MASTER WASTEWATER REPORT UPDATE
FOR
EASTMARK

Revised August 10, 2021
Revised June 30, 2020
Revised January 24, 2018
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DEVELOPMENT SERVICES
REVIEWED FOR CODE
COMPLIANCE
DATE 12/16/2021 RAP
APPROVED

Brookfield Residential
MASTER
DEVELOPER
APPROVAL
EASTMARK
DATE 03/09/2021
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Wastewater Master Report Update March 2021

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WOOD/PATEL
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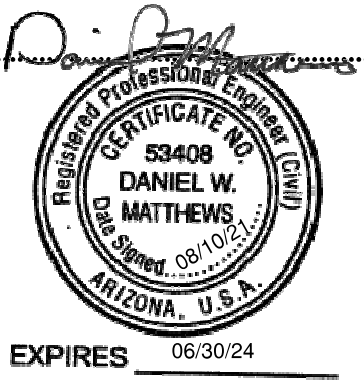

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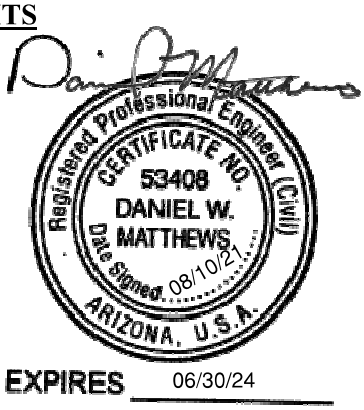

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EXECUTIVE SUMMARY

This report supersedes the *Master Wastewater Report Update for Eastmark*, dated June 30, 2020, and has been prepared to specifically address revisions to the proposed wastewater infrastructure within Development Units 1 (DU 1), 2 (DU 2), 5 West (DU 5W), 3/4 (DU 3/4), 6 North (6N), and 6 South (6S), and other updates within several Development Units. More detailed land use planning within DUs 1, 2, 5W, 6N, and 6S has been prepared and provided to Wood, Patel & Associates, Inc. (WOODPATEL) by DMB Mesa Proving Ground, LLC. Portions of DU 3/4 have already been constructed or are in the process of construction. The next phase of development within Eastmark is planned to include the Commercial Core located at the northeast corner of Ray Road and Ellsworth Road, DU 1, DU 2, DU 5W, and residential parcels in DU 6S.

Changes to the *Master Wastewater Report Update for Eastmark* include:

- Development Unit 5 North (DU 5N) was split into East and West portions.
- Revised boundary of Development Units 6 North (DU 6N) and 6 South (DU 6S). DU 6N decreased to approximately 208 acres, while DU 6S increased to approximately 475 acres.
- Combined boundary of Development Unit 1 (DU 1), DU 2, and Development Unit 5 West (DU 5W), which is now called DU 1-2-5W.
- Revised DU 1-2-5W, Development Unit 5 East (DU 5E), DU 6N, and DU 6S land uses, boundaries, and naming convention to reflect more detailed planning of parcel boundaries, based on potential end users.
- Revised land uses within DU 3/4 and DU 6S to reflect recently constructed sites, sites under construction, and more detailed planning of land uses, based on detailed planning and approved plans.
- Revised Warner Sewer Basin and Elliot Sewer Basin boundary based on DU 1-2-5W, DU 5E, DU 6N, and DU 6S land development and parcel boundary revisions, as requested by the City of Mesa. Warner Sewer Basin decreased to approximately 0.354 million gallons per day (MGD), while Elliot Sewer Basin increased to approximately 1.894 MGD. Refer to Section 3.2 within report.
- Revised Warner Sewer Basin and Ray Road Sewer Basin boundary by splitting parcel DU 6D within DU 6 South, with 54 lots to sewer west through Parcel 6-4 & 6-5; and the remaining 247 lots continuing to sewer to the existing sewer in Parc Joule.
- Added a 12-inch wastewater line within DU 5E to serve Parcels DU 5E1 and DU 5E2.

- Added a 24-inch wastewater line within DU 1-2-5W to serve the north portion of DU 1-2-5W.
- Added an 18-inch wastewater line within DU 1-2-5W along Ellsworth Road to serve the south portion of DU 1-2-5W.

Refer to the attached plan within Exhibit 1 – *Vicinity Map* and Exhibit 2 – *Master Sewer Exhibit.*

1.0 INTRODUCTION

1.1 General Background and Project Location

The proposed Eastmark development (Site) is anticipated to be an approximate 3,154-acre master planned community annexed into the City of Mesa (City). It is a Planned Community District (PCD) which is a mixed-use development that will include single-family residential, multi-family residential, urban mixed-use, commercial mixed-use, office, industrial, hotel, resort, various community uses, and open spaces.

This Master Wastewater Report Update has been prepared in accordance with Wood, Patel & Associates, Inc. (WOODPATEL) understanding of the City of Mesa's technical requirements for wastewater collection systems as applicable for Eastmark.

The Site is located within Sections 14, 15, 22, 23, 26, and 27 of Township 1 South, Range 7 East of the Gila and Salt River Meridian. The Site is bounded by Elliot Road to the north, Cadence (formerly Pacific Proving Grounds) on the south, Ellsworth Road to the west, and Signal Butte Road to the east (refer to Exhibit 1).

1.2 Scope of the Master Wastewater Report

The Master Wastewater Report presents wastewater design flows and sewer main sizes and locations, as required to provide wastewater service to the Site during full-buildout conditions. Land uses modeled within this report are not intended to restrict any entitlement agreement between the City of Mesa and the Developer. If the Site is redeveloped to the full entitlement in the future, additional infrastructure may need to be constructed at that time.

It is the goal of this Master Wastewater Report Update to identify the sewers required to serve Eastmark Development Units, while meeting the requirements of the City's Engineering and Design Standards and City-approved criteria for Eastmark.

The Site is being planned as a PCD. There are ten (10) development units that comprise the PCD. The *Master Wastewater Report for Eastmark* utilizes a Conceptual Land Use Plan, Development Unit Plan, and proposed densities provided by DMB Mesa Proving Grounds, LLC.

A more detailed analysis of the wastewater collection system for each development unit was previously provided with each Development Unit Master Wastewater Report. Each Development Unit Master Wastewater Report addressed changes in the development units and adjacent development units which occurred as development progressed and densities changed. However, since Eastmark is approaching full buildout, it is anticipated no further Development Unit Master Wastewater Reports will be completed. However, updates to the Master Wastewater Report may be required if significant changes are made to the land uses and assumptions utilized to prepare this Report. Additionally, design criteria may change based on actual wastewater generation to calculate demand on the system in the future.

1.3 City of Mesa Wastewater Master Plan

The City of Mesa updated the City's Wastewater Master Plan in 2018. Updates were made to several sewers along Ellsworth Road and Williams Field Road to incorporate the proposed SR24 Freeway. This Report defines the Site to be within the Greenfield Water Reclamation Plant Drainage Area, where wastewater is collected and conveyed within the East Mesa Interceptor (EMI) to the Greenfield Water Reclamation Plant (GWRP). A reclaimed waterline provides treated flow from the GWRP to the Gila River Indian Community (GRIC).

1.4 Study Area and Development Units

The study area includes the Elliot, Warner, Ray, and Williams Field Sewer Drainage Basins, per the City of Mesa Wastewater Master Plan Update, 2018. For a detailed breakdown of modeled land use areas, please refer to the following:

- Table 17 – *Overall Eastmark Modeled Land Use*
- Exhibit 2 – *Master Sewer Exhibit*

1.5 Development Unit Master Plan Approvals

As each development unit is planned, this *Master Wastewater Report for Eastmark* shall be updated as a living document to reflect changes to the land use plan that would affect the full-buildout wastewater collection system. Each Development Unit shall be master planned, utilizing current approved criteria, which accurately reflects the wastewater collection system on a master planned level for the entire community. The Development Unit Master Plans are prepared to ensure the planned infrastructure for the Development Units will adequately serve the interim condition prior to the full buildout, as contemplated in the overall Master Plans. Each development unit has been master planned, utilizing approved criteria.

The approvals of Development Unit Wastewater Master Plans and corresponding criteria are as follows:

- DU 6 North – Overall Master Update approved report dated April 22, 2011 with 2007 City of Mesa wastewater criteria.
- DU 7 – Approved report dated May 17, 2013 with 2009 City of Mesa wastewater criteria.
- DU 8 & 9 – Approved report dated January 15, 2014 with 2009 City of Mesa wastewater criteria.
- DU 3 South – Approved report dated December 17, 2013 with 2009 City of Mesa wastewater criteria.
- DU 6 South – Approved report dated October 9, 2015 with 2012 City of Mesa wastewater criteria along with City-approved population-based criteria.
- DU 5, 5 North, and 6 South – Approved report dated July 27, 2017 with 2012 City of Mesa wastewater criteria along with City-approved population-based criteria.
- DU 3/4 – Approved report dated September 8, 2017 with 2012 City of Mesa wastewater criteria along with City-approved population-based criteria.
- DU 3/4 – Approved report dated June 30, 2020 with 2012 City of Mesa Wastewater criteria along with City-accepted population based criteria.
- DU 2 – Approved report dated June 30, 2020 with 2019 City of Mesa Wastewater criteria along with City-accepted population based criteria.

1.6 Construction Phasing

This Master Wastewater Report presents the full-buildout conditions of the Site. It is anticipated that sewer main construction be phased to correspond with Development Unit Plans. A phasing plan will be presented in each Development Unit Master Report to show the improvements that must be constructed with each development unit to meet the City's requirements.

1.7 Basis of Design Reports for Specific Individual Developments

As development progresses within the Site, Basis of Design (BOD) reports are required for specific individual developments to ensure compliance with this Master Report and the Development Unit Master Report, and to identify significant variations in land use, wastewater flows, and the wastewater infrastructure needed to serve the parcel.

2.0 EXISTING CONDITIONS

2.1 Topographic Conditions

The predeveloped Site consisted of multiple automotive test tracks, a grouping of commercial/industrial buildings, and undisturbed desert. Demolition and remediation of the existing facilities is ongoing. The Site has been utilized by General Motors as a desert automotive testing facility since the 1950's. General Motors has vacated the Site. The majority of the Site is surrounded by undeveloped desert along the northern and western boundaries. Along the southern boundary, the Site is bordered by undeveloped desert and a residential development named Cadence, which is currently under construction. The eastern boundary of the Site is bordered by two (2) residential developments that have recently been constructed or are currently under construction, including Nova Vista and Bella Via (formerly known as Mountain Horizons), and a proposed community not yet developed. The land generally slopes in a southwesterly direction at approximately 0.5 to 1 percent. The peak elevation within the Site is approximately 1,460 feet above mean sea level (MSL), located near the intersection of Signal Butte Road and Elliot Road. The lowest elevation within the Site is approximately 1,390 feet MSL, located near the Ray Road alignment and Ellsworth Road.

2.2 Existing Offsite Wastewater Infrastructure

Existing public wastewater infrastructure in the vicinity of the Site includes the following:

- An existing 12-inch gravity sewer located along Mountain Road between Elliot Road and Pecos Road.
- An existing 10-inch gravity sewer located along Signal Butte Road, between Elliot Road and Ramblewood Circle, and a 12-inch gravity sewer between Ramblewood Circle and Galveston Road.
- An existing 18-inch dry gravity sewer located along Warner Road within the Loop 202 Freeway right-of-way.
- The East Mesa Interceptor (EMI), extending south along Ellsworth Road then west along Elliot Road for two and one-half (2½) miles west of the Site. EMI gravity pipe sizes range from 42 to 66 inches in the vicinity of Eastmark.
- A 30-inch gravity sewer located along Ray Road flowing west from Ellsworth Road and discharging to the EMI, and an abandoned 21-inch and existing 18-inch gravity sewer from Ellsworth Road to Signal Butte Road.

- An existing 24-inch gravity sewer along Elliot Road, from the southwest corner of Signal Butte Road and Elliot Road to the EMI in Ellsworth Road.
- An existing 18-inch, 21-inch, and 24-inch gravity sewer line along Ellsworth Road, from Warner Road to Ray Road.
- An existing 15-inch gravity sewer line through the Cadence development, and along Ellsworth Road from Cadence Parkway to Ray Road.
- An existing 10-inch gravity sewer line along Signal Butte Road, from the La Mira site to Eastmark Parkway.

2.3 Onsite Wastewater Collection Systems

Existing public wastewater collection systems onsite include the following:

- An existing 30-inch gravity sewer draining south to north, along the western portion of the Apple facility at the southwest corner of Signal Butte Road and Elliot Road.
- An existing 21-inch gravity sewer draining south to north, along Everton Terrace, to serve portions of DU 5A, DU 5E1, and DU 5E2.
- An existing 18-inch and 21-inch gravity sewer draining east to west along Ray Road.
- An existing 12-inch and 15-inch sewer within Eastmark Parkway draining from north to south, from Sonic Avenue to Ray Road, to serve portions of DU 6 South and DU 7.
- An existing 12-inch sewer within Point Twenty-Two Boulevard draining northeast to southwest, from west of Signal Butte Road to Eastmark Parkway, to serve DU 6 South and DU 7.
- An existing 12-inch gravity sewer along Point Twenty-Two Boulevard, from west of Eastmark Parkway to Inspirian Parkway.
- An existing 18-inch gravity sewer along Point Twenty-Two Boulevard, draining from east to west, from Inspirian Parkway to Ellsworth Road.
- Existing 8-inch sewer lines within DU 3 South, DU 7, DU 8, DU 9, and portions of DU 6S and DU 3/4.
- Existing 18-inch sewer draining east to west along Ray Road, from Inspirian Parkway to east of Ellsworth Road, to serve DU 8 and DU 9.

- Existing 18-inch, 15-inch, 12-inch, and 10-inch sewer drainage southeast to northwest through DU 8 and DU 9.
- An existing 8-inch sewer draining south along Everton Terrace, from the Parcel 6-7 and 6-8 boundary within DU 6 South to Point Twenty-Two Boulevard.
- An existing 8-inch sewer draining south along Copernicus Drive, from Palladium Drive to Ray Road within DU 3/4.
- An existing 15-inch gravity sewer along Warner Road, draining from east to west, from Eastmark Parkway to Ellsworth Road.
- An existing 12-inch gravity sewer along Eastmark Parkway, draining from north to south, from DU 5N parcel boundary to Warner Road.

3.0 WASTEWATER SYSTEM DESIGN

3.1 Design Criteria

Wastewater design flows and pipe-sizing criteria utilized in this Master Wastewater Report are based on WOODPATEL's understanding of the following:

- Applicable wastewater system design criteria listed in the *2019 City of Mesa Engineering and Design Standards,* along with City accepted population based criteria per Table 16 – *DU 2 Wastewater Design Criteria*.
- Previously-approved report criteria for DU 6N, DU 7, DU 8 and 9, DU 3S, DU 3/4, DU 6S, and DU 5N.
- Regionally-accepted design standards.
- Title 18, Chapter 9 of the *Arizona Administrative Code.*
- DU 1, DU2, and DU 5W criteria and flows provided by the planned user.

Tables 2, 4, 6, 8, 10, 12, 14, and 16 present the Unit Daily Wastewater Flow for each land use category based on density and population specific to each master planned development unit as they have been approved. The design criterion is used in Tables 1, 3, 5, 7, 9, 11, 13, and 15 to determine the daily wastewater flow for each development unit based on the detailed land use in master planned DU's and conceptual land use throughout the rest of Eastmark. The Development Unit daily wastewater flow criteria are used to estimate the wastewater design flows and determine pipe sizes. This was performed by applying this design flow to each sub-basin.

3.2 Wastewater Design Flows

Wastewater design flows are estimated using the design criteria listed above and the *City of Mesa 2025 General Plan*. Projected full-buildout average-day wastewater flows for both Eastmark and areas upstream are summarized as follows, in millions of gallons per day (MGD):

	Offsite Upstream Ray Basin	**Offsite Upstream Williams Field Basin**	**Eastmark**	**Total**
Elliot Road Outfall:	0 MGD	0 MGD	1.894 MGD	**1.894 MGD**
Warner Road Outfall:	0 MGD	0 MGD	0.354 MGD	**0.354 MGD**
Ray Road Outfall:	1.126 MGD	0.965 MGD	1.848 MGD	**3.939 MGD***
Total:	**1.126 MGD**	**0.965 MGD**	**4.096 MGD**	**6.122 MGD**

* Until full buildout of the offsite Warner Road Sewer, Warner Basin flow will be diverted to the Ray Road Sewer, so the total Eastmark outflow to Ray Road will be 2.20 MGD.

Sewer pipe capacities are based upon conveying the flow at two-thirds of the pipe capacity. It is WOODPATEL's understanding, wet-weather infiltration is accounted for within the City of Mesa peaking factors listed in the *City of Mesa Engineering Design Standards*.

An additional scenario was analyzed in this report to evaluate pipe sizes during a peak wet-weather wastewater flow, while a 450,000-gallon pool is drained at a rate to empty within 8 hours (938 gpm) downstream of the proposed Aquatic Center within DU 3/4. Results of the peak wet-weather flow analysis are shown on Table 19 – *Calculated Pipe Capacities.* Results show that during the full-buildout peak wet-weather event, the limiting section of downstream sewer is the proposed 18-inch line from Node R7 to Node R2, located downstream of the Aquatic Center. During the peak wet-weather flows, this pipe section is flowing at 29.3 percent of the full-flow capacity, with a d/D = 0.37. When the pool flow of 938 gpm is added to the peak wet-weather flow, the total sewer flow equals 1,565 gpm, which is 73 percent of the maximum capacity of the 18-inch sewer, with a d/D = 0.64. Refer to Table 19 – *Calculated Pipe Capacities* for the results, and Exhibit 2 for pipe locations.

An additional scenario was analyzed in this report to evaluate the pipe size from Nodes E10 to E9 during a peak instantaneous wet-weather flow of 3,632 gpm for the north portion of DU 1-2-5W, as provided by the planned user. During the peak wet-weather flows, this pipe section is flowing at 30.6 percent of the full-flow capacity, with a d/D = 0.35. When the instantaneous flow of 3,632 gpm is added to the peak wet-weather flow, which is 80 percent of the maximum capacity of the 24-inch sewer, with a d/D = 0.67. Refer to Table 19 for the results, and Exhibit 2 for pipe locations.

Additional detailed design flow calculations are provided in Table 18. WOODPATEL utilized peaking criteria within the *2019 City of Mesa Engineering Design Standards* based on static peaking methodology to calculate peak wet-weather flows for Eastmark. Static methodology is required by the City on an individual project basis to size onsite sewer lines. It is our understanding the City utilized a diurnal peaking methodology to evaluate the overall tributary area, including Eastmark, to aid in the design of the existing Ray Road and Elliot Road sewer lines. Diurnal peaking methodology is based on observed and/or estimated daily wastewater flow cycles for comparable developed areas, and is generally

less conservative than static modeling resulting in lower peak flows. As a result, the peak wet-weather flows calculated in this Report for Eastmark may vary from those used in designing the Ray Road, Warner Road, and Elliot Road offsite sewer lines. The controlling section of the offsite Ray Road sewer is an offsite 30-inch pipe at 0.20 percent slope. The capacity of this pipe flowing full is approximately 11.85 MGD, and at d/D = 0.9 is 12.6 MGD. The controlling section of the Elliot Road sewer is an offsite 24-inch pipe at 0.39 percent slope. The capacity of this pipe flowing full is 9.13 MGD, and at d/D = 0.94 is 9.82 MGD. The Warner Road offsite sewer is not yet designed or constructed. It is WOODPATEL's understanding the City of Mesa will evaluate their wastewater collection system downstream of Eastmark utilizing diurnal peaking factors to evaluate if the system has capacity to convey flows estimated within this report. If measured wastewater flows indicate the capacity is exceeded in these lines, DMB would participate in projects necessary to provide additional capacity in these lines.

3.3 Sustainability Techniques

Eastmark is planned to develop as a sustainable community. In the future, new techniques and technologies will advance in sustainable water management that may be incorporated into the Site and could affect the wastewater system design.

4.0 PROPOSED SYSTEM

4.1 Planned Wastewater Infrastructure

The City of Mesa's Wastewater Master Plan has four sewer drainage basins within the study area of the Site, which include the Elliot, Warner, Ray, and Williams Field Sewer Drainage Basins. The Elliot Basin consists of DU 6N, DU 5E, and a portion of DU 1-2-5W, which is approximately 647 acres located along the northern boundary of Eastmark, from Signal Butte Road to the EMI. The Warner Basin consists of a portion of the Site and property west of the Site to the EMI. The Ray Basin consists of a portion of the Site and property to the east and west, and is the outfall of the Williams Field Basin. The Williams Field Basin includes property to the south and east of the Site.

Based on the City of Mesa's Wastewater Master Plan, three (3) sewer lines west of Ellsworth Road, along Elliot Road, Warner Road, and Ray Road are planned to serve the four (4) sewer drainage basins.

4.1.1 Elliot Sewer Drainage Basin

Within the Elliot Sewer Drainage Basin, onsite flows from Parcels 6A, 6B, and 6C within DU 6N, Parcels 5A, 5B, 5E North, 5E1, and 5E2 within DU 5 East, and a portion of DU 1-2-5W are conveyed by gravity north to the existing Elliot Road Sewer. The Elliot Road Sewer (east of Ellsworth Road) was initially constructed to serve the Apple facility site within DU 6N. The Elliot Sewer conveys flow west to the EMI at the intersection of Elliot and Ellsworth Roads.

4.1.2 Warner Sewer Drainage Basin

Within the Warner Sewer Drainage Basin, onsite flows are conveyed by gravity sewer to the intersection of Ellsworth Road and Warner Road. An existing diversion manhole allows the City to direct flow south to Ellsworth Road and Ray Road until the offsite Warner Road Sewer is constructed. From this point, the Warner Basin flow will combine with the Ray and Williams Field Basin flow and will be conveyed through the offsite Ray Road sewer line to the EMI. Due to the uncertainty of timing for construction of the offsite Warner Road Sewer, the Ellsworth Road sewer was designed to convey flow from the Warner Sewer Basin until the Warner Road sewer is constructed. In the full-buildout condition, the

diversion manhole may be adjusted to direct a portion of, or all of, the flow from the onsite Warner Basin to the offsite Warner Road sewer line. The diversion manhole provides the City operational flexibility to direct flow to the Warner Road and Ray Road sewer lines, as necessary.

The trigger for the planning, design, and construction of the Warner Road offsite sewer was set by the City of Mesa when the estimated average day flow in the Ray Road sewer at Ellsworth Road and Ray Road, from approved Eastmark plats, reaches 2.8 MGD.

4.1.3 Ray Sewer Drainage Basin

The development east of Mountain Road discharges into an existing sewer line along Mountain Road. An existing diversion structure at Mountain Road and Ray Road allows the City to send the flow to either the Ray Road or Pecos Road Sewers. It is our understanding all flow north of Ray Road is currently diverted to the Ray Road Sewer, while flow from the development south of Ray Road is conveyed south to Pecos Road. The City indicated it is their intent to continue this mode of operation during the initial phases of Eastmark to provide additional capacity in the Pecos Road Sewer for future development along Pecos Road.

The Nova Vista and Bella Via (formerly Mountain Horizons) developments east of the Site, between Signal Butte and Mountain Roads, discharge into existing sewer lines that convey flow to Signal Butte and Ray Roads. This flow is planned to combine with the flow east of Mountain Road and be conveyed across the Site in the existing Ray Road sewer line, between Signal Butte Road and Ellsworth Roads. This upstream flow is accounted for per the *Master Wastewater Report for Ray Road Sewer between Ellsworth and Mountain Roads,* prepared by CMX, L.L.C., dated November 18, 2005. From this point, the Ray Basin flow will combine with the initial Warner and Williams Field Basin flows and be conveyed through the offsite Ray Road sewer line to the EMI.

Portions of the original Ray Road sewer have been abandoned in place and replaced with a new sewer within Ray Road, with capacity to convey the projected build-out flows from both Eastmark and offsite.

4.1.4 Williams Field Sewer Drainage Basin

Wastewater from areas within the Williams Field Basin will be conveyed west along Williams Field Road then northwest through the Cadence development to Ellsworth Road. From this point, the Williams Field Basin flow will combine with the initial Warner and Ray Basin flows and be conveyed through the offsite Ray Road sewer line to the EMI. A second sewer will convey wastewater along Williams Field Road, west of the SR 24 ROW to Ellsworth Road, then north along Ellsworth to the SR 24 ROW. From there, it will flow northwest along the SR 24 ROW and discharge to the Ray Road Sewer, west of Ellsworth Road.

4.2 Pipe Sizing

Proposed sewer lines for the Site were sized to accommodate peak wet-weather flow conditions for the full-buildout condition. The onsite collection system includes planned sewer mains with diameters ranging from 8 inches to 30 inches. Refer to Tables 18 and 19 for the planned full-buildout Wastewater Model and Calculated Pipe Capacities, and Exhibit 2 for the planned full-buildout wastewater collection system configuration.

5.0 CONCLUSIONS

The Master Wastewater Report Update for Eastmark presented herein meets City of Mesa standards and requirements, and serves as a guide for construction documents associated with the planned wastewater system. The following items highlight critical conclusions:

1. Eastmark is anticipated to be a 3,154-acre master planned community annexed into the City of Mesa.

2. The wastewater system presented is based on the projected full-buildout conditions of the Site. Eastmark may redevelop to the full City entitlement of 15,000 residential dwelling units, and total floor area of 20,000,000 square feet non-residential. This may require additional infrastructure to be constructed as part of the redevelopment, which will be dependent on existing pipe capacity and projected demands.

3. Detailed analysis of the wastewater system for each development unit was provided with each Development Unit Master Wastewater Report. Each Development Unit Master Wastewater Report addressed changes in the development units and adjacent development units which would occur as development progressed and densities changed, and each report presented the portions of the improvements that were to be built to serve the development unit. The individual Development Unit Master Reports establish the phasing of the wastewater infrastructure as approved by the City.

4. Since Eastmark is approaching full buildout, no further Development Unit Master Wastewater Reports will be completed. However, individual parcels will still be required to complete Wastewater Basis of Design Reports.

5. Wastewater design criteria are based on WOODPATEL's understanding of the *City of Mesa Engineering & Design Standards,* City-accepted population based criteria, regionally accepted design standards, and Title 18, Chapter 9 of the *Arizona Administrative Code*.

6. The approximate average daily onsite flow generated at full buildout of the Site is 4.096 MGD, per Section 3.2 of this report.

7. Proposed onsite sewer mains are sized to accommodate peak wet-weather design flow during the initial-buildout condition.

8. The planned public wastewater collection systems outfall into existing and future gravity sewer lines located along the Elliot Road, Warner Road, and Ray Road alignments.

9. WOODPATEL's model of the wastewater collection system provides conveyance and capacity in conformance with the City of Mesa's standards and Title 18 of the *Arizona Administrative Code*.

10. The City has evaluated the EMI and GWRP capacities, including planned capital improvements for adequacy in serving Eastmark, as well as full-buildout service areas based on flows defined in this Report. Development within the Warner Road Sewer Basin will be initially served by the Ray Road sewer. When the projected average daily flow to the Ray Road Sewer at Ellsworth Road, from approved Eastmark plats, reaches 2.8 MGD, Eastmark shall be responsible for coordinating with the City and other property owners contributing to the Warner Sewer Basin downstream of Eastmark for the design and construction of the Warner Road sewer from Ellsworth Road to the EMI. Eastmark will be responsible for a pro-rata share (based on flow capacity) of the cost to design and construct the Warner Road sewer line from Ellsworth Road to the EMI. If the Development Unit Master Reports alter these flows, the *Master Wastewater Report for Eastmark* may be required to be updated to reflect these changes as stated in Section 1.2.

11. The City of Mesa has indicated they have evaluated the wastewater collection system downstream of Eastmark and, based on this evaluation, the existing Ray Road sewer currently has adequate capacity to convey an average daily flow of 2.25 MGD from Eastmark at build-out. If the average daily flow to the Ray Road sewer from Eastmark is projected to exceed 2.25 MGD, the City of Mesa will re-evaluate the ability of the Ray Road sewer to convey the additional flow. If it is found that the Ray Road sewer does not have adequate capacity, Eastmark will be responsible for a pro-rata share (based on flow capacity) of the cost to design and construct improvements required to convey the additional flow.

TABLE 1

DU 6 NORTH MODELED LAND USE

WOOD/PATEL **TABLE 1 - DU 6 NORTH MODELED LAND USE**

Project: DU 6N at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN BY PARCEL

Parcel	No. of DUs	Residential Acres	Density (DU/AC)	Non-Residential Acres	Commercial/ Industrial/ Retail S.F.	Land Use	Unit Daily Wastewater Flow (GPD/AC)	Avg Day
DU-6A	–	--	–	86.5	1,340,000	INDUSTRIAL[1]	4,500	389,250
DU-6B	–	--	–	50.7	723,200	INDUSTRIAL[1]	4,500	228,150
DU-6C	–	--	–	67.3	700,000	INDUSTRIAL[2]	1,000	67,300
Other	–	--	–	3.0	--	Road ROW	–	–
DU 6 Totals	**0**	**0.0**		**207.5**	**2,763,200**			**684,700**

Notes:

1) The current user of DU-6A and the potential end user of DU-6B are anticipated to have an industrial unit daily wastewater flow of 4,500 GPD/ACRE as provided by DMB Mesa Proving Grounds, LLC.

2) The potential user of DU-6C is anticipated to be similar to DU-5A. Thus, the estimated average daily wastewater flow for the anticipated industrial land use utilized 1,000 GPD/Acre.

3) The potential user of DU-6D anticipates approximately 47,000 square feet of industrial office space as part of the overall square footage of 700,000 square feet. The estimated average daily wastewater flow of 10,725 GPD was provided by the end user which only includes anticipated flows from a small amount of fixtures within each building.

TABLE 2

DU 6 NORTH WASTEWATER DESIGN CRITERIA

Project: DU 6N at Eastmark
Location: Mesa, Arizona
References: 2007 City of Mesa Engineering Design Standards

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

		DENSITY		POPULATION DENSITY			FLOWS		WASTEWATER		
LAND USE CATEGORY	LAND USE	VALUE	UNITS	VALUE	UNITS	PERSONS PER ACRE	Value	Units	Value	Units	NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	1.25	80	GPD/ Person	100	GPD/AC	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2007 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	2.50	80	GPD/ Person	200	GPD/AC	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	3.60	80	GPD/ Person	288	GPD/AC	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	9.00	80	GPD/ Person	720	GPD/AC	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	12.50	80	GPD/ Person	1,000	GPD/AC	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	16.00	80	GPD/ Person	1,280	GPD/AC	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	17.55	80	GPD/ Person	1,404	GPD/AC	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	22.00	80	GPD/ Person	1,760	GPD/AC	
HDR-2	High Density Residential (HDR 15+)	17.0	DU / Acre	1.7	Persons/ DU	28.90	80	GPD/ Person	2,312	GPD/AC	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	25.50	80	GPD/ Person	2,040	GPD/AC	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

	DWELLING UNIT DENSITY		POPULATION DENSITY			FLOWS		WASTEWATER		
LAND USE	VALUE	UNITS	VALUE	UNITS	PERSONS PER ACRE	Value	Units	Value	Units	NOTES
Hotel	–	–	–	–	–	–	–	150	GPD/ ROOM	Source: City of Mesa 2007 Engineering and Design Standards.
Commercial/Retail Office	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
Education/Civic/ Church	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	

OFFSITE

	DWELLING UNIT DENSITY		POPULATION DENSITY		PERSONS	WASTEWATER DESIGN		UNIT DAILY		
LAND USE	VALUE	UNITS	VALUE	UNITS	PER ACRE	Value	Units	Value	Units	NOTES
CC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2007 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	
BPI	–	–	8.0	Employees/ Acre	8.00	54	GPD/ Employee	432	GPD/ AC	
NC	–	–	11.0	Employees/ Acre	11.00	54	GPD/ Employee	594	GPD/ AC	
LI	–	–	7.0	Employees/ Acre	7.00	54	GPD/ Employee	378	GPD/ AC	
MUE	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
GI	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC							708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads* , by CMX, 11/18/2005.

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3')	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3')	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (ADF< 1.0 MGD)	3		1
Peaking Factor (1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (10.0 < ADF< 20.0 MGD)	2.3		1

Notes:
1. Per The City of Mesa 2007 Engineering & Design Standards
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 3

DU 7 MODELED LAND USE

Project: DU 7 at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

Parcel	No. of DUs	Residential Acres	Density (DU/AC)	Non-Residential Acres	Commercial/ Industrial/ Retail S.F.	Land Use	Population Density (persons/ DU or Acre)	Total Population	GPDC	Avg Day	Total Avg Day
7-1	84	15.9	5.28	--	--	MDR-3	3.2	268.8	80	21,504	21,504
7-2	79	19.3	4.09	--	--	MDR-1	3.0	237.0	80	18,960	18,960
7-3	110	30.7	3.58	--	--	MDR-1	3.0	330.0	80	26,400	26,400
7-4	84	32.3	2.60	--	--	MDR-1	3.0	252.0	80	20,160	20,160
7-5	66	25.1	2.63	--	--	MDR-1	3.0	198.0	80	15,840	15,840
7-6	38	18.5	2.05	--	--	MDR-1	3.0	114.0	80	9,120	9,120
7-7	98	26.8	3.66	--	--	MDR-1	3.0	294.0	80	23,520	23,520
7-8	120	23.5	5.11	--	--	MDR-3	3.2	384.0	80	30,720	30,720
7-9	81	23.1	3.51	--	--	MDR-1	3.0	243.0	80	19,440	19,440
7-10	--	--	--	7.5	37,000	CHURCH	15.0	112.5	54	6,075	6,075
7-11	135	24.4	5.53	--	--	MDR-3	3.2	432.0	80	34,560	34,560
7-12	97	23.0	4.22	--	--	MDR-1	3.0	291.0	80	23,280	23,280
7-13	78	19.2	4.06	--	--	MDR-1	3.0	234.0	80	18,720	18,720
7-14	53	17.3	3.06	--	--	MDR-1	3.0	159.0	80	12,720	12,720
7-15	58	18.4	3.15	--	--	MDR-1	3.0	174.0	80	13,920	13,920
7-16	106	26.4	4.02	--	--	MDR-1	3.0	318.0	80	25,440	25,440
7-17	99	20.1	4.93	--	--	MDR-3	3.2	316.8	80	25,344	25,344
7-18	85	29.1	2.92	--	--	MDR-1	3.0	255.0	80	20,400	20,400
7-19	103	23.8	4.33	--	--	MDR-1	3.0	309.0	80	24,720	24,720
7-20	80	19.9	4.02	--	--	MDR-1	3.0	240.0	80	19,200	19,200
7-21	84	19.0	4.42	--	--	MDR-1	3.0	252.0	80	20,160	20,160
7-25	–	--	--	1.7	8,000	CIVIC	15.0	25.5	54	1,377	1,377
7-26	–	--	--	2.0	15,000	COMMERICAL/ RESTURANT	23.0	46.0	54	2,484	2,484
7-50	–	--	--	5.0	185,000	EDUCATION	15.0	75.0	54	4,050	4,050
7-51	–	--	--	8.0	20,000	EDUCATION	15.0	120.0	54	6,480	6,480
7-53	135	14.5	9.31	--		HDR-1	2.0	270.0	80	21,600	21,600
7-52, 7-54[1]	–	--	--	48.0	--	PARK/LAKE/ PUBLIC RESTROOMS/ LIBRARY	--	--	--	1,222	1,222
ROW	–	--	--	33.0	--	INFRASTRUCTURE ROAD R.O.W.	--	--	--	--	--
DU 7 Totals	**1,873**	**470.3**		**105.2**	**265,000**			**5,951**		**467,416**	**467,416**

Notes:
1) The Average Day Wastewater demand for Parcel 7-52, 7-54 was calculated by the following: (4 Restrooms * 200 GPD/Restroom) + (0.34 AC * 1,242 GPD/ AC) = 1,222 GPD.

TABLE 4

DU 7 WASTEWATER DESIGN CRITERIA

Project: Eastmark
Location: Mesa, Arizona
References: 2009 City of Mesa Engineering Design Standards

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

LAND USE CATEGORY	LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	1.25	80	GPD/ Person	100	GPD/AC	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2009 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	2.50	80	GPD/ Person	200	GPD/AC	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	3.60	80	GPD/ Person	288	GPD/AC	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	9.00	80	GPD/ Person	720	GPD/AC	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	12.50	80	GPD/ Person	1,000	GPD/AC	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	16.00	80	GPD/ Person	1,280	GPD/AC	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	17.55	80	GPD/ Person	1,404	GPD/AC	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	22.00	80	GPD/ Person	1,760	GPD/AC	
HDR-2	High Density Residential (HDR 15+)	17.0	DU / Acre	1.7	Persons/ DU	28.90	80	GPD/ Person	2,312	GPD/AC	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	25.50	80	GPD/ Person	2,040	GPD/AC	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
Hotel	–	–	--	–	–	–	–	150	GPD/ ROOM	Source: City of Mesa 2009 Engineering and Design Standards.
Commercial/Retail Office	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
Education/Civic/ Church	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
Public Restrooms[2]	–	–	--	–	–	–	–	200	GPD/ RTR	

OFFSITE

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN Value	WASTEWATER DESIGN Units	UNIT DAILY Value	UNIT DAILY Units	NOTES
CC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2009 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	
BPI	–	–	8.0	Employees/ Acre	8.00	54	GPD/ Employee	432	GPD/ AC	
NC	–	–	11.0	Employees/ Acre	11.00	54	GPD/ Employee	594	GPD/ AC	
LI	–	–	7.0	Employees/ Acre	7.00	54	GPD/ Employee	378	GPD/ AC	
MUE	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
GI	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC							708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between*

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (ADF< 1.0 MGD)	3		1
Peaking Factor (1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (10.0 < ADF< 20.0 MGD)	2.3		1

Notes:
1. Per The City of Mesa 2009 Engineering & Design Standards
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 5

DU 8 & 9 MODELED LAND USE

Project: DU 8 & 9 at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

Parcel	No. of DUs	Residential Acres	Density (DU/AC)	Non-Residential Acres	Commercial/ Industrial/ Retail S.F.	Land Use	Population Density (persons/ DU or Acre)	Total Population	GPDC	Avg Day	Total Avg Day
8-1	74	22.9	3.23	--	--	MDR-1	3	222	80	17,760	17,760
8-2	87	30.0	2.90	--	--	MDR-1	3	261	80	20,880	20,880
8-3	64	24.7	2.59	--	--	MDR-1	3	192	80	15,360	15,360
8-3B	9	4.0	2.25	--	--	MDR-1	3	27	80	2,160	2,160
	-	--	--	2.7	--	PARK	--	--	--	0	
8-4	42	21.0	2.00	--	--	MDR-1	3	126	80	10,080	10,080
8-6	91	23.6	3.86	--	--	MDR-1	3	273	80	21,840	21,840
8-7	74	28.2	2.62	--	--	MDR-1	3	222	80	17,760	17,760
8-8	39	20.0	1.95	--	--	LDR-3	3	117	80	9,360	9,360
8-9	64	21.7	2.95	--	--	MDR-1	3	192	80	15,360	15,360
9-1	189	57.2	3.30	--	--	MDR-1	2	378	80	30,240	30,240
9-2	99	25.6	3.87	--	--	MDR-1	2	198	80	15,840	15,840
9-3	–	--	--	11.2	200,000	Civic	15	168	54	9,072	9,072
9-4	158	49.4	3.20	--	--	MDR-1	2	316	80	25,280	25,280
9-5	144	39.8	3.62	--	--	MDR-1	2	288	80	23,040	23,040
9-6	90	22.4	4.02	--	--	MDR-2	2	180	80	14,400	14,400
9-7	226	60.7	3.72	--	--	MDR-1	2	452	80	36,160	36,160
Other	–	--	--	61.9		Drainage Channel/Road ROW	–	--	--	--	0
DU 8 & 9 Totals	**1,450**	**451.2**		**75.8**	**200,000**			**3,612**		**284,592**	**284,592**

1) Parcels 9-1 through 9-7 are part of a proposed Active Adult community therefore the assumption of 2 persons per dwelling unit in lieu of 3 persons per dwelling unit for the population density would produce a more accurate estimation of peak flows.

TABLE 6

DU 8 & 9 WASTEWATER DESIGN CRITERIA

Project: DU 8 & 9 at Eastmark
Location: Mesa, Arizona
References: 2009 City of Mesa Engineering Design Standards

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

LAND USE CATEGORY	LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	1.25	80	GPD/ Person	100	GPD/AC	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2009 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	2.50	80	GPD/ Person	200	GPD/AC	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	3.60	80	GPD/ Person	288	GPD/AC	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	9.00	80	GPD/ Person	720	GPD/AC	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	12.50	80	GPD/ Person	1,000	GPD/AC	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	16.00	80	GPD/ Person	1,280	GPD/AC	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	17.55	80	GPD/ Person	1,404	GPD/AC	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	22.00	80	GPD/ Person	1,760	GPD/AC	
HDR-2	High Density Residential (HDR 15+)	17.0	DU / Acre	1.7	Persons/ DU	28.90	80	GPD/ Person	2,312	GPD/AC	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	25.50	80	GPD/ Person	2,040	GPD/AC	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
Hotel	–	–	--	–	–	–	–	150	GPD/ ROOM	Source: City of Mesa 2009 Engineering and Design Standards.
Commercial/Retail Office	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
Education/Civic/ Church	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	

OFFSITE

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN Value	WASTEWATER DESIGN Units	UNIT DAILY Value	UNIT DAILY Units	NOTES
CC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2009 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	
BPI	–	–	8.0	Employees/ Acre	8.00	54	GPD/ Employee	432	GPD/ AC	
NC	–	–	11.0	Employees/ Acre	11.00	54	GPD/ Employee	594	GPD/ AC	
LI	–	–	7.0	Employees/ Acre	7.00	54	GPD/ Employee	378	GPD/ AC	
MUE	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
GI	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC							708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between*

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (ADF< 1.0 MGD)	3		1
Peaking Factor (1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (10.0 < ADF< 20.0 MGD)	2.3		1

Notes:
1. Per The City of Mesa 2009 Engineering & Design Standards
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 7

DU 3 SOUTH MODELED LAND USE

Project: DU 3S at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

Parcel	No. of DUs	Residential Acres	Density (DU/AC)	Non-Residential Acres	Land Use	Population Density (persons/ DU or Acre)	Total Population	GPDC	Avg Day	Total Avg Day
3S-1	137	30.9	4.43	--	MDR-2	3.1	425	80	34,000	34,000
3S-2	113	31.4	3.60	--	MDR-2	3.1	350	80	28,000	28,000
3S-3	138	30.0	4.60	--	MDR-2	3.1	428	80	34,240	34,240
DU 3S Totals	**388**	**92.3**		**0.0**			**1,203**		**96,240**	**96,240**

TABLE 8

DU 3 SOUTH WASTEWATER DESIGN CRITERIA

Project: DU 3 South at Eastmark
Location: Mesa, Arizona
References: 2009 City of Mesa Engineering Design Standards

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

LAND USE CATEGORY	LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	1.25	80	GPD/ Person	100	GPD/AC	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2009 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	2.50	80	GPD/ Person	200	GPD/AC	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	3.60	80	GPD/ Person	288	GPD/AC	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	9.00	80	GPD/ Person	720	GPD/AC	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	12.50	80	GPD/ Person	1,000	GPD/AC	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	16.00	80	GPD/ Person	1,280	GPD/AC	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	17.55	80	GPD/ Person	1,404	GPD/AC	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	22.00	80	GPD/ Person	1,760	GPD/AC	
HDR-2	High Density Residential (HDR 15+)	17.0	DU / Acre	1.7	Persons/ DU	28.90	80	GPD/ Person	2,312	GPD/AC	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	25.50	80	GPD/ Person	2,040	GPD/AC	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
Hotel	–	–	--	–	–	–	–	150	GPD/ ROOM	Source: City of Mesa 2009 Engineering and Design Standards.
Commercial/Retail Office	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
Education/Civic/ Church	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	

OFFSITE

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	PERSONS PER ACRE	WASTEWATER DESIGN Value	WASTEWATER DESIGN Units	UNIT DAILY Value	UNIT DAILY Units	NOTES
CC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2009 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	–	23.0	Employees/ Acre	23.00	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	–	14.0	Employees/ Acre	14.00	54	GPD/ Employee	756	GPD/ AC	
BPI	–	–	8.0	Employees/ Acre	8.00	54	GPD/ Employee	432	GPD/ AC	
NC	–	–	11.0	Employees/ Acre	11.00	54	GPD/ Employee	594	GPD/ AC	
LI	–	–	7.0	Employees/ Acre	7.00	54	GPD/ Employee	378	GPD/ AC	
MUE	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
GI	–	–	15.0	Employees/ Acre	15.00	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC							708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between*

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (ADF< 1.0 MGD)	3		1
Peaking Factor (1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (10.0 < ADF< 20.0 MGD)	2.3		1

Notes:
1. Per The City of Mesa 2009 Engineering & Design Standards
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 9

DU 3/4 MODELED LAND USE

Project: DU 3/4 at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

Parcel	No. of DUs	Residential Acres	Density (DU/Acre)	Non-Residential Acres	Land Use	Floor Area (SQ. FT.)	Population Density		Total Population	Wastewater Design Flows (Per Capita)		Avg Day Flow (GPD)	Total Avg Day Flow (GPD)
WARNER ROAD SEWER													
3/4-8 to 3/4-12	242	58.3	4.2	--	MDR-2	--	3.1	Persons/ DU	750.2	80	GPD/ Person	60,016	60,016
3/4-13 (84%)	37	11.1	3.3	--	MDR-2	--	3.1	Persons/ DU	114.7	80	GPD/ Person	9,176	9,176
3/4-34	--	--	--	1.6	Club House/Fitness Center	20,000	--	--	512	10	GPD / Person	5,120	42,640
	276	16.6	16.6	--	HDR-2	--	1.7	Persons/ DU	469	80.0	GPD/ Person	37,520	
Other				1.6	Road ROW	--	--		--		--		--
Warner Road Totals	**555**	**86.0**		**3.2**		**20,000**			**1,846**			**111,832**	**111,832**
RAY ROAD SEWER													
3/4-1 to 3/4-3	251	40.0	6.28	--	MDR-4	0	2.7	Persons/ DU	677.7	80	GPD/ Person	54,216	76,656
	165	11.0	15.00	--	HDR-2	--	1.7	Persons/ DU	280.5	80	GPD/ Person	22,440	
	--	--	--	4.0	Open Space	0	--	--	--	--	--	--	
3/4-4	195	34.0	5.74	--	MDR-3	--	3.2	Persons/ DU	624.0	80	GPD/ Person	49,920	49,920
3/4-6	--	--	--	60.8	Queen Creek High School	420,000	3,100	Students	3,100	28	GPD / Person	86,800	125,600
	--	--	--				240	Staff	240	20	GPD / Person	4,800	
	--	--	--		Aquatic Center (5 AC)	20,000	200	Patrons and Staff / Acre	3,400	10	GPD / Person	34,000	
3/4-7	--	--	--	5.5	Church	21,000	0.4	Employees / 1,000 S.F.	8.4	54	GPD / Person	454	6,754
							15.0	Patrons / 1,000 S.F.	315	20	GPD / Person	6,300	
3/4-8B	216	8.5	25.41	--	HDR-2	--	1.7	Persons/DU	367	80	GPD/ Person	29,360	29,360
3/4-9A	--	--	--	7.19	Restaurant	4,080	--	--	--	0.135	GPD / SF	551	21,788
	--	--	--		Office	78,654	--	--	--	0.270	GPD / SF	21,237	
3/4-9B	--	--	--	7.37	Office	68,000	--	--	--	0.270	GPD / SF	18,360	18,360
3/4-9C	--	--	--	2.22	Restaurant	7,500	--	--	--	0.135	GPD / SF	1,013	1,013
3/4-9D	--	--	--	4.35	Restaurant	3,900	--	--	--	0.135	GPD / SF	527	18,277
					Hotel	66,000	120	Rooms	--	75	GPD / Room	9,000	
	--	--	--		Theater/ Entertainment Center	7 Screens 24,000	250	Seats / Screen	1,750	5	GPD / Seat	8,750	

Parcel	No. of DUs	Residential Acres	Density (DU/Acre)	Non-Residential Acres	Land Use	Floor Area (SQ. FT.)	Population Density		Total Population	Wastewater Design Flows (Per Capita)		Avg Day Flow (GPD)	Total Avg Day Flow (GPD)
3/4-9E	--	--	--	2.11	Hotel	63,155	114	Rooms	--	75	GPD / Room	8,550	8,550
3/4-9F	--	--	--	5.95	Commercial / Retail	30,778	--	--	--	0.135	GPD / SF	4,155	5,620
	--	--	--		Restaurant	10,855	--	--	--	0.135	GPD / SF	1,465	
3/4-9G	--	--	--	1.83	Restaurant	10,380	--	--	--	0.135	GPD / SF	1,401	1,401
3/4-9H	140	4.7	29.8	--	HDR-2	--	1.7	Persons/ DU	238.0	80.0	GPD/ Person	19,040	21,540
	--	--	--	0.30	Recreation Center (Club House)	5,000	--	--	250	10.0	GPD / Person	2,500	
3/4-9J/K	397	13.5	29.4	--	HDR-2	--	1.7	Persons/ DU	674.9	80.0	GPD/ Person	53,992	59,032
	--	--	--	0.28	Recreation Center (Club House)	5,000	--	--	504	10.0	GPD / Person	5,040	
3/4-9L	190	5.9	32.2	--	HDR-2	--	1.7	Persons/ DU	323.0	80.0	GPD/ Person	25,840	31,390
	--	--	--	0.23	Recreation Center (Club House)	5,000	--	--	285	10.0	GPD / Person	2,850	
	--	--	--		Commercial/Retail	20,000	--	--	--	0.135	GPD / SF	2,700	
3/4-10B	--	--	--	6.7	Commercial / Retail	11,000	--	--	--	0.135	GPD / SF	1,485	37,786
	--	--	--	0.5	Commercial / Retail	6,972	--	--	--	0.135	GPD / SF	941	
	260	12.0	21.7	--	HDR-2	--	1.7	Persons/ DU	442.0	80.0	GPD/ Person	35,360	
3/4-13 (16%)	7	2.3	3.0	--	MDR-2	--	3.1	Persons/ DU	21.7	80	GPD/ Person	1,736	1,736
3/4-14 to 3/4-17	201	46.9	4.3	--	MDR-3	--	3.2	Persons/ DU	643.2	80	GPD/ Person	51,456	51,456
3/4-18	121	10.2	11.9	--	HDR-1	--	2.0	Persons/ DU	242.0	80	GPD/ Person	19,360	19,360
3/4-19 to 3/4-22	--	--	--	26.1	Park	--	--	--	--	--	--	--	--
3/4-23 to 3/4-27	217	62.3	3.5	--	MDR-1	--	3.0	Persons/ DU	651.0	80	GPD/ Person	52,080	52,080
3/4-28 to 3/4-30	350	56.1	6.2	--	MDR-3	--	3.2	Persons/ DU	1,120.0	80	GPD/ Person	89,600	89,600
3/4-31 to 3/4-33	223	41.9	5.3	--	MDR-3	--	3.2	Persons/ DU	713.6	80	GPD/ Person	57,088	57,888
	--	-—	--	2.3	Fire Station	--	4.0	Restrooms	-	200	GPD/ Restroom	800	
Other	--	--	--	38.3	Road ROW	--	--		--	--	--	--	--
Ray Road Totals	**2,933**	**349.3**		**176.0**		**881,274**			**16,871**			**785,167**	**785,167**
DU 3/4 Totals	**3,488**	**435.3**		**179.2**		**901,274**			**18,717**			**896,999**	**896,999**

TABLE 10

DU 3/4 WASTEWATER DESIGN CRITERIA

Project: DU 3/4 at Eastmark
Location: Mesa, Arizona
References: 2012 City of Mesa Engineering Design Standards and City of Mesa Approved Population Based Criteria

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

LAND USE CATEGORY	LAND USE	DWELLING UNIT DENSITY		POPULATION DENSITY		WASTEWATER DESIGN FLOWS (PER CAPITA)		UNIT DAILY WASTEWATER FLOWS		NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	80	GPD/ Person	200	GPD/DU	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2012 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	80	GPD/ Person	200	GPD/DU	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	80	GPD/ Person	240	GPD/DU	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	80	GPD/ Person	240	GPD/DU	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	80	GPD/ Person	248	GPD/DU	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	80	GPD/ Person	256	GPD/DU	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	80	GPD/ Person	216	GPD/DU	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	80	GPD/ Person	160	GPD/DU	
HDR-2	High Density Residential (HDR 15+)	20.0	DU / Acre	1.7	Persons/ DU	80	GPD/ Person	136	GPD/DU	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	80	GPD/ Person	136	GPD/DU	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

LAND USE	Population Density		WASTEWATER DESIGN FLOWS		NOTES
University - Boarded Student	---	—	80	GPD / Person	Source: City of Mesa approved polulation based criteria and Administrative Code, Title 18, Chapter 9.
Queen Creek High School[3]	3,100	Students	28	GPD / Person	
	240	Staff	20	GPD / Person	
University - Commuter Student and Staff	---	—	40	GPD / Person	
Elementary School - Student and Staff	200	Students and Staff / Acre	40	GPD / Person	
Middle School - Student and Staff	100	Students and Staff / Acre	40	GPD / Person	
Civic / Church / Library Staff	0.4	Employees / 1,000 S.F.	54	GPD / Person	
Civic / Church / Library Patrons	2	Patrons / 1,000 S.F.	20	GPD / Person	
Aquatic Center	200	Patrons and Staff / Acre	10	GPD / Person	
Recreation Center (Club House)	–	--	10	GPD / Person	
Commercial / Retail	2.5 Employees & Patrons/1,000 SF * 54 GPD/Person		0.135	GPD / SF	
Restaurant	2.5 Employees & Patrons/1,000 SF * 54 GPD/Person		0.135	GPD / SF	
Office	5 Employees/1,000 SF * 54 GPD/Person		0.27	GPD / SF	
Theater	250	Seats / Screen	5	GPD / Seat	
Hotel	---	---	75	GPD / Room	
Resort	---	---	380	GPD / Room	

OFFSITE

LAND USE	DWELLING UNIT DENSITY VALUE	DWELLING UNIT DENSITY UNITS	POPULATION DENSITY VALUE	POPULATION DENSITY UNITS	WASTEWATER DESIGN FLOWS (PER CAPITA) Value	WASTEWATER DESIGN FLOWS (PER CAPITA) Units	UNIT DAILY WASTEWATER FLOWS Value	UNIT DAILY WASTEWATER FLOWS Units	NOTES
CC	–	--	14.0	Employees/ Acre	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2012 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	--	23.0	Employees/ Acre	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	--	14.0	Employees/ Acre	54	GPD/ Employee	756	GPD/ AC	
BPI	–	--	8.0	Employees/ Acre	54	GPD/ Employee	432	GPD/ AC	
NC	–	--	11.0	Employees/ Acre	54	GPD/ Employee	594	GPD/ AC	
LI	–	--	7.0	Employees/ Acre	54	GPD/ Employee	378	GPD/ AC	
MUE	–	--	15.0	Employees/ Acre	54	GPD/ Employee	810	GPD/ AC	
GI	–	--	15.0	Employees/ Acre	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC						708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads*, by CMX, 11/18/2005.

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (New Pipes ADF< 1.0 MGD)	3		1
Peaking Factor (New Pipes 1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (New Pipes 10.0 < ADF< 20.0 MGD)	2.3		1
Peaking Factor (Existing Pipes ADF< 1.0 MGD)	2.3		1
Peaking Factor (Existing Pipes 1.0 < ADF< 10.0 MGD)	1.9		1
Peaking Factor (Existing Pipes 10.0 < ADF< 20.0 MGD)	1.7		1

Notes:

1. Per The City of Mesa 2012 Engineering & Design Standards

2. Title 18, Chapter 9 of the Arizona Administrative Code

3. The assumptions for Queen Creek High School were taken from the *Final Sewer Design Report for Queen Creek High School-Eastmark Campus*, prepared by Hess-Rountree, Inc. dated January 12, 2018

TABLE 11

DU 6 SOUTH MODELED LAND USE

Project: DU 6 South at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

Parcel	No. of DUs	Residential Acres	Density (DU/Acre)	Non-Residential Acres	Land Use	Floor Area (SQ. FT.)	Population Density		Total Population	Wastewater Design Flows (Per Capita)		Avg Day Flow (GPD)	Total Avg Day Flow (GPD)
WARNER ROAD SEWER													
6-4, 6-5	92	31.3	2.9	--	MDR-1	–	3.0	Persons/ DU	276	80	GPD/ Person	22,080	22,080
	--	--	–	5.2	Open Space	–	--	–	–	--	--	--	
6-6	58	17.9	3.2	--	MDR-1	–	3.0	Persons/ DU	174	80	GPD/ Person	13,920	13,920
	--	--	–	1.4	Open Space	–	--	–	–	--	--	--	
6-9 & 6-17	116	24.9	4.7	--	MDR-3	–	3.2	Persons/ DU	371.2	80	GPD/ Person	29,696	29,696
	--	--	–	0.5	Open Space	–	--	–	–	--	--	--	
6-16 & 6-18	114	36.7	3.1		MDR-1	–	3.0	Persons/ DU	342	80.0	GPD/ Person	27,360	27,360
6-19 through 6-23	291	72.8	4.0	--	MDR-2	–	3.1	Persons/ DU	902.1	80.0	GPD/ Person	72,168	72,168
	--	--	–	4.0	Open Space	–	--	–	–	--	--	--	
DU 6D West	54	14.3	3.8	--	MDR-3	–	3.2	Persons/ DU	172.8	80.0	GPD/ Person	13,824	13,824
Warner Road Totals	**725**	**197.9**		**11.1**		**–**			**2,238**			**179,048**	**179,048**
RAY ROAD SEWER													
6-1/2	107	31.0	3.5	--	MDR-1	–	3.0	Persons/ DU	321	80	GPD/ Person	25,680	25,680
	--	--	–	1.7	Open Space/ Road ROW	–	--	–	–	--	--	--	
6-3	--	--	–	17.9	Commercial/Retail	131,000	2.5	Employees and Patrons / 1,000 S.F.	327.5	54	GPD / Person	17,685	17,685
	--	--	–	0.5	Open Space	–	--	–	–	--	--	--	
6-7	61	21.0	2.9	--	MDR-1	–	3.0	Persons/ DU	183	80	GPD/ Person	14,640	14,640
6-8	52	30.2	1.7	--	LDR-3	–	3.0	Persons/ DU	156	80	GPD/ Person	12,480	12,480
	--	--	–	0.8	Open Space	–	--	–	–	--	--	--	
6-10 through 6-12	171	41.9	4.1	--	MDR-2	–	3.1	Persons/ DU	530.1	80.0	GPD/ Person	42,408	42,408
6-13 through 6-15	161	50.2	3.2	--	MDR-1	–	3.0	Persons/ DU	483	80.0	GPD/ Person	38,640	38,640
DU-6D East	247	65.6	3.8	--	MDR-3	–	3.2	Persons/ DU	790.4	80.0	GPD/ Person	63,232	63,232
	--	--	–	5.4	Open Space/ Road ROW	–	--	–	–	--	--	--	
Ray Road Totals	**799**	**239.9**		**26.3**		**131,000**			**2,791**			**214,765**	**214,765**
DU 6 South Totals	**1,524**	**437.8**		**37.4**		**131,000**			**5,029**			**393,813**	**393,813**

TABLE 12

DU 6 SOUTH WASTEWATER DESIGN CRITERIA

Project: DU 6 South at Eastmark
Location: Mesa, Arizona
References: 2012 City of Mesa Engineering Design Standards and City of Mesa Approved Population Based Criteria

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

LAND USE CATEGORY	LAND USE	DWELLING UNIT DENSITY		POPULATION DENSITY		WASTEWATER DESIGN FLOWS (PER CAPITA)		UNIT DAILY WASTEWATER FLOWS		NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	80	GPD/ Person	200	GPD/DU	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2012 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	80	GPD/ Person	200	GPD/DU	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	80	GPD/ Person	240	GPD/DU	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	80	GPD/ Person	240	GPD/DU	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	80	GPD/ Person	248	GPD/DU	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	80	GPD/ Person	256	GPD/DU	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	80	GPD/ Person	216	GPD/DU	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	80	GPD/ Person	160	GPD/DU	
HDR-2	High Density Residential (HDR 15+)	20.0	DU / Acre	1.7	Persons/ DU	80	GPD/ Person	136	GPD/DU	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	80	GPD/ Person	136	GPD/DU	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

LAND USE	Population Density		WASTEWATER DESIGN FLOWS (PER CAPITA)		NOTES
University - Boarded Student	---	—	80	GPD / Person	Source: City of Mesa approved polulation based criteria and Arizona Administrative Code, Title 18, Chapter 9.
University - Commuter Student and Staff	---	—	40	GPD / Person	
Elementary School - Student and Staff	200	Students and Staff / Acre	40	GPD / Person	
Middle School - Student and Staff	100	Students and Staff / Acre	40	GPD / Person	
Civic / Church / Library Staff	0.4	Employees / 1,000 S.F.	54	GPD / Person	
Civic / Church / Library Patrons	2	Patrons / 1,000 S.F.	20	GPD / Person	
Aquatic Center	200	Patrons and Staff / Acre	10	GPD / Person	
Commercial / Retail / Restaurant	2.5	Employees and Patrons / 1,000 S.F.	54	GPD / Person	
Office	5	Employees / 1,000 S.F.	54	GPD / Person	
Theater	250	Seats / Screen	5	GPD / Seat	
Hotel	---	—	75	GPD / Room	
Resort	---	—	150	GPD / Room	

OFFSITE

LAND USE	DWELLING UNIT DENSITY		POPULATION DENSITY		WASTEWATER DESIGN FLOWS (PER CAPITA)		UNIT DAILY WASTEWATER FLOWS		NOTES
	VALUE	UNITS	VALUE	UNITS	Value	Units	Value	Units	
CC	–	--	14.0	Employees/ Acre	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2012 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	--	23.0	Employees/ Acre	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	--	14.0	Employees/ Acre	54	GPD/ Employee	756	GPD/ AC	
BPI	–	--	8.0	Employees/ Acre	54	GPD/ Employee	432	GPD/ AC	
NC	–	--	11.0	Employees/ Acre	54	GPD/ Employee	594	GPD/ AC	
LI	–	--	7.0	Employees/ Acre	54	GPD/ Employee	378	GPD/ AC	
MUE	–	--	15.0	Employees/ Acre	54	GPD/ Employee	810	GPD/ AC	
GI	–	--	15.0	Employees/ Acre	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC						708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads* , by CMX, 11/18/2005.

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (ADF< 1.0 MGD)	3		1
Peaking Factor (1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (10.0 < ADF< 20.0 MGD)	2.3		1

Notes:
1. Per The City of Mesa 2012 Engineering & Design Standards
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 13

DU 5 EAST MODELED LAND USE

Project: DU 5 East at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN BY PARCEL

Parcel	No. of DUs	Residential Acres	Density (DU/AC)	Non-Residential Acres	Commercial/ Industrial/ Retail S.F.	Land Use	Unit Daily Wastewater Flow (GPD/DU) OR (GPD/AC)[1]	Avg Day	Total Avg Day Flow
ELLIOT ROAD SEWER									
DU-5A	--	--	--	25.0	390,000	Industrial[1]	1,000	25,000	25,000
	--	--	--	6.1	--	Road ROW/Open Space	--	--	
DU-5B	--	--	--	47.4	560,000	Industrial[1]	1,000	47,400	47,400
DU-5E NORTH	--	--	--	117.0	1,250,000	Industrial[2]	4,500	526,500	526,500
	--	--	--	3.7	--	SRP Substation/ ROW	--	--	--
DU-5E1	625	25	25.0	--	--	HDR-2	136	85,000	85,000
	--	--	--	6.8	--	Road ROW/ Well Site/Open Space	--	--	
DU-5E2	--	--	--	28.5	300,000	Industrial	1,000	28,500	28,500
	--	--	--	4.6	--	Open space	--	--	--
Elliot Road Totals	**625**	**25.0**	**--**	**239.1**	**2,500,000**			**712,400**	**712,400**
DU 5 NorthTotals	**625**	**25.0**		**239.1**	**2,500,000**			**712,400**	**712,400**

Notes:
1) The estimated average daily wastewater flow for the anticipated industrial land uses utilized 1,000 GPD/Acre based on information provided by the potential end user for DU-5A, DU-5B, and DU-5D.
2) The potential end user of DU-5E north is anticipated to have an industrial unit daily wastewater flow of 4,500 GPD/ACRE as provided by DMB Mesa Proving Grounds, LLC.

TABLE 14

DU 5 EAST WASTEWATER DESIGN CRITERIA

Project: DU 5 North at Eastmark
Location: Mesa, Arizona
References: 2012 City of Mesa Engineering Design Standards and City of Mesa Approved Population Based Criteria

UNIT DAILY RESIDENTIAL WASTEWATER FLOWS

LAND USE CATEGORY	LAND USE	DWELLING UNIT DENSITY		POPULATION DENSITY		WASTEWATER DESIGN FLOWS (PER CAPITA)		UNIT DAILY WASTEWATER FLOWS		NOTES
LDR-1	Low Density Residential (LDR 0-1)	0.5	DU / Acre	2.5	Persons/ DU	80	GPD/ Person	200	GPD/DU	Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2012 Engineering and Design Standards.
LDR-2	LDR 0-1 & LDR 1-2 AVG.	1	DU / Acre	2.5	Persons/ DU	80	GPD/ Person	200	GPD/DU	
LDR-3	Low Density Residential (LDR-1-2)	1.2	DU / Acre	3.0	Persons/ DU	80	GPD/ Person	240	GPD/DU	
MDR-1	Medium Density Residential (MDR 2-4)	3.0	DU / Acre	3.0	Persons/ DU	80	GPD/ Person	240	GPD/DU	
MDR-2	MDR 2-4 & MDR 4-6 AVG.	4	DU / Acre	3.1	Persons/ DU	80	GPD/ Person	248	GPD/DU	
MDR-3	Medium Density Residential (MDR 4-6)	5.0	DU / Acre	3.2	Persons/ DU	80	GPD/ Person	256	GPD/DU	
MDR-4	Medium Density Residential (MDR 6-10)	6.5	DU / Acre	2.7	Persons/ DU	80	GPD/ Person	216	GPD/DU	
HDR-1	High Density Residential (HDR 10-15)	11.0	DU / Acre	2.0	Persons/ DU	80	GPD/ Person	160	GPD/DU	
HDR-2	High Density Residential (HDR 15+)	20.0	DU / Acre	1.7	Persons/ DU	80	GPD/ Person	136	GPD/DU	
MUR-1	Mixed Use/Residential (MUR) Residential	15.0	DU / Acre	1.7	Persons/ DU	80	GPD/ Person	136	GPD/DU	

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS

LAND USE	Population Density		WASTEWATER DESIGN FLOWS (PER CAPITA)		NOTES
University - Boarded Student	---	—	80	GPD / Person	Source: City of Mesa approved polulation based criteria and Arizona Administrative Code, Title 18, Chapter 9.
University - Commuter Student and Staff	---	—	40	GPD / Person	
Elementary School - Student and Staff	200	Students and Staff / Acre	40	GPD / Person	
Middle School - Student and Staff	100	Students and Staff / Acre	40	GPD / Person	
Civic / Church / Library Staff	0.4	Employees / 1,000 S.F.	54	GPD / Person	
Civic / Church / Library Patrons	2	Patrons / 1,000 S.F.	20	GPD / Person	
Aquatic Center	200	Patrons and Staff / Acre	10	GPD / Person	
Commercial / Retail / Restaurant	2.5	Employees and Patrons / 1,000 S.F.	54	GPD / Person	
Office	5	Employees / 1,000 S.F.	54	GPD / Person	
Theater	250	Seats / Screen	5	GPD / Seat	
Hotel	---	—	75	GPD / Room	
Resort	---	—	150	GPD / Room	

OFFSITE

LAND USE	DWELLING UNIT DENSITY		POPULATION DENSITY		WASTEWATER DESIGN FLOWS (PER CAPITA)		UNIT DAILY WASTEWATER FLOWS		NOTES
	VALUE	UNITS	VALUE	UNITS	Value	Units	Value	Units	
CC	–	--	14.0	Employees/ Acre	54	GPD/ Employee	756	GPD/ AC	Source: City of Mesa 2012 Engineering and Design Standards and the City of Mesa 2025 General Plan
O	–	--	23.0	Employees/ Acre	54	GPD/ Employee	1,242	GPD/ AC	
RC	–	--	14.0	Employees/ Acre	54	GPD/ Employee	756	GPD/ AC	
BPI	–	--	8.0	Employees/ Acre	54	GPD/ Employee	432	GPD/ AC	
NC	–	--	11.0	Employees/ Acre	54	GPD/ Employee	594	GPD/ AC	
LI	–	--	7.0	Employees/ Acre	54	GPD/ Employee	378	GPD/ AC	
MUE	–	--	15.0	Employees/ Acre	54	GPD/ Employee	810	GPD/ AC	
GI	–	--	15.0	Employees/ Acre	54	GPD/ Employee	810	GPD/ AC	
OFFUPSTREAM	1,040,576 GPD / 1470 Acres = 708 GPD/AC						708	GPD/ AC	Source: *Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads* , by CMX, 11/18/2005.

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (ADF< 1.0 MGD)	3		1
Peaking Factor (1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (10.0 < ADF< 20.0 MGD)	2.3		1

Notes:
1. Per The City of Mesa 2012 Engineering & Design Standards
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 15

DU 1-2-5W MODELED LAND USE

Project: DU 1, DU 2, DU 5W at Eastmark
Location: Mesa, Arizona

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

Parcel	No. of DUs	Residential Acres	Density (DU/Acre)	Non-Residential Acres	Commercial/ Industrial/ Retail S.F.	Land Use	Unit Daily Wastewater Flow (GPD/AC)		Avg Day Flow (GPD)	Total Avg Day Flow (GPD)
ELLIOT ROAD SEWER[1]										
DU-1-2-5W NORTH	--	--	–	174.9	2,620,000	Industrial	--	--	497,052	497,052
ELLIOT ROAD SEWER TOTALS	--	--	--	**174.9**	**2,620,000**	**–**	--	--	**497,052**	**497,052**
WARNER ROAD SEWER[2]										
DU-1-2-5W SOUTH	--	--	–	219.6	380,000	Industrial	--	--	63,025	63,025
	--	--	–	1.52	--	Road ROW/Open	--	--	--	
WARNER ROAD SEWER TOTALS	--	--	--	**221.1**	**380,000**	**–**	--	--	**63,025**	**63,025**
DU 1-2-5W Totals				**396.0**	**3,000,000**				**560,077**	**560,077**

Notes:

1) The estimated average daily wastewater flow for the anticipated industrial land uses within the Elliot Sewer Basin utilized the following information from Olsson Engineers Land Use Tables:
*The Phase 1 Average Day Flow over 12 months=201,880 GPD and the Phase 1 Peak Day=788,300 GPD. Therefore, the Phase 1 relationship between Peak Day to Average Day (Peak Day / Average Day Flow), a peaking factor of approximatly 4 was determined.
*Maintaining the same relationship assumption from Phase 1 to Full Buildout (FBO). FBO Peak Day=1,970,750 GPD + 17,460 GPD=1,988,210 GPD, therefore, FBO Average Day Flow=FBO Peak Day/Peaking Factor=1,988,210 GPD/4=497,052GPD

2) The estimated average daily wastewater flow and peak daily wastewater flow was provided by Olsson Engineers for the proposed Buildings within the Warner Road Sewer Basin within DU 1-2-5W.

TABLE 16

DU 1-2-5W WASTEWATER DESIGN CRITERIA

Project: DU 1,2, 5W at Eastmark
Location: Mesa, Arizona
References: Per Olsson Engineer's land use information provided on 01/17/2021

UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS					
LAND USE	Population Density		WASTEWATER DESIGN FLOWS (PER CAPITA)		NOTES
Industrial	--	—	—	--	Refer to the Utility Monthly Water Use - Phase 1 Table provided by Olsson Engineers dated 01/17/2021 in Appendix A

OFFSITE

Description	Value	Units	Note(s)
General			
Minimum Velocity (d/D=2/3)	2	ft/sec	1
Maximum Flow Velocity (d/D=2/3)	9	ft/sec	1
Maximum Peak Flow Depth-to-Diameter Ratio (d/D)	0.67	-	
Minimum Pipe Diameter	8	in	1
Manning's "n" value	0.013	-	2
Peaking Factor (Proposed User 1-2-5W)	4		3
Peaking Factor (New Pipes ADF< 1.0 MGD)	3		1
Peaking Factor (New Pipes 1.0 < ADF< 10.0 MGD)	2.5		1
Peaking Factor (New Pipes 10.0 < ADF< 20.0 MGD)	2.3		1
Peaking Factor (Existing Pipes ADF< 1.0 MGD)	2.3		1
Peaking Factor (Existing Pipes 1.0 < ADF< 10.0 MGD)	1.9		1
Peaking Factor (Existing Pipes 10.0 < ADF< 20.0 MGD)	1.7		1

Notes:
1. *Per The City of Mesa 2019 Engineering & Design Standards*
2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 17

OVERALL EASTMARK MODELED LAND USE

Project: Eastmark
Location: Mesa, Arizona

EASTMARK - PRELIMINARY RESIDENTIAL LAND USE AND DWELLING UNIT BREAKDOWN

Land Use	LDR-2	LDR-3	MDR-1	MDR-2	MDR-3	MDR-4	HDR-1	HDR-2	**Residential Total**	Mixed Use Residential Acres/Units	**Total Residential Units**
Acreage	0.0	50.2	1,031.1	301.1	367.6	40.0	24.7	97.2	**1,911.9**	0.0	**---**
Dwelling Units	0	91	3,431	1,226	1,824	251	256	2,269	**9,348**	0	**9,348**

EASTMARK - WASTEWATER FLOW CALCULATIONS

Development Unit	Total Area (AC)	Residential (AC)	Total Dwelling Units	Hotel/ Resort Keys[1]	Gross Non-Residential[2] (AC)	Total Floor Area (sq. ft.)	Education (AC)	Church (AC)	Civic (AC)	Other (AC)	Avg. Day Wastewater Flow (GPD)	Development Unit Flow Area (AC)	Unit Daily Wastewater Flow (GPD/AC)
1,2,5W	396.0	0.0	0	0	0.0	3,000,000	0.0	0.0	0.0	1.5	560,077	396.0	1,414
3S	92.3	92.3	388	0	0.0	0	0.0	0.0	0.0	0.0	96,240	92.3	1,043
3/4	616.8	435.3	3,488	234	42.9	901,274	60.8	5.5	2.3	70.0	896,999	616.8	1,454
5E	264.1	25.0	625	0	221.6	2,500,000	--	--	--	17.5	712,400	264.1	2,697
6N	207.5	0.0	0	0	204.5	2,763,200	0.0	0.0	0.0	3.0	684,700	207.5	3,300
6S	475.2	437.8	1,524	0	17.9	131,000	--	0.0	0.0	19.5	393,813	475.2	829
7	575.5	470.3	1,873	0	2.0	265,000	13.0	7.5	1.7	81.0	467,416	575.5	812
8	198.8	196.1	544	0	0.0	0	0.0	0.0	0.0	2.7	130,560	198.8	657
9	328.2	255.1	906	0	0.0	200,000	0.0	0.0	11.2	61.9	154,032	328.2	469
Subtotal:	**3,154.4**	**1,911.9**	**9,348**	**234**	**488.9**	**9,760,474**	**73.8**	**13.0**	**15.2**	**257.1**	**4,096,237**	**3,154.4**	**---**

[1] Anticipated number of "Keys" represents hotel and resort uses. This includes approximately 3.5 acres within DU 3/4.

[2] Non-residential wastewater flows are calculated based on actual land use where detailed information is known and estimated square feet on the remainder.

TABLE 18

WASTEWATER MODEL

Project: Eastmark
Location: Mesa, Arizona
References: City of Mesa 2012 Engineering and Design Standards
Arizona Administrative Code, Title 18, Chapter 9

FROM NODE	TO NODE	PROPOSED /EXISTING SEWER PIPE	SEWER AREA(S) SERVED	AREA SERVED (ACRES)	UNIT FLOW (GPD/AC)	PARCEL ADF (GPD)	SEWER NODE ADF (GPD)	TOTAL ADF (GPD)	PEAKING FACTOR	PEAK WET WEATHER FLOW (GPD)
Elliot Road Onsite Wastewater Flows										
E2	E1	Existing	DU-6A	86.5	4,500.0	389,250	389,250	389,250	2.3	895,275
E4	E3	Proposed	DU-6B	50.7	4,500.0	228,150	295,450	295,450	3.0	886,350
			DU-6C	67.3	1,000.0	67,300				
			Other	3.0	–	--				
E7	E6	Proposed	DU-5E1	31.8	2,673.0	85,000	113,500	113,500	3.0	340,500
			DU-5E2	33.1	861.0	28,500				
E6	E5	Existing	DU-5A	31.1	803.9	25,000	598,900	712,400	2.3	1,638,520
			DU-5B	47.4	1,000.0	47,400				
			DU-5E-NORTH	120.7	4,362.1	526,500				
E10	E9	Proposed	DU-1-2-5W	174.9	2,841.9	497,052	497,052	497,052	4.0	1,988,208
Total to Elliot Road Outfall				**646.5**		**1,894,152**	**1,894,152**	**1,894,152**		**5,408,353**
Warner Road Onsite Wastewater Flows										
W9	W8	Existing	6-6	19.3	721.2	13,920	43,616	43,616	2.3	100,317
			6-9, 6-17	25.4	1,169.1	29,696				
W11	W10	Proposed	DU 6D WEST	14.3	829.0	13,824	13,824	13,824	3.0	41,472
W10	W8	Existing	6-4, 6-5	36.5	604.9	22,080	22,080	35,904	2.3	82,579
W8	W7	Existing	6-16, 6-18	36.7	745.5	27,360	27,360	106,880	2.3	245,824
W12	W7	Existing	6-19 to 6-23	76.8	939.7	72,168	72,168	72,168	2.3	165,986
W7	W6	Existing	3/4-8 to 3/4-12	58.3	1,029.4	60,016	69,192	248,240	2.3	570,952
			3/4-13 (84%)	11.1	826.7	9,176				
W6	W1	Existing	3/4-34	19.8	2,153.5	42,640	42,640	290,880	2.3	669,024
W13	W1	Proposed	DU-1-2-5W SOUTH	219.6	287.0	63,025	63,025	63,025	3.0	189,075
			Other	1.5	–	--				
W1	WARNER ROAD SEWER	Proposed	–	--	–	–	--	353,905	3.0	1,061,715
Total to Warner Road				**519.3**		**353,905**	**353,905**	**353,905**		**1,061,715**
Ray Road Onsite And Offsite Upstream Wastewater Flows										
FROM	**TO**	**PROPOSED**	**SEWER**	**AREA**	**UNIT FLOW**	**PARCEL**	**SEWER NODE**	**TOTAL**	**PEAKING**	**PEAK WET**
R4	R3A	(10)Existing	–	–	–	--	–	353,905	2.3	813,982
R3A	R3B	Existing	(1/6) 3/4-28 to 3/4-30	9.35	1597.1	14,933	14,933	368,838	2.3	848,327
R5	R3B	Proposed	(5/6) 3/4-28 to 3/4-30	46.75	1597.2	74,667	74,667	74,667	3.0	224,001
R3B	R2	Existing	–	–	–	--	–	443,505	2.3	1,020,062
R6	R9	Proposed	3/4-18	10.2	1,898.0	19,360	19,360	19,360	3.0	58,080
R9	R8	Existing	–	–	–	--	0	19,360	2.3	44,528
R8	R7	Existing	3/4-6	60.8	2,065.8	125,600	125,600	144,960	2.3	333,408
R50	R7	Proposed	3/4-14 to 3/4-17	46.9	1,097.1	51,456	105,272	105,272	3.0	315,816
			3/4-13 (16%)	2.3	754.8	1,736				
			3/4-23 to 3/4-27	62.3	836.0	52,080				
			3/4-19 to 3/4-22 & Park	64.4	-	-				
R7	R2	Existing	3/4-7	5.5	1,228.0	6,754	142,576	392,808	2.3	903,458
			3/4-9A	7.19	3,030.3	21,788				
			3/4-9B	7.37	2,491.2	18,360				
			3/4-10B	19.2	1,968.0	37,786				
			3/4-31 to 3/4-33	41.9	1,381.6	57,888				
R2	R1	Existing	3/4-9C	2.22	456.3	1,013	1,013	837,326	2.3	1,925,850
R48	R49	Proposed	3/4-9D	4.35	4,201.6	18,277	100,250	100,250	3.0	300,750
			3/4-9G	1.83	765.6	1,401				
			3/4-9H	5.0	4,308.0	21,540				
			3/4-9J/K	13.78	4,283.9	59,032				

Project: Eastmark
Location: Mesa, Arizona
References: City of Mesa 2012 Engineering and Design Standards
Arizona Administrative Code, Title 18, Chapter 9

FROM NODE	TO NODE	PROPOSED /EXISTING SEWER PIPE	SEWER AREA(S) SERVED	AREA SERVED (ACRES)	UNIT FLOW (GPD/AC)	PARCEL ADF (GPD)	SEWER NODE ADF (GPD)	TOTAL ADF (GPD)	PEAKING FACTOR	PEAK WET WEATHER FLOW (GPD)
R49	R1	Proposed	3/4-9E	2.1	4,071.4	8,550	11,360	111,610	3.0	334,830
			(50%) 3/4-9F	3.0	936.7	2,810				
R46	R47	Proposed	DU-6D East	65.6	963.9	63,232	63,232	63,232	3.0	189,696
			Other	5.4	-	-				
R47	R24	Existing	6-1/2	32.7	785.3	25,680	43,365	106,597	2.3	245,173
			6-3	18.4	961.1	17,685				
R24	R22	Existing	7-8	23.5	1,307.2	30,720	56,235	162,832	2.3	374,514
			7-9	23.1	841.6	19,440				
			7-10	7.5	810.0	6,075				
R12	R22	Existing	6-7	21.0	697.1	14,640	27,120	27,120	2.3	62,376
			6-8	31.0	402.6	12,480				
R23	R22	Existing	7-6	18.5	493.0	9,120	90,480	90,480	2.3	208,104
			7-7	26.8	877.6	23,520				
			7-11	24.4	1,416.4	34,560				
			7-12	23.0	1,012.2	23,280				
R22	R21	Existing	--	--	–	–	--	280,432	2.3	644,994
R11	R10	Existing	6-13 to 6-15	50.2	769.7	38,640	38,640	38,640	2.3	88,872
R10	R21	Existing	6-10 to 6-12	41.9	1,012.1	42,408	42,408	81,048	2.3	186,410
R21	R20	Existing	7-13	19.2	975.0	18,720	73,440	434,920	2.3	1,000,316
			7-14	17.3	735.3	12,720				
			7-15	18.4	756.5	13,920				
			7-53	14.5	1,489.7	21,600				
			7-51	8.0	810.0	6,480				
R20	R19	Existing	7-16	26.4	963.6	25,440	56,056	490,976	2.3	1,129,245
			7-17	20.1	1,260.9	25,344				
			7-50	5.0	810.0	4,050				
			7-52,7-54	48.0	25	1,222				
			Other	33.0	-	-				
R19	R16	Existing	7-18	29.1	701.0	20,400	85,857	576,833	2.3	1,326,716
			7-19	23.8	1,038.7	24,720				
			7-20	19.9	964.8	19,200				
			7-21	19.0	1,061.1	20,160				
			7-25	1.7	810.0	1,377				
R18	R17	Existing	OFFUPSTREAM[(2)]	1473.0	707.2	1,041,710	1,099,214	1,099,214	1.9	2,088,507
			7-1	15.9	1,352.5	21,504				
			7-4	32.3	624.1	20,160				
			7-5	25.1	631.1	15,840				
R17	R16	Existing	7-2	19.3	982.4	18,960	45,360	1,144,574	1.9	2,174,691
			7-3	30.7	859.9	26,400				
R16	R15	Existing	7-26	2.0	1,242.0	2,484	2,484	1,723,891	1.9	3,275,393
R15	R14	Existing	3/4-8B	8.5	3,454.1	29,360	60,750	1,784,641	1.9	3,390,818
			3/4-9L	6.13	5,120.7	31,390				
R40	R39	Existing	La Mira	99.1	853.9	84,620	84,620	84,620	2.3	194,626
R39	R38	Existing	9-6	22.4	642.9	14,400	14,400	99,020	2.3	227,746
R38	R34	Existing	9-2	25.6	618.8	15,840	24,912	123,932	2.3	285,044
			9-3	11.2	810.0	9,072				
R36	R35	Existing	9-7	60.7	595.7	36,160	48,718	48,718	2.3	112,051
			Other	61.9	-	-				
			18% of 9-5	7.2	573.8	4,131				
			33% of 9-4	16.3	517.0	8,427				
R37	R35	Existing	82% of 9-5	32.6	580.0	18,909	35,762	35,762	2.3	82,253
			67% of 9-4	33.1	509.2	16,853				
R35	R34	Existing	–-	0.0	–	–	--	84,480	2.3	194,304
R34	R33	Existing	–-	0.0	–	–	--	208,412	2.3	479,348
R33	R27	Existing	18% of 9-1	10.3	528.2	5,440	5,440	213,852	2.3	491,860
R32	R30	Existing	8-6	23.6	925.4	21,840	60,480	60,480	2.3	139,104
			8-7	28.2	629.8	17,760				
			42% of 8-3	10.4	623.1	6,480				
			8-3B	6.7	322.4	2,160				
			67% of 8-4	14.1	476.6	6,720				
			26% of 8-2	7.8	707.7	5,520				
R31	R30	Existing	58% of 8-3	14.3	621.0	8,880	38,400	38,400	2.3	88,320
			56% of 8-2	16.8	700.0	11,760				
			8-1	22.9	775.5	17,760				
R30	R28	Existing	–-	0.0	–	–	--	98,880	2.3	227,424
R29	R28	Existing	8-9	21.7	707.8	15,360	31,680	31,680	2.3	72,864
			8-8	20.0	468.0	9,360				
			33% of 8-4	6.9	487.0	3,360				
			18% of 8-2	5.4	666.7	3,600				
R28	R27	Existing	–-	0.0	–	–	--	130,560	2.3	300,288
R27	R26	Existing	42% of 9-1	24.0	526.7	12,640	12,640	357,052	2.3	821,220
R26	R25	Existing	40% of 9-1	22.9	531.0	12,160	12,160	369,212	2.3	849,188
R25	R41	Existing	–-	0.0	–	–	--	369,212	2.3	849,188

Project: Eastmark
Location: Mesa, Arizona
References: City of Mesa 2012 Engineering and Design Standards
Arizona Administrative Code, Title 18, Chapter 9

FROM NODE	TO NODE	PROPOSED /EXISTING SEWER PIPE	SEWER AREA(S) SERVED	AREA SERVED (ACRES)	UNIT FLOW (GPD/AC)	PARCEL ADF (GPD)	SEWER NODE ADF (GPD)	TOTAL ADF (GPD)	PEAKING FACTOR	PEAK WET WEATHER FLOW (GPD)
R42	R41	Existing	3S-2	31.4	891.7	28,000	62,240	62,240	2.3	143,152
			3S-3	30.0	1,141.3	34,240				
R45	R41	Existing	3/4-1 to 3/4-3	55.0	1,393.7	76,656	126,576	126,576	2.3	291,125
			3/4-4	34.0	1,468.2	49,920				
R41	R44	Existing	--	--	--	--	--	558,028	2.3	1,283,464
R43	R44	Existing	3S-1	30.9	1,100.3	34,000	34,000	34,000	2.3	78,200
R44	R14	Existing	--	0.0	--	--	--	592,028	2.3	1,361,664
R14	R13	Existing	50% 3/4-9F	3.0	937	2,810	2,810	2,379,479	1.9	4,521,010
R13	R1	Existing	LDR3-1	380	720.0	273,600	965,166	3,344,645	1.9	6,354,826
			GI-1	40	810.0	32,400				
			LI-1	318	378.0	120,204				
			MUE-1	112	810.0	90,720				
			MUE-2	7	810.0	5,670				
			MDR3-1	231	1,280.0	295,680				
			MUR1-1	62	2,040.0	126,480				
			CC-1	27	756.0	20,412				
R1	RAY ROAD SEWER	Existing	(1)	0	--	--	--	4,293,581	1.9	8,157,804
Total Onsite Flow to Elliot Road Outfall				**646.5**	(3)	**1,894,152**	**1,894,152**	**1,894,152**		**5,408,353**
Total Onsite Flow to Warner Road Outfall				**519.3**	(4)	**353,905**	**353,905**	**353,905**		**1,061,715**
Total Onsite Flow to Ray Road Outfall at Ellsworth Road (Ray Sewer Basin Only)				**1,984.1**	(5)	**1,848,180**	**1,848,180**	**1,848,180**	(1), (8)	**3,511,542**
Total Onsite Flow to Ray Road Outfall at Ellsworth Road (Includes Warner and Ray Road Sewer Basins)				**2,503.4**	(6)	**2,202,085**	**2,202,085**	**2,202,085**	(1), (8)	**4,183,962**
Total Onsite Flow, Elliot + Warner + Ray Basins:				**3149.9**		**4,096,237**	**4,096,237**	**4,096,237**		**9,592,315**
Total to Ray Road Outfall at Ellsworth Road (Ray Sewer Basin Only)				**4,733**	(7)	**3,939,676**	**3,939,676**	**3,939,676**	(1), (8)	**7,485,384**
Total to Ray Road Outfall at Ellsworth Road (Warner and Ray Sewer Basins)				**5,253**	(6), (7)	**4,293,581**	**4,293,581**	**4,293,581**	(1), (8), (9)	**8,157,804**

(1) Peak Wet Weather Wastewater Flow for the proposed sewer area (3/4-6) aquatic center equals the average day flow of 34,000 GPD times a peaking factor of 3. Additionally, during the draining of the pool facility, an additional capacity of 450,000 gallons over 8 hours is required by the City of Mesa Parks and Recreation. Draining the pool facility is considered a rare occurance, but for calculations during the draining of the pool facility see Notes 3, 4, and 5 on Table 19.

(2) Offsite wastewater flow within the Signal Butte Road sewer line includes flow from existing residential developments to the east (Avg Day = 1,040,576 gpd) per the Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads, by CMX, 11/18/2005, and the City of Mesa Signal Butte/Elliot Water Campus (Avg Day = 1,134 gpd)

(4) The total acreage for the Warner Road Outfall at Ellsworth Road includes the area specified as right-of-way or other as shown on Tables 11 and 15.

(5) The total acreage for the Ray Road Outfall at Ellsworth Road includes the area specified as right-of-way, park, or other as shown on Tables 3, 5, 9, and 11.

(6) Total acreage for the Ray Road Outfall at Ellsworth includes the acreage from the Ray and Warner Sewer Basins.

(7) Total flow to Ray Road Outfall at Ellsworth Road includes offsite sewer to the south and east of Eastmark.

(8) The existing peaking factors for existing sewer lines were utilized. Less than 1 MGD=2.3, 1 to 10 MGD=1.9.

(9) During initial buildout of Eastmark, the onsite flow from the Ray and Warner sewer basins will discharge to the existing 30-inch sewer line in Ray Road.

(10) The 18" and 21" sewer lines along Ellsworth (South of Warner) have been constructed, so the existing peaking factors were utilized for these pipe segments.

TABLE 19

CALCULATED PIPE CAPACITIES

Project: Eastmark
Location: Mesa, Arizona
References: ADEQ Bulletin No. 11
City of Mesa 2012 Engineering and Design Standards

FROM NODE	TO NODE	NOTES	PIPE DIA. (INCHES)	MODELED PIPE SLOPE (FT / FT)	PIPE CAPACITY		PEAK FLOW RESULTS					
					GPD	GPM	PEAK WET WEATHER FLOW (GPD)	PEAK WET WEATHER FLOW (GPM)	d/D (WET WEATHER)	FLOW VELOCITY (FT/S) AT d/D=2/3	SURPLUS CAPACITY (WET WEATHER) (GPD)	PERCENT OF CAPACITY (WET WEATHER)
Elliot Road Basin Pipe Sizes												
E2	E1	(1) Existing	30	0.0010	8,248,208	5,728	895,275	622	0.22	2.9	7,352,933	10.9%
E4	E3	Proposed	12	0.0025	1,167,463	811	886,350	616	0.66	2.5	281,113	75.9%
E7	E6	Proposed	12	0.0025	1,167,463	811	340,500	236	0.37	2.5	826,963	29.2%
E6	E5	Existing	21	0.0020	4,663,391	3,238	1,638,520	1,138	0.41	3.3	3,024,871	35.1%
(6) E10	E9	Existing	24	0.0020	6,497,044	4,512	1,988,208	1,381	0.38	3.5	4,508,836	30.6%
Warner Road Basin Pipe Sizes												
W9	W8	Existing	8	0.0039	496,346	345	100,317	70	0.31	2.4	396,029	20.2%
W11	W10	Proposed	9	0.0033	628,158	436	41,472	29	0.18	2.4	586,686	6.6%
W10	W8	Existing	10	0.0039	881,219	612	82,579	57	0.21	2.8	798,640	9.4%
W8	W7	Existing	11	0.0039	1,151,536	800	165,986	115	0.26	3.0	985,550	14.4%
W12	W7	Existing	12	0.0039	1,421,260	987	165,986	115	0.23	3.1	1,255,274	11.7%
W7	W6	Existing	13	0.0039	1,787,077	1241	570,952	396	0.38	3.3	1,216,125	31.9%
W6	W1	Existing	14	0.0039	2,141,736	1487	669,024	465	0.39	3.4	1,472,712	31.2%
W13	W1	Proposed	15	0.0020	1,903,379	1322	189,075	131	0.21	2.7	1,714,304	9.9%
Ray Road Basin Pipe Sizes												
R4	R3A	(2) Existing	18	0.0025	3,426,184	2,379	813,982	565	0.33	3.3	2,612,202	23.8%
R3A	R3B	Existing	21	0.0020	4,663,391	3,238	848,327	589	0.29	3.3	3,815,064	18.2%
R5	R3B	Existing	8	0.0040	496,346	345	224,001	156	0.48	2.4	272,345	45.1%
R3B	R2	Existing	21	0.0020	4,663,391	3,238	1,020,062	708	0.32	3.3	3,643,329	21.9%
R6	R9	Proposed	8	0.0040	496,346	345	58,080	40	0.23	2.4	438,266	11.7%
R9	R8	Existing	8	0.0040	496,346	345	44,528	31	0.20	2.4	451,818	9.0%
R8	R7	(3) Existing	18	0.0020	3,083,566	2,141	333,408	232	0.22	3.0	2,750,158	10.8%
R50	R7	Proposed	8	0.0040	496,346	345	315,816	219	0.58	2.4	180,530	63.6%
R7	R2	(4) Existing	18	0.0020	3,083,566	2,141	903,458	627	0.37	3.0	2,180,108	29.3%
R2	R1	(5) Existing	24	0.0018	6,294,012	4,371	1,925,850	1,337	0.38	3.4	4,368,162	30.6%
R48	R49	Proposed	8	0.0040	775,473	539	300,750	209	0.43	2.4	474,723	38.8%
R49	R1	Proposed	10	0.0030	496,346	345	334,830	233	0.59	2.4	161,516	67.5%
R46	R47	Proposed	8	0.0040	496,346	345	189,696	132	0.43	2.4	306,650	38.2%
R47	R24	Existing	8	0.0040	496,346	345	245,173	170	0.49	2.4	251,173	49.4%
R24	R22	Existing	12	0.0045	1,522,778	1,057	374,514	260	0.33	3.3	1,148,264	24.6%
R12	R22	Existing	8	0.0040	496,346	345	62,376	43	0.24	2.8	433,970	12.6%
R23	R22	Existing	8	0.0050	564,029	392	208,104	145	0.42	2.8	355,925	36.9%
R22	R21	Existing	12	0.0045	1,522,778	1,057	644,994	448	0.45	3.3	877,784	42.4%
R11	R10	Existing	8	0.0040	496,346	345	88,872	62	0.28	2.7	407,474	17.9%
R10	R21	Existing	12	0.0030	1,268,982	881	186,410	129	0.26	2.7	1,082,572	14.7%
R21	R20	Existing	15	0.0020	1,903,379	1,322	1,000,316	695	0.52	2.7	903,063	52.6%
R20	R19	Existing	15	0.0020	1,903,379	1,322	1,129,245	784	0.55	2.7	774,134	59.3%
R19	R16	Existing	15	0.0020	1,903,379	1,322	1,326,716	921	0.61	2.7	576,663	69.7%
R18	R17	Existing	18	0.0064	5,481,895	3,807	2,088,507	1,450	0.42	5.3	3,393,388	38.1%
R17	R16	Existing	18	0.0070	5,710,307	3,965	2,174,691	1,510	0.43	5.5	3,535,616	38.1%
R16	R15	Existing	21	0.0034	6,062,408	4,210	3,275,393	2,275	0.52	4.3	2,787,015	54.0%
R15	R14	Existing	21	0.0030	5,596,069	3,886	3,390,818	2,355	0.56	4.0	2,205,251	60.6%
R40	R39	Existing	10	0.0027	740,224	514	194,626	135	0.35	2.3	545,598	26.3%
R39	R38	Existing	10	0.0027	740,224	514	227,746	158	0.38	2.3	512,478	30.8%
R38	R34	Existing	12	0.0019	1,015,186	705	285,044	198	0.36	2.2	730,142	28.1%
R36	R35	Existing	8	0.0033	451,224	313	112,051	78	0.34	2.2	339,173	24.8%
R37	R35	Existing	8	0.0033	451,224	313	82,253	57	0.29	2.2	368,971	18.2%
R35	R34	Existing	10	0.0024	704,975	490	194,304	135	0.36	2.2	510,671	27.6%
R34	R33	Existing	15	0.0014	1,586,149	1,101	479,348	333	0.38	2.2	1,106,801	30.2%
R33	R27	Existing	15	0.0014	1,586,149	1,101	491,860	342	0.38	2.2	1,094,289	31.0%
R32	R30	Existing	8	0.0038	473,785	329	139,104	97	0.38	2.3	334,681	29.4%
R31	R30	Existing	8	0.0098	767,080	533	88,320	61	0.23	3.8	678,760	11.5%
R30	R28	Existing	8	0.0126	879,886	611	227,424	158	0.35	4.3	652,462	25.8%
R29	R28	Existing	8	0.0038	473,785	329	72,864	51	0.27	2.3	400,921	15.4%
R28	R27	Existing	8	0.0043	518,907	360	300,288	209	0.54	2.5	218,619	57.9%
R27	R26	Existing	15	0.0014	1,586,149	1,101	821,220	570	0.51	2.2	764,929	51.8%
R26	R25	Existing	18	0.0011	2,284,123	1,586	849,188	590	0.42	2.2	1,434,935	37.2%
R25	R41	Existing	18	0.0011	2,284,123	1,586	849,188	590	0.42	2.2	1,434,935	37.2%
R42	R41	Existing	8	0.0040	496,346	345	143,152	99	0.37	2.4	353,194	28.8%
R45	R41	Existing	8	0.0040	496,346	345	291,125	202	0.55	2.4	205,221	58.7%
R41	R44	Existing	18	0.0011	2,284,123	1,586	1,283,464	891	0.53	2.2	1,000,659	56.2%
R43	R44	Existing	8	0.0040	496,346	345	78,200	54	0.27	2.4	418,146	15.8%
R44	R14	Existing	18	0.0050	4,796,658	3,331	1,361,664	946	0.37	4.7	3,434,994	28.4%
R14	R13	Existing	21	0.0048	7,150,533	4,966	4,521,010	3,140	0.57	5.1	2,629,523	63.2%
R13	R1	Existing	24	0.0081	13,197,121	9,165	6,354,826	4,413	0.49	7.2	6,842,295	48.2%

NOTES:

(1) Pipe segment E2 to E1 is existing and was originally sized by First Solar's Engineer to convey the entire DU 6 North Parcels.

(2) This pipe segment has been upsized to convey the Warner Sewer Basin flow prior to Warner Sewer Construction. The pipe size represents a scenario assuming no onsite flow discharging to Warner Road during the full buildout. If Warner Road sewer has been constructed prior to the complete buildout, then the Warner Sewer Basin could be diverted to the Warner Road sewer.

3) Peak Wet Weather Wastewater Flow for the proposed sewer area (3/4-6) aquatic center equals the average day flow of 34,000 gpd times a peaking factor of 3. However, during the draining of the pool facility, an additional capacity of 450,000 gallons over 8 hours is required by the City of Mesa Parks and Recreation. Therefore, all sewer lines downstream of node R8 have an additional 937.5 GPM (450,000 gallons/8 hours/ 60 minutes per hour) during the time the pool facility is drained. This additional flow increases the peak wet weather flow to 1,170 GPM for the pipe segment R8 to R7. The pipe has a maximum capacity of 2,141 GPM; thus, the pipe will be flowing at 55% full.

4) The additional flow of 937.5 GPM during the draining of the pool facility increases the peak wet weather flow to 1,536 GPM for the pipe segment R7 to R2. The pipe has a maximum capacity of 2,141 GPM; thus, the pipe will be flowing at 72% full.

5) The additional flow of 937.5 GPM during the draining of the pool facility increases the peak wet weather flow to 2,893 GPM for the pipe segment R2 to R1. The pipe has a maximum capacity of 4,371 GPM; thus, the pipe will be flowing at 66% full.

6) A peak instantaneous flow of 1, 368 GPM + 72 GPM + 2,192 GPM=3,632 GPM for DU 1-2-5W is added to the peak wet-weather flow. The total instantaneous flow within pipe section Node E10 to E9 is 3,632 GPM, the minimum pipe size that could convey this flow with the capacity of the pipe is a 24-inch. The d/D for this scenarios is 0.67, with the pipe flowing at 80% full.

APPENDIX A

DEVELOPMENT UNITS 1-2-5W DEMANDS

Steven McKee

From: Daniel Matthews
Sent: Wednesday, January 20, 2021 7:49 AM
To: Steven McKee
Subject: FW: Eastmark - Coordination for Master Plan Updates for Project Huckleberry - A20-1829
Attachments: Eastmark Master Water Exhibit_Olsson.pdf; Eastmark Master Wastewater Exhibit_Olsson.pdf; 020-1829 Mesa_Vol Required 2021-01-15.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Dan Matthews, PE
Principal

D: 602.335.8542
M: 602.341.8505
dmatthews@woodpatel.com
www.woodpatel.com

From: Josh Elledge [mailto:jelledge@olsson.com]
Sent: Friday, January 15, 2021 8:57 AM
To: Daniel Matthews
Cc: Cardell Andrews; eric.tune@brookfieldpropertiesdevelopment.com; christina.christian@brookfieldpropertiesdevelopment.com; 020-1829-A
Subject: RE: Eastmark - Coordination for Master Plan Updates for Project Huckleberry - A20-1829

Dan,

We had a pretty in-depth call with the City of Mesa yesterday morning and they have asked that we try and set-up a meeting with our office, your office, and the City to discuss water and sewer connection points before the Master Reports are finalized, as a few flows will trigger additional offsite improvements required for the Eastmark Development. If that works, I can try and coordinate with the City to determine a day and time that works best for everyone.

More specifically we are working with the following people at the City:

- Jessie Haywood
- Brian Draper
- Stephen Ganstrom

Below is a look at the proposed flow and peaking factors. Please note that this site will not operate like Apple, as we do not have onsite storage tanks to regulate the flow. You will also notice that the peaking factors get pretty low in the winter months, unlike Apple, as the outside air is used more to help with cooling.

- You can assume a linear ramp up based on:
    - 1/1/2021: No Demand
    - 7/1/2022: Demand shown on Phase 1

- 1/1/2024: Demand of Final Phase (full build out)

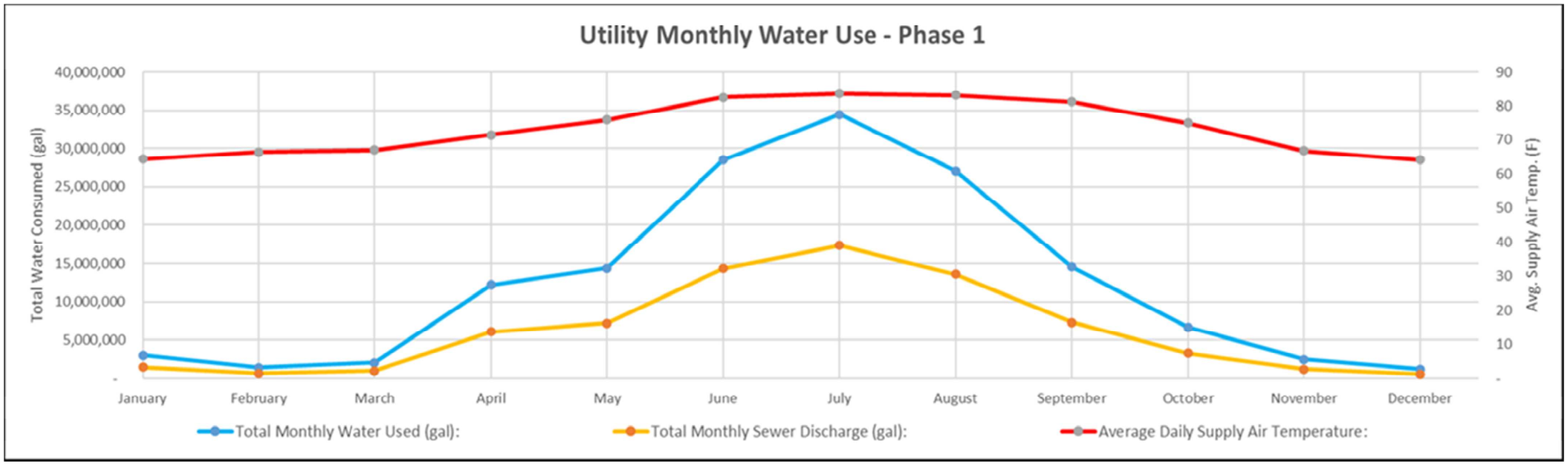
Phase 1 (7/1/2022)	Water	Sewer
Utility	148,132,298	74,066,149
Peak GPMo	34,683,887	17,354,093
Peak GPD	1,576,600	788,300
Peak GPH	105,224	52,612
Peak GPM	1,754	877
Max 48 Hour Use	2,991,740	1,495,870
Domestic Water		
GPY	3,650,400	3,650,400
GPD	14,040	14,040
Peak GPM	58	58

Final Phase (1/1/2024)	Water	Sewer
Utility	370,330,745	185,165,372
Peak GPMo	86,770,467	43,385,234
Peak GPD	3,941,501	1,970,750
Peak GPH	263,060	131,529
Peak GPM	4,384	2,192
Max 48 Hour Use	7,479,350	3,739,676
Domestic Water		
GPY	4,539,600	4,539,600
GPD	17,460	17,460
Peak GPM	72	72

- "Utility" is Gallons per year
- We use "Phases" rather than buildings. Phase 1 is the targeting 7/1/2022 to use the water shown. Final Phase targeted for 1/1/2024 is the total demand for the project. There will be a ramp between those phases but this will hopefully give you an idea of our growth projection for the entire site.
- Majority of the water use is for evaporative cooling. So these metrics are based on a typical weather year. The water usage is nonlinear. Summer is very high due to the heat. Winter is very low due to the cooler temperatures. The system also varies day to night due to temperature changes. You can follow the same principles of a cooling tower.
- Below is the monthly peaking factors where the numbers represent percentage of peak month volume. (i.e- So you would multiply these by 34.7 MG for Phase 1 and 86.8 MG for Phase 2)

	Monthly peaking factors:
January	0.09
February	0.04
March	0.06
April	0.35
May	0.42

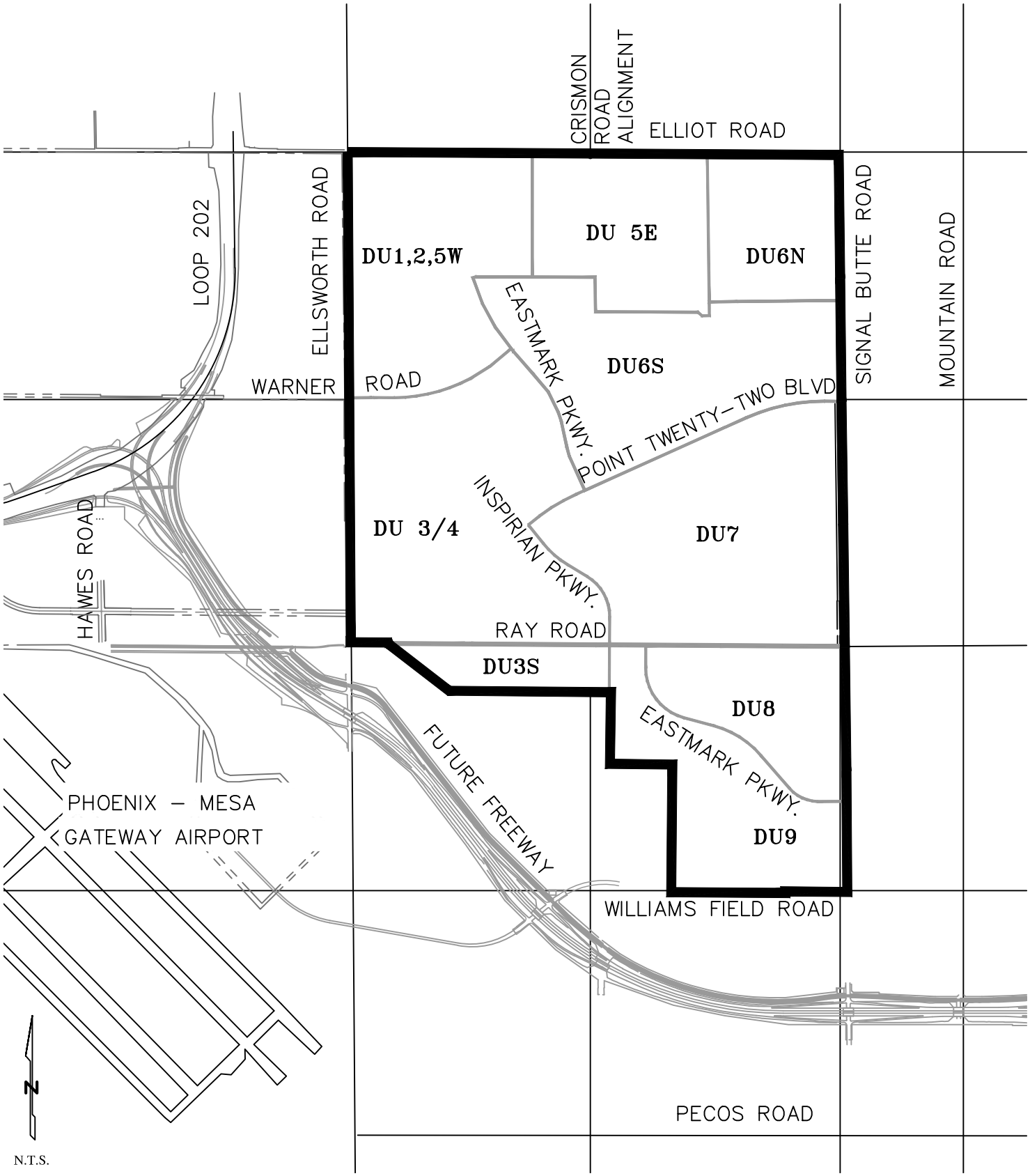
- Here is an estimate of the load profile for a typical year



	MONTHLY												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Total Monthly Water Used (gal):	3,047,372	1,421,699	2,085,337	12,177,693	14,393,932	28,486,000	34,455,907	27,053,935	14,564,812	6,696,260	2,517,884	1,231,468	148,132,298
Peak 24 hr Makeup / month	380,794	290,882	298,471	916,939	1,218,174	1,492,612	1,571,404	1,542,222	1,156,982	502,937	430,419	254,344	
Total Monthly Sewer Discharge (gal):	1,482,561	645,853	991,731	6,082,092	7,199,505	14,324,771	17,354,093	13,609,389	7,293,942	3,315,673	1,217,667	548,871	74,066,149
Average Daily Supply Air Temperature:	64	66	67	72	76	83	84	83	81	75	67	64	
Average Daily Water Used (gal):	98,302	50,775	67,269	405,923	464,320	949,533	1,111,481	872,708	485,494	216,008	83,929	39,725	
Average Daily Sewer Discharge (gal):	47,825	23,066	31,991	202,736	232,242	477,492	559,809	439,013	243,131	106,957	40,589	17,706	

EXHIBIT 1

VICINITY MAP



TOWNSHIP 1 SOUTH, RANGE 7 EAST
OF THE GILA AND SALT RIVER
MERIDIAN, MARICOPA COUNTY, ARIZONA

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NOT FOR CONSTRUCTION
OR RECORDING

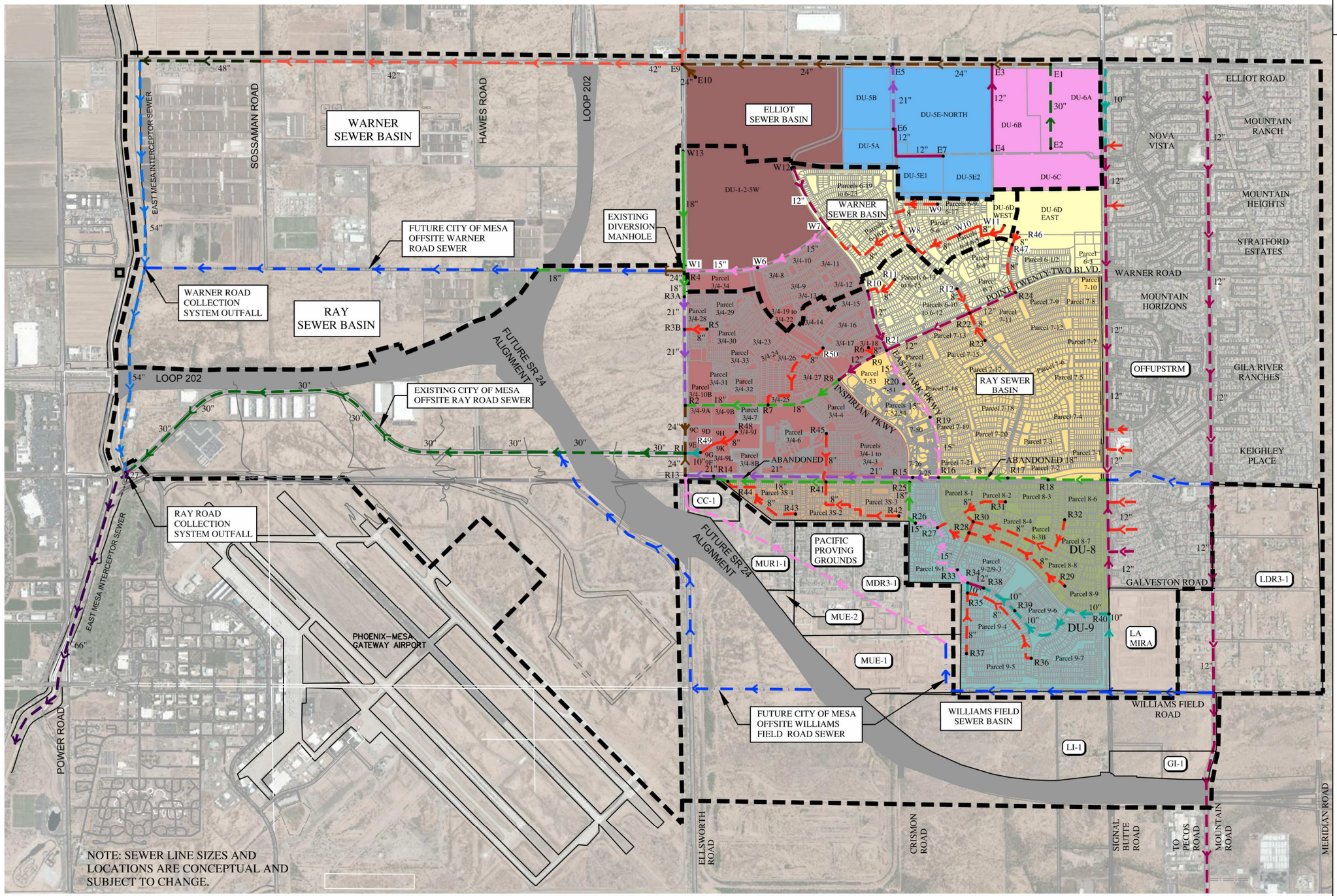
EXHIBIT 1: VICINITY MAP

EASTMARK
MESA, ARIZONA

WOOD PATEL

EXHIBIT 2

MASTER SEWER EXHIBIT



LEGEND

EXISTING SEWER

FIRST LIFE CYCLE PLANNED SEWER

8" 10" 12" 15" 18" 21" 24" 27" 30" 36" 42" 48" 54" 66"

ON-SITE DEVELOPMENT UNITS

- DU 1, 2, 5W
- DU 3S
- DU 3/4
- DU 5E
- DU 6N
- DU 6S
- DU 7
- DU 8
- DU 9

OFF-SITE LAND USE DESIGNATIONS*

- SEWER BASIN BOUNDARIES
- ONSITE SEWER SUB-BASIN BOUNDARIES
- ONSITE SEWER SUB-BASIN LABELS (DU-1A)
- OFFSITE CONTRIBUTING SEWER BASIN (LDR3-1)
- OFFSITE SEWER SUB-BASIN BOUNDARIES

* OFF-SITE LAND USE DESIGNATIONS ARE PER THE 2004 COM WWMP

OTHER

- FUTURE SEWER BY OTHERS
- EXISTING SEWER LIFT STATION

N

0 2500 5000

Horz. 1 in. = 2500 ft.

PRELIMINARY
NOT FOR CONSTRUCTION
OR RECORDING

EXHIBIT 2 - MASTER SEWER EXHIBIT

EASTMARK
MESA, ARIZONA

WOOD PATEL

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