# MASTER WASTEWATER REPORT
# FOR
# DEVELOPMENT UNIT 5 EAST
# AT
# EASTMARK

May 14, 2014

WP# 144173

CITY OF MESA
APPROVED
Date 5/20/14 By RAP

REVIEWED BY
CITY STAFF
5/16/14 BY
DATE

WOOD/PATEL
MISSION: CLIENT SERVICE™

# MASTER WASTEWATER REPORT
# FOR
# DEVELOPMENT UNIT 5 EAST
# AT
# EASTMARK

May 14, 2014

WP# 144173

DMB Master Developer Approval — EASTMARK.

Date 05/13/14

ERIK J. TUNE

SR. PROJECT MANAGER

*Submitted to:*

**City of Mesa**
55 North Center Street
P.O. Box 1466
Mesa, Arizona 85211-1466
*Phone: (480) 644-3258*

*Prepared for:*

**DMB Mesa Proving Grounds, LLC**
7600 East Doubletree Ranch Road
Suite 300
Scottsdale, Arizona 85258
*Phone: (480) 367-7000*

Registered Professional Engineer (Civil) — CERTIFICATE NO. 53408 — DANIEL W. MATTHEWS — Date Signed 05-14-14 — ARIZONA, U.S.A.

EXPIRES 06-30-2015

*Prepared By:*

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WOOD/PATEL
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### PLATES




EXPIRES 06-30-2015

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# 1.0 INTRODUCTION

## 1.1 General Background and Project Location

The proposed Development Unit 5 East is anticipated to be an approximate 82-acre Development Unit (DU) within the 3,151-acre Eastmark master planned community in the City of Mesa (City). The planned land use for DU 5 East is Industrial.

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

The Site is located within Section 14, Township 1 South, Range 7 East of the Gila and Salt River Meridian. The Site is bounded by Elliot Road to the north, future Development Unit 6 North on the east, and future Development Unit 5 on the south and west (refer to Plate 1 – *Vicinity Map*).

## 1.2 Scope of the DU 5 East Master Wastewater Report

The DU 5 East Master Wastewater Report presents wastewater design flows, and sewer main sizes and locations as required to provide wastewater service to the Site at full build-out conditions prior to the full build-out of Eastmark.

The purpose of this report is to provide a sewer analysis reflecting the developed condition of DU 5 East prior to the full build-out of Eastmark, based on the land uses provided by DMB Mesa Proving Grounds, LLC, and to identify the sewer infrastructure required to serve the Site, while meeting the requirements of the City's Engineering and Design Standards.

Updates to the DU 5 East 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 Wastewater Master Report for Eastmark

The *Master Wastewater Report Update for Eastmark*, by Wood, Patel & Associates, Inc., dated December 17, 2013, was approved by the City of Mesa. Additionally, the *Master Wastewater Report Update for Eastmark*, by Wood, Patel & Associates, Inc. dated May 14, 2014, is being submitted concurrently for review and approval to the City of Mesa. The report sets the design criteria required within Eastmark, and sets sewer basin boundaries tributary to the Elliot Road, Warner Road, and Ray Road offsite sewers. The updated report includes revised land uses and sewer alignments across Eastmark.

## 1.4 Study Area and Development Units

The study area includes the Elliot Sewer Drainage Basin, per the *City of Mesa Wastewater Master Plan Update,* 2009. For a detailed breakdown of modeled land use areas, please refer to the following:

- Table 2 – *Overall Eastmark Modeled Land Use*
- Table 3 – *DU 5 East Modeled Land Use*
- Table 4 – *DU 5 East Wastewater Model*
- Plate 2 – *DU 5 East Master Sewer Exhibit*

## 1.5 Basis of Design Reports for Specific Individual Developments

As development progresses within the Site, Basis of Design reports are required for specific individual developments to ensure compliance with the Master Report and this 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 Site consists of multiple automotive test tracks and undisturbed desert, which borders the Site to the west and south. Along the eastern boundary, the portion of DU 6 North directly adjacent to the Site is undeveloped, and was previously master planned with industrial use. To the north, the Site is bound by Elliot Road with undeveloped industrial parcels planned to the north. The land generally slopes in a southwesterly direction, at approximately 0.5 to 1 percent. The peak elevation within the Site is approximately 1,445 feet above mean sea level (MSL), located along Elliot Road at the northeast corner of DU 5 East. The lowest elevation within the Site is approximately 1,435 feet above mean sea level (MSL), located at the southwest corner of DU 5 East. Refer to Plate 1 – *Vicinity Map* for roadway alignments.

### 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 12-inch gravity sewer located along Signal Butte Road, between Elliot Road 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), which is approximately two and one-half (2 ½) miles west of the Site, is an existing 54-inch and 66-inch gravity sewer line extending in a southerly direction parallel with the East Maricopa Floodway.
- A 27-inch and 30-inch gravity sewer located along Ray Road, flowing east from Ellsworth Road discharging to the EMI, and a 21-inch and 18-inch gravity sewer from Ellsworth Road to Signal Butte Road.
- A 24-inch gravity sewer line in Elliot Road, beginning just west of Signal Butte Road, to the EMI at Ellsworth Road and Elliot Road.

## 3.0 WASTEWATER SYSTEM DESIGN

### 3.1 Design Criteria

Wastewater design flows and pipe-sizing criteria utilized in this DU 5 East Master Wastewater Report are based on Wood/Patel's understanding of the following:

- The *Master Wastewater Report for Eastmark.*
- Applicable wastewater system design criteria listed in the *2012 City of Mesa Engineering Design Standards,* along with City-accepted population based criteria per Table 1-DU 5 East Wastewater Design Criteria.
- Regionally-accepted design standards.
- Title 18, Chapter 9 of the *Arizona Administrative Code.*

Table 1 – *DU 5 East Wastewater Design Criteria* presents the Unit Daily Wastewater Flow for each land use category, based on density and population.

### 3.2 Wastewater Design Flows

Estimated wastewater design flows under full build-out conditions were estimated for DU 5 East based on water demands estimated by others and provided to Wood/Patel by DMB Mesa Proving Grounds, LLC. The potential user did not provide the anticipated wastewater discharges for the proposed site uses; therefore, the estimated average daily wastewater demand was assumed to be 80% of the average daily water demand of 1.0 million gallons per day (MGD). Projected full build-out average daily wastewater flows for DU 5 East and the existing development within Eastmark, including the First Solar retrofit, are summarized as follows in millions of gallons per day:

| | DU 5 East | Planned Offsite Eastmark DU 6 North | **Eastmark Total** |
|---|---|---|---|
| Elliot Road Outfall: | 0.80 MGD | 3.16 MGD | **3.96 MGD** |
| **Total:** | **0.80 MGD** | **3.16 MGD** | **3.96 MGD** |

Sewer pipe capacities are based on conveying the peak wet-weather wastewater flow at two-thirds of the pipe capacity. It is Wood/Patel's understanding that wet-weather infiltration is accounted for within the City of Mesa peaking factors listed in the 2012 City of Mesa Engineering Design Standards.

Wood/Patel utilized criteria within the 2012 City of Mesa 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. The proposed total peak wet-weather design flow within DU 5 East is 2.4 MGD.

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 Elliot Road sewer. 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 design of the Elliot Road sewer line. 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 9.15 MGD, and at d/D = 0.95 is 9.84 MGD. With the pipe flowing two-thirds full, the capacity is 7.18 MGD, with a velocity of 4.99 feet per second (fps).

## 4.0 PROPOSED SYSTEM

### 4.1 Planned Wastewater Infrastructure

The previous Eastmark Wastewater Master Plans contemplated the Elliot Basin serving DU 6 North. The current *Eastmark Master Wastewater Report Update* has revised the Elliot Road sewer boundary to include DU 5 East. DU 5 East was previously planned as a golf course, which did not generate wastewater flows. Currently, the offsite Elliot Road sewer has been constructed downstream of Eastmark.

### 4.2 Pipe Sizing

Proposed sewer lines for the Site were sized to accommodate peak wet-weather flow conditions for the full build-out condition. The onsite collection system includes a planned 21-inch sewer main at 0.2 percent slope. Refer to Plate 2 for the planned DU 5 East wastewater infrastructure.

## 5.0 CONCLUSIONS

The Master Wastewater Report for Development Unit 5 East at 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. Development Unit 5 East is anticipated to be 82 acres within the 3,155-acre Eastmark master planned community in the City of Mesa.
2. The wastewater system presented is based on the projected full build-out condition of the Site.
3. Wastewater design criteria are based on Wood/Patel's understanding of the *2012 City of Mesa Engineering & Design Standards*, regionally-accepted design standards, the *Master Wastewater Report Update for Eastmark*, and Title 18, Chapter 9 of the *Arizona Administrative Code*.
4. The approximate average daily flow generated at build-out by the DU 5 East is 0.8 MGD, per Section 3.2 of this report.
5. Proposed onsite sewer mains are sized to accommodate peak wet-weather design flow for the full build-out condition.
6. The planned public wastewater collection system will outfall into the existing gravity sewer line located along Elliot Road.
7. Wood/Patel's model of the proposed onsite wastewater system provides conveyance and capacity in conformance with the City of Mesa's standards and Title 18 of the *Arizona Administrative Code*.

# TABLE 1

## DU 5 East Wastewater Design Criteria

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

Proj. Number: 144173
Proj. Engineer: Dan Matthews, P.E.

**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 ) | 8.5 | 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 population 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 2009 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 2**

**Overall Eastmark**
**Modeled Land Use**

# TABLE 2 - OVERALL EASTMARK MODELED LAND USE

**Project:** Eastmark
**Location:** Mesa, Arizona

Proj. Number: 144173
Proj. Engineer: Dan Matthews, P.E.

## 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 | -- | 20.0 | 779.6 | 114.7 | 83.9 | -- | 20.0 | 228.0 | **1,246.2** | -- | --- |
| Dwelling Units | -- | 39 | 2,614 | 481 | 438 | -- | 220 | 4,559 | **8,351** | -- | **8,351** |

## 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[3] (GPD/AC) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3S | 92.3 | 92.3 | 391 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 97,040 | 92.3 | 1,051.4 |
| 3/4 | 608.3 | 228.0 | 4,559 | 150 | 118.0 | 2,728,680 | 176.0 | 0.0 | 31.0 | 27.4 | 2,590,610 | 608.3 | 4,258.8 |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5E | 82.0 | 0.0 | 0 | 0 | 82.0 | 1,000,000 | 0.0 | 0.0 | 0.0 | 0.0 | 800,000 | 82.0 | 9,756.1 |
| 6N | 272.5 | 0.0 | 0 | 0 | 272.5 | 5,360,000 | 0.0 | 0.0 | 0.0 | 0.0 | 3,157,352 | 272.5 | 11,586.6 |
| 6S | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | 575.5 | 475.8 | 1,958 | 0 | 5.5 | 265,000 | 20.0 | 13.5 | 2.5 | 58.2 | 495,319 | 575.5 | 860.7 |
| 8 | 198.8 | 192.0 | 535 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 35.0 | 128,400 | 198.8 | 645.9 |
| 9 | 327.8 | 258.1 | 908 | 0 | 0.0 | 200,000 | 0.0 | 0.0 | 12.4 | 22.3 | 155,324 | 327.8 | 473.8 |
| **Subtotal:** | **2,157.2** | **1,246.2** | **8,351** | **150** | **478.0** | **9,553,680** | **196.0** | **13.5** | **45.9** | **142.9** | **7,424,045** | **2,157.2** | --- |

[1] Anticipated number of "Keys" represents hotel and resort uses. This includes approximately 2.5 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.

[3] The unit daily wastewater flow is calculated by taking the average day wastewater flow divided by the development unit flow area. The result is a unit daily wastewater flow in gallons per day per acre.

Abbreviations:
AC = Acres
GPD = Gallons Per Day
GPD/AC = Gallons Per Day Per Acre

# TABLE 3

## DU 5 East Modeled Land Use

## TABLE 3-DU 5 East Modeled Land Use

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

Proj. Number: 144173
Proj. Engineer: Dan Matthews, P.E.

**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)[2] | Avg Day (GPD)[1] |
|---|---|---|---|---|---|---|---|---|
| DU 5E | -- | -- | -- | 82.0 | 1,000,000 | INDUSTRIAL | 9,756 | 800,000 |
| **DU 5 East Totals** | **0** | **0.0** | | **82.0** | **1,000,000** | | | **800,000** |

**Notes:**

1) Estimated wastewater design flows under full build-out conditions were estimated for DU 5 East based on water demand flows that were provided to Wood/Patel by DMB Mesa Proving Grounds, LLC. The potential user did not provide the anticipated wastewater dishcharges for the proposed site uses; therefore, the estimated average daily wastewater demand was assumed to be 80% of the average daily water demand provided of 1.0 million gallons per day (MGD).

2) The unit daily wastewater flow is calculated by taking the average day wastewater flow divided by the non-residential acres. The result is a unit daily wastewater flow in gallons per day per acre.

# TABLE 4

# DU 5 East Wastewater Model

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

Proj. Number: 144173
Proj. Engineer: Dan Matthews, P.E.

| FROM NODE | TO NODE | 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 | | | | | | | | | |
| E3 | E2 | DU-6C | 129.7 | 11,485.0 | 1,489,541 | 1,489,541 | 1,489,541 | 2.5 | 3,723,853 |
| E2 | E1 | DU-6A | 89.1 | 10,360.0 | 923,040 | 1,667,811 | 3,157,352 | 2.5 | 7,893,380 |
| | | DU-6B | 53.7 | 13,869.0 | 744,771 | | | | |
| E5 | E4 | DU-5E | 82.0 | 9,756.1 | 800,000 | 800,000 | 800,000 | 3.0 | 2,400,000 |
| Total to Elliot Road Outfall | | | 354.5 | | 3,957,352 | 3,957,352 | 3,957,352 | | 10,293,380 |

# TABLE 5

## DU 5 East Calculated Pipe Capacities

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

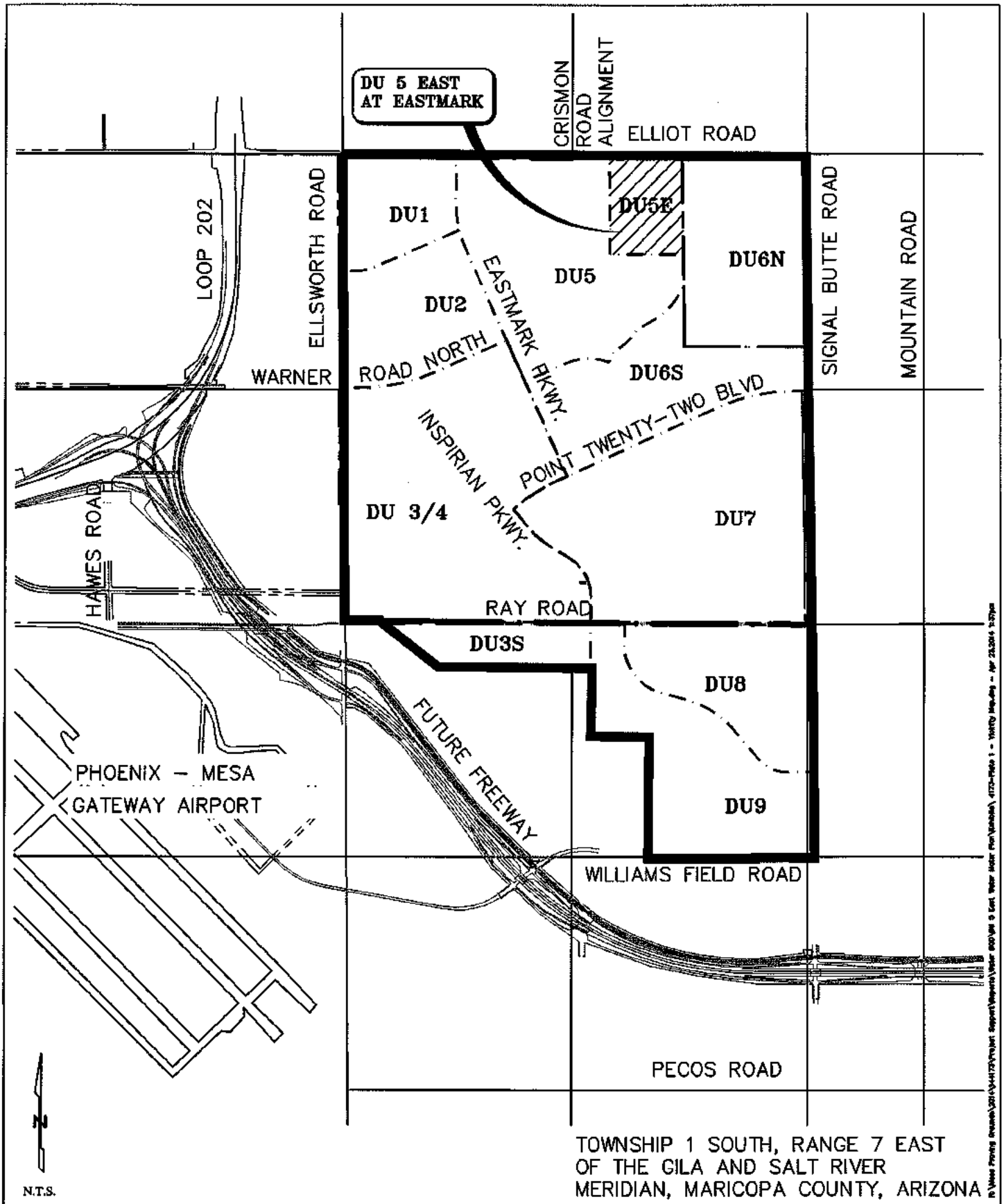
Proj. Number: 144173
Proj. Engineer: Dan Matthews, P.E.

| | | | | | | PEAK FLOW RESULTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FROM NODE | TO NODE | NOTES | PIPE DIA. (INCHES) | MODELED PIPE SLOPE (FT / FT) | PIPE CAPACITY (GPD) | PEAK WET WEATHER FLOW (GPD) | 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 | | | | | | | | | | |
| E3 | E2 | Proposed | 24 | 0.0010 | 4,669,751 | 3,723,853 | 0.67 | 2.5 | 945,898 | 79.7% |
| E2 | E1 | (1) Existing | 30 | 0.0010 | 8,248,208 | 7,893,380 | 0.77 | 2.9 | 354,828 | 95.7% |
| E5 | E4 | Proposed | 21 | 0.0020 | 4,663,391 | 2,400,000 | 0.51 | 3.3 | 2,263,391 | 51.5% |

NOTES:
(1) Pipe segment E2 to E1 is existing and was sized by First Solar's Engineer.

# PLATE 1

## Vicinity Map




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

NOT FOR CONSTRUCTION
OR RECORDING

## PLATE 1: VICINITY MAP

EASTMARK
MESA, ARIZONA

WOOD/PATEL
LAND DEVELOPMENT ◆ WATER RESOURCES
STRUCTURES ◆ TRANSPORTATION/TRAFFIC
WATER/WASTEWATER ◆ SURVEYING
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Mesa, AZ 85210
(480) 834-3300
www.woodpatel.com
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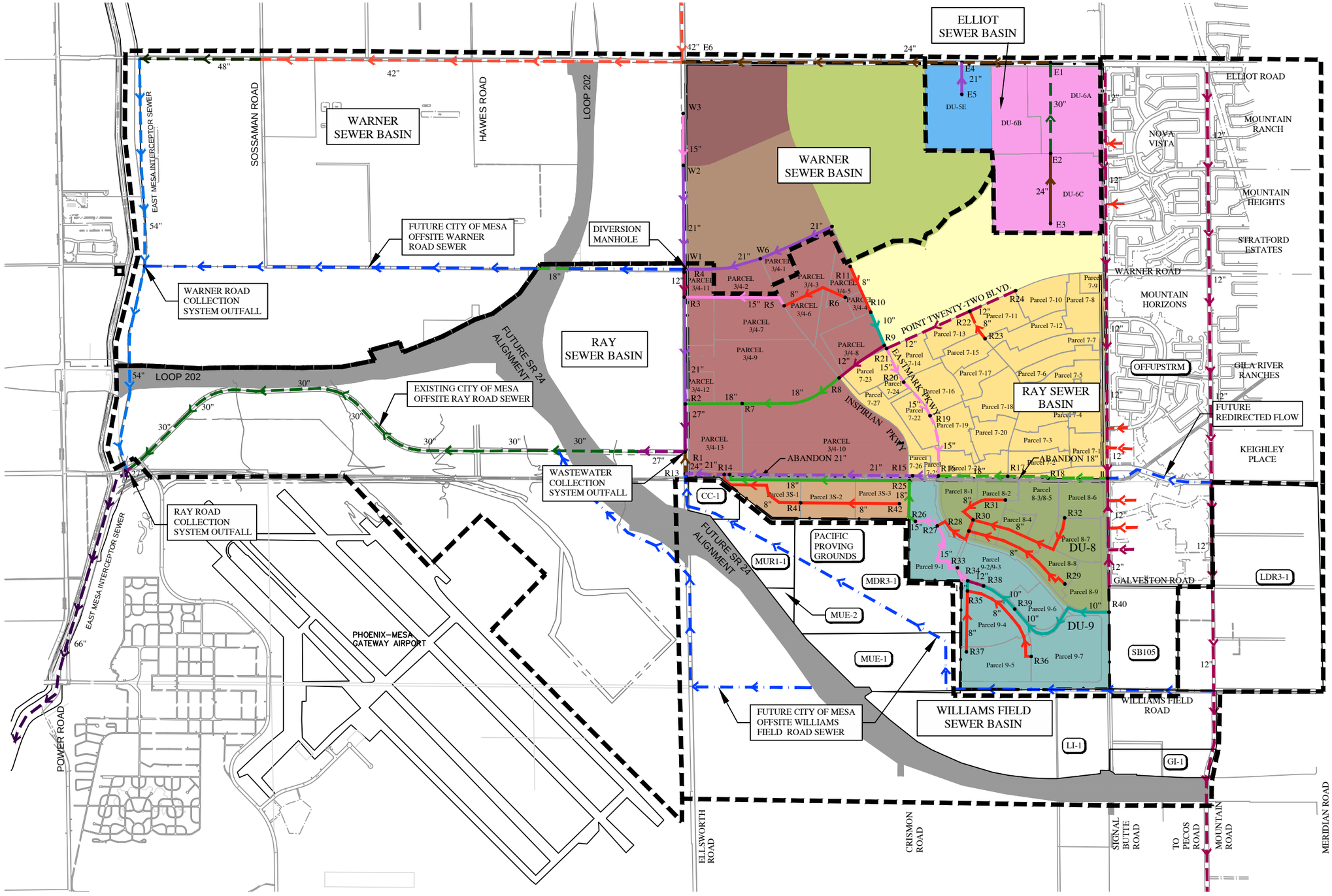
# PLATE 2

# DU 5 East Master Sewer Exhibit




LEGEND

EXISTING SEWER / PLANNED SEWER

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

ON-SITE DEVELOPMENT UNITS

DU 1, DU 2, DU 3S, DU 3/4, DU 5, 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

2500 0 1250 2500

Horz. 1 in. = 2500 ft.

PRELIMINARY
NOT FOR CONSTRUCTION
OR RECORDING

# PLATE 2 - DU 5 EAST MASTER SEWER EXHIBIT

EASTMARK
MESA, ARIZONA


**WOOD/PATEL**
LAND DEVELOPMENT ● WATER RESOURCES
STRUCTURES ● TRANSPORTATION / TRAFFIC
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