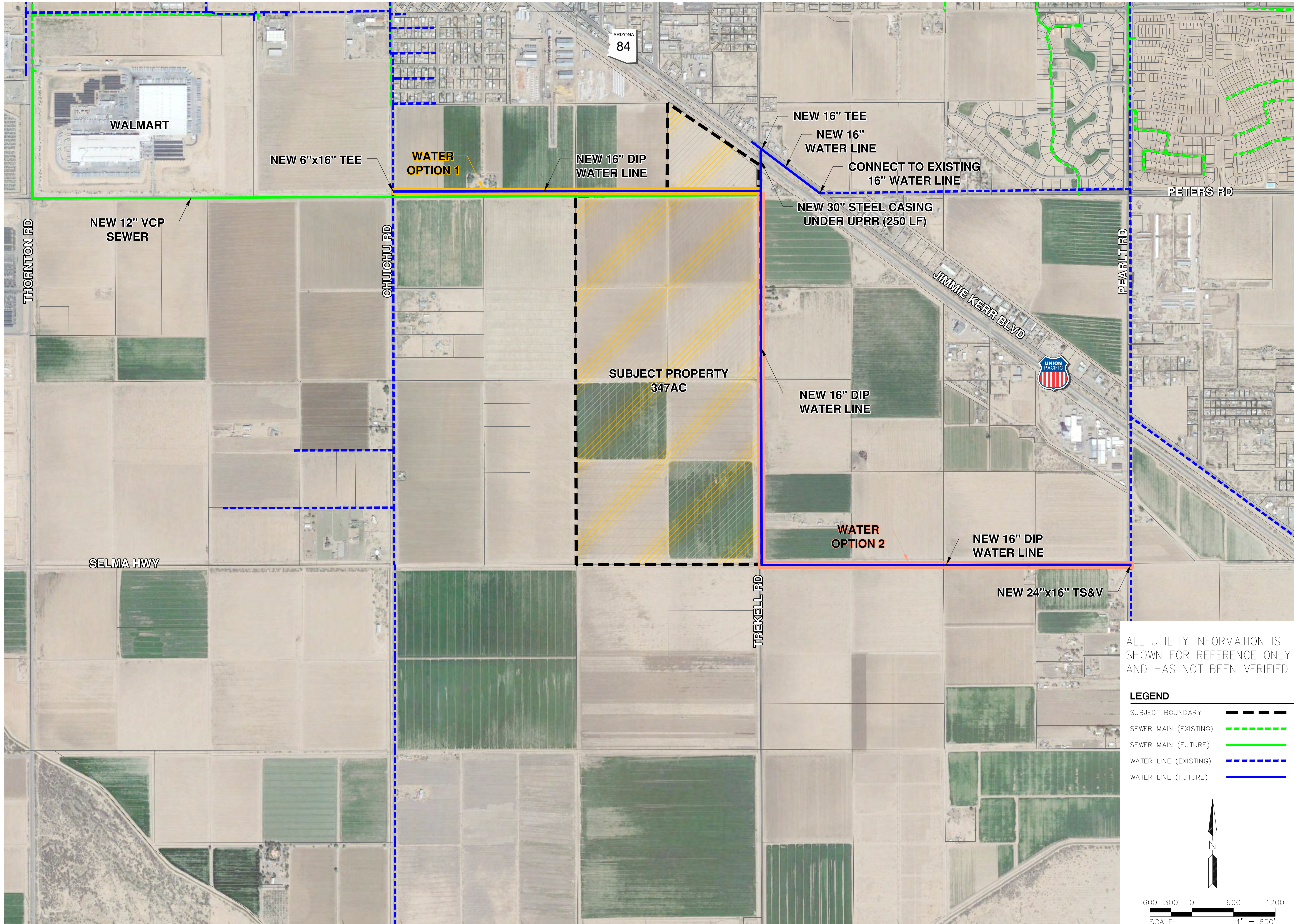
|                                              |           |                     |
|----------------------------------------------|-----------|---------------------|
| Water Line Construction                      | \$        | 2,400,000.00        |
| Sewer Line Construction                      | \$        | 2,120,000.00        |
| Design, Permitting & Construction Soft Costs | \$        | 570,000.00          |
| Contingency                                  | \$        | 510,000.00          |
| <b>Estimated Project Cost</b>                | <b>\$</b> | <b>5,600,000.00</b> |

**Option 2 - looped connection to 24" line at Peart Road**

|                                              |           |                     |
|----------------------------------------------|-----------|---------------------|
| Water Line Construction                      | \$        | 3,940,000.00        |
| Sewer Line Construction                      | \$        | 2,120,000.00        |
| Design, Permitting & Construction Soft Costs | \$        | 590,000.00          |
| Contingency                                  | \$        | 660,000.00          |
| <b>Estimated Project Cost</b>                | <b>\$</b> | <b>7,310,000.00</b> |

AACE Class 5 estimate for budgeting purposes only based on best available costs under Spring 2022 market conditions. Assumes minimum cover installation in shoulder or dirt road. Crossings under drainage and/or irrigation culverts not included.

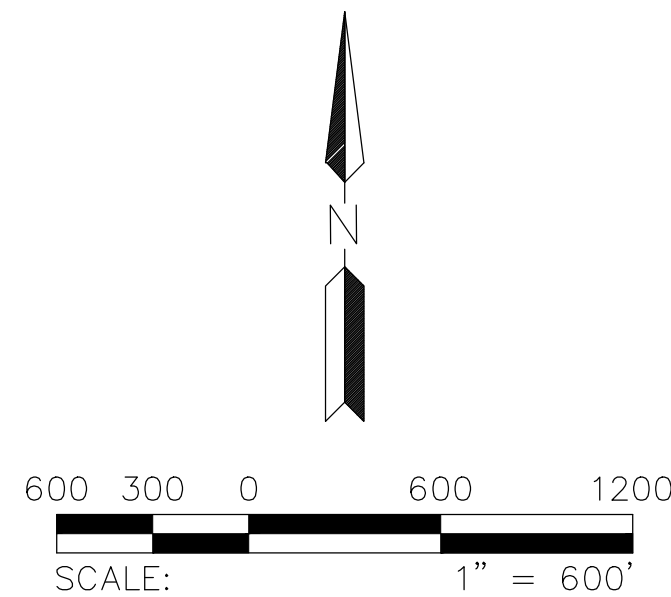
Other than adding "as-built" information, are allowed by anyone other than authorized HILGARTWILSON, LLC employees.



ALL UTILITY INFORMATION IS  
SHOWN FOR REFERENCE ONLY  
AND HAS NOT BEEN VERIFIED

**LEGEND**

- SUBJECT BOUNDARY
- SEWER MAIN (EXISTING)
- SEWER MAIN (FUTURE)
- WATER LINE (EXISTING)
- WATER LINE (FUTURE)



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| REV: |  |
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**HILGARTWILSON**  
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ARIZONA LAND CONSULTING, LLC CASA GRANDE SITE

CITY OF CASA GRANDE, ARIZONA

WATER & SEWER CONSTRAINTS EXHIBIT

|                      |                  |
|----------------------|------------------|
| <b>HILGARTWILSON</b> | PROJ. NO.: 8888  |
|                      | DATE: MAY 2022   |
|                      | SCALE: 1" = 600' |
|                      | DRAWN: SL        |
|                      | DESIGNED: CE     |
|                      | APPROVED: DW     |
|                      | <b>01</b>        |