Cottonwood Drainage Master Plan

Prepared for:

City of Cottonwood

"Inspiring a Vibrant Community"

Prepared by:

Shephard Wesnitzer, Inc.
1756 East Villa Drive, Suite C-11
Cottonwood, AZ 86326

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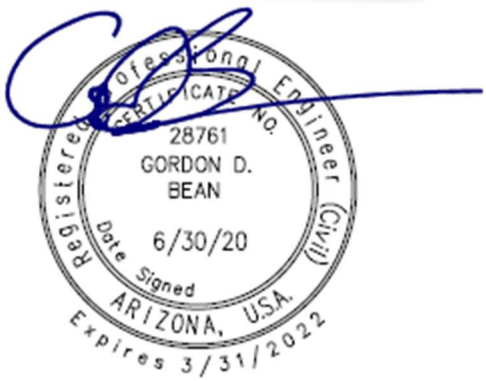



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1.0 Purpose

The primary focus of this Cottonwood Drainage Master Plan (CDMP) for the City of Cottonwood (City) is to identify existing drainage issues, flooding concerns, and to develop a prioritized plan for future capital improvement projects and expenditures. The Town of Cottonwood had previously completed its only drainage study in 1985. The City has seen substantial growth since that report was adopted. From 1987 to 2020 the City has grown from 5.23 square miles to 16.5 square miles. See Figure 1 for a comparison of the 1987 to the 2020 City Limits. The City has also adopted new Engineering Design Standards in 2019. When the previous study was completed most of the major drainage paths were not designated FEMA floodplains. Since that time many of these have been mapped as FEMA floodplains and therefore these basins were not further analyzed in this CDMP.

The Town of Cottonwood was incorporated in 1960, became a City in 1987, and today has an estimated population of 12,200, according to the 2018 U.S. Census Bureau estimate. In the early years of the City's development little thought was given to the management of storm water runoff. The primary method to convey runoff was by the use of roadside ditches. Due to limited drainage infrastructure and budget limitations, many residents, commercial properties and roadways have been negatively impacted by storm water runoff.

The City received funding from the Yavapai County Flood Control District (YCFCD) to evaluate the existing drainage facilities, and to evaluate and provide recommendations for future capital improvement projects.

The first task completed as part of the Drainage Master Plan was to compile an inventory of the existing drainage structures throughout the City. Data was collected for approximately 1,950 structures, consisting of culverts, box culverts, storm drain pipe, storm drain structures, and scuppers, were logged as part of this inventory. This data was compiled and submitted to Arizona Department of Environmental Quality (ADEQ) as part of the MS4 Permitting process.

2.0 Location & Basins

The City is located in portions of Sections 22, 25, 26, 27, 28, 29, 32, 33, 34, 35, and 36 in Township 16N Range 3E; Sections 1, 2, 3, 4, 5, 8, 9, 11, 12, 13, 14, 15, 22, 23, and 24 in Township 15N Range 3E; Section 13 in Township 16N Range 4E; and Sections 6, 19, 29, 30, and 31 in Township 15N Range 4E, located in Yavapai County, Arizona. The City is bisected by the Verde River and there are twelve (12) significant tributaries that further divide the portion of the City west of the Verde River. There are six (6) significant tributaries east of the Verde River that divide the City.

The tributary area for the Verde River, that includes the City of Cottonwood, is approximately 99.4 square miles. The City of Cottonwood makes up approximately 16.5 square miles of this area. The overall tributary area is shown in Figure 2.

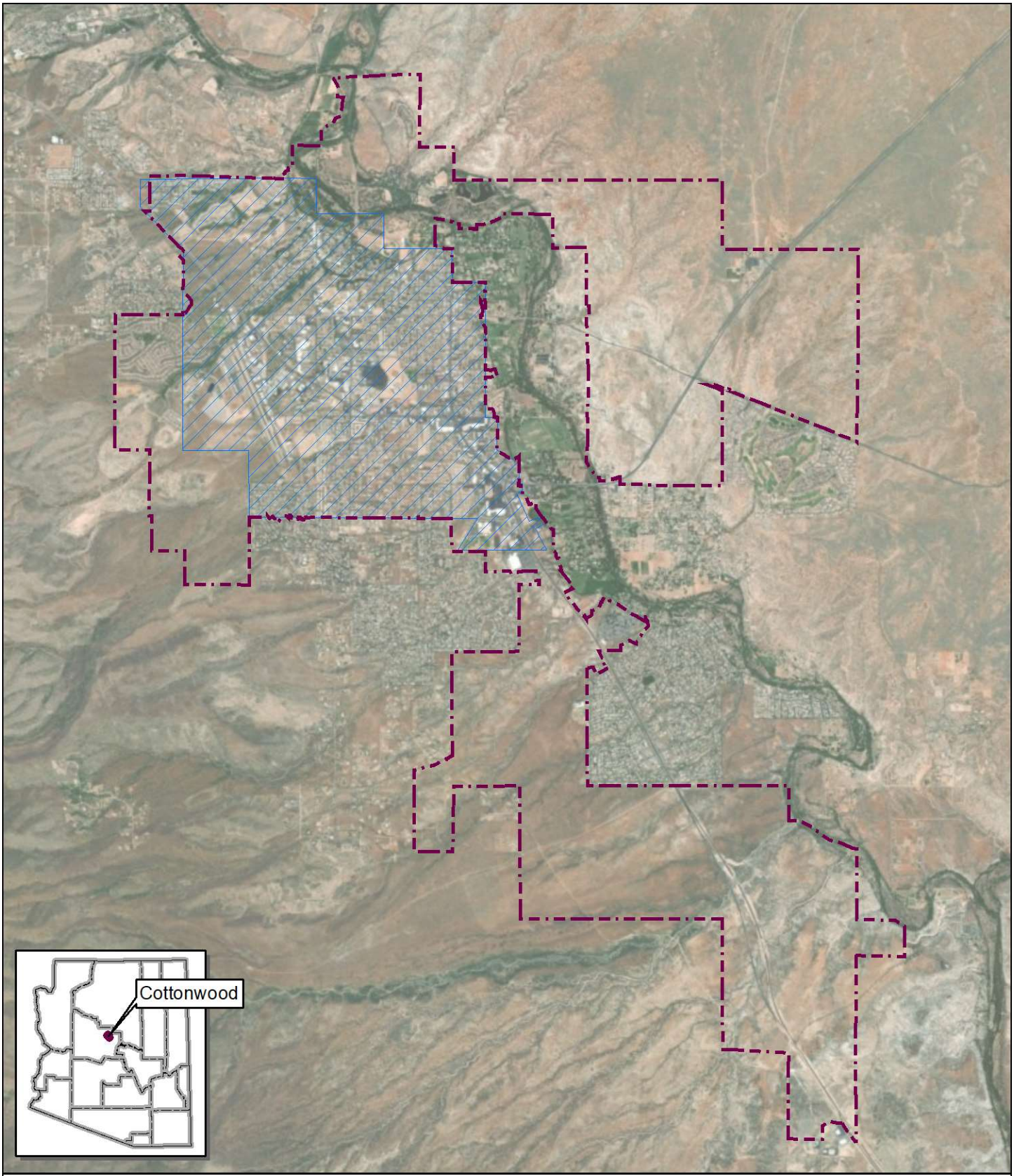

Figure 1. 1987 vs. 2020 City Limits

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Legend
City of Cottonwood (2020)
City of Cottonwood (1987)

N
miles
0 1

Sources: City of Cottonwood; Basemap ESRI Digital Globe (2018)

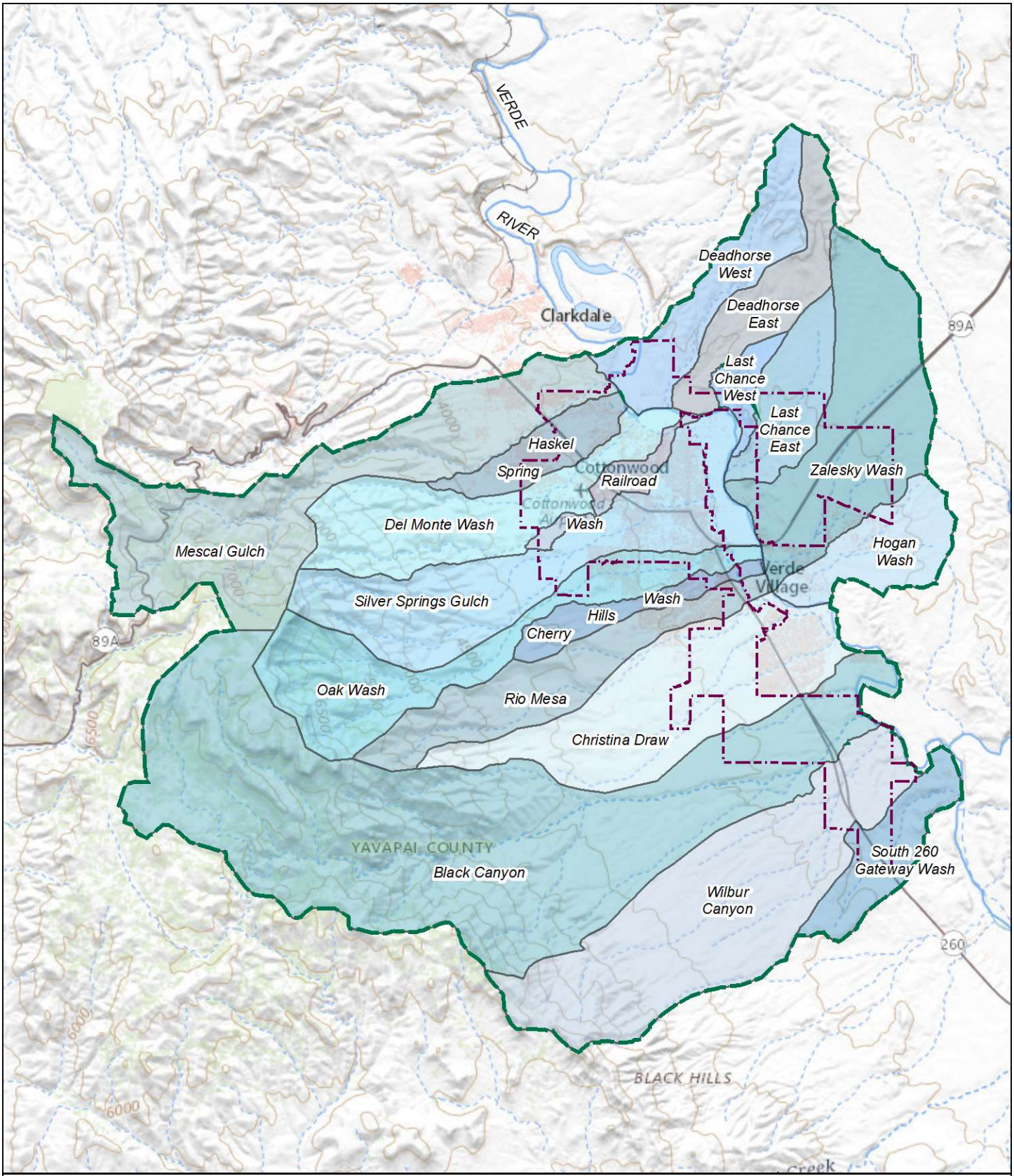

Figure 2. Verde River Tributary Area and Drainage Basins

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Legend

- Watershed Boundary
- City of Cottonwood (2020)

N

miles

0 2

Sources: City of Cottonwood; Basemap USGS The National Map (5/13/2020)

2.1 Drainage Basins

The City is divided by several large washes. These washes make up the boundaries of the watersheds and underlying drainage basins that have been reviewed as part of this study. The Verde River effectively bisects the City. The area to the east of the Verde River is broken into six (6) drainage basins: Deadhorse West, Deadhorse East, Last Chance West, Last Chance East, Zalesky Wash, and Hogan Wash; and the area to the west is broken into twelve (12) drainage basins: Mescal Gulch, Haskel Spring, Del Monte Wash, Rail Road Wash, Silver Springs Gulch, Oak Wash, Cherry Hills Wash, Rio Mesa, Christina Draw, Black Canyon, Wilbur Canyon, and South 260 Gateway Wash.

The Deadhorse West Drainage Basin is approximately 2,212 acres in size. The major wash within this basin has been previously referenced as an unnamed tributary. However, for this Master Plan the basin was assigned the name Deadhorse West as it passes through Deadhorse State Park. The basin is primarily made up of National Forest and State Park Land. If the Forest Service property is annexed and improved, the subject development will be required to supply the City with detailed drainage analysis. The lower portion of the basin at the confluence with the Verde River is designated FEMA Zone A floodplain per the Verde River Flood Hazard Assessment Study. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 3.

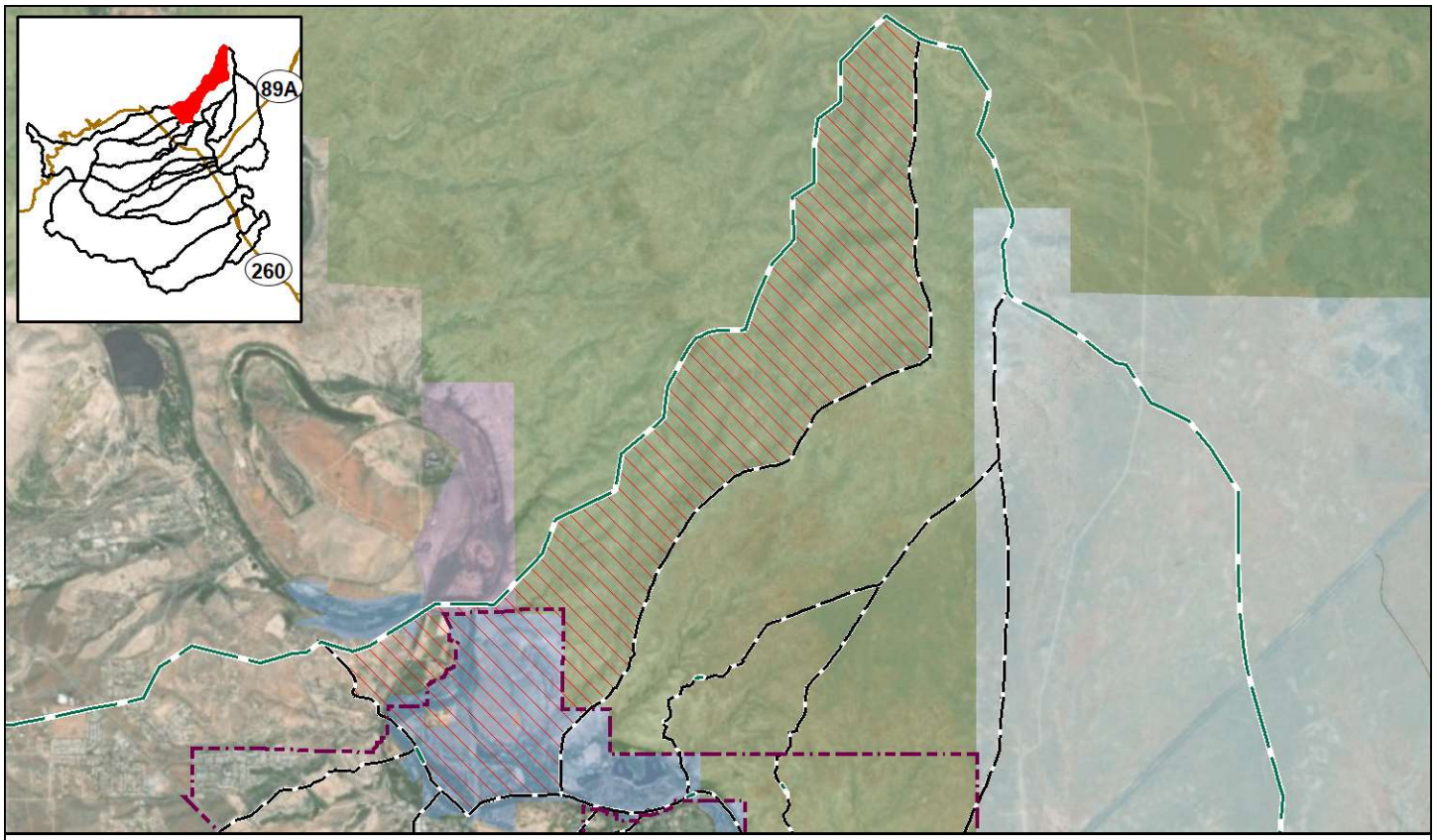

Figure 3. Deadhorse West Drainage Basin

The Deadhorse East Drainage Basin is approximately 1,802 acres in size. The major wash within this basin has been previously referenced as an unnamed tributary. However, for this Master Plan the basin was assigned the name Deadhorse East as it passes through Deadhorse State Park. The basin is primarily made up of National Forest and State Park Land. If the Forest Service property is annexed and improved, the subject development will be required to supply the City with detailed drainage analysis. The lower portion of the basin, at the confluence with the Verde River, is designated FEMA Zone A floodplain per the Verde River Flood Hazard Assessment Study. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 4.

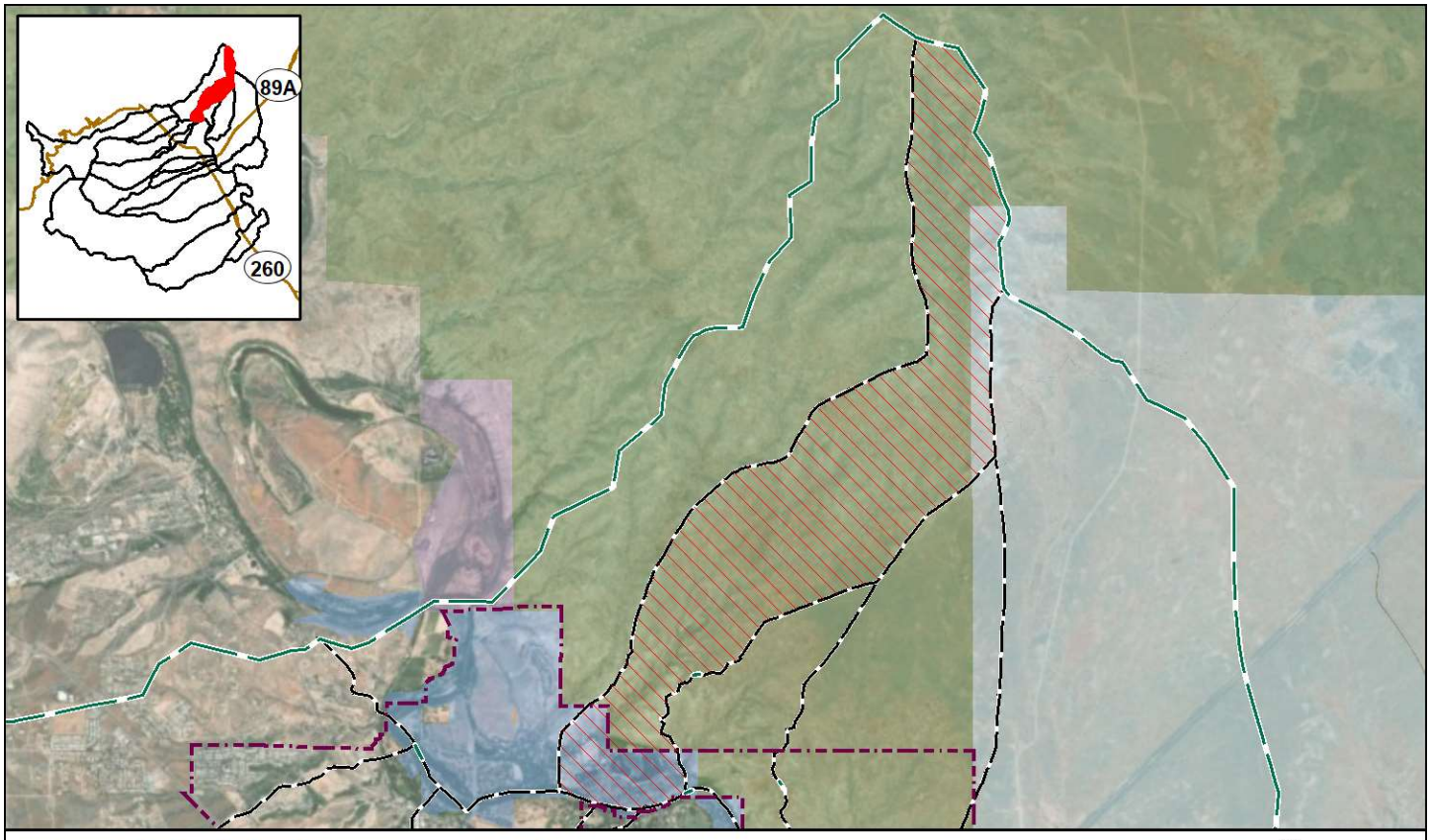

Figure 4. Deadhorse East Drainage Basin

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The Last Chance West Drainage Basin is approximately 474 acres in size. The major wash within this basin has been previously referenced as an unnamed tributary. However, for this Master Plan the basin was assigned the name Last Chance West for the tank that is located in the basin directly to the east. The basin is primarily made up of National Forest Land. If this undeveloped property is annexed and improved, the subject development will be required to supply the City with detailed drainage analysis. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 5.

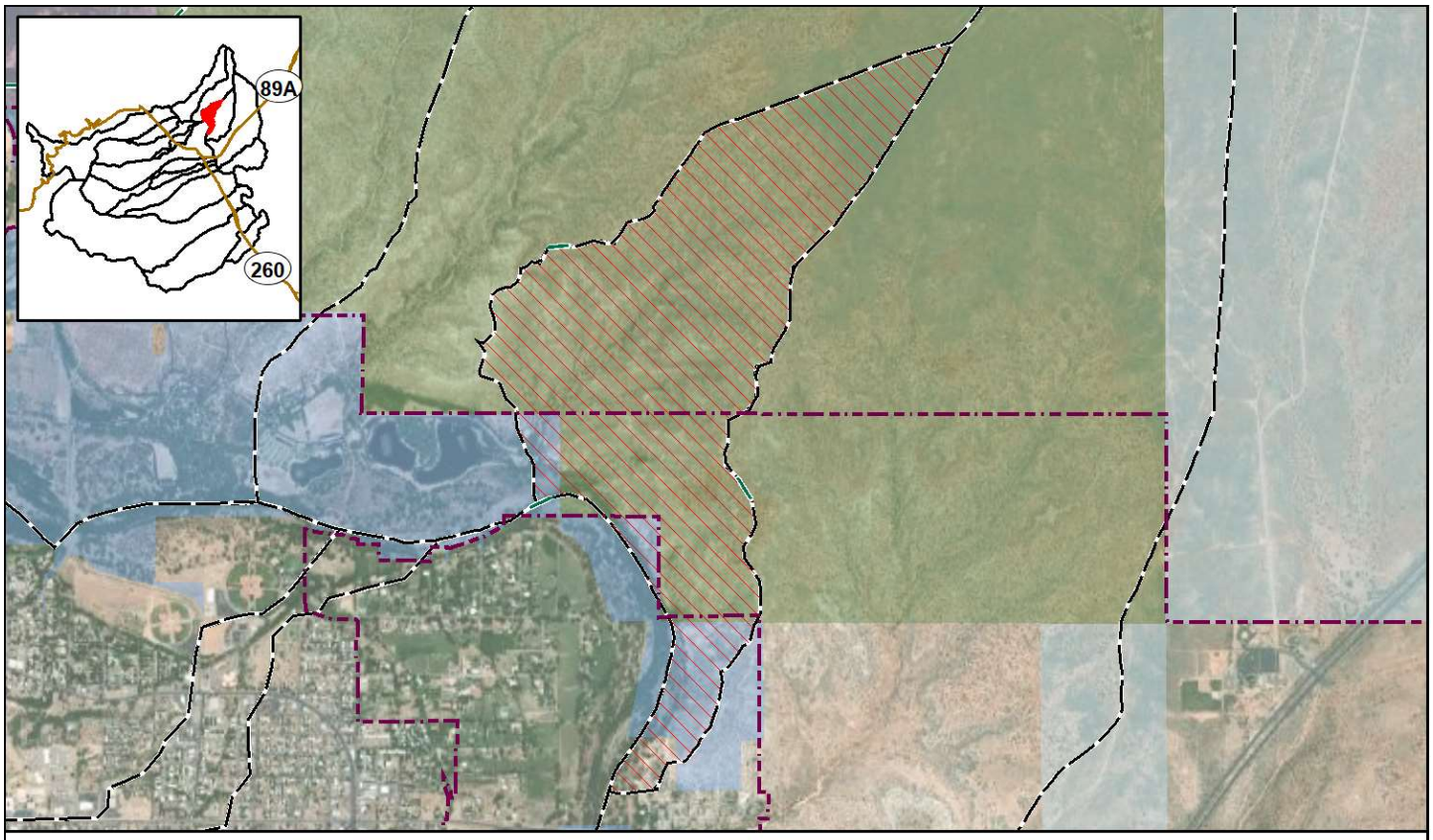

Figure 5. Last Chance West Drainage Basin

The Last Chance East Drainage Basin is approximately 1,547 acres in size. The major wash within this basin has been previously referenced as an unnamed tributary. However, for this Master Plan the basin was assigned the name Last Chance East for the tank that is located in the upper reaches of the basin. The basin is primarily made up of National Forest Land in the upper reaches of the basin, and Yavapai County property adjacent to Mingus Avenue. As this undeveloped property is annexed and improved, the subject development will be required to supply the City with detailed drainage analysis. The lower portion of the basin at the confluence with the Verde River is designated FEMA Zone A floodplain per the Verde River Flood Hazard Assessment Study. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 6.

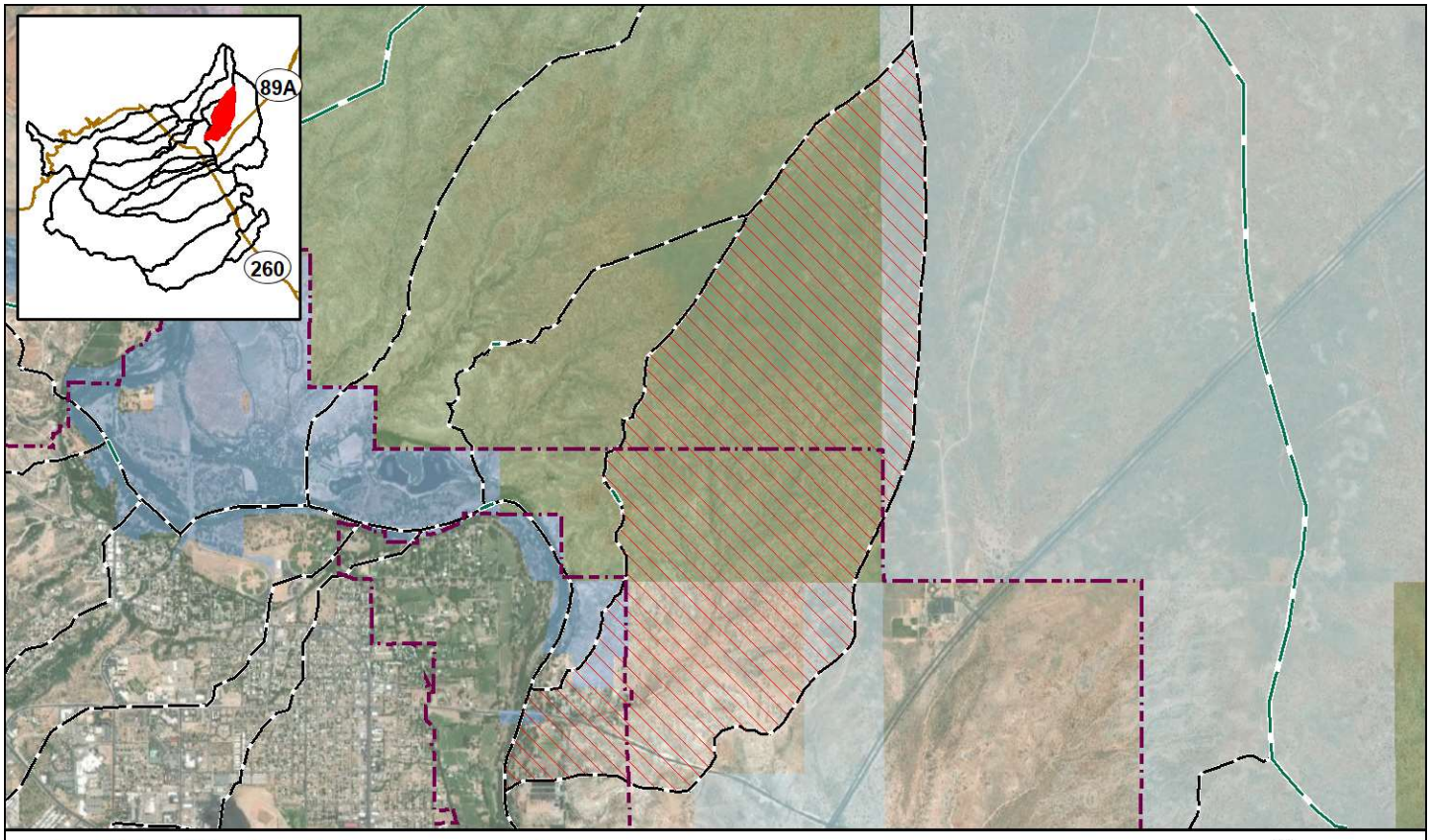

Figure 6. Last Chance East Drainage Basin

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Legend
- Watershed Boundary
- Last Chance East
- Basin Boundary
- City of Cottonwood (2020)

Land Ownership
- Forest
- Natl. Parks
- Private
- State Parks
- State Trust

N

Miles
0 0.25 0.5 0.75 1

Sources: City of Cottonwood; Basemap ESRI DigitalGlobe (June 2018)

The Zalesky Wash Drainage Basin is approximately 4,616 acres in size. The basin is primarily made up of Arizona State Trust Land west of State Route 89A. East of State Route 89A the basin is composed of Arizona State Trust Land and undeveloped property. There is also a portion of National Forest Service and Verde Santa Fe development within this basin. As the undeveloped property is improved, the subject development will be required to supply the City with detailed drainage analysis. The lower portion of the basin at the confluence with the Verde River is designated FEMA Zone AE floodplain per the Verde River Flood Hazard Assessment Study. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 7.

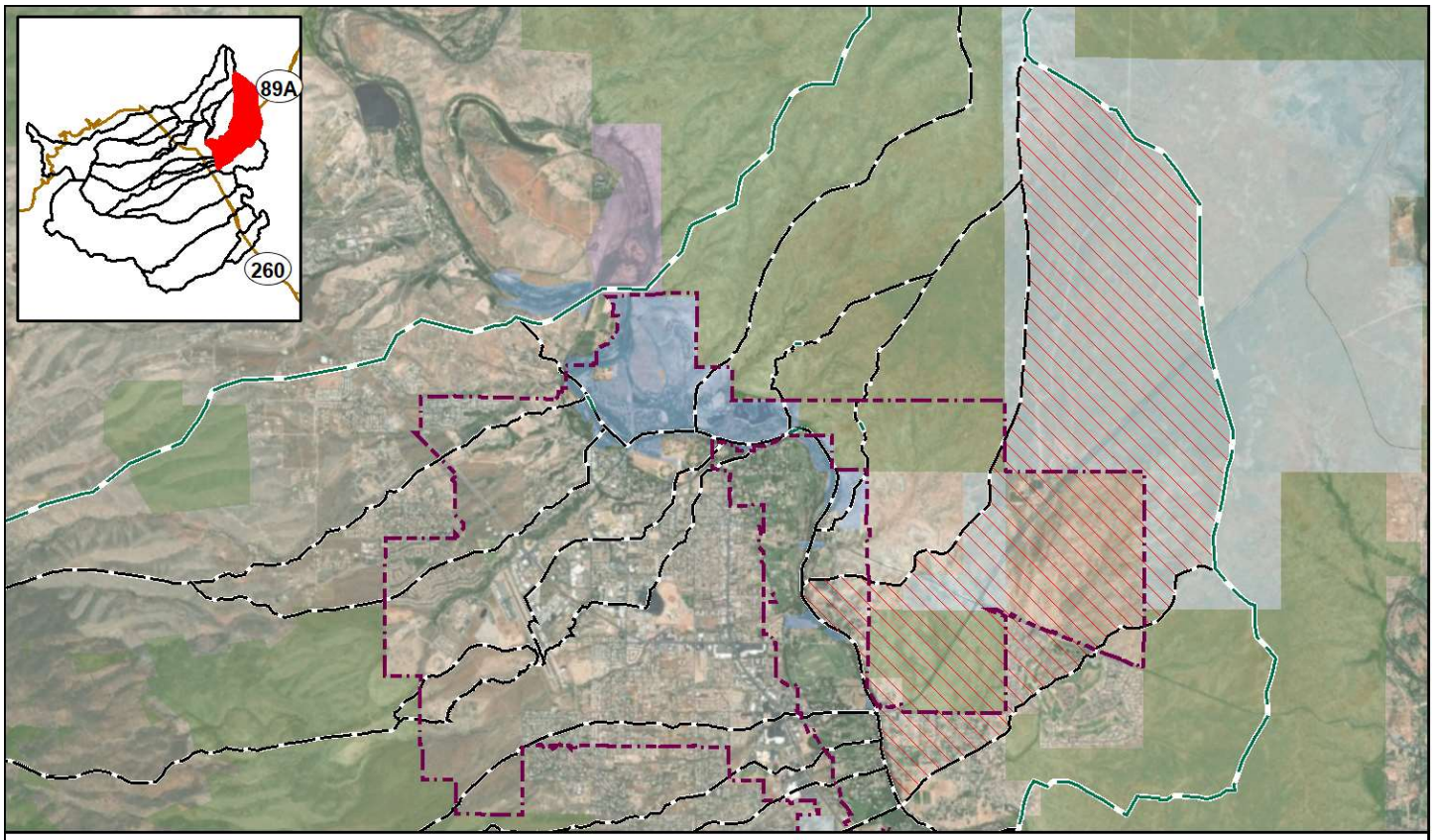

Figure 7. Zalesky Wash Drainage Basin

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The Hogan Wash Drainage Basin is approximately 1,636 acres in size. The basin is primarily made up of National Forest Land and Verde Santa Fe development. There is also a portion of developed Yavapai County Zoned single family residential properties adjacent to the Verde River. As the undeveloped property is improved, the subject development will be required to supply the City with detailed drainage analysis. The lower portion of the basin at the confluence with the Verde River is designated FEMA Zone A floodplain per the Verde River Flood Hazard Assessment Study. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 8.

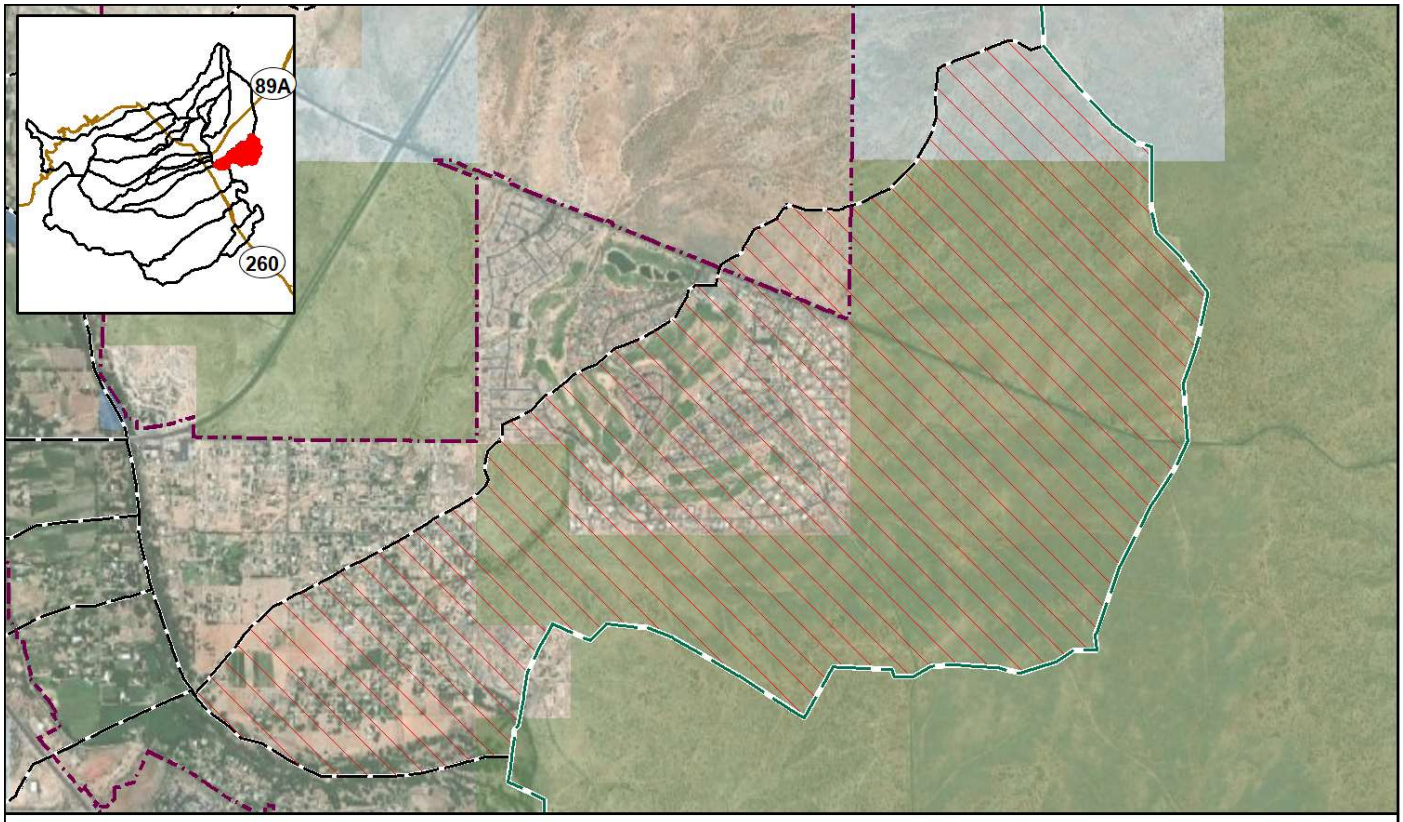

Figure 8. Hogan Wash Drainage Basin

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The Mescal Gulch Drainage Basin is approximately 6,401 acres in size. This basin is designated as a FEMA Zone AE floodplain. The City has indicated that they currently have no intention to file Letter of Map Revision (LOMR) applications to FEMA to adjust the floodplains. Therefore, this area was not further analyzed as part of the CDMP and the established FEMA flows will be utilized. The location of this drainage basin is shown below in Figure 9.

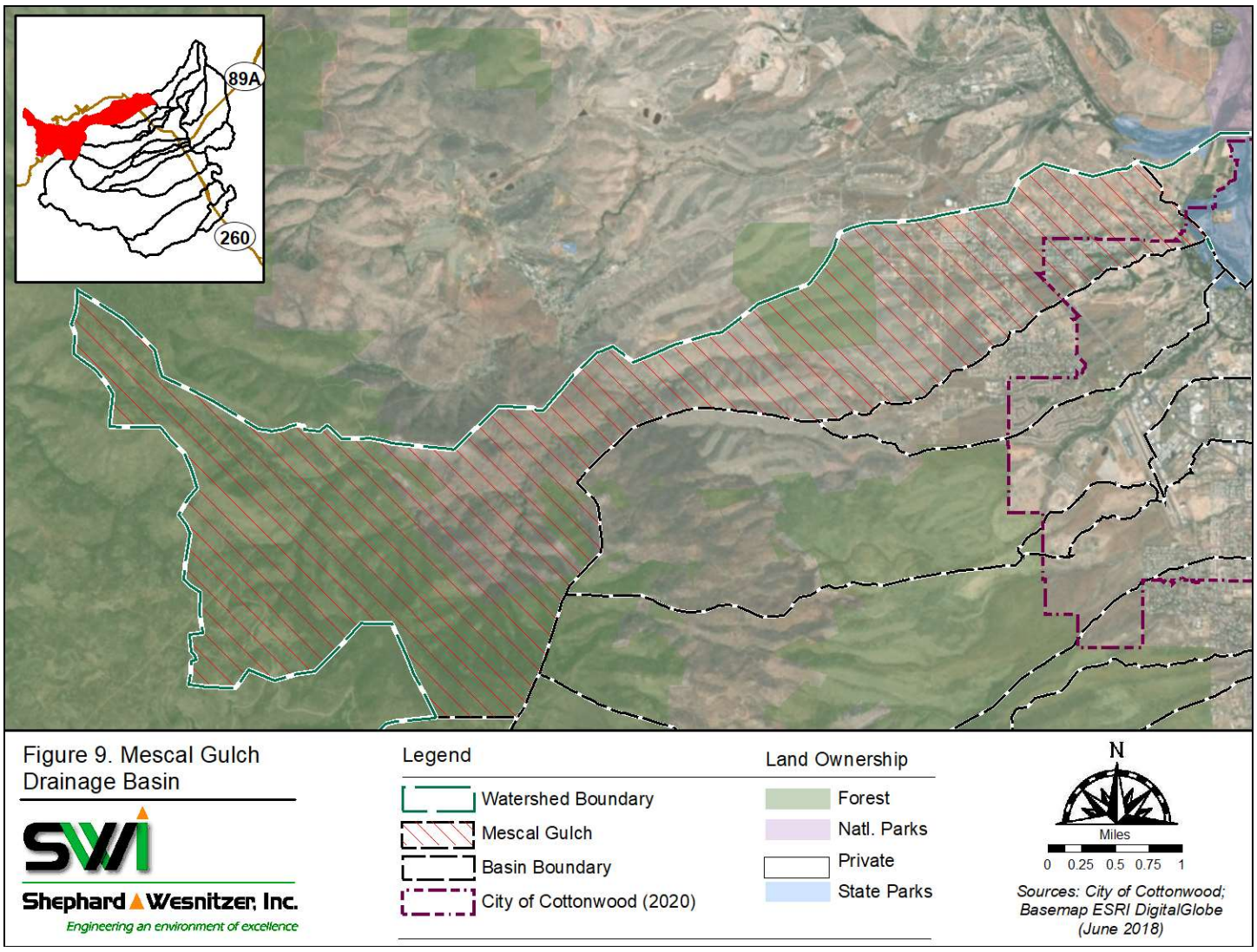

Figure 9. Mescal Gulch Drainage Basin

The Haskel Spring Drainage Basin is approximately 1,092 acres in size. The major washes within this basin have been previously referenced as unnamed tributaries. However, for this Master Plan the basin was assigned the name Haskel Spring for the spring that is located in the upper reaches of the basin. This basin is made up of non-FEMA regulated washes. This area has seen substantial infill development over the years. New development within this basin will be subject to the City's current drainage requirements. The portion of this basin within City limits makes up the majority of the north study area of this drainage master plan. The location of this drainage basin is shown below in Figure 10.

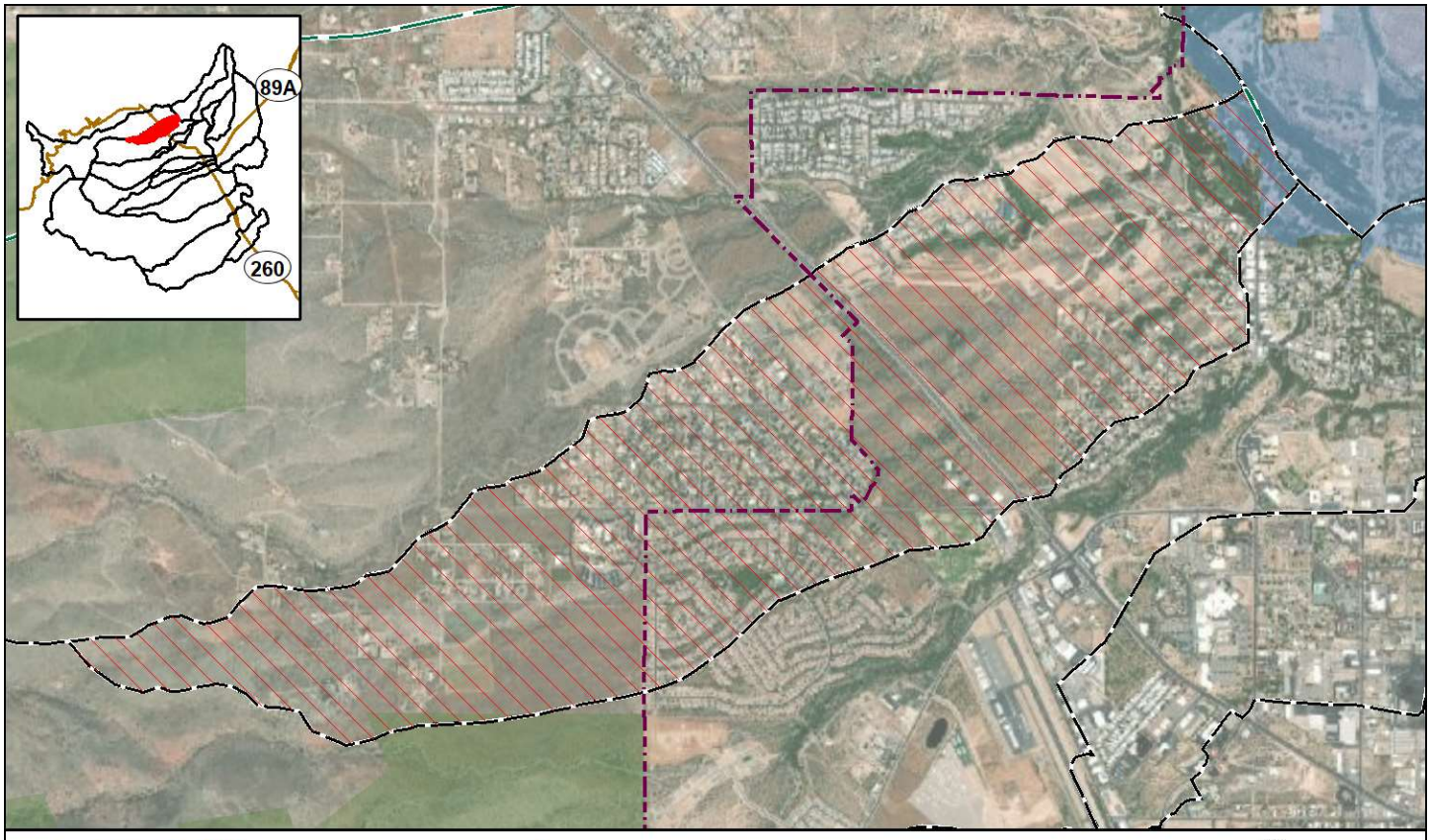

Figure 10. Haskel Spring Drainage Basin

The Del Monte Wash (Blowout Creek) Drainage Basin is approximately 3,373 acres in size. This basin is designated as a FEMA Zone AE floodplain. The City has just completed a Letter of Map Revision (LOMR) application to FEMA to adjust the floodplain. Therefore, this area was not further analyzed as part of the CDMP and the established FEMA flows will be utilized. The location of this drainage basin is shown below in Figure 11.

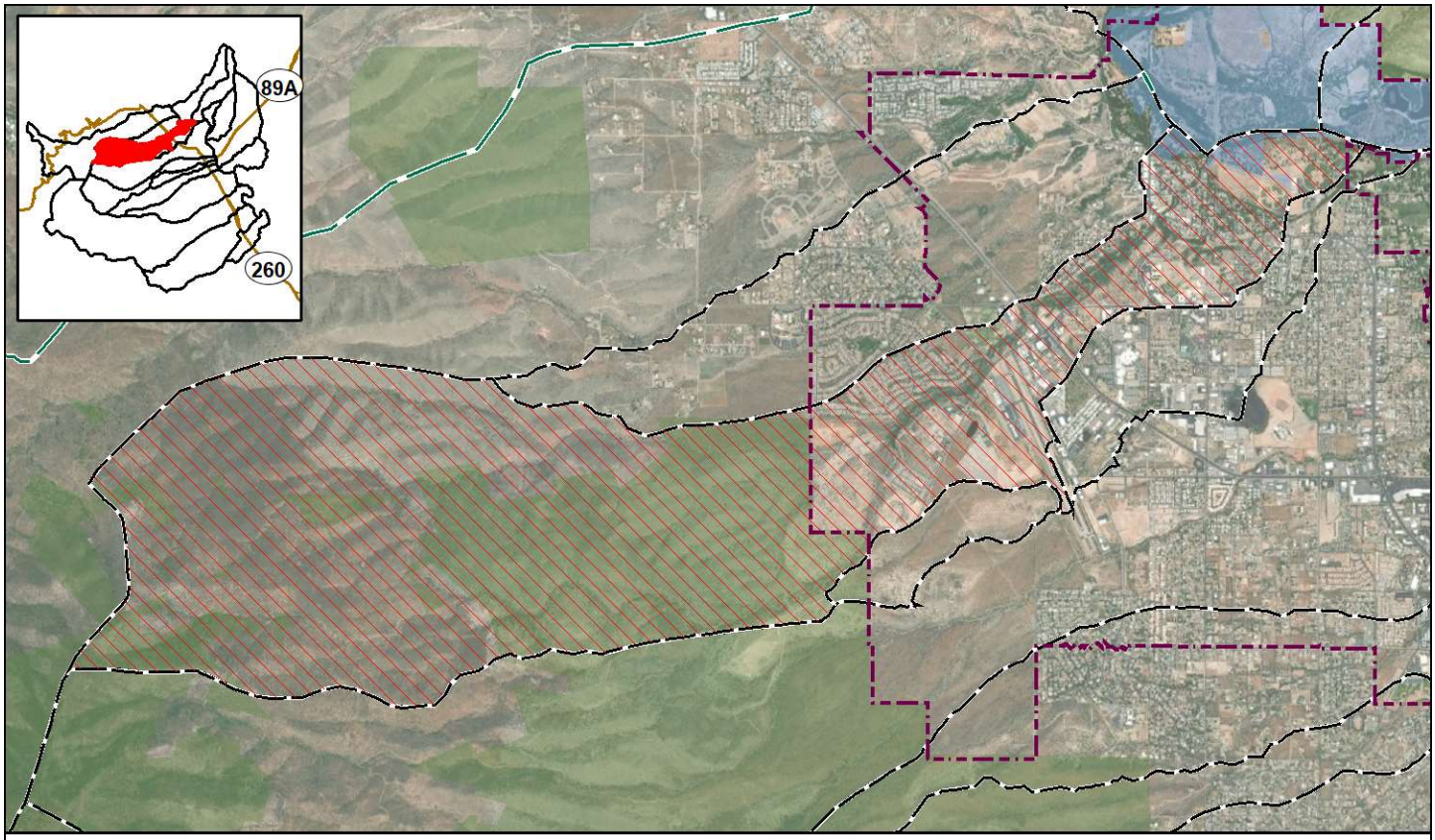

Figure 11. Del Monte Wash Drainage Basin

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The Railroad Wash Drainage Basin is approximately 565 acres in size. The upper portion of the basin consists of existing industrial and commercial property. The lower portion of the basin passes through existing single family residential. The majority of the basin is fully developed. The Railroad Wash basin is currently being studied for submittal of Letter of Map Revision (LOMR) application to FEMA to adjust the floodplain. The majority of the basin is included within the Central Area of study for this master plan. The location of this drainage basin is shown in Figure 12.

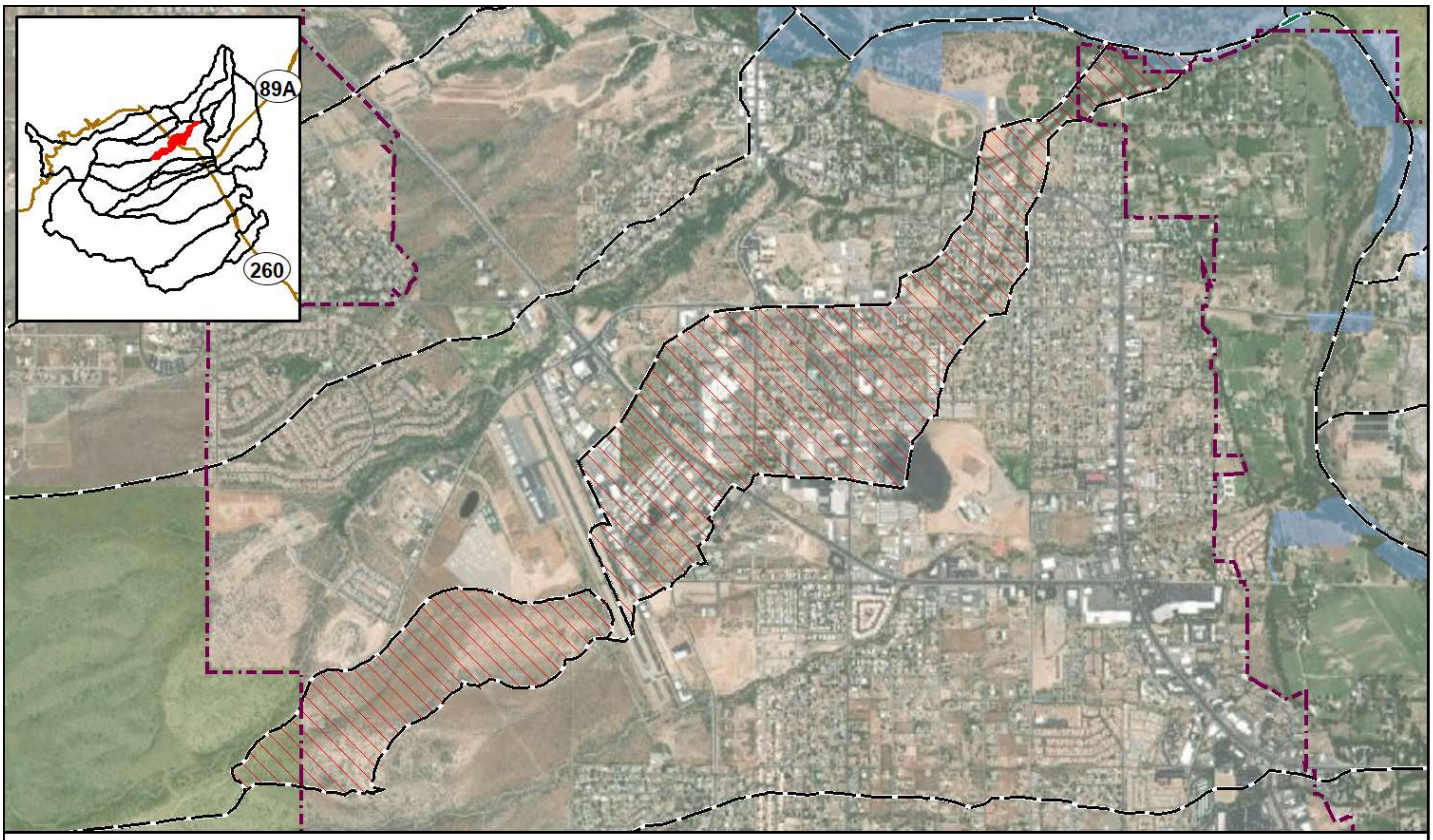

Figure 12. Railroad Wash Drainage Basin

The Silver Springs Gulch Drainage Basin is approximately 4,935 acres in size. The Silver Springs Gulch drainage basin is designated a FEMA delineated AE floodplain. The City is currently working on a new detailed study of the floodplain. It is intended to be submitted to FEMA via LOMR. Therefore, the floodplain portion of the basin will not be studied. The portion of this basin north of the floodplain does not directly contribute to the Gulch. This area is made up of single family residential neighborhoods that don't have a significant storm drain system. This area makes up the majority of the Central Area. The portion of the basin south of the floodplain that does not directly contribute to the Gulch is made up of single family residential neighborhoods that utilize roadside ditches as the principle method to convey runoff. This area makes up the majority of the South Area. The location of this drainage basin is shown in Figure 13.

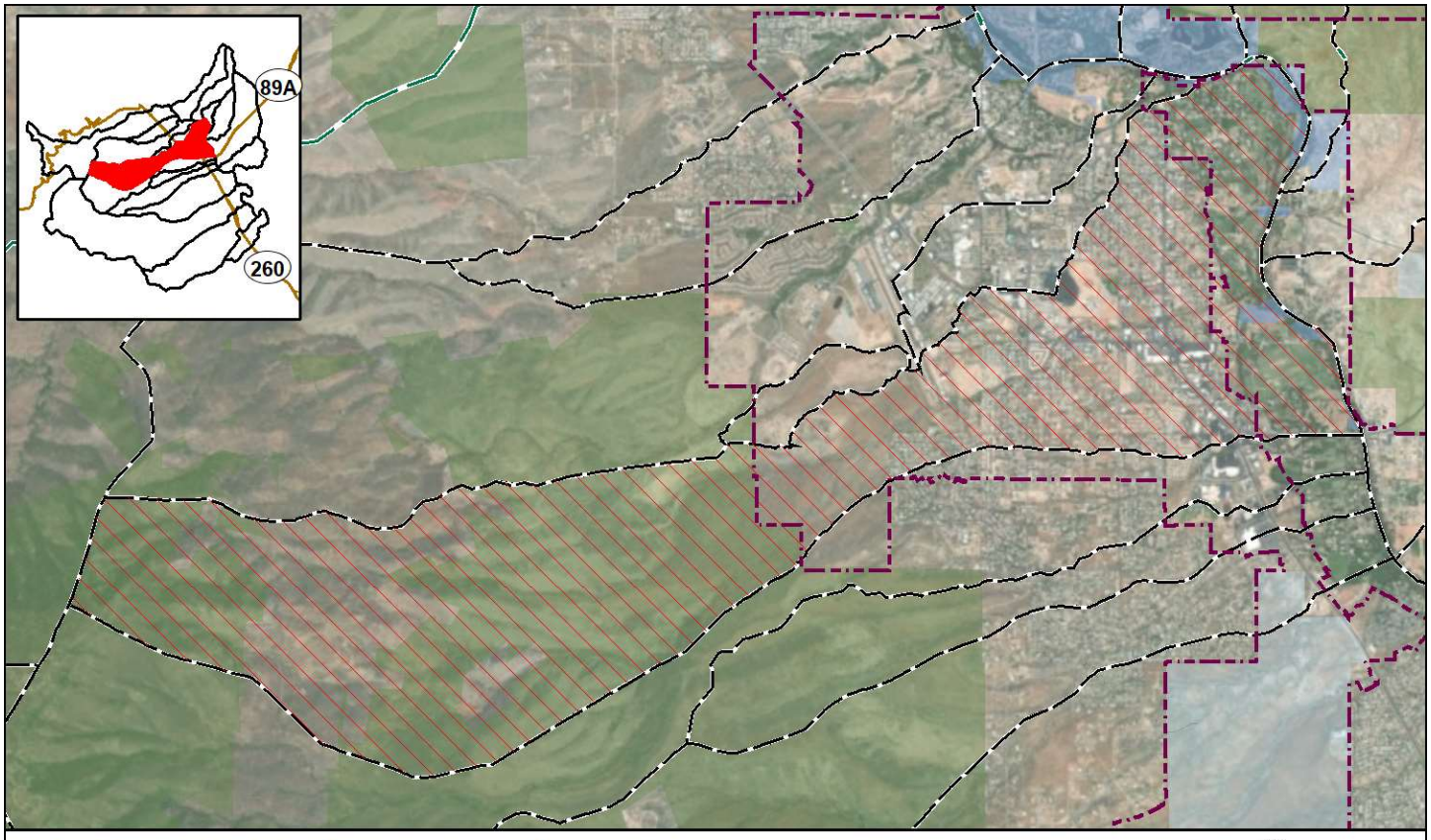

Figure 13. Silver Springs Gulch Drainage Basin

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The Oak Wash Drainage Basin is approximately 3,630 acres in size. This basin was recently designated as a FEMA delineated AE floodplain in 2015. The City has indicated that they currently have no intention to adjust the floodplain. Therefore, this area was not further analyzed as part of the CDMP and the established FEMA flows will be utilized. The location of this drainage basin is shown below in Figure 14.

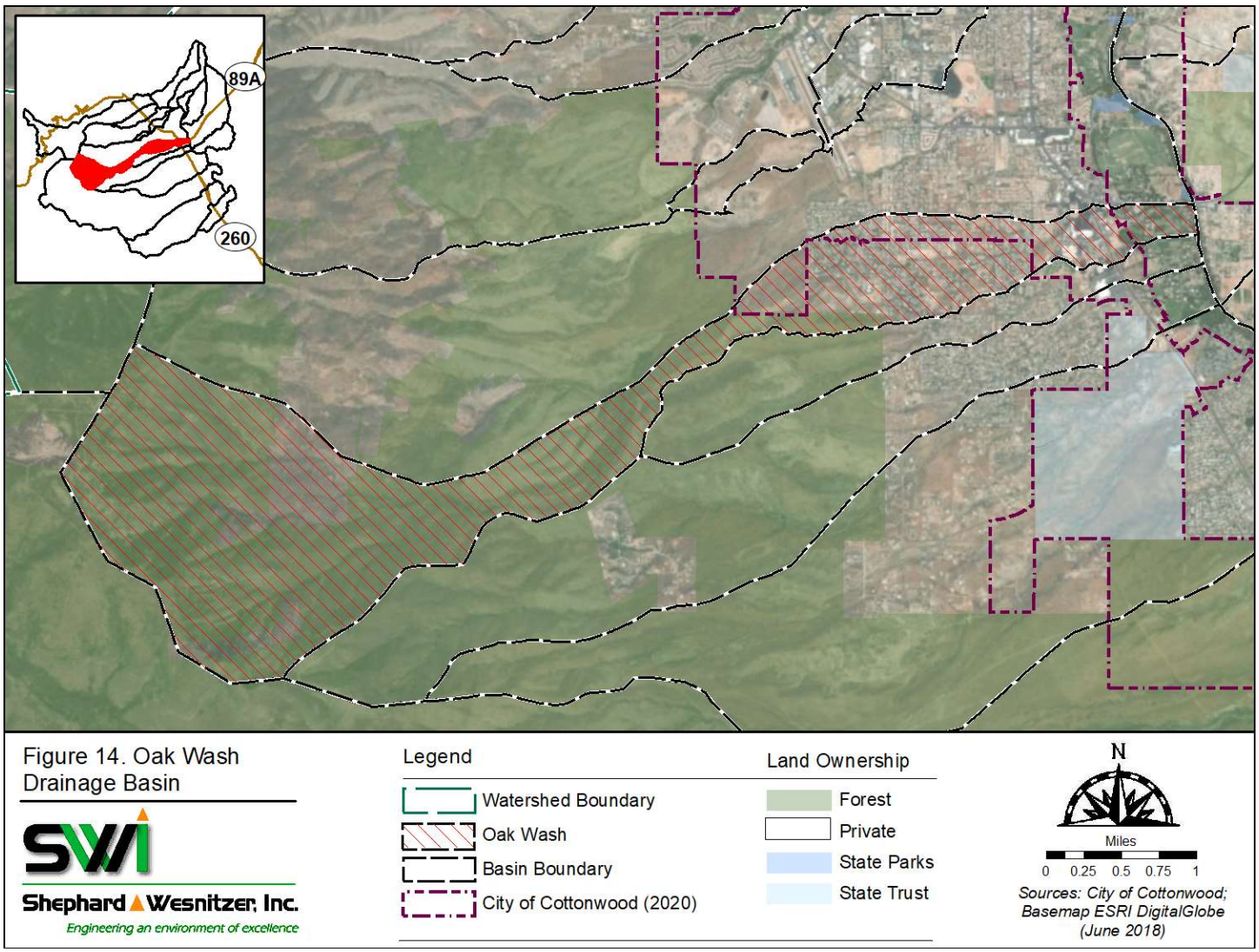

Figure 14. Oak Wash Drainage Basin

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The Cherry Hills Drainage Basin is approximately 841 acres in size. The basin is primarily made up of National Forest Land in the upper reaches of the basin. The remainder of the basin outside of City limits is made up of Yavapai County zoned single family residential. This basin was recently designated as a FEMA delineated AE floodplain in 2015. The City has indicated that they currently have no intention to adjust the floodplain. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 15.

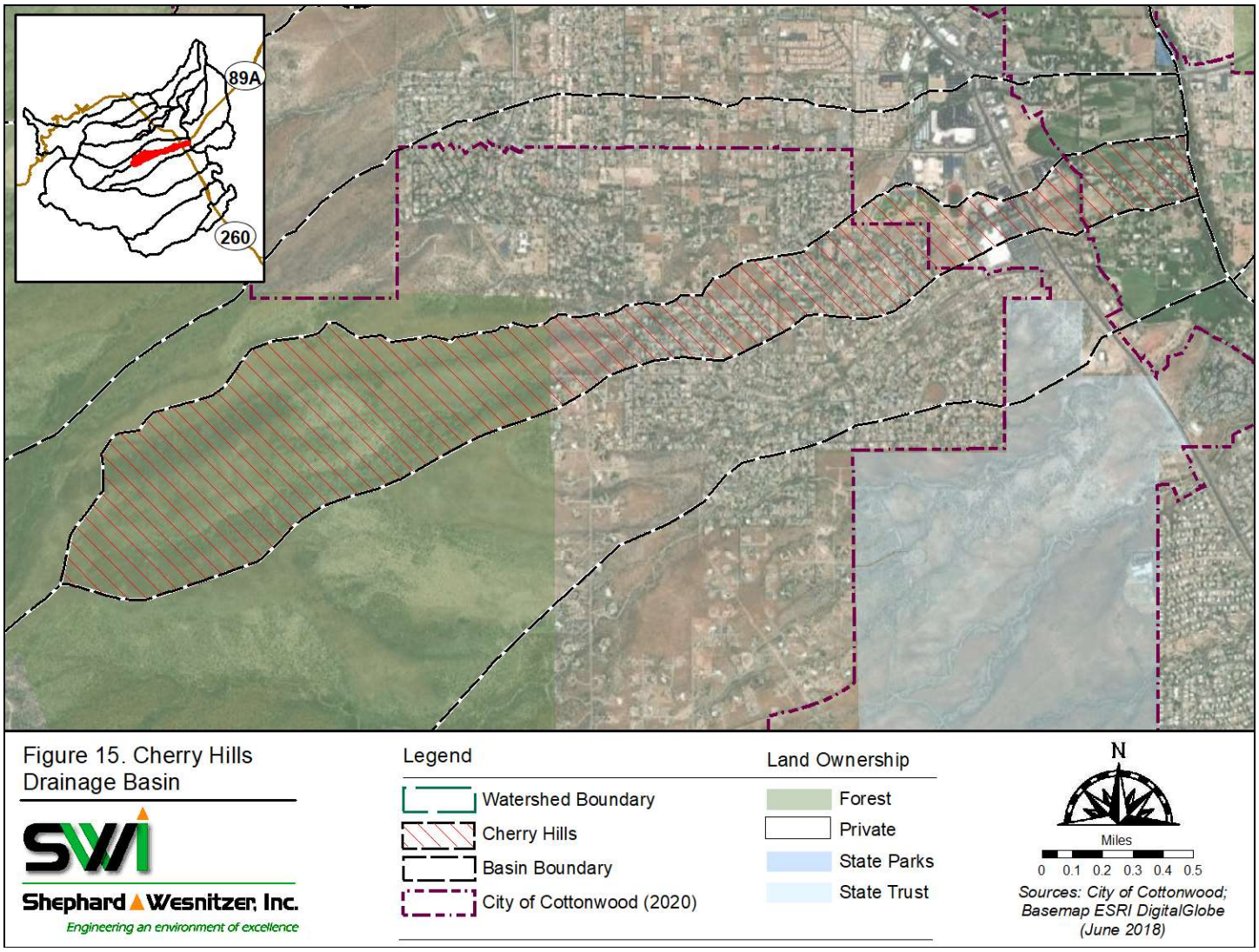

Figure 15. Cherry Hills Drainage Basin

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The Rio Mesa Drainage Basin is approximately 2,689 acres in size. This basin was recently designated as a FEMA delineated AE floodplain in 2015. The City has indicated that they currently have no intention to adjust the floodplain. Therefore, this area was not further analyzed as part of the CDMP and the established FEMA flows will be utilized. The location of this drainage basin is shown below in Figure 16.

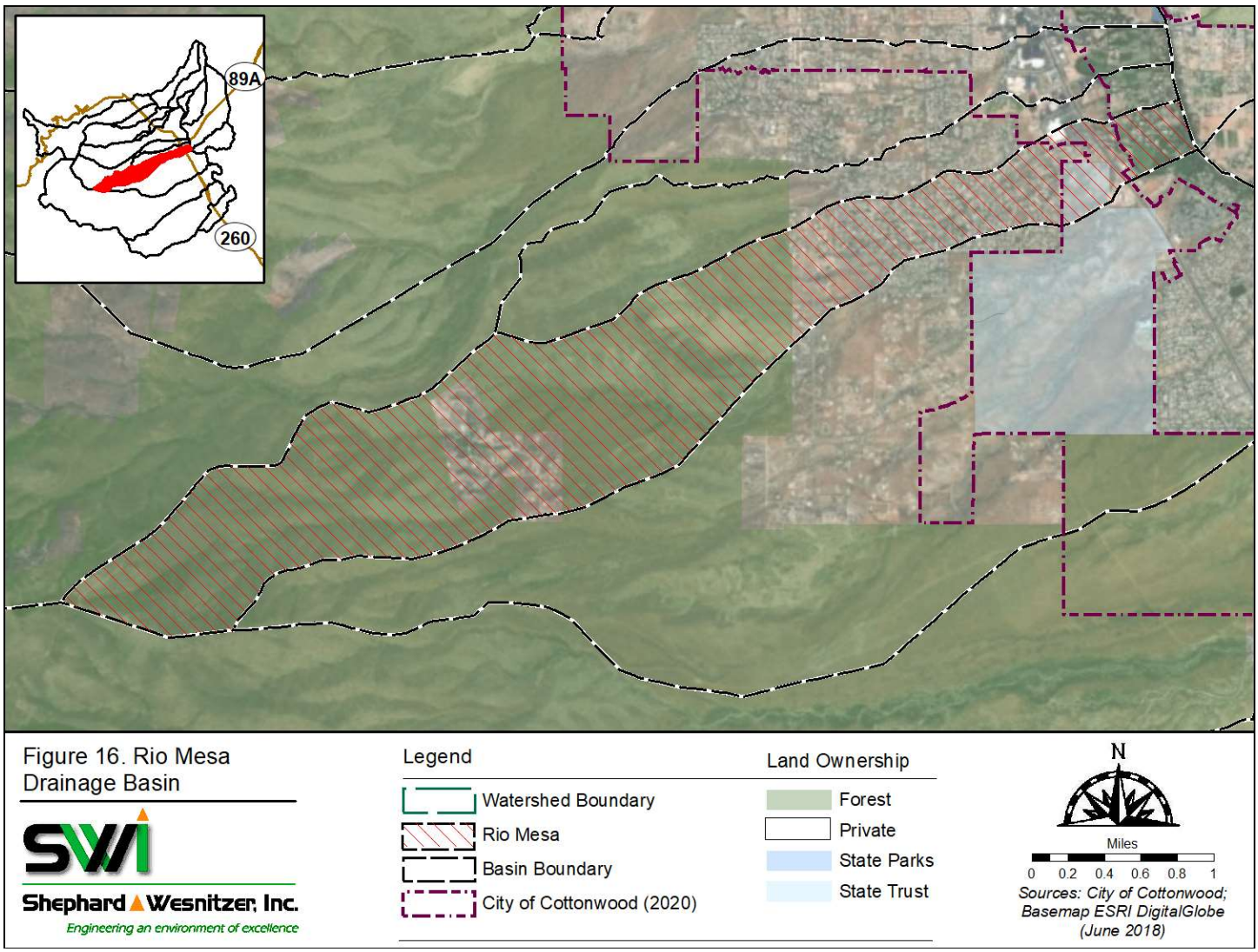

Figure 16. Rio Mesa Drainage Basin

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The Christina Draw Drainage Basin is approximately 4,976 acres in size. The basin is primarily made up of National Forest Land in the upper reaches of the basin. The remainder of the basin outside of City limits is made up of Yavapai County zoned single family residential. The area within the City limits is primarily Arizona State Trust Land. As this undeveloped property is annexed and improved, the subject development will be required to supply the City with detailed drainage analysis. The southern portion of the basin is made up of Pipe Creek which is a FEMA delineated A floodplain. Therefore, this area was not further analyzed as part of the CDMP. The location of this drainage basin is shown below in Figure 17.

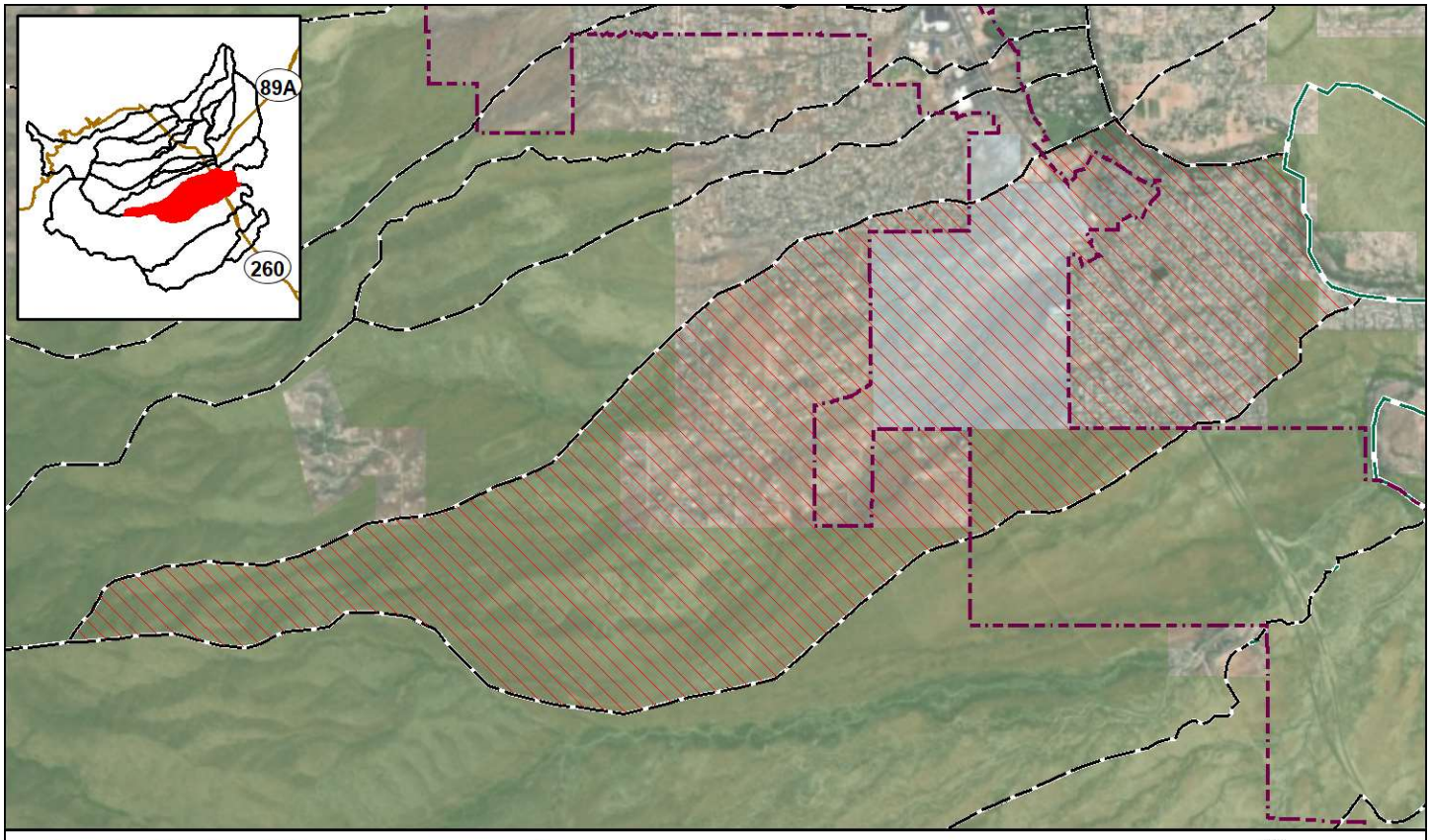

Figure 17. Christina Draw Drainage Basin

The Black Canyon Drainage Basin is approximately 15,767 acres in size. The basin is primarily made up of National Forest Land. As this undeveloped property is improved, the subject development will be required to supply the City with detailed drainage analysis. Therefore, this area was not further analyzed as part of the CDMP. The lower portion of the basin at the confluence with the Verde River is designated Zone A floodplain per the Verde River Flood Hazard Assessment Study. The location of this drainage basin is shown below in Figure 18.

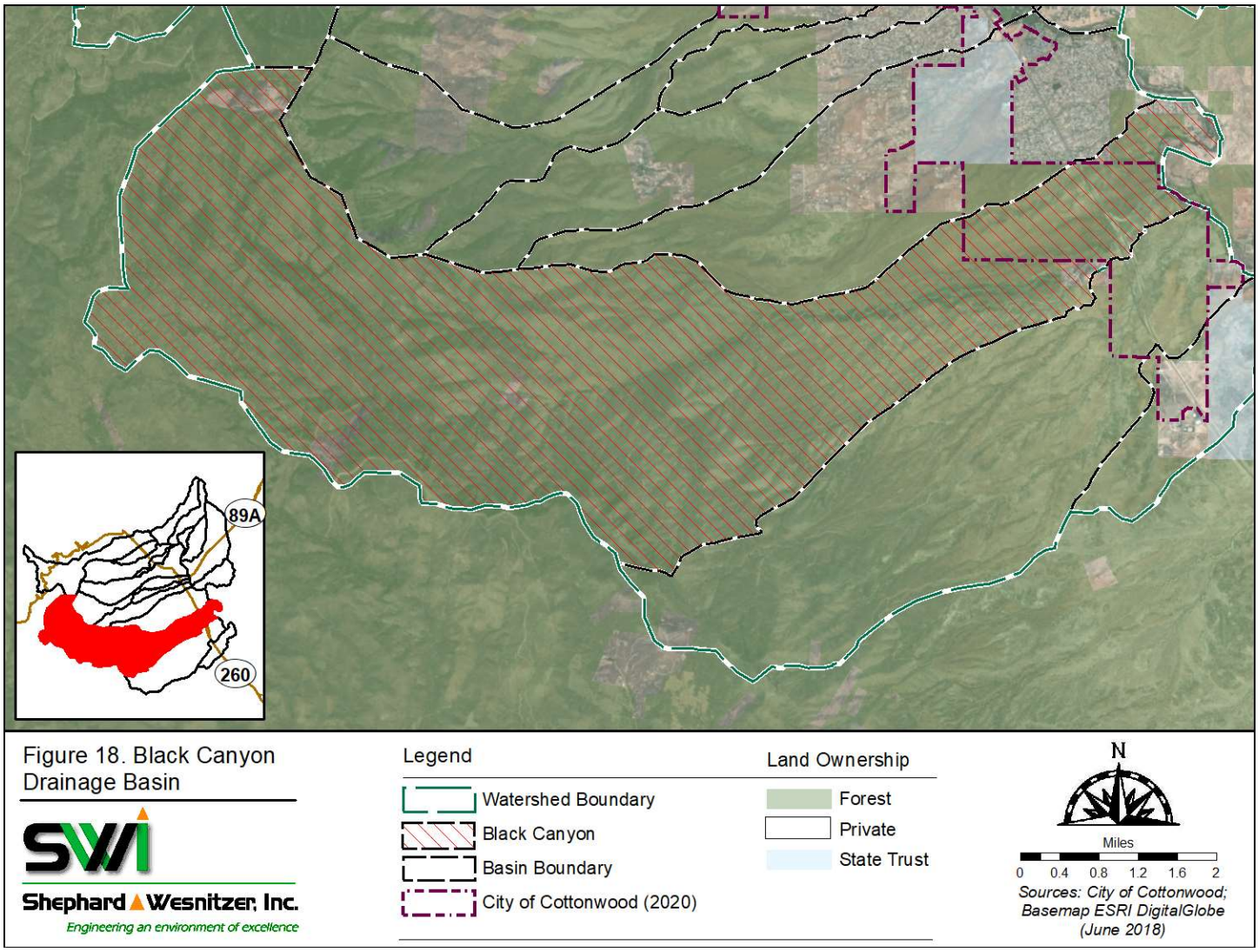

Figure 18. Black Canyon Drainage Basin

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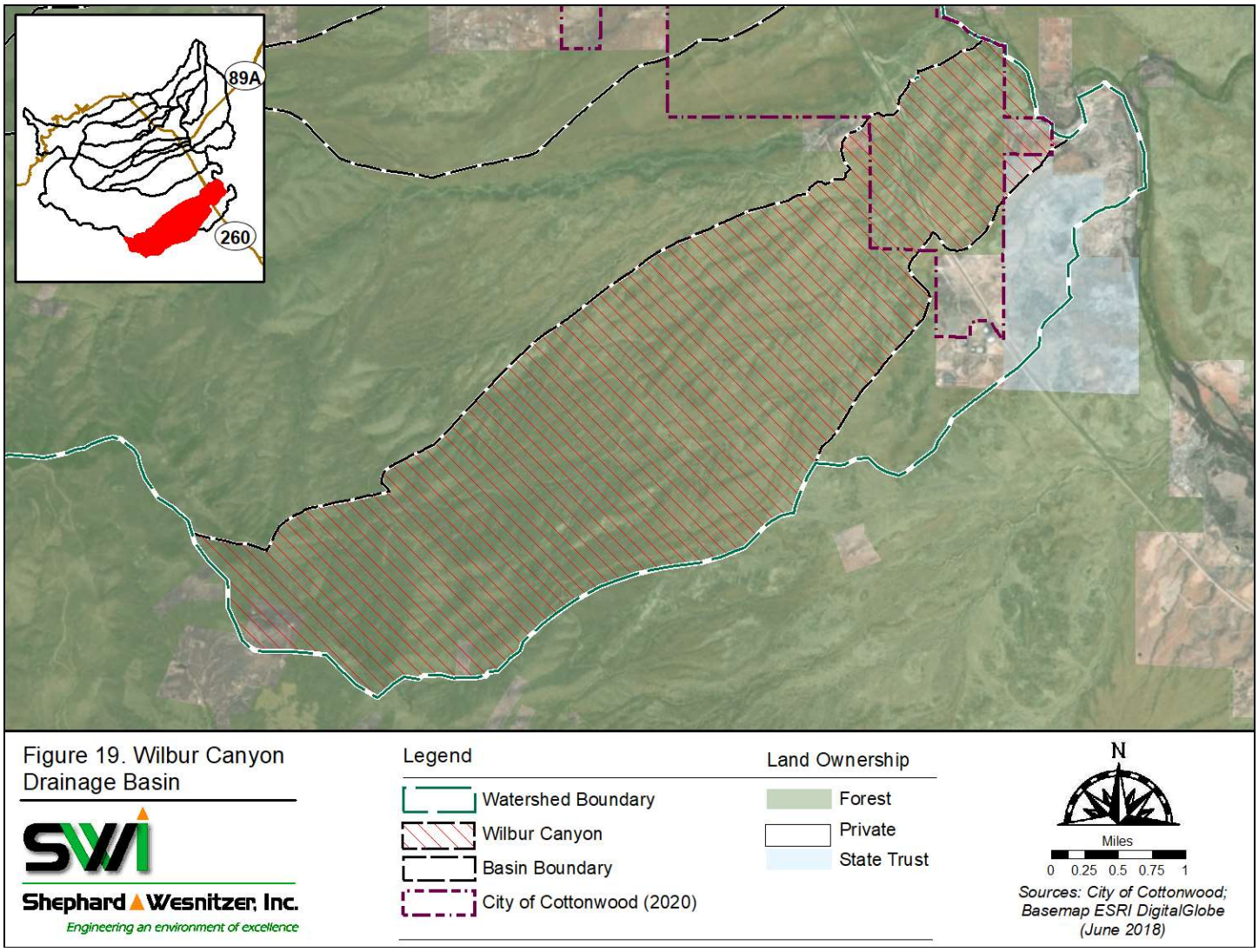
The Wilbur Canyon Drainage Basin is approximately 6,898 acres in size. The basin is primarily made up of National Forest Land. As this undeveloped property is improved, the subject development will be required to supply the City with detailed drainage analysis. Therefore, this area was not further analyzed as part of the CDMP. The lower portion of the basin at the confluence with the Verde River is designated Zone A floodplain per the Verde River Flood Hazard Assessment Study. The location of this drainage basin is shown below in Figure 19.



The South 260 Gateway Wash Drainage Basin is approximately 1,491 acres in size. The basin south of State Route 260 is primarily made up of National Forest Land with undeveloped Industrial zoned property adjacent to the roadway. As this undeveloped property is improved, the subject improvements will be required to supply the City with detailed drainage analysis Therefore, this area was not further analyzed as part of the CDMP. The lower portion of the basin at the confluence with the Verde River is designated Zone A floodplain per the Verde River Flood Hazard Assessment Study. The location of this drainage basin is shown below in Figure 20.

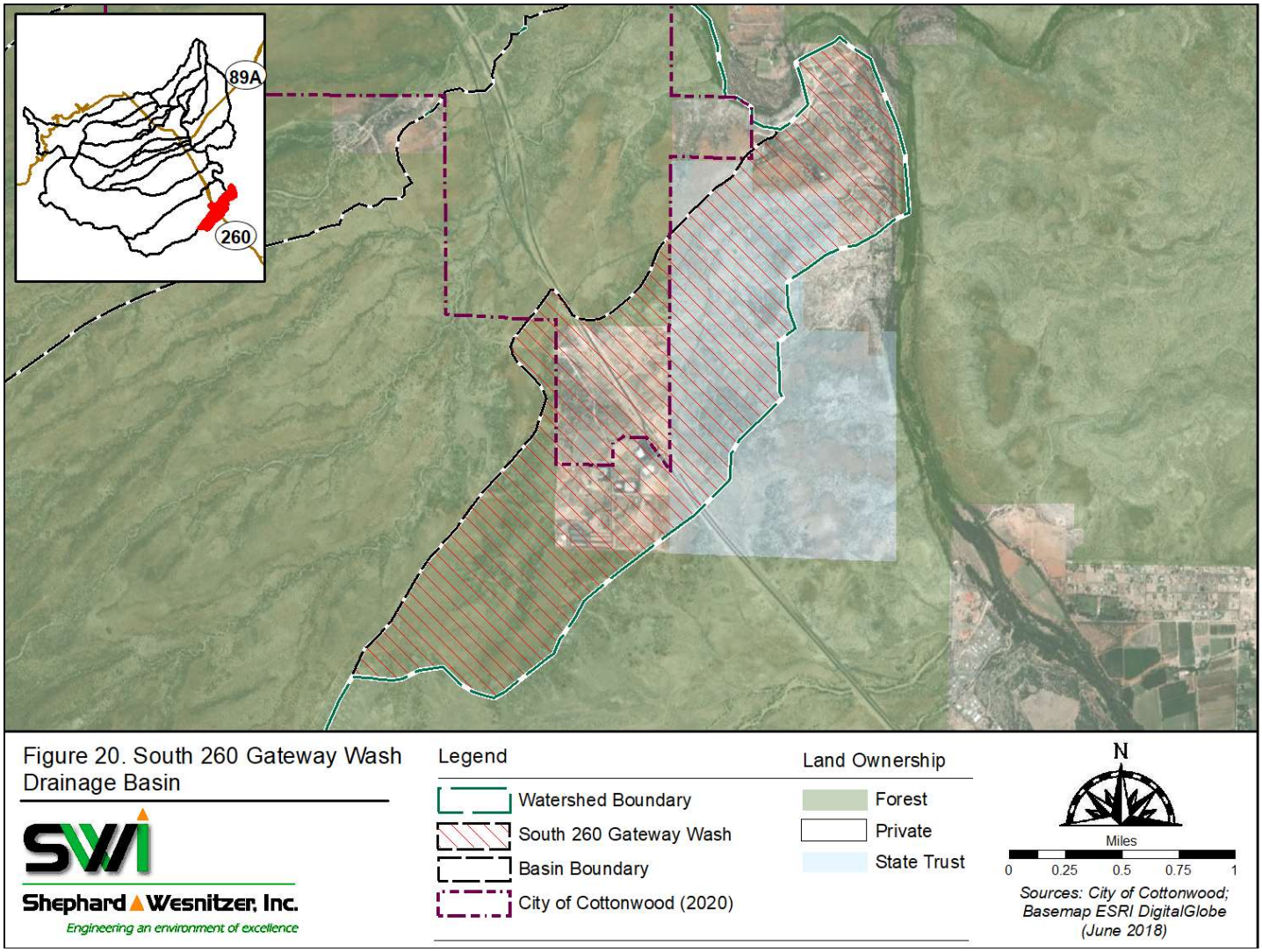
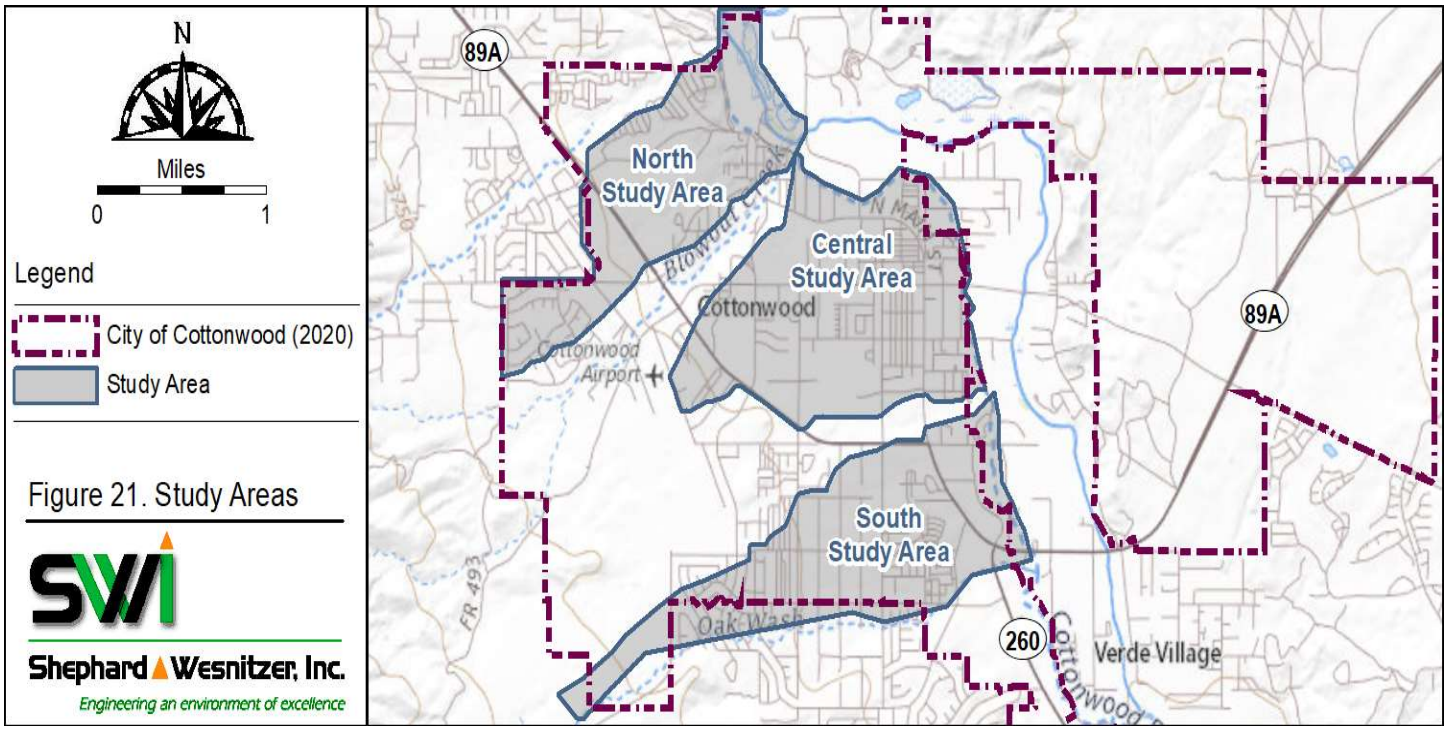


Figure 20. South 260 Gateway Wash Drainage Basin

2.2 Study Areas

Three study areas were determined based on input from City staff, the review of past drainage issues supplied by the City, the elimination of FEMA designated drainages, and areas of future development that will be required to supply the City with detailed drainage studies per City development code. See Figure 21 below for an overall map of the study areas of the CDMP.



The North Area is bounded on the north by Mescal Gulch and the south by Del Monte Wash (Blowout Creek), the City limits to the west, and the Cottonwood Ditch to the east. The basin is made up of four (4) primary flow paths. The drainage from Blackhills Terrace and Cottonwood Ranch enters the study area from the west. Neighborhoods in the study area include the Willard Addition, Pugh Subdivision, Verde Heights, Robega Terrace and Kindra Heights. A detailed exhibit of the North Area is provided in Appendix 1.

The Central Area is bounded on the north by Del Monte Wash (Blowout Creek) and Silver Springs Gulch to the south, and is bisected by the lower portion of Railroad Wash. The eastern limit is the Cottonwood Ditch, which is close to the City limits. The western limit is the Cottonwood Airport, beginning near Airpark Road. The basin has six (6) primary flow paths including Railroad Wash. The drainage from the north and west of Railroad Wash includes Cottonwood Airpark, El Rio De Oro Mobile Home Park, Verde Valley Medical Center, Mountain Terrace Office Complex, commercial lots north of E. Mingus Avenue, and the Noble Terrace Subdivision. The drainage from the south and east of Railroad Wash includes the Scott Addition, Smelter City, the Carroll Subdivision, Mingus Park, Valley View, Aspen Shadows, Happy Homes and the Wright Subdivision. See Figure 21 for an overall map. A detailed exhibit of the Central Area is provided in Appendix 1.

The South Area is bounded by Silver Springs Gulch to the north, Oak Wash to the south, and easterly by the Cottonwood Ditch. The basin is made up of four (4) primary flow paths. The study area receives drainage from Verde Village and also includes Vista Grande Ranch, Verde Palisades, Crestview Subdivision, Five Star Heights, Cottonwood Square/ Commons, Villas on Elm, Hillcrest Villa, Skyline View Estates, Sawmill Estates and Cottonwood Cove and commercial property along Main Street. See Figure 21 for an overall map. A detailed exhibit of the South Area is provided in Appendix 1.

3.0 Comments and Public Meetings

3.1 Public Meetings

Input from the public was compiled from “open house” style meetings. The meeting was held on August 10, 2017. The public was presented with a form to complete which included location, frequency, severity, and a space for comments. The form also inquired as to whether the issue had been brought up to the City staff previously.

Below is a list of the types of issues that were reported:

- Local nuisance drainage issues
- Local maintenance issues
- Roadside ditch and driveway culvert issues
- Debris washing onto property and/or right of way

The comments were reviewed with City staff and compared with the drainage complaints described in the section below.

3.2 Drainage Complaints

The City of Cottonwood has supplied a copy of the drainage related complaints from 2015 through 2019. These complaints were reviewed along with input from the public meetings with the City. Issues deemed to be a hazard to property or the traveling public have been included on the Issue Area Exhibit found in Appendix 2. Areas that were determined to be local nuisance or maintenance issues can be considered by the Public Works Department for repair. The selected issues were then put into the prioritization matrix for recommendation of projects that should be considered a priority for the City.

4.0 Drainage Structure Inventory

As part of this Master Plan, a storm sewer system mapping of the existing drainage structures within the City of Cottonwood was performed.

4.1 Structure Inventory

The structure inventory consisted of locating the existing culverts, box culverts, storm drain pipes, catch basins, and scuppers. Size of structure was noted, as well as the entrance and outfall elevations. The original task assumption was to inventory 1,000 structures. However after beginning the task it was determined that the City's drainage system is made up of far more structures than this. After approximately 1,950 structures were documented, SWI and the City decided to proceed with the Drainage Master Plan. SWI staff completed the inventory in June, 2017 and the City submitted it to ADEQ. A copy of the Drainage Structure Inventory plans can be found in Appendix 3.

5.0 Drainage Criteria

5.1 Source of Criteria

City of Cottonwood Engineering Design Standards Manual 2018 (EDSM), Yavapai County Drainage Design Manual, ADOT Hydrology Manual were used in developing the criteria for data used to create the Flo-2d models.

5.2 Hydrologic/ Hydraulic Criteria and Results

5.2.1 Model Description (North, Central & South)

The study areas have been modeled using Flo-2d to establish the existing conditions. Flo-2d is a dynamic flood routing model that simulates channel flow, unconfined overland flow, street flow, and storm drain systems. Flo-2d has the added benefit of the ability to combine hydrologic and hydraulic modeling within the same software. The study area models include rainfall, rainfall losses, peak in-flows, out-flows, and conveyance for hydraulic structures.

5.2.2 Grid Development and Inflow/ Outflow Nodes

The Flo-2d models have been developed based on a 30 foot by 30 foot grid. The grid size selected was based on the use of the Yavapai County-provided two-foot interval contours. It was determined that the use of a smaller grid resulted in grid elevation errors due to the nature of two-foot contours and relatively flat areas of the City. Known inflows from previous studies were placed at concentration points as they entered the study areas. Out-flows were placed along the

perimeter of the study area to allow that flow to flow off the side of the model, and artificially contribute to the runoff of other sub-basins.

5.2.3 Grid Elevations, Roughness and Area/ Width Reductions

The elevation of the grid elements that make up the Flo-2d model are calculated by averaging elevation points created on a 10-foot by 10-foot grid. The elevation points have been taken from the Yavapai County two-foot contour data. The vertical datum for this data is North American Vertical Datum of 1988 (NAVD 88). The horizontal coordinate system is Arizona State Plane Central Zone International Feet.

An approximate Manning's 'n' value has been assigned to each grid element based on the City of Cottonwood zoning. Table 1 summarizes the Manning's 'n' value assigned to each zoning district. A zoning district map is shown in Figure 22.

Table 1 Manning's 'n' value

Zoning District	Manning's 'n' value
AR-43	.03
AR-20	.025
GA	.02
R-1	.02
R-2	.018
R-3	.018
MH	.02
PAD	.02
C-1	.013
C-2	.013
I-1	.013
I-2	.013

Flo-2d models use the Manning's 'n' value in various ways depending on the depth of flow found in the model. The Manning's 'n' value is initially assigned to each grid element based on user-assigned data. The model then iteratively calculates the runoff using the values shown below in Table 2.

Table 2 Manning's 'n' vs Flow Depth

Flow Depth	Manning's 'n'
0.0 < flow depth < 0.2 ft.	n = shallow 'n' value
0.2 ft. < flow depth < 0.5 ft.	n = shallow 'n'/2
0.5 ft. < flow depth < 1 ft.	$n = n_b * 1.5 * e^{-(0.4\ depth/dmax)}$
1 ft. < flow depth	n = user inputted value

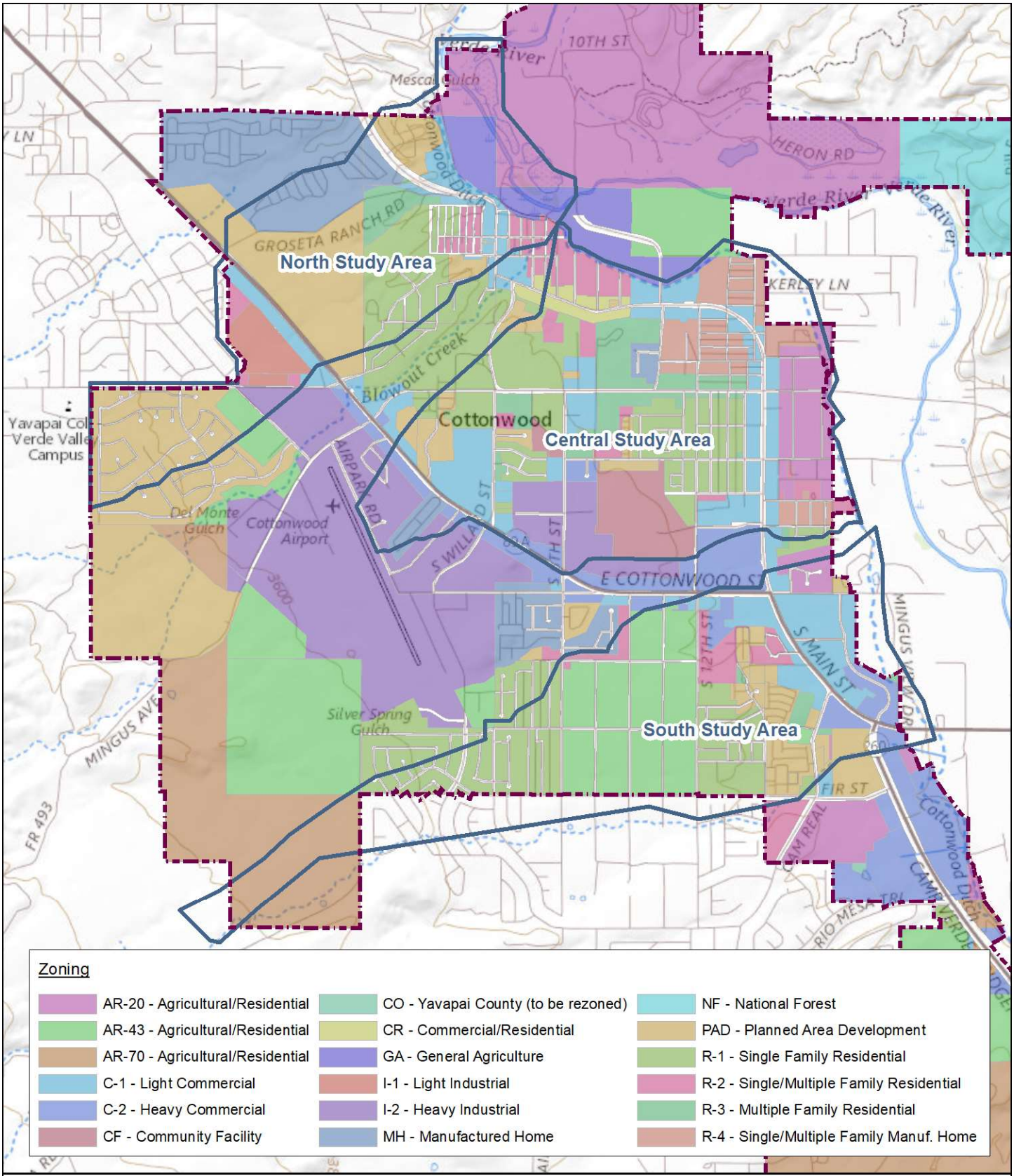


Figure 22. City of Cottonwood Zoning Map

Legend

City of Cottonwood (2020)

Study Area

N

miles

0 0.5

Sources: City of Cottonwood; Basemap USGS The National Map (5/13/2020)

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5.2.4 Rainfall and Loss Parameters

Rainfall data was taken from the City of Cottonwood EDSM. The 24-hour rainfall depth for various storm events is shown below in Table 3.

Table 3 City of Cottonwood Rainfall Depths

Storm Event	Rainfall Depth (inches)
2-year	1.77
5-year	2.22
10-year	2.58
25-year	3.06
50-year	3.44
100-year	3.83

The rainfall distribution used in the Flo-2d model was the SCS Type II distribution as outlined in the City of Cottonwood EDSM. Rainfall losses were calculated using the Soil Conservation Service (SCS) method. The input curve numbers for the SCS method take into account the hydrologic soil group, cover types, impervious areas, and antecedent runoff conditions. These values were taken from the SCS, TR-55 manual. The hydrologic soil data was taken from the Natural Resources Conservation Service (NRCS) web soil survey and is shown in Figure 23.

5.2.5 Hydraulic Structures, Channels, Streets, Storm Drains, etc.

The data gathered in the drainage structure inventory was included within the Flo-2d model in certain areas. The structures are typically located where drainage ways intersect roadways and at driveways. The drainage structure inventory is included in Appendix 3.

5.2.6 Numerical Controls and Tolerances

Flo-2d controls and numerical stability are user-controlled variables. Table 4 outlines the values for the key inputs used for the Flo-2d model.

Table 4 Flo-2d Key Inputs

Model Variable	Value
Model Simulation Time (hrs.)	24
Output Time Interval (hrs.)	0.25
Modeled Hydraulic Structures	Yes
Froude Limit	0.95
Shallow ‘n’	.013
Minimum Flow Depth for flood routing (ft.)	0.001

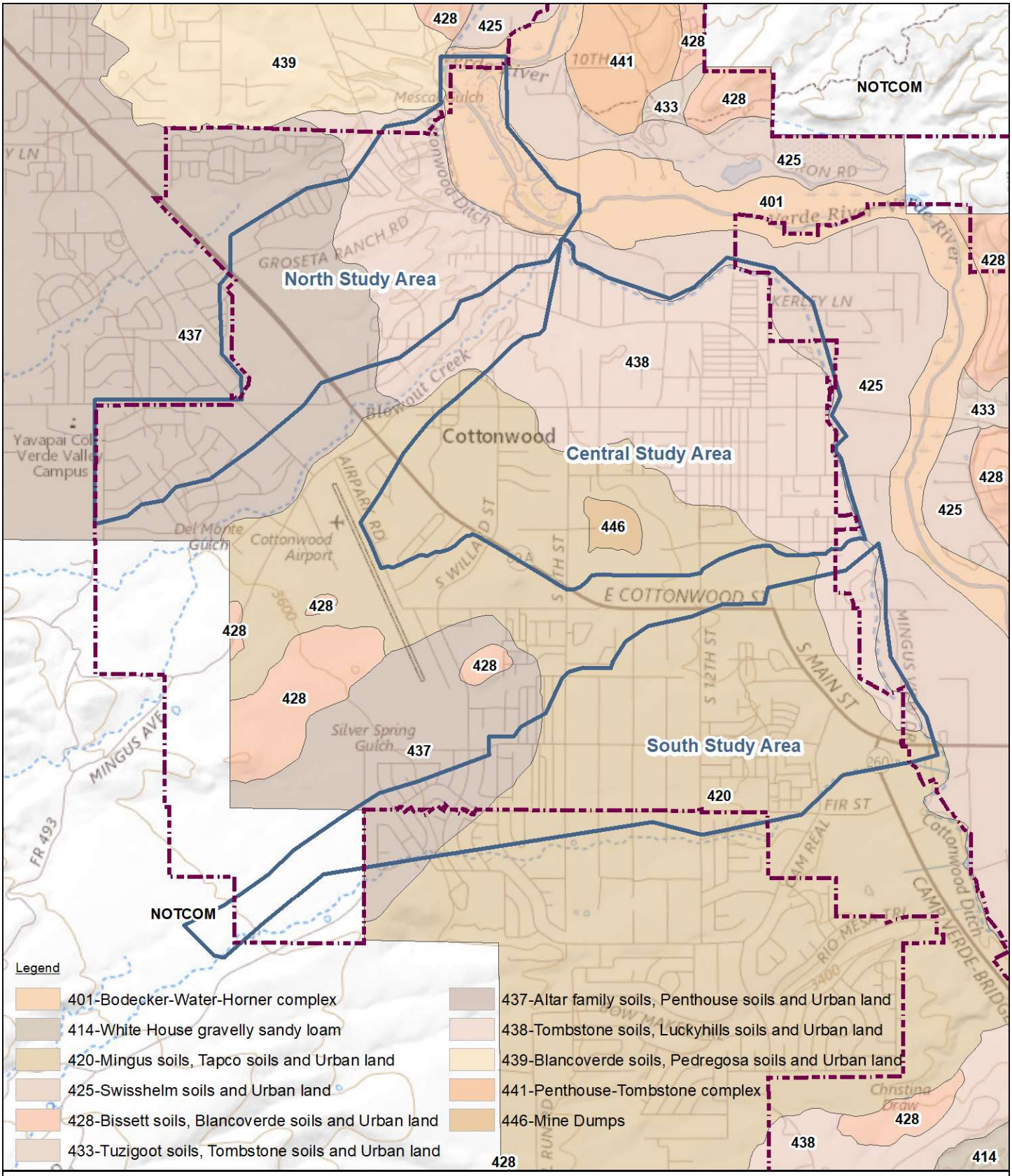

Figure 23. Hydrologic Soils Map

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Legend
City of Cottonwood (2020)
Study Area

N
miles
0 0.5

Sources: City of Cottonwood; USDA NRCS gSSURGO (2019) Basemap USGS The National Map (5/13/2020)

5.2.7 Peak Flow Rate Summary (North, Central & South)

The Flo-2d modeling output files for the 2, 5, 10, 25, 50, and 100-year events are found in Appendix 4. Exhibits showing the maximum runoff for the 100-year event are also found in Appendix 4. Storm water runoff concentration points have been developed throughout the City. The estimated flow for the previously mentioned storm events is listed at each point. These points are shown on the supplemental plan set that can be found in Appendix 5.

6.0 Prioritization of North, Central, and South Areas

While this Master Plan focuses on the North, Central, and South study areas previously described, the City has also identified other significant drainage issues such as Del Monte Wash in Old Town, Silver Springs, and portions of Railroad Wash that are currently being studied separately from this CDMP.

A prioritization matrix is a valuable tool to quantify selection criteria chosen by the planning team and the City. The project prioritization below is a list of issue areas that have been vetted through coordination with the City based on several criteria listed below.

6.1 Matrix Criteria

Severity of Flooding Depth

Depth of flooding in the 100-year event based on the Flo-2d or other modeling was entered as one of the matrix variables.

Frequency of Flooding Events

Based on current Cottonwood Engineering Design Standards, the event (2yr, 5yr, 10yr, 25yr, 50yr, or 100yr storms) which caused flooding depths exceeding 1 foot was noted and entered as a matrix variable.

Property Threat

Flooding of private properties can cause a range of damage. Minor ponding with no significant damage will be rated a 1. Damage to landscaping due to overland flows will be a 2. Potential damage to structures including roadway crossings will rate a 3.

Traffic Nuisance

Flooding of roadways has an impact on traffic flow patterns. Minor ponding for a short duration will be rated a 1. Water frequently flowing across a major roadway will be rated a 3.

Complexity of Design

The team's estimation of complexity of the project was entered into the matrix at a scale of 1 to 5 to help differentiate the projects' scopes of work. If coordination with another study was required 1 point was subtracted. If coordination with a State agency such as ADOT was required an additional point was also subtracted.

Cost of Drainage Improvements

A concept level estimate of drainage improvements was developed for consideration in the matrix.

6.2 Prioritization Matrix

Rank	Site #	Description	100 yr. Flood Depth	Flooding Frequency	Property Threat	Number of Properties	Traffic Nuisance	Complexity	Cost	Cost/Benefit	Watershed	SWI Study Area	Matrix Comment
1	7	Main St. – 10th to 12th	1.13	2	2	8	2	2	10000	122	Railroad Wash	Central	Remove sediment from box culvert
2	26	Date St. & S. 7th – 686 E. Date Street	0.39	3	2	2	1	5	19000	514	Railroad Wash	Central	Undersized culvert; poor ditches
3	29	N. Apsco Lane near Organ Pipe	1.14	2	2	10	1	3	72000	785		North	Raw land flowing into subdivision
4	2	6th St. – Boulder to Cypress St.	4	3	1	100	3	4	1165000	1555	Silver Springs	South	Blocks street, sediment; Alternative route available
5	4	Camino Real & Fir St.	0.29	2	1	2	2	4	136000	3731	Oak Wash	South	Undersized storm sewer likely, erosive ditches, need sediment basin
6	11	Cochise & 10th St.	0.27	2	2	4	1	4	216000	4660	Railroad Wash	Central	Improve ditches; Add storm sewer to box culvert
7	13&25	8th St. Wash & 6th St. Storm Sewer	1.26	3	3	45	3	4	1703000	4834	Railroad Wash	Central	Runoff into structures; Regional solution needed
8	10	Cactus St. at Santa Cruz St.	3.54	3	3	4	3	2	474000	6345		North	Channel through private parcels
9	30	E. Cottonwood St. – 203 through 320	1	3	2	6	3	5	554000	7103	Silver Springs	South	Wash crosses road at grade, blocks access
10	19	1402 E. Navajo	0.73	1	2	1	1	5	26000	7123		Central	Improve ditch along cemetery
11	1	Calvary Way – Storm Sewer	0.29	2	1	1	2	3	65000	10078	Railroad Wash	Central	Intercept and divert to RR Wash
12	6	Main Street – Graham to Gila	0.52	1	2	4	2	4	520000	10484		Central	Gap in storm sewer system

Additional drainage issues relating to Cottonwood Ditch Association:

Cottonwood Ditch – Drainage Issues per Letter	
CD-1	Home Depot/ CVS Fir Street drainage
CD-2	Verde Palisades Wash (South of Safeway) crossing Cove Parkway
CD-3	E. Cottonwood Street drainage & GR #1
CD-4	125 S. 18th Street wash crossing
CD-5	16th Street ditch to Franquero
CD-6A	7th Street drainage
CD-6B	8th Street drainage

7. Top "12" Priorities

7.1 Priority Details and Proposed Solutions

Priority 1

Site 7 – Main Street at Railroad Wash



Deficiency:

Sediment has built-up and is affecting hydraulic performance of box culvert.

Hydraulic Analysis Summary: This box culvert, if not obstructed with sediment, is capable of passing the 100-year event with a free board of about .36 feet based on the modeling.

Proposed solution:

Remove sediment and vegetation causing obstruction. Consider inlet modifications to minimize future maintenance.

Priority 2

Site 26 - Date Street & S. 7th



Deficiency:

Flow northward in ditches along S. 7th is likely overwhelming the culvert (890) at the intersection of E. Date Street. Culvert 890 is 18 inches in diameter and has minimal slope.

Hydraulic Analysis Summary: This 18 inch culvert, if not obstructed with sediment, is only capable of passing the 10-year event based on the modeling.

Proposed solution:

Analyze capacity of existing culvert. Replace with correct size and grade ditches as needed. Impact on existing utilities should be determined.

Priority 3

Site 29 - N. Apsco Lane



Deficiency:

This street borders on raw land, and an undersized culvert is likely being overwhelmed, which leads to a channel through a residential area.

Hydraulic Analysis Summary: This culvert is not capable of passing any of the design storm events based on the modeling.

Proposed solution:

Determine drainage basin and size this culvert and downstream culverts accordingly. Analyze capacity of existing channels. Consider diversion channel via drainage easement to the wash just to the north.

Priority 4

Site 2 – 6th St. - Boulder to Cypress St.



Deficiency:

The at-grade crossing of Silver Springs Gulch, which frequently blocks 6th Street, has sediment buildup as an on-going maintenance issue.

Hydraulic Analysis Summary: Runoff depths exceed 4 feet in the 100-year event.

Proposed solution:

Install box culvert and modify roadway profile to decrease impact on access and decrease maintenance costs.

Priority 5

Site 4 - Camino Real & Fir Street



Deficiency:

Intake into the storm sewer has poor inlet characteristics, and a lot of erosion is evident in the ditches due to high velocities and uncontrolled runoff from the school parking lot.



Hydraulic Analysis Summary: This beginning section of storm sewer has the capacity to pass the 25-year event but velocities of approximately 7.2 feet/second are in the erosive range for the ditches along Camino Real.

Proposed solution:

Analyze capacity of storm sewer, improve inlet, install sediment basin, and riprap ditches to decrease erosion.

Priority 6

Site 11 - Cochise & 10th Street



Deficiency:

Runoff from two culverts is forced into an area with a confused drainage path and only one small inlet on the other side of the street.

Hydraulic Analysis Summary: Current ditches and landscaped channels only have the capacity to convey the 10-year event based on the analysis.

Proposed solution:

Consider extending/ enlarging storm sewer and improving ditches in the area.

Priority 7

8th Street Wash & 6th Street Storm Sewer

Part 1: Site 13 - 8th Street Wash



Deficiency:

Effectiveness of the 8th Street wash may be limited by entrance characteristics and slope of the upper section, and the pedestrian crossing obstruction near E. Ash Drive. Some scour is evident north of E. Ash suggesting channel stabilization may be needed.



Hydraulic Analysis Summary: This significant regional channel is not capable of passing the 100-year event and has only 0.5 feet of freeboard in the 25-year event.

Proposed solution:

Analyze capacity of existing channel and model channel obstructions. The proposed solution for improvements to this wash is variable since it is also related to the 6th Street storm sewer as a viable option for receiving those flows. A lowering of the upper section would provide options for a storm sewer outlet, and the option of eliminating the at-grade flows across E. Aspen Street.

Priority 7 (continued)

Part 2: Site 25 - 6th Street - E. Cherry to E. Aspen



Deficiency:

Ditches starting at E. Cherry Street drain northward along the west side of 6th Street and then are forced to surface drain into the curb & gutter, carrying a lot of sediment onto the street. A surface flow outlet drains through a mini-storage property to an undefined outlet channel draining through private parcels causing flooding and erosion issues.



Hydraulic Analysis Summary: Flow depths in the 25 year event exceed the capacity that can be carried within the roadway and flows through private commercial properties.

Proposed solution:

Consider storm sewer from the 8th Street Wash along E. Aspen to 6th Street, then up to E. Cherry. Alternative alignments may be available if easements could be obtained through the industrial/commercial properties in this area.

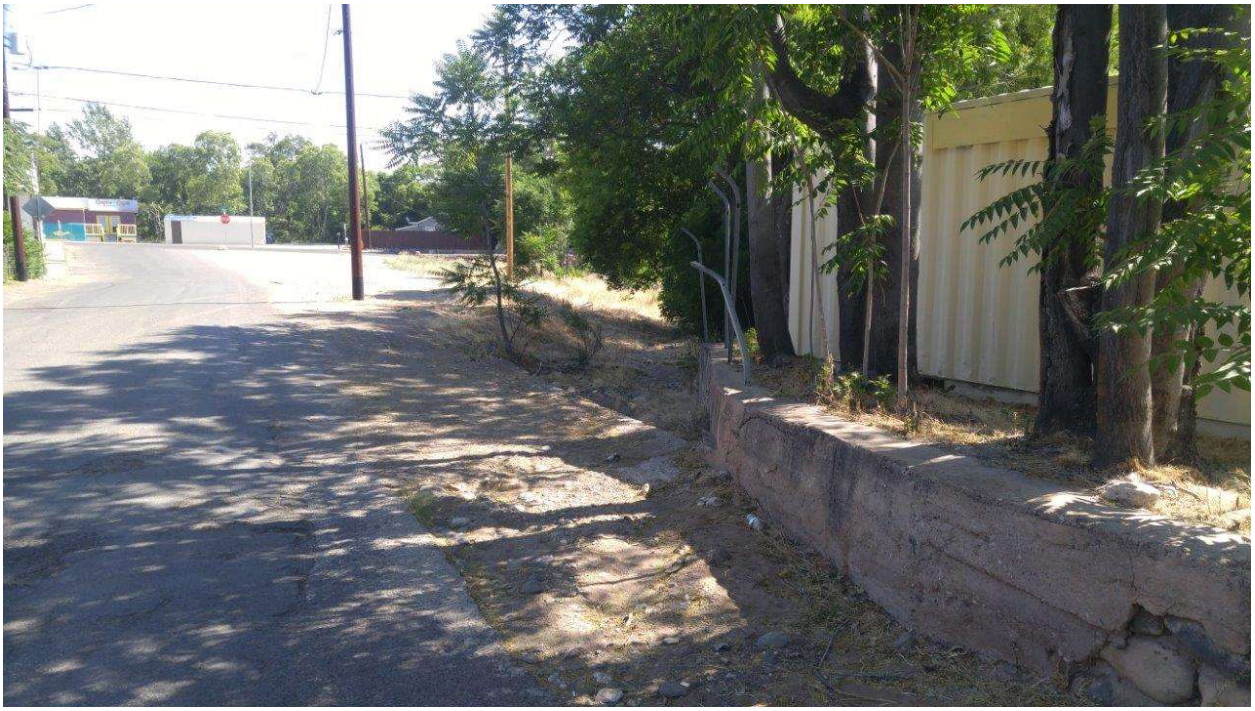
Priority 8

Site 10 – N. Cactus St. at Santa Cruz St.



Deficiency:

At-grade crossing of wash causing access issues during storm events, blocking N. Cactus Street and impacting residential driveways.



Hydraulic Analysis Summary: Events greater than the 5-year storm have flow depths exceeding 1 foot.

Proposed solution:

Consider drop inlet and culverts to minimize storm events blocking the street. Large events would overtop, so a concrete low water crossing is also recommended.

Priority 9

Site 30 – E. Cottonwood Street – 203 thru 320



Deficiency:

At-grade crossing of wash causes access issues during large storm events for residential driveways.

Hydraulic Analysis Summary: Flow depths for events greater than the 2–year storm exceed 4 inches in depth. The 100-year depth is about 8 inches deep.

Proposed solution:

Consider about 300 feet of storm sewer to intercept flows from the south side of E. Cottonwood near 203, conveying eastward to the existing crossing outlet point on the north side near 320.

Priority 10

Site 19 – Outlet Channel near E. Navajo



Deficiency:

Ditch upstream of cattle guard has insufficient capacity and is overtopping roadway and flooding properties to the east.

Hydraulic Analysis Summary: The roadside ditch has a capacity for the 10-year event, and events larger than the 25-year storm will overtop N. 14th Street based on the modeling.

Proposed solution:

Re-grade and widen ditch along N. 14th from E. Mohave Street north to the cattle guard.

Priority 11

Site 1 – Calvary Way at 89A



Deficiency:

Calvary Way street drainage sheet flows across SR 89A to an inlet on the north side of the highway causing a traffic nuisance and hazard.

Hydraulic Analysis Summary: With the amount of developed property draining to this intersection, the catch basins do not have the capacity to remove the runoff from the roadway.

Proposed solution:

Consider adding catch basins and storm sewer to intercept the south part of Calvary Way drainage and diverting it to City parcel 406-08-024Y, which is a regional detention site.

Priority 12

Site 6 - Main Street - Graham St. to Gila St.



Deficiency:

This section of Main Street has a gap in the storm sewer causing surface flows to overwhelm the inefficient channels and gutter.

Proposed solution:

Consider extending portions of storm sewer and adding catch basins to intercept excess surface flows in the area.

7.2 Cost Summary

Priority Rank	Site #	Location	Improvement Type	Estimated Cost
1	7	Main St. at RR Wash	Channel Improvements	$ 10,000.
2	26	Date St. & S. 7th	Culvert & Ditch Grading	$ 19,000.
3	29	N. Apsco Lane	Channel Diversion	$ 72,000.
4	2	6th St.- Boulder to Cypress	Box culvert, Grade Raise	$1,165,000.
5	4	Camino Real at Fir St.	Sediment Basin, Inlet & Ditch Riprap	$ 151,000.
6	11	Cochise & 10th	Storm Sewer	$ 222,000.
7	13 & 25	6th St. to 8th St. Wash	Storm Sewer, Channel Improv.	$1,702,000.
8	10	Cactus St. at Santa Cruz St.	Inlet, Culverts & Low Water Crossing	$ 538,000.
9	30	E. Cottonwood St.	Inlet & Culverts, Grade Raise	$ 629,000.
10	19	14th St. at E. Navajo St.	Ditch Grading	$ 26,000.
11	1	Calvary Way	Storm Sewer	$ 75,000.
12	6	Main Street - Graham to Gila	Storm Sewer	$ 549,000.
			Totals	$5,158,000.

8. Conclusions

The Cottonwood Drainage Master Plan was developed to identify existing drainage issues, flooding concerns, and to develop a prioritized plan for future capital improvement projects and expenditures. Existing studies along with updated FEMA information, was reviewed and Study Areas were analyzed using a GIS-based map of the greater Cottonwood Area. Three areas within the City limits were identified as lacking in detailed current analysis data, and were defined as the North, Central, and South Areas, which were then modeled with Flo-2D software by SWI. The estimated flow rates for the 2, 5, 10, 25, 50, and 100-year, 24-hour storm events were quantified. Maps depicting the inundation limits and flow depths for the 100-year event were also prepared for the study areas.

As part of the CDMP, SWI also mapped a significant number of structures (approximately 1,950) in order to build the basis for the City wide analysis. The structure inventory is included in an Appendix. The storm drain mapping will continue to evolve as a more complete database with the addition of storm drain structures, and will require periodic updates due to future development and infrastructure improvements.

The City of Cottonwood also provided the lists of annual drainage complaints for the past five years in order to identify areas of concern. These problem areas have been added to the GIS files and exhibits are included in the Appendices. The input from residents, verified by the modeling, was used to determine problem areas. These problem areas were evaluated using several different criteria to develop a prioritization matrix. The criteria included: Depth of flooding, frequency of flooding, threat to properties, number of properties impacted, traffic nuisance due to flooding, cost and complexity of the improvements.

Twelve top priorities were selected in the CDMP using the priority matrix. Proposed improvements were described for the priorities and cost estimates prepared for budgeting purposes. By grouping the priorities by study area and watershed it was noted that Railroad Wash within the Central study area is the most problematic drainage in the City accounting for 42% of the prioritized problem areas.

Seven areas were identified, by the Cottonwood Ditch Association, as problematic relating to storm runoff being intercepted by the ditch along the City limit boundary. We recommend that meetings continue to be held with the Ditch Association, Yavapai County and the City to discuss prioritization and funding of possible improvements to mitigate the multi-jurisdictional problem areas.

Based on the top twelve cost estimates approximately five (5) million dollars will need to be budgeted to improve the drainage facilities identified in the site specific recommendations. We recommend that the City seek funding assistance for the larger projects.

It was the intent of this study to provide a user friendly report for the City that will be the foundation for a living document that is periodically updated as development progresses and further drainage studies become available. A flowchart to assist users in gathering information for the public's use is provided in Appendix 8 - User's Flowchart.

We also recommend that the City pursue development of a GIS interface to increase accessibility to drainage information when possible. Integration with existing data available from other City departments would also be beneficial.

9. References

City of Cottonwood Engineering Design Standards Manual, 2018

Drainage Design Manual for Yavapai County, 2015

Arizona Department of Transportation Highway Drainage Design Manual Volume 2 Hydrology Second Edition, 2014

Various studies supplied by the City.

Appendix 1: Basin Exhibits

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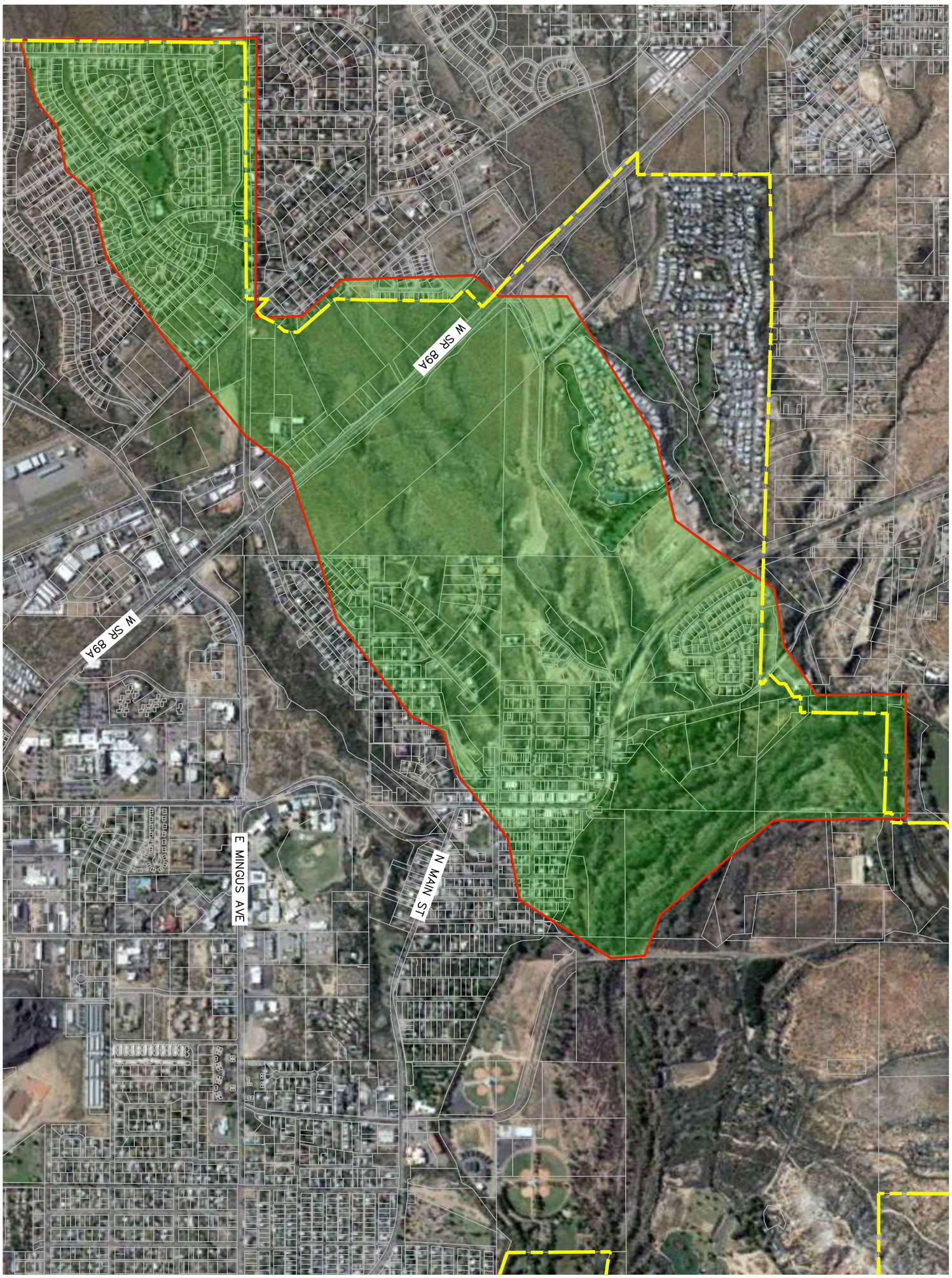

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500
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NORTH

LEGEND

STUDY AREA

STUDY AREA BOUNDARY

CITY LIMIT BOUNDARY

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Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)

Shephard Wesnitzer, Inc.

221 N. Marina St.
Suite 102
Prescott, AZ 86301
928.541.0443
928.541.1075 fax
www.swiaz.com

JOB NO:	14267
DATE:	JAN 20
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DESIGN:	JRW
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COTTONWOOD DRAINAGE MASTER PLAN — COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE MASTER PLAN
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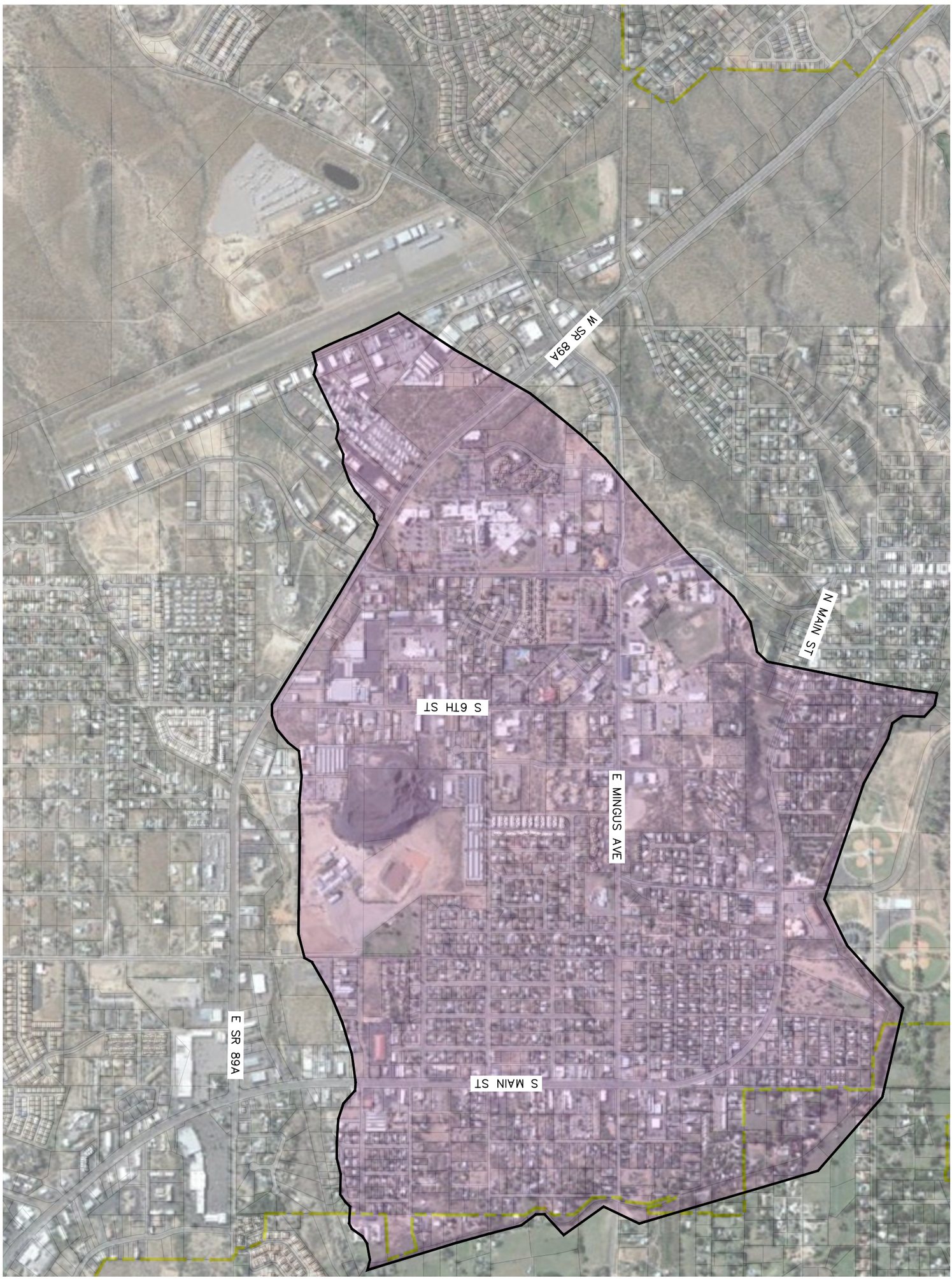

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NORTH

LEGEND

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STUDY AREA BOUNDARY

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COTTONWOOD DRAINAGE MASTER PLAN COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE MASTER PLAN
CENTRAL STUDY AREA E□□IBIT

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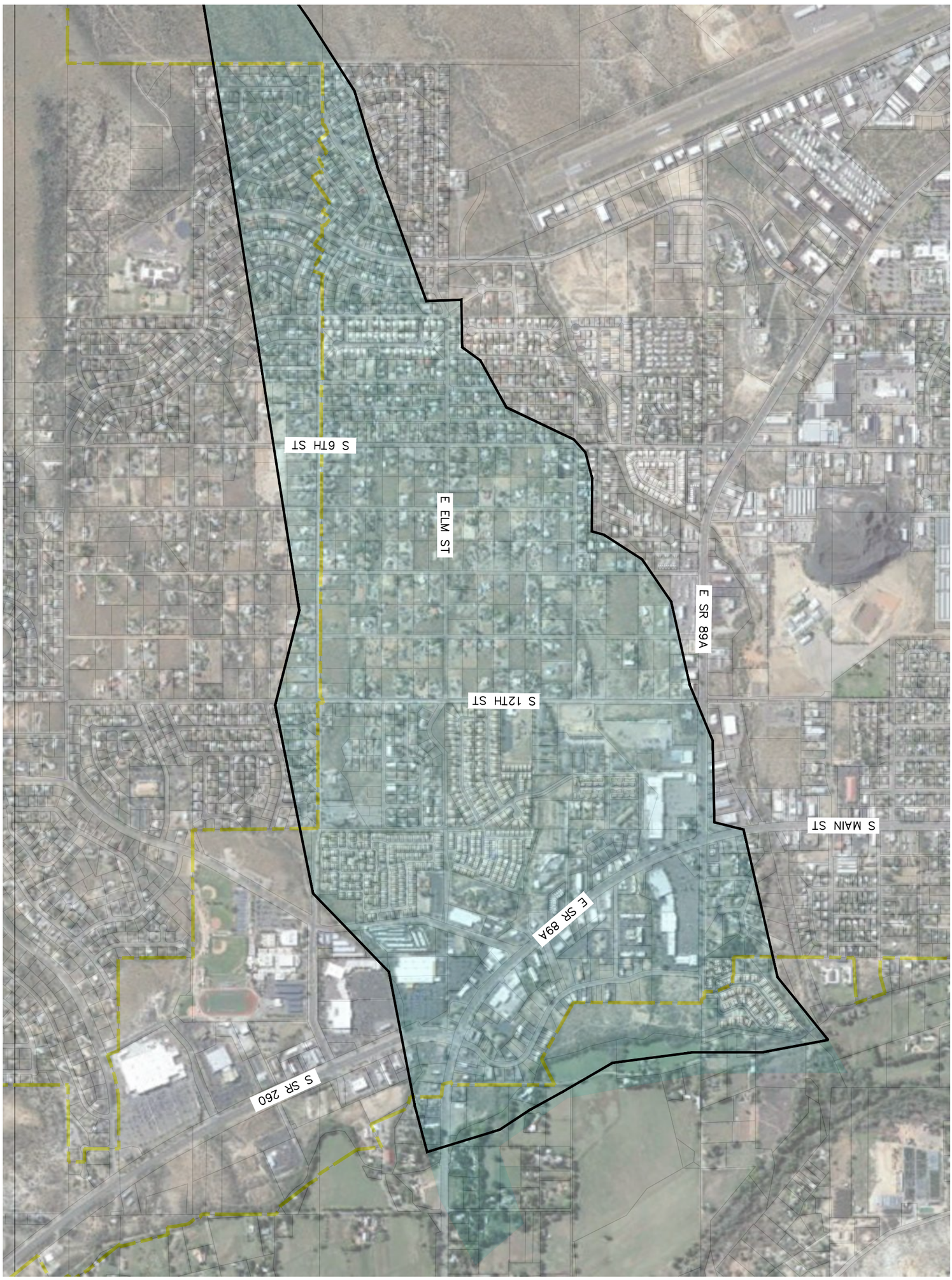

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NORTH

LEGEND

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COTTONWOOD DRAINAGE MASTER PLAN COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE MASTER PLAN
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SHEET A1 □□

OF

Appendix 2: Comment Letters and Maps

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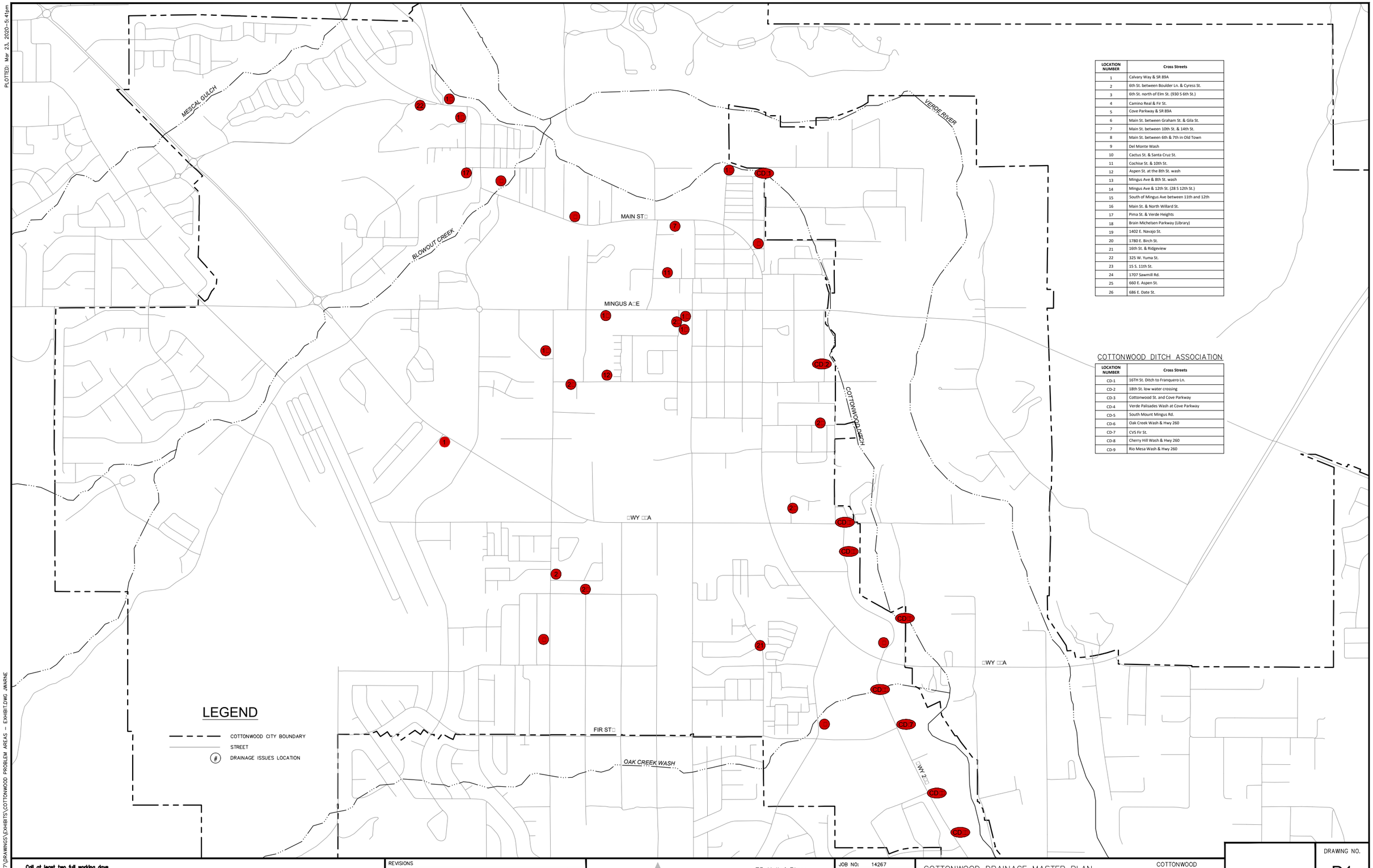

LOCATION NUMBER	Cross Streets
1	Calvary Way & SR 89A
2	6th St. between Boulder Ln. & Cyress St.
3	6th St. north of Elm St. (930 S 6th St.)
4	Camino Real & Fir St.
5	Cove Parkway & SR 89A
6	Main St. between Graham St. & Gila St.
7	Main St. between 10th St. & 14th St.
8	Main St. between 6th & 7th in Old Town
9	Del Monte Wash
10	Cactus St. & Santa Cruz St.
11	Cochise St. & 10th St.
12	Aspen St. at the 8th St. wash
13	Mingus Ave & 8th St. wash
14	Mingus Ave & 12th St. (28 S 12th St.)
15	South of Mingus Ave between 11th and 12th
16	Main St. & North Willard St.
17	Pima St. & Verde Heights
18	Brain Michelsen Parkway (Library)
19	1402 E. Navajo St.
20	1780 E. Birch St.
21	16th St. & Ridgeview
22	325 W. Yuma St.
23	15 S. 11th St.
24	1707 Sawmill Rd.
25	660 E. Aspen St.
26	686 E. Date St.

COTTONWOOD DITCH ASSOCIATION

LOCATION NUMBER	Cross Streets
CD-1	16TH St. Ditch to Franquero Ln.
CD-2	18th St. low water crossing
CD-3	Cottonwood St. and Cove Parkway
CD-4	Verde Palisades Wash at Cove Parkway
CD-5	South Mount Mingus Rd.
CD-6	Oak Creek Wash & Hwy 260
CD-7	CVS Fir St.
CD-8	Cherry Hill Wash & Hwy 260
CD-9	Rio Mesa Wash & Hwy 260

Call at least two full working days before you begin excavation.
ARIZONA 811
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)

REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
75 Kallof Place
Sedona, AZ 86336
928.282.1061
928.282.2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	MAR 20
SCALE:	1"=750'
DRAWN:	AKC
DESIGN:	AKC
CHECKED:	JTL

COTTONWOOD DRAINAGE MASTER PLAN — COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE ISSUE AREAS

DRAWING NO. D1

SHT NO. 1 OF 1

FILE: P:\2014\14267\DRAWINGS\EXHIBITS\COTTONWOOD PROBLEM AREAS - EXHIBIT.DWG JWARNE

CITY OF COTTONWOOD DRAINAGE MASTER PLAN

Shephard Wesnitzer, Inc. is working on behalf of the City of Cottonwood and the Yavapai County Flood Control District to prepare a Drainage Master Plan for the City of Cottonwood. We will be hosting an open house style meeting **at the Cottonwood Recreation Center, 150 S. 6th Street, Cottonwood, AZ 86326** on **August 10, 2017, from 6 p.m. to 8 p.m.**

As part of our work, we would like to gain an understanding of storm drainage related problems that you may have experienced in the immediate vicinity of your property. Shephard Wesnitzer, Inc. respectfully asks that you complete this brief questionnaire so that we may gain an insight to the drainage related problems you may have experienced.

PROPERTY OWNER NAME: Cottonwood Ditch Association

PROPERTY ADDRESS: P.O. Box 445 Cottonwood, AZ 86326

ASSESSOR'S PARCEL NUMBER: Cottonwood Ditch Association Service Area

EMAIL ADDRESS: wdartranch@qwestoffice.net

PHONE NUMBER: 928-634-7872/928-634-4333

☐Y ☐ N Has your property experienced a storm drainage related problem that resulted in damage to the interior of your home?

☐Y ☐ N Has your property experienced a storm drainage related problem that resulted in damage to the landscaping associated with your home?

☐Y ☐ N Have you contacted the City of Cottonwood or the Yavapai County Flood Control District regarding a storm drainage related problem on your property?

☐Y ☐ N If your property is located along and adjacent to an existing natural watercourse, have you experienced erosion on your property associated with storm flows in this watercourse?

Please provide any additional comments that you may have regarding storm drainage concerns in the immediate vicinity of your property. (Please use back or additional sheets if more space is needed)

PLEASE SEE ATTACHED SHEET

City of Cottonwood Drainage Master Plan Meeting
August 10, 2017

The Cottonwood Ditch Association (CDA) has been in existence since December 10, 1877 providing irrigation water to farmers and ranchers and other Shareholders in its service area in Cottonwood and Bridgeport areas. The vast majority of the CDA canal system is directly within or adjacent to the municipal boundary of the City of Cottonwood.

Over the decades, Cottonwood, Bridgeport and the surrounding areas have grown immeasurably. With all of the growth in the Cottonwood area, this has caused increased storm water runoff off from developed properties, including shopping centers, other retail/ commercial centers, residential developments, etc. This has caused severe storm water drainage issues with the CDA, causing much damage (deposits of debris, sand, silt and gravel) to the irrigation ditch.

Because of all of this development, the Cottonwood Ditch Association has become the "catch all" from all of this new additional storm water runoff. The CDA, by default, has become a "storm water flood control business". Up until recent years, most developments did not have to build retention basins for their projects. An example of this is both the Basha's/Food City and Safeway Shopping Centers. All of the runoff from both of these Centers ends up flowing into a wash and/or Cottonwood Street and directly into the Cottonwood Ditch. In addition, several new developments including Cottonwood Square Commons, The Villas on Elm, Crestview and now Ridgecrest Townhomes located east of 12th Street, and accessed off of Skyline Drive west of 16th Street, all have their storm runoff drainage water dump into two (2) separate washes, both of which dump into the Cottonwood Ditch. This is creating an adverse impact not only to the Cottonwood Ditch Association, but also to property owners on S. Mt. Mingus Road, and on the north end of Oasis Road. In addition, the two (2) washes have washed across Mt. Mingus Road numerous times in the last 30 days causing severe wash outs and damaging the sewer manhole cover on Mt. Mingus Road.

The CDA has adversely taken on the roll as the main drainage outlet for many areas of the City's drainage system. Over the last few decades an increase in impervious surfaces (pavements, etc.) with a lack of properly engineered drainage facility requirements, along with new drainage facilities installed in areas of the City have caused a giant increase in unwanted excessive storm water discharges directly draining into CDA facilities. CDA facilities are not designed or constructed to accommodate municipal storm water discharge.

The City's excessive storm water discharge has caused several adverse issues to the CDA:

1) An increase in CDA liability due to potential flooding of properties along the CDA canal;
2) An increase in CDA costs due to excessive monitoring and maintenance of the CDA canal;
3) An increase in contaminant loads in the CDA canal which results in potential contamination hazards on adjacent properties receiving CDA water;

4) An increase in contaminant loads through CDA facilities ultimately return flows into the Verde River which is a great threat to contributing to water quality impairment.

Therefore, the City needs to directly work with the CDA in its Drainage Master Plan. Simply holding a meeting to hear CDA's concerns is not enough. If the City's storm water discharge is not addressed in both the planning aspect through the Drainage Master Plan and through physical on the ground corrections to drainage facilities, the previously described adverse issues will continue to harm the CDA, its Shareholders and adjacent property owners and the Verde River.

Action may be required to consider the formation of a storm water drainage district in the Cottonwood area. This ultimately is going to come to the need of additional funds for increased liability, increased monitoring and maintenance of the existing CDA canal system and ultimately newly designed and installed infrastructure to handle the increase of the City's storm water discharge(s).

We have attempted to list several different locations in the City of Cottonwood where the CDA is receiving storm water drainage runoff in extreme quantities that is damaging the Cottonwood Ditch:

Washes that collect storm water runoff from developed areas:

1) Wash running under Highway 260 by CVS (south side of CVS Drug Store), Home Depot developments running directly into the Cottonwood Ditch.

2) Wash coming from the area of Cottonwood Square Commons, The Villas on Elm, Crestview, and Ridgecrest Townhomes, that runs behind the Food City and Safeway Shopping Centers. This wash is creating severe flooding and erosion issues on APN No. 406-04-264 and dumps directly into the Cottonwood Ditch. (See attached map)

3) The Safeway Shopping Center creates substantial runoff which runs into the wash (same as identified in No. 2 above) and also onto east Cottonwood Street, which dumps directly into the Cottonwood Ditch at the CDA Bridge on east Cottonwood Street. (See attached map)

4) Wash that drains developments along Main Street that runs on the east side of Main Street between 17th and 18th Streets and crosses (low water crossing) at 125 S. 18th Street directly into the Cottonwood Ditch.

5) Bar ditch that runs along the east side of north 16th Street from east Greenlee Street to Franquero Bridge, where all of the water dumps directly into the Cottonwood Ditch.

6) Wash that runs on the east side of the Catholic Social Service building and south of Main Street across the old Siler property (Nackard is the present owner) across Main Street to 7th Street (by Hog Wild Barbecue) and runs down 7th Street directly into the Cottonwood Ditch. Also CDA picks up storm runoff water off of Main Street and 8th Street too.

Attached, please find a map showing the location of the Cottonwood Ditch; and another map showing the flooding issues along east Cottonwood Street and the washes that traverse through the Cove Parkway development.

We are requesting that a meeting be set up between the City Manager, City Engineer, Public Works Director along with the representatives from Shepard Wesnitzer and the Cottonwood Ditch Association to resolve these drainage issues. **The Cottonwood Ditch can no longer receive additional flood water from existing and <u>new</u> developments in the City.**

We also are requesting the Yavapai County Flood Control District be contacted to work with the City of Cottonwood to minimize the existing flood water drainage issues and to require all new developments that no additional runoff can come off of these properties once developed.

If you have any questions and/or to set up a meeting, please contact Andy Groseta, CDA President/Ditch Boss at 928-634-4333-office or 928-300-6621-cell.





E Cottonwood St
WASH COLLECTING CITY STORM WATER DISCHARGE INTO CDA
AREA OF FLOODING / EROSION
Cottonwood Chamber of Commerce
Cottonwood Auto Sales
Mt Hope Foods Naturally
Little Caesars Pizza
Flowers Unlimited
Cottonwood Lodge
Valvoline Instant Oil Change
Blimpie
Cove Pkwy

CITY OF COTTONWOOD DRAINAGE MASTER PLAN

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PROPERTY OWNER NAME: Groseta Ranches LLC (Andy and Mary Beth Groseta)

PROPERTY ADDRESS: 625 S. Mt. Mingus Road

ASSESSOR'S PARCEL NUMBER: 406-04-032B, 406-04-031Z

EMAIL ADDRESS: wdartranch@qwestoffice.net

PHONE NUMBER: 928-634-7872 (ranch); 928-634-4333 (office)

☐ Y ☒ N Has your property experienced a storm drainage related problem that resulted in damage to the interior of your home?

☐ Y ☒ N Has your property experienced a storm drainage related problem that resulted in damage to the landscaping associated with your home?

☒ Y ☐ N Have you contacted the City of Cottonwood or the Yavapai County Flood Control District regarding a storm drainage related problem on your property?

☐ Y ☒ N If your property is located along and adjacent to an existing natural watercourse, have you experienced erosion on your property associated with storm flows in this watercourse?

Please provide any additional comments that you may have regarding storm drainage concerns in the immediate vicinity of your property. (Please use back or additional sheets if more space is needed)

SEE ATTACHED SHEET

City of Cottonwood Drainage Master Plan Meeting
August 10, 2017

I. The City of Cottonwood in July, 2017 installed sidewalks on both sides of east Cottonwood Street adjacent to Sawmill Square (Safeway) Shopping Center. In addition, a drainage ditch & culverts were built and placed on the north side of Cottonwood Street from Sawmill Road to Sawmill Cove Road at the entrance of Sawmill Gardens Townhome Development. At that point, all of the drainage surface water that is now being collected in the new drainage ditch is now dumped directly onto Cottonwood Street flowing down the street and causing severe flooding issues on east Cottonwood Street to where it becomes a gravel road and also on the gravel road crossing the Cottonwood Ditch. We have never experienced the excess storm water runoff (drainage) issues on east Cottonwood Street until after the City of Cottonwood completed its new drainage ditch and sidewalk project on the north side of Cottonwood Street. During the summer rains (7") that occurred in July of this year, it severely eroded Cottonwood Street which never has occurred in the past. It has wasted away all of the surfacing on the gravel roadway and has started to erode into a small ditch in the center of the roadway. In addition, all of this water runs down east Cottonwood Street into the Cottonwood Ditch; and now across the CDA Bridge because of the excess water. Now because of the additional water that is collected, it crosses the roadway across the bridge and floods our property APN No. 406-04-032B located at the SE corner of Mt. Mingus Rd. & Cottonwood Street. **Attached, please find a map of this area**. The City has altered the flow of surface runoff on the North side of Cottonwood Street across from the Safeway Shopping Center. I notified Morgan Scott of the City on August 1, 2017 and again on August 8th and have requested a meeting to resolve this issue. To date we have not heard back for Mr. Scott.
In addition, this additional flood water has created additional drainage issues with the Cottonwood Ditch Association. Before the new drainage ditch was built on the north side of Cottonwood Street, the rain fall would just percolate into the soil and any runoff would run off into the property owner's property, and very little of it ever ran onto Cottonwood Street.

The Sawmill Village Shopping Center was built in 1978, with no retention ponds. All of the surface water runoff from the Center from rains runs off along Cottonwood Street and into the Ditch. The Ditch company by default is now in the flood control business.

Now, on the north side of Cottonwood Street, the **City of Cottonwood has increased flow of surface runoff water**, not only adversely impacting the Cottonwood Ditch, but also all of the property owners who live east of Sawmill Gardens on Cottonwood Street including those whose properties are located east of the Cottonwood Ditch and the road that they travel on.

We request that the City resolve this matter immediately, as the **City has created this problem and is liable for increasing and changing the flow** of surface water runoff off of the properties located on the north side of Cottonwood Street onto the street and then easterly down to the Cottonwood Ditch and across the CDA Bridge to properties located on the east side of Mt. Mingus Road.

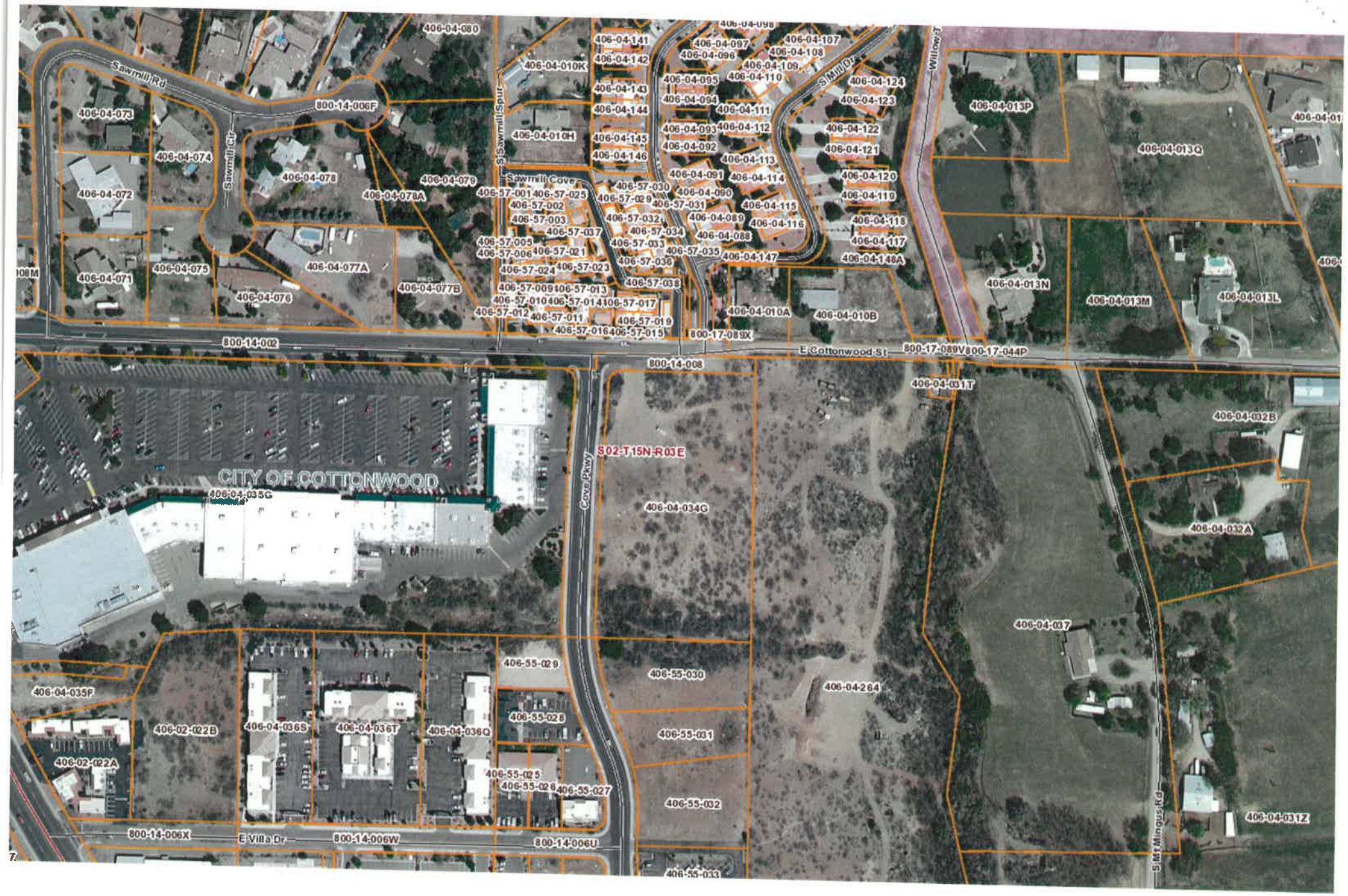
II. Another surface water drainage problem that has also has increased water flows in the last few years is the wash that runs by the Mt. Hope property, and across Cove Parkway over the Cottonwood Ditch and runs down Mt. Mingus Road and then onto our property (APN: 406-04-031Z) down to the Verde River.

Almost every time this wash runs water onto Mt. Mingus Road, it erodes the soil away around the sewer manhole cover which sometimes is left sticking 4"-6" exposed above the road surface. It is in that condition presently and needs to be fixed. The road is severely eroded and is barely passable.

In the last 30 days, this wash has run 3-4 times with floodwater running down Mt. Mingus Road towards our corrals and barn, which it never has done before. The bottom line is that this wash is collecting more surface water runoff and has exceeded its capacity. It now has caused severe road and property erosion issues; and as it progresses towards the river. It is causing an adverse impact to our property and to Mt. Mingus Road. This issue needs to be resolved immediately.



WASH COLLECTING CITY STORM WATER DISCHARGE INTO CDA
AREA OF FLOODING / EROSION
AREA OF FLOODING / EROSION
WASH COLLECTING CITY STORM WATER DISCHARGE INTO CDA
E Cottonwood St
E Villa Dr
Cottonwood Auto Sales
Mt Hope Fellowship Naturally
Little Caesars Pizza
Flowers Unlimited
Cottonwood Chamber of Commerce
Cove Pkwy
Cottonwood Lodge
Cottonwood AZ
Verde Valley Extended Stay
Verde Valley Extended Stay
Verde Valley Apartments


Sawmill Rd
Sawmill Cir
S Sawmill Spur
Sawmill Cove
S Mill Dr
Willow Ln
E Cottonwood St
Cove Pkwy
E Villa Dr
S Mt Mingus Rd
CITY OF COTTONWOOD
S02-T15N-R03E
800-14-002
800-14-006F
800-14-008
800-14-006X
800-14-006W
800-14-006U
800-17-089X
800-17-089V
800-17-044P
406-04-080
406-04-073
406-04-074
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406-57-015

PRIVATE DRAINAGE ISSUES (2015)

COMPLAINT DATE	NAME	PHONE	APN	TYPE	ADDRESS	COMPLAINT	STATUS	CLOSED DATE	ACTION
5/30/2014	Tom Carley	928-649-9614	406-50-455	Residential	1118 S Ironwood Cir	Ditch filled in and doesn't want his property to be flooded.	Closed	12/5/2014	Ditch cleared.
7/9/2014	Russel Powell	928-300-5607	406-05-109A	Residential	1124 S 6th St	Pea gravel from alley is washing into the drainage ditch on his property.	Open		Field verify. If not then work order to clean-up vegetation. Not much we can do about the pea gravel, except remove and replace with millings or hydroseed.
7/10/2014	Art Durazo	928-639-2560	800-14-008R	Clarkdale	Broadway-Main Drainage Swale	Sediment from swale is draining into curb and gutter along Main and proceeding into Clarkdale city limits along Broadway.	Open		Field visit after check dams are installed
7/15/2014	Mark Pearson	928-301-3629	Multiple	Residential	270 S. 6th Pl	Runoff from upstream of his property is causing his dirt/gravel driveway to be washed into the street.	Closed	9/12/2014	Ditch has been mucked out, vegetation trimmed, and breaches repaired. More permanent solution to be designed.
7/21/2014	Mary Sanders	928-639-0681	406-50-292 & 406-50-294	Residential	1131 S Ocotillo Dr & 1121 S Ocotillo Dr	Drainage ditch has been filled in by neighbors causing flooding into their property.	Closed	11/3/2014	Ditch re-opened by City crews.
7/21/2014	Kelly Larkin	928-202-5157	406-50-477	Residential	1108 Ridge Circle	Rocks in drainage ditch	Closed	8/12/2014	Drainage channel seems to perform satisfactorily at this time. Drainage in this area needs to be studied.
7/25/2014	Mary Arkush	928-639-1234	406-42-185D	Jerona Java Café	667 E Mingus Ave	Culverts going into the channel are getting filled up and scour downstream of culverts.	Closed	11/3/2014	Detention basin upstream opened up, breach areas repaired and berms built up.
8/11/2014	Robert Crannel	928-300-9535	406-50-335	Residential	521 W Mesquite Dr	Culvert is plugged	Open		Submitted work order. Follow-up
8/11/2014	Didi Chambers	928-634-8988	406-45-110L	Residential	565 N 16th St	Drainage from road is entering her driveway and making a mess.	Open		Street wide solution
8/15/2014	Annette Larsen	928-634-8588	406-06-038	Residential	804 S 5th St	Culvert is blocked	Closed	9/1/2014	Culvert cleared
8/18/2014	Cindy Smith	928-634-8033	406-56-058 & 406-42-177	Residential	39 Brian Mickelsen Pkwy	Ditch from pool to Mingus Ave has breached and cause flooding down by library.	Closed	9/4/2014	Drainage ditch was cleared and graded to drain.
8/19/2014	Kathy Watson	928-282-3986	406-30-049	Residential	750 W Ocotillo St	The runoff from her neighbors property is ruining the landscaping on her property.	Closed	9/1/2014	This is a private matter.
8/25/2014	Wayne Latham	928-300-3437	406-38-131A	Residential	701 N 8th St	Drainage from last storm entered property and got to the step threshold.	Closed	12/22/2014	Recommend sand bags or berm until a street wide solution can be initiated.
8/26/2014	James & Josephine Hayes	928-634-8962	406-05-124	Residential	1033 S 5th St	Drainage complaint that runoff from road is flooding her driveway. House and driveway are lower than the road.	Closed	9/4/2014	City crews regraded the shoulder to improve the drainage.
9/3/2014	Heather McCullum	928-301-3566	406-32-018H	Residential	405 N Apsco Ln	Ditch beside is filled up with sediment	Closed	9/17/2014	Private matter - ditch is in private property
9/4/2014	Gary Wilsher	905-852-6033	406-22-255C	Carefree Assisted Living	22 S 7th St	Berm is breached on west side of property causing flooding and sheet flow from vacant property on south flooding parking lot.	Open		Private matter - told him to talk with Mary Arksuh about the berm. Call him about the other drainage issue.
9/16/2014	Doug Nurnberg	928-649-1538	406-38-084	Greenbriar Mobile Home Park	727 N Main St	Two mobile home units are repeatedly flooded	Open		The alley is not for drainage. Recommend the manager make a channel across property to redirect the flow. Pre-FIRM structures. Follow-up
9/16/2014	Bob Hall	928-300-6699	406-42-097N	Aspen Mini Storage	751 E Aspen	Ministorage got flooded during past rain events	Open		Follow-up
9/16/2014	Roy Strickland	300-5054	406-42-106A	Yes the Arc	417 S Willard	Flooding of parking lot from street runoff	Open		Design drainage improvements. Work order to install ditch and culverts in ROW.
10/6/2014	Bill	n/a	406-01-018	Residential	1719 E Cherry St	Rut in front of house	Closed	10/7/2014	City crews filled it in
10/7/2014	Sherry Twamley & Anna Sales	928-639-1666	406-32-071	Residential	302 N Organ Pipe	Street runoff from Apsco Ln causing house flooding.	Closed	10/17/2014	Street wide solution
10/15/2014	Barbara Bradford	603-661-2060	406-50-468	Residential	1022 Monte Tesoro	Ponding in front of house	Closed	2/6/2015	City crews re-installed the driveway culvert.
10/25/2014	Blair Ashton	928-634-2001	406-04-053E	Cottonwood Super Storage	1800 E Fir St	Drainage issues and want to clear/grub in the floodplain	Closed	11/26/2014	Floodplain Development Permit is required. Watch for activity without a permit. Driveway on south side accepts drainage from Fir St. Ditch on west side of property could use some maintenance.
12/5/2014	John Powell	928-300-9996	406-06-053	Residential	959 S 4th St	Flooding in yard	Closed	2/19/2015	City crews installed a berm.
1/5/2015	Mark Philpot	815-978-5295	406-57-038	Residential	Sawmill Cove	Grates in block wall could cause flooding	Closed	2/17/2015	Private Issue
1/8/2015	Deborah McCormick	512-923-6729	406-38-010A	Residential	760 N Main St	Flooding on property	Open		2/19/15 Meet Jim Paris at site. He agreed to revegetate and fix damaged straw wattles. Get a hold of other private property owner?
1/13/2015	Diane Jeons		406-50-317	Residential	312 W Mesquite Dr	LOMA?	Open		
1/20/2015	Susan Cox	928-300-0234	406-06-554	Residential	742 S 3rd Dr	Erosion issues	Closed	2/19/2015	Field visit. Slope stability will be addressed when garage and front door entrance plans are submitted.

Stokes/Mulcaire wash by Be 406-06-009N

11th street to 12th Street, south of Mingus Ave

STORM/DRAINAGE ISSUE LOG (2017)

	Date	Address	SWI Area (N, C or S)	APN	Complaintant			Owner	City	Issue	Resolution
					Name	phone	email	Name / Phone # email	Staff		
1	7/24/2017	1145 S 8th	C	406-05-022C	Randy Garrison	300-1420	Randy.Garrison@Yavapai.us	STEINERT RYAN & RUBY	Morgan	Unpermitted grading and undersized culvert caused water and mud to back onto 8th Street	
2	7/24/2017	157 S 17th St	C	406-43-044A	Clark Piper	300-9444	plmrclark@gmail.com	Clark Piper	Morgan	water from Main St and from 17th N of property drains into property and near house, also water sits on 17th St for a long amount of time, video in parcel file	
3	7/24/2017	201 E Mingus Ave	Railroad Wash study	406-42-175E	James Brassard	634-4229 ext. 214	jbrassard@capitalseniorliving.net>	James Brassard	Morgan & Robert	water from Railroad wash back waters onto the property	Robert and Morgan met with the owner to explain that backwatering is to be expected, a work order has been placed to relcoate some boulders and to clean some mud out of Railroad wash
4		520 S Yorba Lane	Verde River study	406-04-027T	YORBA ZIRA & HEATHER				David		
5		620 S Yorba Lane	Verde River study	406-04-027S	Duane & Renee Dewey	301-6364	deweysplumbing@commspeed.net		David		
6		1800 E Cottonwood St	S	406-04-077B					David		
7		401 N 16th Street	C	406-45-004F	Verde Valley Sanctuary	634-2511	vvs@sedona.net		Morgan	wanter enters from 16th street throught the gate and into the building	
8	7/27/2017	605 W Ocotillo	N	406-30-057A	Tom Bonomo	634-2916	bonomotom@gmail.com		RW/MS	The wash is cutting away at the road that is built thru it.	
9	8/25/2017	1506 E Birch	C	406-41-031	Robert Sheble	300-3638	sheble1@me.com		RW/MS		R& M met with 8/30
10	8/30/2017	1509 E Birch	C	406-41-042A	Robert Janica	593-9004					R& M met with 8/30
11	8/30/2017	1738 E Cypress	Silver Springs study	406-01-023	Mimi Perkins	634-9589	memi@cableone.net	David Conlin	RW/MS	House flooded from run off water throughout the house - all wood floor - buckled	
12	8/30/2017	472 S Main St	Silver Springs study	406-06-266	Brent Kyte/Pizza Hut Jim Barnhart	520-490-0845 520-404-2040	brentkyte@pizzahutaz.com jimbarnhart@pizzahutaz.com		RW/MS	The wash is clode to taking out the parking lot City was given an easement.	
13	8/30/2017	200 E Cottonwood St	Silver Springs study	406-06-246D	Carol Vreeland	649-0339 399-0859	carvree42@yahoo.com		RW/MS	Culvert is plugged and drainage is extreme, and goes into the house. Asphalt is washing away.	
14	8/30/2017	853 S Main Street	S	406-04-033B	Hank Chakin / Mt. Hope Foods	821-0149	hchaikin@msn.com		RW/MS	issue with drainage of neighboring retention pond	
15	8/24/2017	1435 E Cochise St	C	406-37-014B	Eric Eastwood	862-8362	2016eastwood@gmail.com		RW/MS	culverts have flooded both streets	
16	8/30/2017	574C Sawmill Cove	S		Sari McQuality	282-6200			RW/MS	evicted due to flooding - will email video	SHE WAS EVICTED DUE TO THIS FLOOD,SO WAS NEIGHBOR, SHE HAS PHOTOS OF PLUGGED DRAIN.
17	8/24/2017	1307 E Elm Street	S	406-06-195	Shane Harpet	593-9449	THROUGHTIME67@GMAIL.COM		RW/MS	culvert full of mud, took out his driveway & road	
18	8/24/2017	520 N Organ Pipe St	N	406-30-034	Dan Stephens	634-5475	mdstephens68@gmail.com		RW/MS	culvert is plugged up - he tried to clear	
19	8/24/2017	Candy Ln & Mingus	Del Monte Wash study		Desmond Devois	300-3279			RW/MS	drainage has sides of road caving in	
20	8/24/2017	43 S 11th Street	C	406-40-011	Alice Stattman	634-3607	seetpatootie1212@msn.com		RW/MS	5" to 6" of gravel washed in the road	
21	8/24/2017	2280 Willow Tree Ln	S(County)	406-04-012D	Eric Woolsey	593-9700	eric@commspeed.net		RW/MS	severe flooding to home	was advised by Mayor that it was City's fault - Doug stated city is not paying for damages
22	8/24/2017	East Elm & 16th St	S						RW/MS	wash is completely blocked with mud and debris	
23	8/23/2017	1021 S Vista Grande Dr	S	406-06-383	Cecelia Gordon	634-0526			RW/MS	1011, 1021, 1031 -drainage ditch blocked by weeds	
24	8/15/2017	16th St up to Franquero	C		Polly Swanson	649-6092			RW/MS	Very deep drainage ditch blocked by weeds	
25	8/30/2017	Yucca & Organ Pipe	N				the guys were approached in field		RW/MS	drainage ditch filled with dirt/debris	
26	8/14/2017	1410 E Navajo St	C	406-37-212B	Tim Canning	399-0296	timcann@hotmail.com		RW/MS	drainage ditch filled and flooded property	
27	8/13/2017	N Willard St	Del Monte Wash study	800-14-009U	Amanda Wilbur		awilbur@cottownoodaz.gov		RW/MS	rocks wash in the road just south of Lion's Park	
28	8/24/2017	1759 E Villa Drive	S	406-04-036P	Jennette Heath	639-4685	jheath@hhaccountingcpas.com		RW/MS	retention basin flooded building - Tom Pender advised her that it may be from Big 5's drainage has been diverted to their retension basin which was not the original intent.	
29	8/29/2017	16th & Elm	S	800-14-007G	per Morgan				RW/MS	culvert needs to be cleaned out	
30	8/28/2017	1780 E Birch St	C	406-45-071C	Shane Johnson	821-2818	shane@jpmpropertymgt.com		RW/MS	drainage issue	
31	8/28/2017	19 Beech Street	C	406-39-008	Jim Paris	639-5508	james.paris@nahealth.com		RW/MS	daycare flooded due to drainage issue	
32	8/28/2017	800 E Cherry St	C	406-06-016B	Coleen Gilboy	634-3290	rentals@vvfair.com		RW/MS	Drain outside the fence by the road - issue	
33	8/25/2017	Sawmill Cove HOA	S		Mary De Vries	634-7692	08m37xp@gmail.com		RW/MS	mud coming thru the weep holes and into pkg lot	
34	8/28/2017	780 Cove Parkway	S	406-55-020B	Kelly Kathcart	301-8043/634-3030	per Morgan		RW/MS		
36	8/28/2017	1024 N 2nd Street	N	406-34-017	Amber Massaro	274-4348/634-9780	egagles1579@centurylink.net		RW/MS	mud is always washed in street from drainage	
37	8/28/2017	Aspen & 18th St	C		Dan Sullivan	300-5919	no email		RW/MS	gravel & dirt in low water crossing and filling up	
38	8/28/2017	725 Skyline Dr	S		Marie Escott	505-417-4035		Emily 562-652-6330	RW/MS	gravel & dirt washed over sidewalks from drainage	
39	8/30/2017	114 S 10th Place	C	406-40-061	Nellie Cavender	300-9881	no email		RW/MS	culvert is filled and holds water and weeds mosquitos are horrible	
40	8/30/2017	806 S 5th St	Silver Springs study	406-06-037	Sheila Van Rixel	414-852-2221	svanrixel52@gamil.com		RW/MS	overflow issues washing away driveway	
41	8/31/2017	2185 W Trail Blazer	Del Monte Wash study	406-60-501	Sandra Steele	649-9888	desertdwellers@cableone.net			Debris in street from storms	
42	8/28/2017	539 S Sawmill Gardens Dr	S	406-04-095	Alberto Salas	282-2932/399-9455	alberto.salas@wellsfargo.com		RW/MS	Meeting Thurs 8 am 8/31- water is funneling in	
43	8/31/2017	520 s Sawmill Gardens Dr	S	406-04-141	Randy Osborn	701-238-2059			RW/MS		
44	8/31/2017	588 Sawmill Cove Unit A	S	406-57-018	Mary Steiger	928-779-6051			RW/MS		
45	8/31/2017	586 Sawmill Cove	S	406-57-015	George Nassar	639-0001	georgehjsn@gmail.com		RW/MS		
46	8/31/2017	1750 E Parada Del Sol	Oak Wash Study	406-59-270	Bob Rauen	503-510-4041/503-881-2837	rauen9733@gmail.com		RW/MS		
47	9/5/2017	406 S 17th Street	C	406-01-001	Ryan Piper	928-862-6161	rjpiper83@gmail.com		RW/MS	Drainage issues that almost took out his fence	
48	9/6/2017	785 E Elm St	S	406-05-056	Duane Lovegrove	634-6414	irmalovegrove@yahoo.com			Drainage issues in the easement in front of house	
49	9/6/2017				Maureen Jackson		maureen.jackson68@yahoo.com			per Morgan's email 9/6/2017 7:40 am	
50	9/11/2017	2003 E Rodeo Dr	Rio Mesa Study	406-12-027P	Darryl Spinks	479-204-2603	darryl.spinks@walmart.com			storm washed Larry Green hillside on to SR 260	
51	9/19/2017	150 S 17th Street	C	406-43-027A	Richard Copeland	928-567-5315	rcopeland@verdesolair.com	Richard Copeland	Morgan	Water from Aspen Street comes onto property and into the house	
52	9/26/2017	1415 E Birch St	C		Bob Parker	928-963-4126	no email		RW	Rains 6-7 weeks ago - @ end of Dirt Alley	
53	10/2/2017	1049 S Monte Tesoro	S	406-50-217	Randy & Nancy Elmer	300-1120	egs4171@gmail.com				
54	2015	1133 N Main	N	406-23-031	Randy Garrisson/ Nancy Burnett				Morgan	edge of road gets washed out several times a year	curb and gutter or storm drain
55											
56											

STORM/DRAINAGE ISSUE LOG (2018)

	Date	Address	SWI Area (N, C or S)	APN	Complaintant			Owner	City	Issue	Resolution
					Name	phone	email	Name / Phone # email	Staff		
1	1/9/2018	831 E Mingus Ave	Railroad Wash Study	406-42-179B	Mike Robertson	274-9219				culvert needs to be cleaned out	
2	1/16/2018	1317 E Five Starr Blvd.	S		Levi	623-225-0470				sidewalk and curb are being eaten away by drainage	
3	1/17/2018	S Camino Real	N/A							next to recycling bins - asphault is chipping off - no drainage	
4	3/12/2018	1111 E Cochise St	Railroad Wash Study	406-42-060	Gloria Warner	592-3774				added ab mix & asphalt to fill in dip by road - no drainage	
5	4/4/2018	31 S 17th Street & Aspen	C	406-43-037C	Steve Snow	274-2452				poor drainage has cause potholes and gravel to cross road	
6	6/6/2018	1044 N Main St - Alley	N	406-22-037	per Robert					pavement at the end of the alley is eroding from storm run off	ab mix with concrete
7	7/3/2018	S Drainage ditch Mingus Ave	Railroad Wash Study	800-14-012N						water pools up - ditch needs to be cleaned	
8	7/12/2018	1402 E Navajo St	C	406-37-243	Andrew Rittorno	399-1610				culvert in ROW needs to be deepend - run off goes into his house	ditch was dug as deep as possible - utilities are underneath
9	7/16/2018	Yuma Street - Old Town	N	800-14-011E	Jason Keller					Dirt road needs to be graded - storm drainage has damaged	
10	7/18/2018	290 Pima Street	Del Monte Wash study	406-34-074	Traci	808-345-7192				debris is building up in the wash next to her house	
11	8/2/2018	1780 E Birch St	C		Nancy Reed	451-5410				resident requested the drainage ditch be cleaned out as water is flooding their apt.	8/13/18 - redifined storm drainage ditch.
12	8/2/2018	595 E Cherry St	C	406-42-105N	COC					sw corner - sidewalked washed out underneath	restored dirt and washed out area
13	8/6/2018	826 N 7th Street	Verde River study	406-38-096	Wanda Scholz	928-699-6256				weeds and grass are clogging drainage ditch	weed eated, raked up clippings.
14	8/13/2018	Vista Grande Dr	S							storm ditch full of weeds - Behind 1011, 1021 & 1031 Vista Grande Dr	weed eated, raked up clippings.
15	8/21/2018	416 E Cottonwood Dr	Silver Springs study	406-06-143	Judy Belden	634-8929				drainage ditch needs to be cleaned out and dug out - the neighbors culvert is blocked and causing flooding.	redifined the drainage ditch on the entire street Cottonwood Dr. & Cottonwood Place
16	8/21/2018	1400 Block of Cochise	C							rocks, dirt and debris wash onto street with every rain	used sidebroom and swept rocks to the shoulder
17	8/22/2018	1202 S Monte Tesoro Dr.	S	406-50-475	Magdelana Hardy	257-6065				ditch in the ROW has filled in and needs to be deepened - weed abatement	cleaned out weeds and ditch - repaired road edge with ABC
18	8/23/2018	817 & 827 S 5th Street	Silver Springs study	406-05-105,104						catch basin needs to be cleaned out - almost flooded neighbors	cleaned out catch basin
19	8/23/2018	814 S 5th Street	Silver Springs study	406-06-038	Annette Larson	634-8588				Culverts are blocked and causing damage	cleaned culvert
20	8/15/2018	1410 E Navajo - ally way	C	800-14-003L	Timothy	399-0296				Clean out ally - weeds are causing drainage issues	weed eated alley way
21	8/26/2018	820 E State Route 89A	Silver Springs study	406-06-015A	Jeff Seitz	928-567-3346				Drainage issue with wash - SC Fuels location	this street is located on private property - causing flooding
22	8/26/2018	Oriley parking lot	S	406-04-041C		634-0542				Every heavy rain - the parking lot floods	
23	9/12/2018	306 N Organ Pipe	N	406-32-072	Bobbi Moore	300-6448				ditch is not draining, causing damage	area is a utility easement - not a ROW, was referred back to Robert
24	10/1/2018	16th St & Ridgeview	S							drainage grate completely blocked - will flood 7 homes	cleaned out grate
25	9/19/2018	776 S 6th Street	Silver Springs study	406-06-249C	Steve Kuntz		slaaco@hotmail.com			culvert has collapsed and causing flooding	
26											
27											

STORM/DRAINAGE ISSUE LOG (2019)

	Date	Address	SWI Study Area (N , C or S)	APN	Complaintant			Owner	City Staff	Issue	Resolution
					Name	phone	email	Name/Phone # email			
1	9.3.19	Kindra Hghts Subdivision	N		Phil Terbell	300-2252				stated there was 6" of mud run off in the subdivision	
2	9.3.19	416 E Cottonwood St	Silver Springs study	406-06-143	Judith Belden	634-8929				this is the 3rd year in a row her house was flooded	
3	9.3.19	1435 E Cochise St	C	406-37-014B	Eric Eastwood	862-8362		Jesus & Rebecca Vrizuela			
4	9.3.19	1022 S Viejo Dr	Silver Springs study	406-50-290	Evelyn Couturier	634-0366				Culvert is clogged - large drainage ditch overflowing	
5	9.3.19	930 S 6th Street	S	406-05-089	Shirley Moore	649-1292				sinkhole 5' x 2' - drainage ditch to south flooded yard	
6	9.3.19	106 W Mesquite	Silver Springs study	406-50-310	Tracy Voytec	402-746-0686				drainage ditch along her road is blocked	
7	9.3.19	E Elm & 16th St	S	800-14-007D	COC					drain grated needs to be cleared out - erosion is going into Crestview	
8	9.3.19	950 S Camino Real	S	406-04-046H	Cottonwood Cool Storage	928-890-4455		Annie		culverts backed up - starting to flood property	
9	9.3.19	1119 Ochoa Drive	S	406-50-458	Patrice Romer	634-5606				her gravel washed into street	
10	9.3.19	400 Kindra Heights Rd	N	406-23-034	Mrs. Renner	634-7738				Her driveway was washed out due to construction above her property	
11	9.3.19	859 S 3rd St	Silver Springs study	406-06-185	Julie Bower	832-541-6546				Drainage was clogged - almost flooded house	
12	9.4.19	325 W Yuma Street	N	800-14-008S	Michael Hampton	856-534-0302		COC		COC ROW Road - gets washed out with every good rain storm	
13	9.4.19	1012 N 3rd Street	Del Monte Wash study	406-34-024A	Suan Pierce	277-4411				A lot of debris after water ran thru the street	
14	9.4.19	18th & Aspen Street	C	800-14-004C	Resident - voicemail	300-5919				A lot of debris after water ran thru the street	
15	9.4.19	251 Cottonwood Street	Silver Springs study	406-06-290H	Mobile Home Park					A lot of debris after water ran thru the street	
16	9.4.19	200 E Cottonwood Street	Silver Springs study	406-06-246D	Carol Vreeland	649-0339				Storm washed out culvert	9/6/19 - placed ABC back and cleaned up. Javi & dave
17	9.4.19	615 W Mesquite Dr	Silver Springs study	406-50-333	Samantha McKay	480-599-9389				culverts plugged debris in the street	
18	9.5.19	865 N 16th Street	C	406-45-108	Adam Day	602-363-5312		800-14-003L - COC		culverts on 16th have been wide/deepened except last 2 properties on NE side - water took out 4' of driveway	9/13/19 - mixed concrete - fixed drive - dave, javi, alec
19	9.10.19	15 S 11th Street	C	406-42-080	Linda Sibert	301-3203				parking lot across the street is draining and flooding her home, yard, garage	
20	9.10.19	942 S 5th Street	S	406--06-050	Tony Velasquez	821-5579				Culvert plugged on Elm St., low dip in alley causes flooding in house	
21	9.10.19	1707 Sawmill Road	S	406-04-072	Mark Fisher	702-498-2370		Terry Fisher - Father		water from Credit Union Drainage floods these properties as well: 406-04-071, 406-04-075	
22	9.10.19	660 E Aspen Street	C	406-42-144	Barry Lay	808-285-4829				He has flooding inside his building from bad drainage	
23	9.11.19	942 S 5th Street	S	406-06-050	Tony Velasquez	821-5579				Culvert is plugged on Elm, creates a low dip in alley that floods his home	
24	9.12.19	709 W Mesquite Drive	Silver Springs study	406-50-331	Nannette Wear	574-606-7784				stated the culvert is plugged at the end of her driveway.	
25	9.12.19	1800 E Fir Street	Oak Wash study	406-04-053E	Cottonwood Super Storage	634-2001				gravel in ROW is being washed into driveway on to property	
26	9.17.19	1702 E Birch Street	C		Frances Pollock	634-8903				The road is washed out along her property and large potholes in driveway	
27	9.26.19	686 E Date Street	Silver Springs study	406-06-291	John Wilson	301-9855		Sonia Mineer		There is no drainage culverts, 2 streets drain into his driveway	
28											
29											
30											
31											
32											
33											
34											

Appendix 3: Drainage Structure Inventory

PLOTTED: Jun 29, 2017-9:46am

STORM DRAIN INDEX MAP #1

COORDINATE SYSTEM DETAILS

LINEAR UNIT: INTERNATIONAL FOOT
GEODETIC DATUM: NAD83 (2011)
VERTICAL DATUM: NAVD 88 (SEE BELOW)
SYSTEM: SPCS 83
ZONE: ARIZONA CENTRAL (0202)

PROJECTION:
TRANSVERSE MERCATOR
LATITUDE OF GRID ORIGIN: 31°00'00" N
LONGITUDE OF CENTRAL MERIDIAN: 111°55'00" W
NORTHING AT GRID ORIGIN: 0.00 FT
EASTING AT CENTRAL MERIDIAN: 70000.00 FT
CENTRAL MERIDIAN SCALE FACTOR: 0.9999

ALL MEASURED DISTANCES AND BEARINGS SHOWN HEREON ARE GRID VALUES BASED ON THE PRECEDING PROJECTION DEFINITION. GRID DISTANCES ARE NOT EQUIVALENT TO "GROUND" DISTANCES IN THE PROJECT AREA.

THE BASIS OF BEARINGS IS TRUE GEODETIC NORTH. NOTE THAT THE MEASURED GRID BEARINGS SHOWN HEREON (OR IMPLIED BY GRID COORDINATES) DO NOT EQUAL GEODETIC BEARINGS DUE TO MERIDIAN CONVERGENCE.

ORTHOMETRIC HEIGHTS (ELEVATIONS) WERE TRANSFERRED TO THE SITE FROM NGS POINT "PANORAMA" (NGS PID DH5792) USING GPS WITH NGS GEOID MODEL "GEOID 12A". ELEVATIONS SHOWN HEREON ARE REFERENCED THE PUBLISHED ELEVATION OF THIS STATION.

CONTROL POINTS:

POINT ID	DESCRIPTION	NORTHING	EASTING	ELEVATION
PANORAMA	NGS PID: DH5792	1368390.95	653848.04	3936.56
B 31	NGS PID: ET0839	1342101.21	674189.26	3508.02
R 18	NGS PID: ES0478	1356417.67	680773.08	3367.37

NOTES:

1. ALL REFERENCE DATA UTILIZED IN THIS DOCUMENT INCLUDING PARCEL LINES, FLOOD PLAINS AND CITY BOUNDARIES PROVIDED BY YAVAPAI COUNTY ON JANUARY 17, 2016. SHEPHARD–WESNITZER, INC. AND ARON M. REAY, RLS MAKE NO WARRANTIES TO THE ACCURACY OF THE INFORMATION PROVIDED BY YAVAPAI COUNTY. SEE NOTE 5 FOR EXPLANATION OF FLOOD DATA.

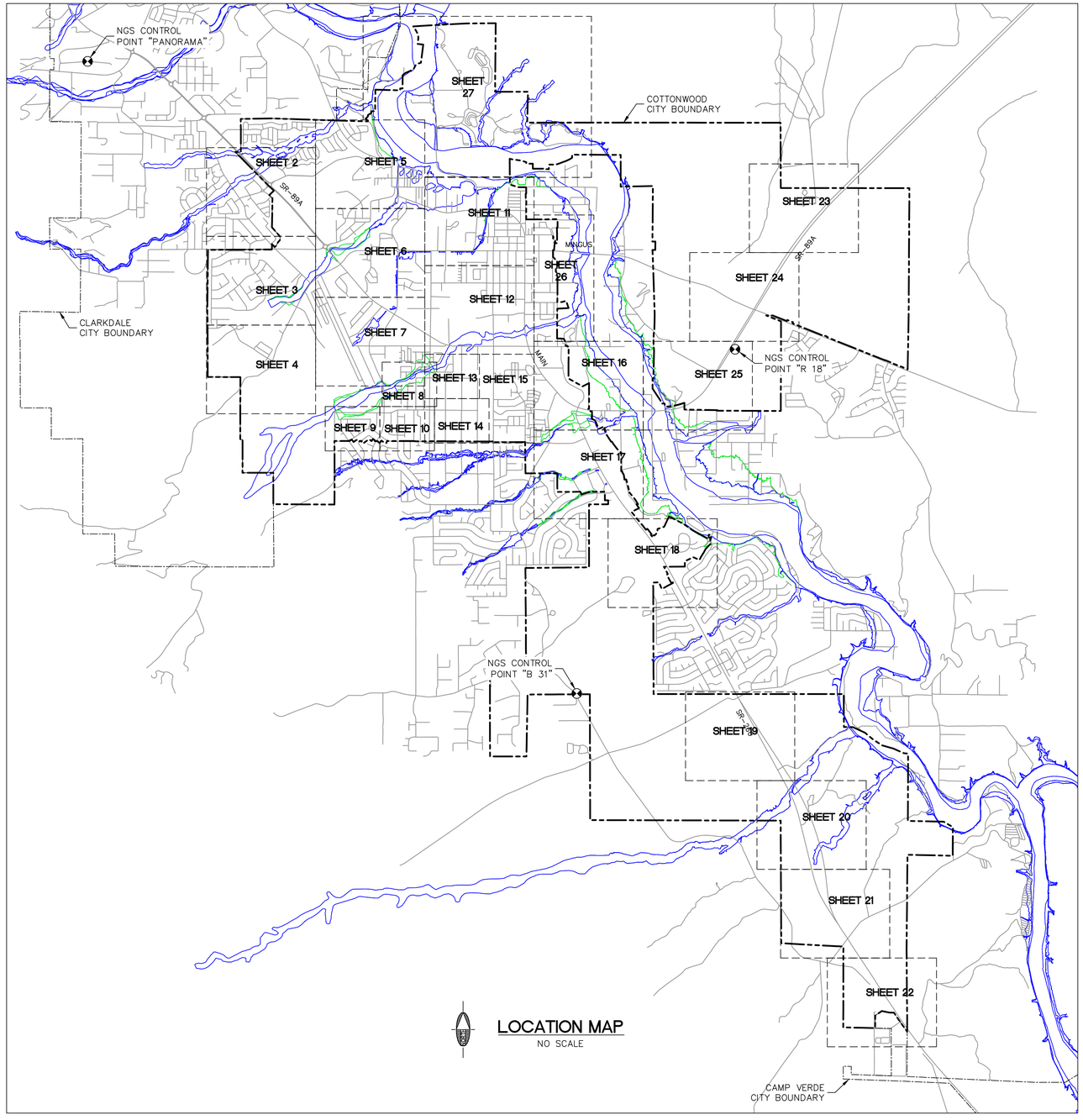
2. SURVEY DATA FOR STORM DRAIN STRUCTURES SHOWN HEREON OBTAINED FROM FIELD SURVEYS CONDUCTED BY SHEPHARD–WESNITZER, INC. COMPLETED IN JUNE 2017.

3. COTTONWOOD IS LOCATED IN THE VERDE RIVER WATERSHED AND THE VERDE RIVER IS THE RECEIVING WATER AS STATED IN THE CITY OF COTTONWOOD STORM WATER MANAGEMENT PROGRAM PREPARED BY WOOD/PATEL DATED JANUARY 30, 2014, OBTAINED FROM THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY.

4. STORM DRAIN PIPES AND STRUCTURES SHOWN HEREON ARE NUMBERED IN THE SAME SEQUENCE. WHERE MULTIPLE PIPES HAVE BEEN INSTALLED PARALLEL, THEY ARE COUNTED AS PART OF THE SAME PIPE RUN. FOR THE PURPOSES OF THIS SURVEY, BOX CULVERTS AND OTHER MISCELLANEOUS STORM WATER CONVEYANCE STRUCTURES HAVE BEEN COUNTED AS PIPES IN THE TABLES SHOWN HEREON.

5. THE Q3 FLOOD DATA ARE DERIVED FROM THE FLOOD INSURANCE RATE MAPS (FIRMS) PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA). THE FILE IS GEOREFERENCED TO THE EARTH'S SURFACE USING THE UNIVERSAL TRANSVERSE MERCATOR (UTM) PROJECTION AND A ZONAL COORDINATE SYSTEM (UNITS IN METERS). SPECIFICATIONS FOR THE HORIZONTAL CONTROL OF Q3 FLOOD DATA FILES ARE CONSISTENT WITH THOSE REQUIRED FOR MAPPING AT A SCALE OF 1:24000. FLOOD HAZARD AREAS FROM YAVAPAI COUNTY BY THE US DEPARTMENT OF AGRICULTURE AND THE NATURAL RESOURCES CONSERVATION SERVICE COMBINED WITH FEMA 1996 DATA.

6. STORM DRAIN PIPES AND STRUCTURES SHOWN HEREON ARE LOCATED WITHIN PUBLIC RIGHTS OF WAY WITHIN THE CITY OF COTTONWOOD MUNICIPAL BOUNDARIES. STORM DRAIN PIPES AND STRUCTURES WITHIN PRIVATE PROPERTIES ARE NOT A PART OF THIS PROJECT AND ARE NOT SHOWN HEREON.



LOCATION MAP
NO SCALE

COTTONWOOD STORM DRAIN SYSTEM SUMMARY

TOTAL STORM DRAIN PIPES	1375
TOTAL STORM DRAIN STRUCTURES	573
TOTAL ITEMS	1948

LEGEND

COTTONWOOD CITY BOUNDARY
STREET CENTER LINE
100 YEAR FLOOD PLAIN (FEMA)
500 YEAR FLOOD PLAIN (FEMA)

CERTIFICATE OF LAND SURVEYOR

I HEREBY STATE THAT THE SURVEY SHOWN HEREON WAS DONE UNDER MY DIRECT SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

ARON M. REAY, RLS 60237

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT

REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN INDEX MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

DRAWING NO.
M1

SHT NO. 1 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-1-COVER.dwg AMR-C3D-17

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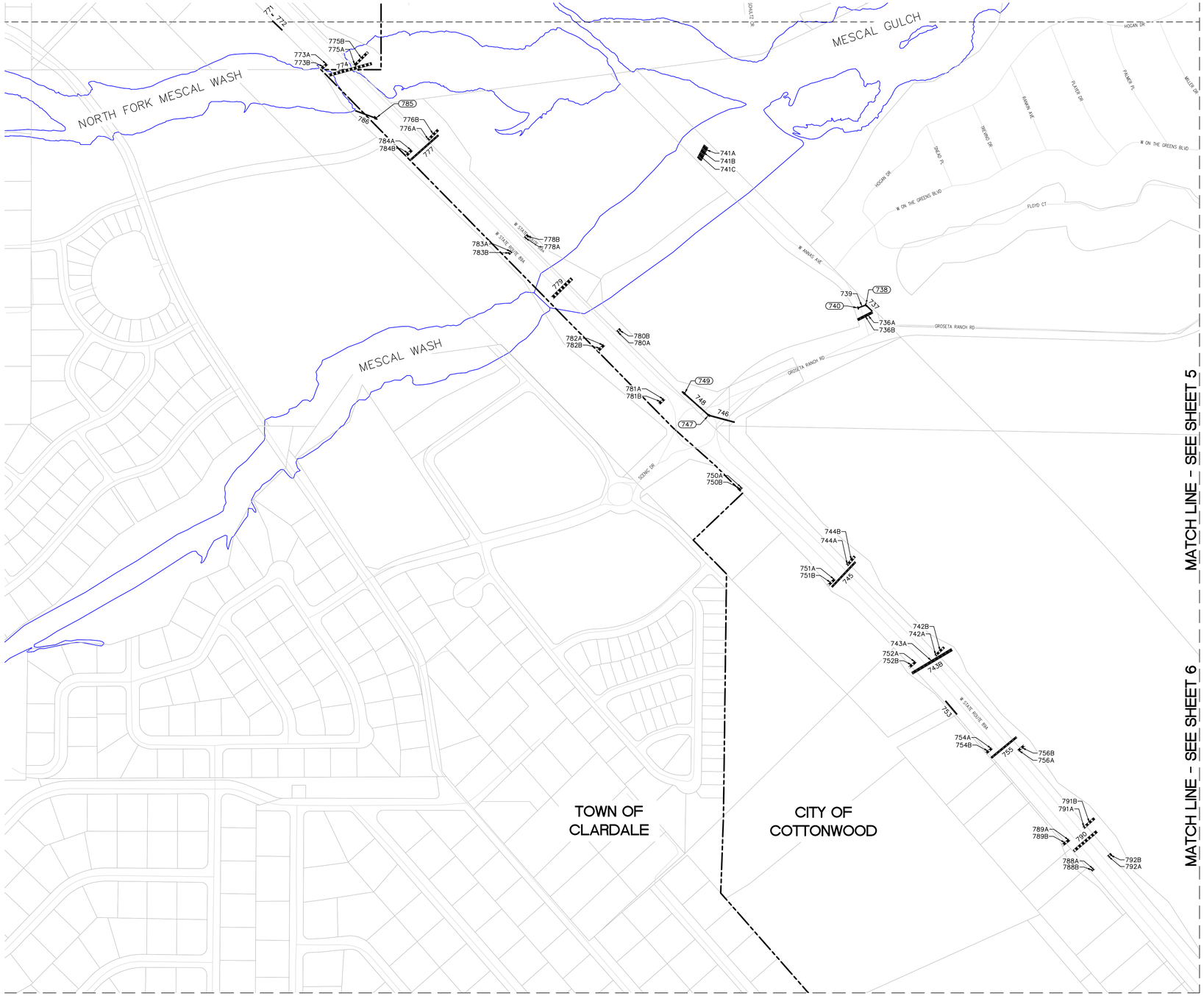
STORM DRAIN MAP #2



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
736A	30"	CMP	3481.19	3480.39
736B	30"	CMP	3481.28	3480.47
737	18"	RCP	3480.91	3480.49
739	18"	RCP	3481.26	3480.98
741A	48"	CMP	3475.03	3473.70
741B	48"	CMP	3475.07	3473.71
741C	48"	CMP	3475.05	3473.65
742A	N/A	6"x96" SIDEWALK SCUPPER	3497.95	3497.62
742B	N/A	6"x96" SPILLWAY	3497.66	3489.79
743A	36"	CMP	3486.69	3481.90
743B	36"	CMP	3486.71	3481.93
744A	N/A	6"x108" SIDEWALK SCUPPER	3505.69	3505.50
744B	N/A	6"x108" SPILLWAY	3505.50	3496.68
745	48"	CMP	3498.04	3495.38
746	24"	CMP	3507.12	3505.49
748	24"	CMP	3507.47	3507.28
750A	N/A	6"x96" SIDEWALK SCUPPER	3511.40	3511.11
750B	N/A	6"x96" SPILLWAY	3511.11	3510.86
751A	N/A	6"x96" SIDEWALK SCUPPER	3505.88	3505.60
751B	N/A	6"x96" SPILLWAY	3505.60	3501.47
752A	N/A	6"x96" SIDEWALK SCUPPER	3498.74	3498.45
752B	N/A	6"x96" SPILLWAY	3498.45	3493.98
753	24"	CMP	3493.50	3493.41
754A	N/A	6"x96" SIDEWALK SCUPPER	3491.79	3491.64
754B	N/A	6"x96" SPILLWAY	3491.64	3488.08
755	60"	CMP	3482.63	3481.19
756A	N/A	6"x96" SIDEWALK SCUPPER	3490.54	3490.26
756B	N/A	6"x96" SPILLWAY	3490.26	3483.96
771	N/A	5"x108" SIDEWALK SCUPPER	3538.22	3538.18
772	24"	CMP	3535.44	3534.69
773A	N/A	6"x108" SIDEWALK SCUPPER	3529.22	3528.99
773B	N/A	6"x108" SPILLWAY	3528.99	3523.78
774	N/A	10'x10' BOX CULVERT	3512.33	3505.43
775A	N/A	6"x108" SIDEWALK SCUPPER	3527.09	3526.73
775B	N/A	6"x108" SPILLWAY	3526.73	3512.17
776A	N/A	6"x108" SIDEWALK SCUPPER	3522.00	3521.67
776B	N/A	6"x108" SPILLWAY	3521.67	3510.42
777	48"	CMP	3512.74	3508.71
778A	N/A	6"x108" SIDEWALK SCUPPER	3519.20	3518.95
778B	N/A	6"x108" SPILLWAY	3518.95	3517.79
779	N/A	12'x10' BOX CULVERT	3504.65	3502.33
780A	N/A	6"x108" SIDEWALK SCUPPER	3516.38	3516.07
780B	N/A	6"x108" SPILLWAY	3516.07	3515.00
781A	N/A	6"x108" SIDEWALK SCUPPER	3513.55	3513.42
781B	N/A	6"x108" SPILLWAY	3513.42	3511.62
782A	N/A	6"x108" SIDEWALK SCUPPER	3516.20	3516.04
782B	N/A	6"x108" SPILLWAY	3516.04	3511.74
783A	N/A	6"x108" SIDEWALK SCUPPER	3519.00	3518.77
783B	N/A	6"x108" SPILLWAY	3518.77	3518.03
784A	N/A	6"x108" SIDEWALK SCUPPER	3522.00	3521.65
784B	N/A	6"x108" SPILLWAY	3521.65	3517.72
786	18"	CMP	3520.45	3518.36
788A	N/A	6"x96" SIDEWALK SCUPPER	3487.37	3487.22
788B	N/A	6"x96" SPILLWAY	3487.22	3486.75
789A	N/A	6"x108" SIDEWALK SCUPPER	3486.94	3486.58
789B	N/A	6"x108" SPILLWAY	3486.58	3481.80
790	N/A	10'x10' BOX CULVERT	3475.53	3472.23
791A	N/A	6"x108" SIDEWALK SCUPPER	3486.46	3486.26
791B	N/A	6"x108" SPILLWAY	3486.26	3475.30
792A	N/A	6"x108" SIDEWALK SCUPPER	3487.22	3487.01
792B	N/A	6"x108" SPILLWAY	3487.01	3485.48

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
738	5'x72" CURB INLET 16'x72" GRATE RIM = 3483.21 INV IN = 3480.23 INV OUT = 3480.16
740	5'x41" CURB INLET 16'x41" GRATE RIM = 3483.84 INV OUT = 3480.51
747	5'x42" CURB INLET 24"x42" GRATE RIM = 3512.52 INV IN = 3506.28 INV OUT = 3506.12
749	5'x96" CURB INLET 24"x41" GRATE RIM = 3513.88 INV OUT = 3506.47
785	5'x132" CURB INLET RIM = 3523.45 INV OUT = 3519.70

SCALE: 1" = 200

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
EXPIRES 9/30/2018

DRAWING NO.
M2

SHT NO. 2 OF 27

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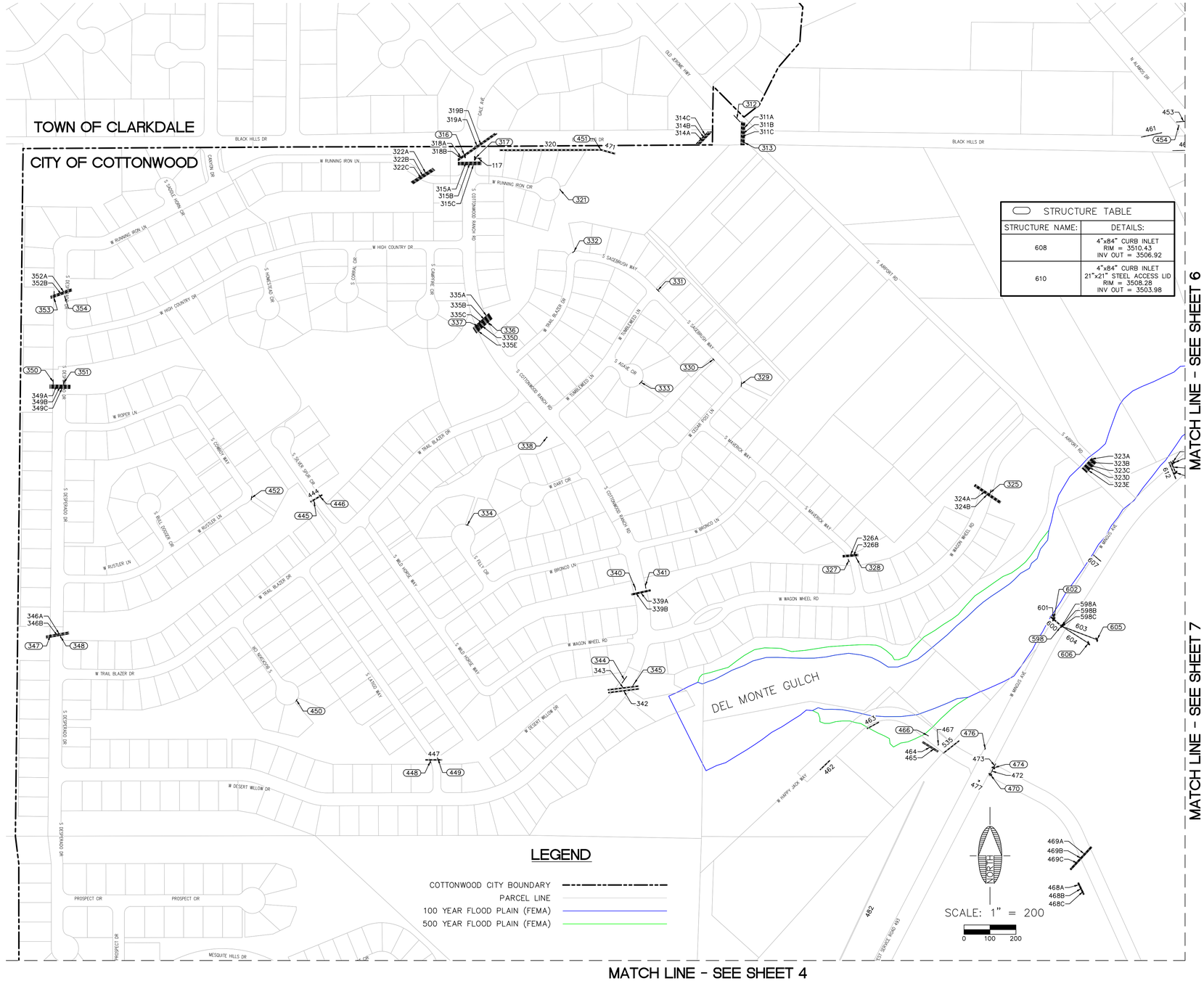
STORM DRAIN MAP #3



MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 7

MATCH LINE - SEE SHEET 4

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
608	4"x84" CURB INLET RIM = 3510.43 INV OUT = 3506.92
610	4"x84" CURB INLET 21"x21" STEEL ACCESS LID RIM = 3508.28 INV OUT = 3503.98

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
312	33' CURB OPENING RIM = 3531.26
313	4"x32" GRATE 12" CMP INTO 311A RIM = 3536.74
316	6"x18' CURB INLET 21"x21" STEEL ACCESS LID RIM = 3573.96 INV IN = 3570.45 INV OUT = 3570.35
317	6"x23' CURB INLET 21"x21" STEEL ACCESS LID RIM = 3571.42 INV OUT = 3562.85
321	48" CURB DEPRESSION RIM = 3561.66
325	24' CURB DEPRESSION RIM = 3531.12
327	8' CURB DEPRESSION RIM = 3553.35
328	8' CURB DEPRESSION RIM = 3553.38
329	15' CURB DEPRESSION RIM = 3556.50
330	7' CURB DEPRESSION RIM = 3557.60
331	12' CURB DEPRESSION RIM = 3558.82
332	8' CURB DEPRESSION RIM = 3563.72
333	15' CURB DEPRESSION RIM = 3568.18
334	7' CURB DEPRESSION RIM = 3599.10
336	20' CURB DEPRESSION RIM = 3580.70
337	20' CURB DEPRESSION RIM = 3580.82
338	30" STEEL GRATE RIM = 3578.57
340	14' CURB DEPRESSION RIM = 3576.70
341	16' CURB DEPRESSION RIM = 3576.85
344	30' CURB DEPRESSION RIM = 3581.24
345	13' CURB DEPRESSION RIM = 3581.12
347	7' CURB DEPRESSION RIM = 3665.18
348	9' CURB DEPRESSION RIM = 3664.99
350	16' CURB DEPRESSION RIM = 3653.78
351	16' CURB DEPRESSION RIM = 3653.67
353	36" CURB DEPRESSION RIM = 3648.66
354	48" CURB DEPRESSION RIM = 3648.59
445	12' CURB DEPRESSION RIM = 3614.32
446	8' CURB DEPRESSION RIM = 3614.34
448	13' CURB DEPRESSION RIM = 3616.70
449	4' CURB DEPRESSION RIM = 3616.83
450	8' CURB DEPRESSION RIM = 3633.47
451	MANHOLE 32" LID RIM = 3555.73 INV IN = 3546.03 INV OUT = 3546.03
452	12' CURB DEPRESSION RIM = 3626.16
454	36" CURB CUT RIM = 3492.19
466	30" CURB DEPRESSION RIM = 3551.83
470	5"x60" CURB INLET 21"x21" STEEL ACCESS LID 18"x42" BACK INLET RIM = 3552.88 INV OUT = 3550.38
474	5"x6' CURB INLET 21"x21" STEEL ACCESS LID RIM = 3552.56 INV IN = 3549.25 INV IN = 3549.04
476	48" CURB DEPRESSION RIM = 3552.03
598	8"x11' CATCH BASIN (BACK SIDE) 26" STEEL MANHOLE RIM = 3536.06 INV IN = 3526.38 INV IN = 3528.89 INV OUT = 3521.76
602	6"x72" CURB INLET 16"x72" GRATE RIM = 3536.03 INV OUT = 3530.07
605	4"x96" CURB INLET 21"x21" STEEL ACCESS LID RIM = 3533.85 INV OUT = 3530.02
606	4"x96" CURB INLET 21"x21" STEEL ACCESS LID RIM = 3533.78 INV OUT = 3529.70

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
117	36"	CMP	3564.35	3572.40
311A	48"	CMP	3528.26	3522.82
311B	48"	CMP	3528.24	3522.75
311C	48"	CMP	3528.23	3522.80
314A	36"	CMP	3535.56	3534.78
314B	36"	CMP	3535.78	3534.76
314C	36"	CMP	3535.97	3534.75
315A	36"	CMP	3566.31	3565.13
315B	36"	CMP	3566.42	3565.04
315C	36"	CMP	3566.17	3565.06
318A	36"	CMP	3567.34	3571.91
318B	36"	CMP	3567.13	3571.95
319A	36"	CMP	3571.80	3563.98
319B	36"	CMP	3571.85	3564.04
320	60"	CMP	3560.23	3548.53
322A	36"	CMP	3574.65	3570.82
322B	36"	CMP	3574.65	3570.82
322C	36"	CMP	3574.65	3570.82
323B	48"	CMP	3504.58	3503.62
323C	48"	CMP	3504.58	3503.62
323D	48"	CMP	3504.58	3503.62
323E	48"	CMP	3504.58	3503.62
324A	48"	CMP	3523.12	3517.48
324B	48"	CMP	3523.12	3517.48
326A	42"	CMP	3548.98	3549.29
326B	42"	CMP	3548.98	3549.29
335A	48"	CMP	3574.88	3572.21
335B	48"	CMP	3574.88	3572.21
335C	48"	CMP	3574.88	3572.21
335D	48"	CMP	3574.88	3572.21
335E	48"	CMP	3574.88	3572.21
339A	30"	CMP	3573.28	3572.82
339B	30"	CMP	3573.28	3572.82
342	48"	CMP	3576.64	3576.12
343	48"	CMP	3576.53	3575.80
346A	48"	CMP	3660.33	3659.69
346B	36"	CMP	3660.33	3659.69
349A	48"	CMP	3648.25	3647.07
349B	48"	CMP	3648.25	3647.07
349C	48"	CMP	3648.25	3647.07
352A	48"	CMP	3643.00	3639.57
352A	48"	CMP	3643.00	3639.57
352B	48"	CMP	3643.00	3639.57
352B	48"	CMP	3643.00	3639.57
444	48"	CMP	3609.57	3608.28
447	42"	CMP	3612.33	3611.59
453	18"	CMP	3490.20	3487.86
460	10"	PVC	3493.68	3491.69
461	18"	CMP	3495.95	3493.55
462	36"	Elliptical CMP	3563.46	3561.59
463	36"	Elliptical CMP	3554.13	3552.32
464	24"	HDPE	3548.98	3546.62
465	24"	HDPE	3548.90	3546.71
467	N/A	6"x24" SIDEWALK SCUPPER	3551.55	3551.52
468A	18"	CMP	3560.12	3559.21
468B	18"	CMP	3560.12	3559.21
468C	18"	CMP	3560.12	3559.21
469A	24"	CMP	3556.67	3553.27
469B	24"	CMP	3556.67	3553.27
469C	24"	CMP	3556.67	3553.27
471	60"	CMP	3548.53	3546.94
472	24"	CMP	3551.38	3550.25
473	24"	CMP	3551.31	3550.04
477	N/A	6"x62" SIDEWALK SCUPPER	3554.94	3554.60
535	36"	CMP	3544.23	3541.18
598A	8"	PVC	3534.83	3534.83
598B	8"	PVC	3534.88	3534.88

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
598C	8"	PVC	3534.88	3534.88
600	48"	CMP	3523.76	3523.14
601	24"	CMP	3531.07	3530.15
603	24"	CMP	3531.02	3527.38
604	18"	CMP	3530.45	3529.64
607	18"	CMP	3523.06	3521.09
609	36"	Elliptical CMP	3508.42	3504.70
611	36"	CMP	3505.48	3504.36
612	36"	Elliptical CMP	3512.04	3504.60

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DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

DRAWING NO.
M3

SHT NO. 3 OF 27

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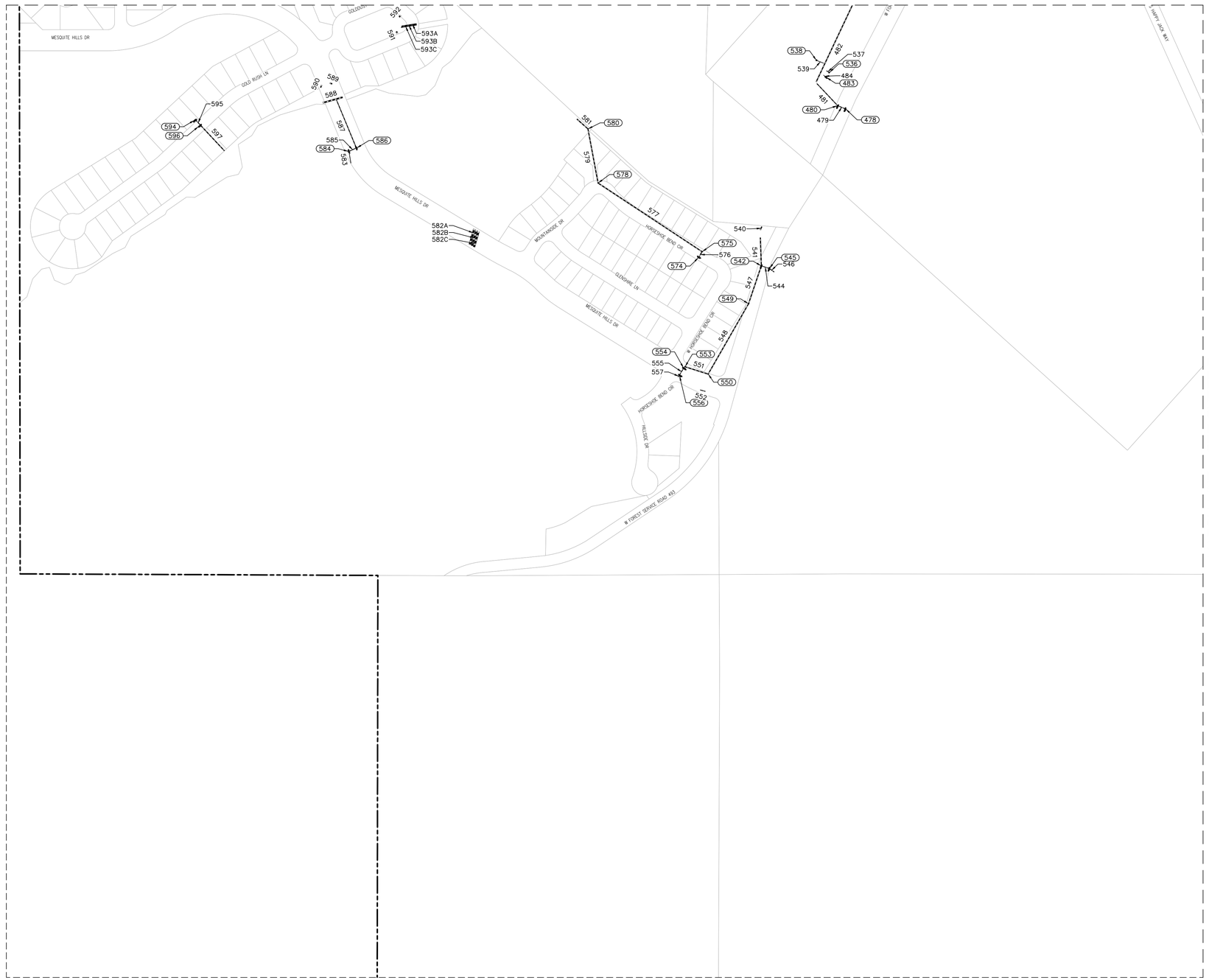
STORM DRAIN MAP #4

MATCH LINE - SEE SHEET 3



MATCH LINE - SEE SHEET 7

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
481	24"	CMP	3596.08	3590.12
482	36"	CMP	3551.14	3588.97
540	36"	CMP	3615.56	3614.93
541	36"	CMP	3625.01	3618.02
546	24"	CMP	3624.52	3624.34
547	36"	CMP	3626.16	3624.11
548	36"	CMP	3629.10	3626.18
551	36"	CMP	3630.29	3629.15
552	18"	CMP	3639.98	3639.53
577	36"	CMP	3622.50	3620.37
579	36"	CMP	3620.18	3619.60
581	36"	CMP	3618.89	3619.24
582A	84"	CMP	3642.86	3639.80
582B	84"	CMP	3642.95	3639.82
582C	84"	CMP	3642.95	3639.98
583	12"	PVC	3636.32	3632.90
585	18"	CMP	3632.90	3632.44
587	24"	CMP	3632.03	3612.55
588	60"	CMP	3629.53	3627.57
589	N/A	6"x42" SIDEWALK SCUPPER	3639.20	3638.83
590	N/A	6"x42" SIDEWALK SCUPPER	3639.18	3638.78
591	N/A	6"x54" SIDEWALK SCUPPER	3624.18	3623.86
592	N/A	6"x54" SIDEWALK SCUPPER	3624.10	3623.72
593A	18"	CMP	3622.31	3621.65
593B	18"	CMP	3622.38	3621.72
593C	18"	CMP	3622.41	3621.67
597	30"	CMP	3655.25	3653.60

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
478	5"x14' CURB INLET 24"x40" STEEL GRATE RIM = 3600.23 INV OUT = 3597.12
480	5"x14' CURB INLET 24"x40" STEEL GRATE RIM = 3600.32 INV IN = 3596.78 INV OUT = 3595.08
483	3"x24" CURB INLET 10"x24" STEEL GRATE RIM = 3595.93 INV IN = 3593.84
536	CATCH BASIN 14"x36" STEEL GRATE RIM = 3591.81 INV OUT = 3589.80
538	CATCH BASIN 28"x36" STEEL GRATE RIM = 3591.45
542	5"x14' CURB INLET 26"x40" STEEL GRATE 24" STEEL LID RIM = 3629.85 INV IN = 3622.61 INV IN = 3623.65 INV OUT = 3623.51
545	5"x14' CURB INLET 26"x40" STEEL GRATE RIM = 3629.84 INV IN = 3623.34 INV OUT = 3623.77
549	MANHOLE 28" STEEL LID RIM = 3633.14 INV IN = 3624.68 INV OUT = 3624.66
550	MANHOLE 28" STEEL GRATE RIM = 3639.41 INV IN = 3627.65 INV OUT = 3627.60
553	MANHOLE 28" STEEL LID RIM = 3637.67
554	5"x14' CURB INLET 24"x40" STEEL GRATE RIM = 3636.84 INV IN = 3629.33
556	5"x14' CURB INLET 24"x40" STEEL GRATE RIM = 3636.88 INV IN = 3630.65 INV OUT = 3630.40
574	5"x40' CURB INLET 26"x72" STEEL GRATE RIM = 3627.50 INV OUT = 3621.36
575	MANHOLE 26" STEEL LID RIM = 3628.17 INV IN = 3621.15 INV OUT = 3621.00
578	MANHOLE 26" STEEL GRATE RIM = 3632.89 INV IN = 3618.87 INV OUT = 3618.68
580	MANHOLE 26" STEEL GRATE RIM = 3624.80 INV IN = 3618.10 INV IN = 3617.74
584	6"x9.5' CURB INLET 28"x42" STEEL GRATE RIM = 3636.18
586	6"x9.5' CURB INLET 28"x42" STEEL GRATE RIM = 3636.15
594	7"x10' CURB INLET 28"x42" STEEL GRATE RIM = 3658.06 INV OUT = 3654.14
596	7"x10' CURB INLET 28"x42" STEEL GRATE RIM = 3658.22 INV IN = 3654.05 INV OUT = 3654.00

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

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JOB NO:	14267
DATE:	JUNE 2017
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DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

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CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

DRAWING NO.
M4

SHT NO. 4 OF 27

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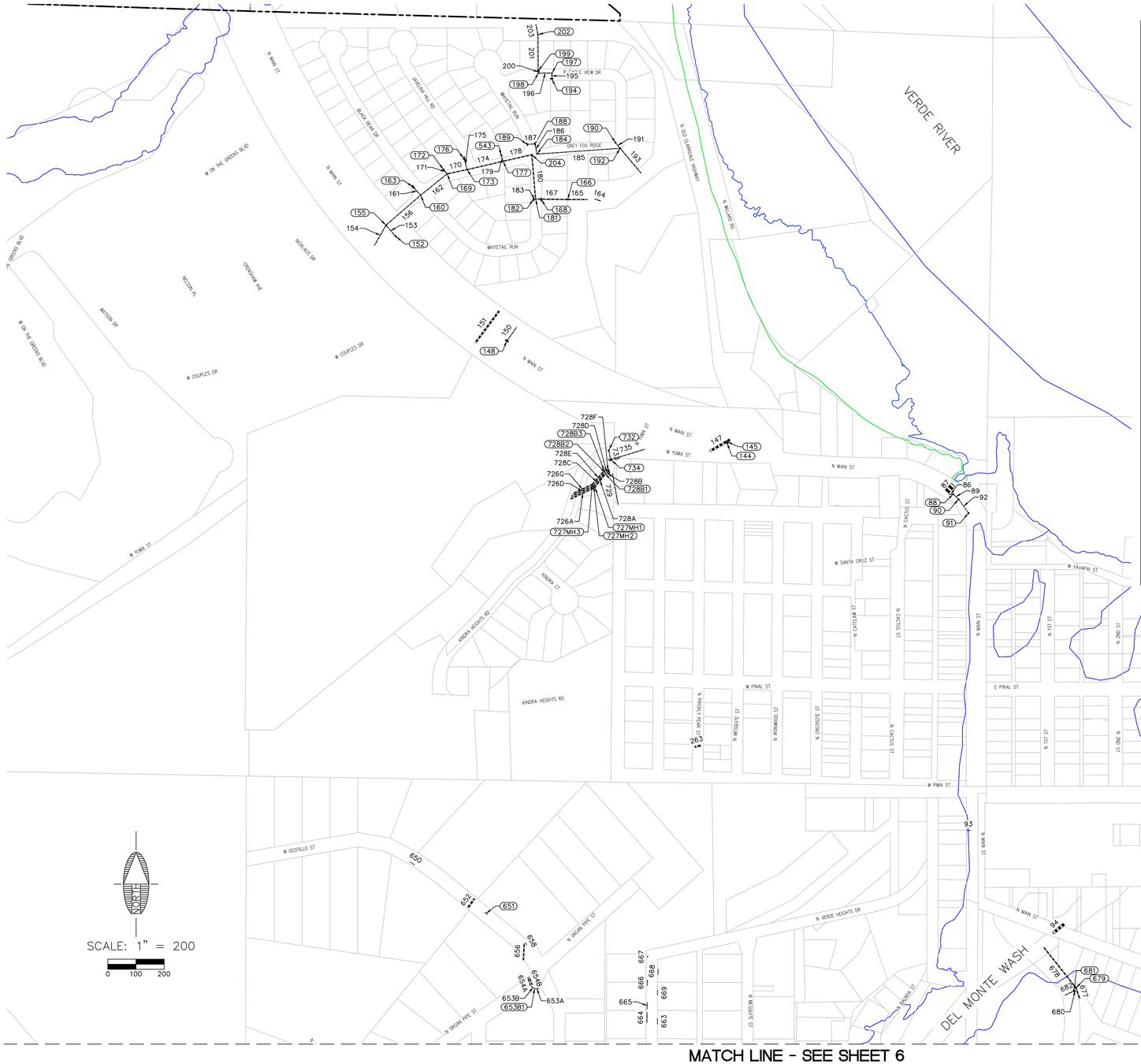
STORM DRAIN MAP #5



STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
202	24" SDMH RIM = 3366.20 INV IN = 3360.17 INV OUT = 3349.57
204	32" SDMH RIM = 3388.45 INV IN = 3377.15 INV OUT = 3377.03
543	33"x46" GRATE RIM = 3392.27 INV OUT = 3386.84
651	9' CONCRETE SCUPPER RIM = 3396.60
653B1	12" PIPE BEND RIM = 3417.76 INV IN = 3416.70 INV OUT = 3416.70
679	36" MANHOLE SOLID STEEL LID RIM = 3357.35 INV IN = 3349.75 INV OUT = 3349.52
681	5"x82" CURB INLET RIM = 3356.82 INV IN = 3351.94 INV OUT = 3351.85
727MH1	28" MANHOLE RIM = 3358.73 INV IN = 3348.07 INV OUT = 3347.73
727MH2	28" MANHOLE RIM = 3358.46 INV IN = 3347.84 INV OUT = 3347.66
727MH3	28" MANHOLE RIM = 3358.16 INV IN = 3348.22 INV OUT = 3347.95
728B1	PIPE BEND RIM = 3350.79 INV IN = 3346.58 INV OUT = 3346.58
728B2	PIPE BEND RIM = 3350.73 INV IN = 3346.52 INV OUT = 3346.52
728B3	PIPE BEND RIM = 3350.74 INV IN = 3346.53 INV OUT = 3346.53
732	30"x42" GRATE RIM = 3354.22 INV OUT = 3349.90
734	5"x66" CURB INLET WITH STEEL LID RIM = 3353.41 INV IN = 3350.19 INV OUT = 3350.09

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
88	18"x40" GRATE RIM = 3317.59 INV IN = 3312.96 INV OUT = 3313.09
90	18"x40" GRATE RIM = 3316.74 INV IN = 3312.66 INV OUT = 3312.52
91	18"x40" GRATE RIM = 3317.59 INV OUT = 3313.16
144	5"x72" CURB INLET RIM = 3344.51
145	CMP RISER RIM = 3345.03
148	5"x72" CURB INLET RIM = 3388.89 INV OUT = 3383.48
152	5"x72" CURB INLET RIM = 3406.33 INV OUT = 3402.28
155	26" SDMH RIM = 3407.35 INV IN = 3400.21 INV IN = 3400.43 INV OUT = 3400.08
160	24" SDMH RIM = 3408.31 INV IN = 3396.00 INV IN = 3400.26 INV OUT = 3395.87
163	CB TYPE 'E' (MAG 534) RIM = 3407.10 INV OUT = 3401.11
166	32" SDMH RIM = 3371.55 INV IN = 3363.06 INV OUT = 3340.08
168	CB TYPE 'E' (MAG 534) RIM = 3384.45
169	24" SDMH RIM = 3402.86 INV IN = 3393.90 INV IN = 3394.08 INV OUT = 3393.44
172	33"x46" GRATE RIM = 3401.83 INV OUT = 3394.92
173	24" SDMH RIM = 3399.74 INV IN = 3390.19 INV IN = 3390.64 INV OUT = 3389.98
176	5"x72" CURB INLET RIM = 3398.20 INV OUT = 3392.26
177	32" SDMH RIM = 3393.44 INV IN = 3384.86 INV IN = 3385.29 INV OUT = 3384.51
181	28" SLOTTED STORM DRAIN LID RIM = 3384.83 INV IN = 3377.59 INV IN = 3376.87 INV OUT = 3376.97
182	CB TYPE 'E' (MAG 534) RIM = 3386.02 INV OUT = 3377.67
184	24" SDMH RIM = 3387.74 INV IN = 3379.88 INV OUT = 3379.84
188	16"x40" CURB INLET RIM = 3387.02 INV IN = 3380.37 INV OUT = 3380.22
189	CB TYPE 'E' (MAG 534) RIM = 3386.96 INV OUT = 3381.56
190	30"x42" GRATE RIM = 3380.73 INV OUT = 3372.69
192	30"x42" GRATE RIM = 3380.73 INV IN = 3374.45 INV IN = 3372.63 INV OUT = 3373.83
194	CB TYPE 'E' (MAG 534) RIM = 3387.49 INV OUT = 3375.62
197	24" SDMH RIM = 3389.27 INV IN = 3375.28 INV OUT = 3375.36
198	24" SDMH RIM = 3390.74 INV IN = 3374.26 INV OUT = 3374.25
199	CB TYPE 'E' (MAG 534) RIM = 3388.18 INV IN = 3373.60 INV OUT = 3373.50

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
87	N/A	17' BRIDGE	3308.69	3308.29
92	12"	CMP	3313.66	3313.16
93	N/A	14"x4" SCUPPER	3348.59	3347.90
94	N/A	BOX CULVERT	3342.06	3341.76
147	N/A	BOX CULVERT	3333.80	3332.39
150	18"	HDPE	3384.22	3368.00
151	N/A	BOX CULVERT	3365.56	3360.82
153	18"	HDPE	3403.03	3401.18
154	24"	HDPE	3403.29	3401.21
156	24"	HDPE	3401.08	3397.00
161	18"	HDPE	3401.86	3401.01
162	24"	HDPE	3396.87	3394.90
164	24"	CMP	3337.47	3337.46
165	36"	CMP	3341.58	3338.88
167	36"	CMP	3378.47	3364.56
170	32"	HDPE	3394.77	3391.52
174	32"	HDPE	3391.31	3386.20
175	18"	HDPE	3393.01	3391.38
178	36"	HDPE	3386.01	3378.65
180	36"	HDPE	3378.53	3378.37
183	18"	HDPE	3378.42	3378.34
185	18"	HDPE	3380.59	3375.20
186	18"	HDPE	3380.97	3380.63
187	18"	HDPE	3382.31	3381.12
193	18"	CMP	3374.58	3330.05
196	24"	HDPE	3376.36	3375.26
201	24"	HDPE	3374.50	3361.17
203	24"	HDPE	3350.57	3348.48
263	72"	72"x33" CMP ARCH	3353.23	3352.69
650	12"	CMP	3421.95	3420.77
652	72"	CMP	3389.04	3387.25
653A	12"	CMP	3417.42	3417.20
653B	12"	CMP	3417.20	3412.56
654A	30"	CMP	3411.39	3409.53
654B	36"	Elliptical CMP	3413.06	3411.97
656	48"	CMP	3403.79	3400.76
658	12"	CMP	3406.47	3405.72
663	12"	CMP	3425.03	3424.97
664	18"	CMP	3426.01	3425.50
665	16"	CMP	3425.20	3424.95
666	18"	CMP	3424.75	3424.84
667	N/A	18"x22" CONCRETE	3424.45	3424.78
668	10"	PVC	3423.99	3423.70
669	10"	CONCRETE	3424.53	3424.37
677	42"	Elliptical CMP	3352.66	3351.50
678	42"	Elliptical CMP	3351.27	3347.30
680	18"	CMP	3352.60	3352.23
682	18"	CMP	3354.82	3352.70
726A	48"	CMP	3354.31	3350.07
726D	48"	CMP	3354.68	3349.84
726G	48"	CMP	3354.52	3350.22
728A	48"	CMP	3349.73	3348.58
728B	48"	CMP	3348.58	3348.25
728C	48"	CMP	3349.66	3348.52
728D	48"	CMP	3348.52	3348.51
728E	48"	CMP	3349.95	3348.53
728F	48"	CMP	3348.53	3348.37
729	18"	CMP	3387.23	3347.15
733	18"	CMP	3350.65	3350.94
735	18"	CMP	3350.84	3343.80

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

CALL TWO WORKING DAYS BEFORE YOU DIG
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REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, U.S.A.
Expires 9/30/2018

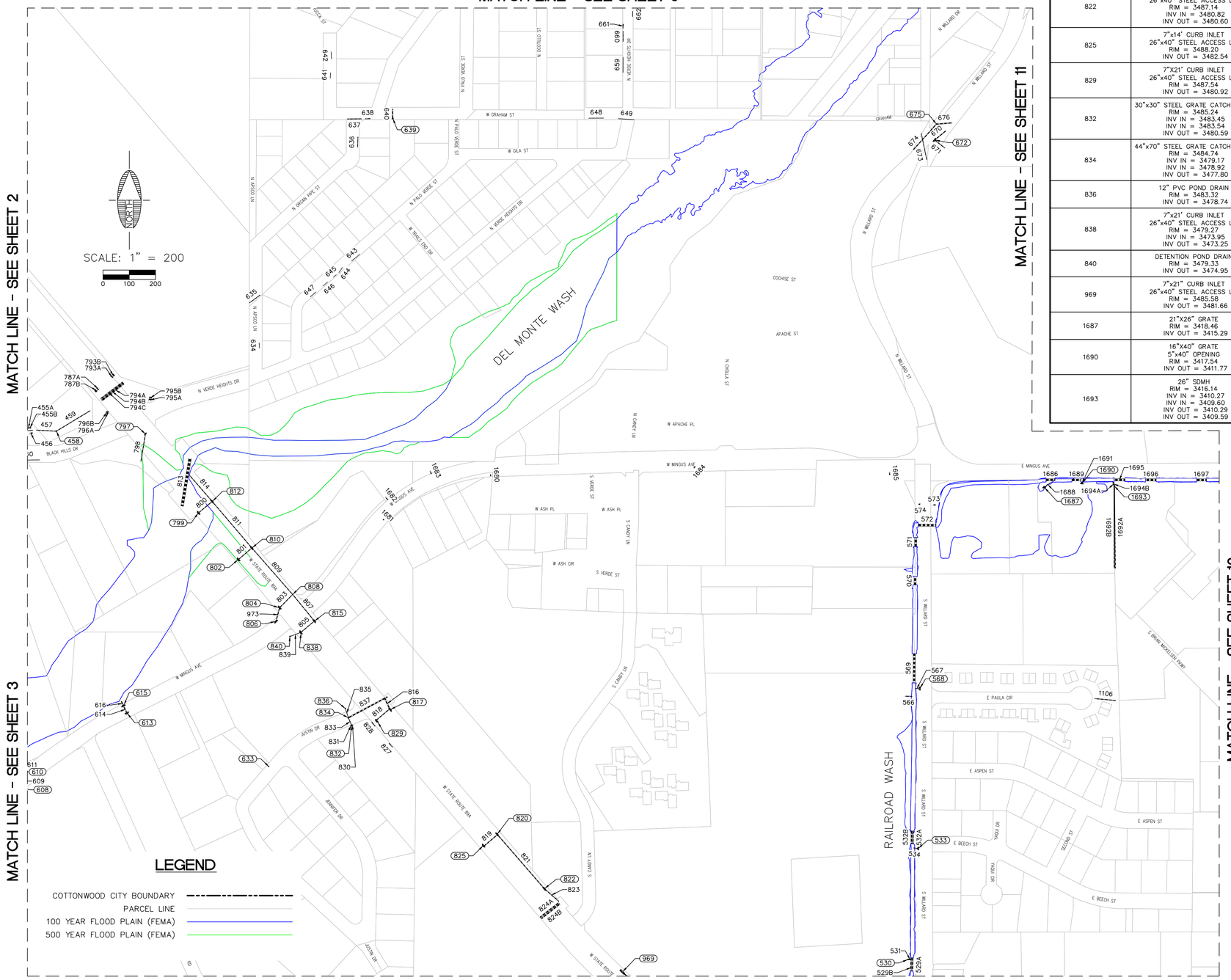
DRAWING NO.
M5

SHT NO. 5 OF 27

FILE: \\VR-FILESDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-5.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017–8:42am

STORM DRAIN MAP #6



STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
820	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3488.06 INV IN = 3481.18 INV OUT = 3480.98
822	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3487.14 INV IN = 3480.82 INV OUT = 3480.60
825	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3488.20 INV OUT = 3482.54
829	7"X21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3487.54 INV OUT = 3480.92
832	30"x30" STEEL GRATE CATCH BASIN RIM = 3485.24 INV IN = 3483.45 INV IN = 3483.54 INV OUT = 3480.59
834	44"x70" STEEL GRATE CATCH BASIN RIM = 3484.74 INV IN = 3479.17 INV IN = 3478.92 INV OUT = 3477.80
836	12" PVC POND DRAIN RIM = 3483.32 INV OUT = 3478.74
838	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3479.27 INV IN = 3473.95 INV OUT = 3473.25
840	DETENTION POND DRAIN RIM = 3479.33 INV OUT = 3474.95
969	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3485.58 INV OUT = 3481.66
1687	21"X26" GRATE RIM = 3418.46 INV OUT = 3415.29
1690	16"X40" GRATE 5"x40" OPENING RIM = 3417.54 INV OUT = 3411.77
1693	26" SDMH RIM = 3416.14 INV IN = 3410.27 INV IN = 3409.60 INV OUT = 3410.29 INV OUT = 3409.59

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
453	18"	CMP	3490.20	3487.86
455B	N/A	48" SPILLWAY	3491.57	3490.96
456	N/A	6"x48" SIDEWALK SCUPPER	3491.98	3490.98
457	24"	HDPE	3486.97	3483.48
459	24"	HDPE	3483.27	3481.02
460	10"	PVC	3493.68	3491.69
529A	42"	Elliptical CMP	3450.22	3449.15
529B	42"	Elliptical CMP	3450.18	3449.31
531	18"	CMP	3450.34	3449.78
532A	42"	CMP	3441.56	3440.93
532B	42"	CMP	3441.37	3441.00
534	12"	HDPE	3442.26	3441.78
566	24"	CMP	3437.97	3438.51
567	12"	HDPE	3435.21	3434.30
569	N/A	(2) 8'x3' BOX CULVERT	3434.29	3432.98
570	N/A	(2) 8'x3' BOX CULVERT	3430.42	3430.01
571	N/A	(2) 8'x3' BOX CULVERT	3428.89	3428.49
572	N/A	(2) 8'x3' BOX CULVERT	3428.03	3426.25
573	N/A	8"x48" SIDEWALK SCUPPER	3431.69	3431.31
574	N/A	6"x48" SIDEWALK SCUPPER	3431.78	3431.26
634	12"	CMP	3470.77	3470.56
635	18"	CMP	3464.44	3463.42
636	18"	CMP	3444.97	3444.40
637	18"	CMP	3446.14	3443.95
638	18"	CMP	3442.88	3442.64
640	36"	CMP	3433.56	3432.54
641	12"	CMP	3451.17	3450.63
642	12"	CMP	3449.61	3449.24
643	8"	CMP	3459.51	3459.03
644	8"	CMP	3461.12	3460.49
645	6"	CMP	3462.08	3461.75
646	8"	CMP	3462.90	3462.52
647	8"	CMP	3464.42	3463.74
648	12"	CMP	3436.84	3436.19
649	12"	STEEL	3434.04	3432.45
659	12"	STEEL	3431.54	3430.13
660	14"	STEEL	3428.64	3427.52
661	27"	6"x28" CONCRETE	3427.01	3426.83
662	12"	CMP	3425.90	3425.37
670	30"	CMP	3400.64	3394.37
671	24"	CMP	3401.20	3400.91
673	18"	Elliptical CMP	3405.93	3402.86
674	30"	CMP	3403.63	3393.68
676	36"	CMP	3393.53	3392.39
787A	N/A	6"x102" SIDEWALK SCUPPER	3482.92	3482.71
787B	N/A	6"x102" SPILLWAY	3482.71	3482.54
793A	N/A	6"x108" SIDEWALK SCUPPER	3481.85	3481.54
793B	N/A	6"x108" SPILLWAY	3481.54	3479.97
794A	36"	CMP	3477.82	3476.11
794B	36"	CMP	3477.80	3476.16
794C	36"	CMP	3478.11	3476.32
795A	N/A	6"x108" SIDEWALK SCUPPER	3479.22	3478.98
795B	N/A	6"x108" SPILLWAY	3478.98	3478.95
796A	N/A	6"x108" SIDEWALK SCUPPER	3480.50	3480.33
796B	N/A	6"x108" SPILLWAY	3480.33	3480.06
798	24"	CMP	3473.76	3474.86
800	24"	CMP	3465.01	3461.96
801	24"	CMP	3468.23	3465.82
803	24"	CMP	3472.73	3471.00
805	24"	CMP	3474.25	3472.06
807	24"	CMP	3471.86	3470.90
809	24"	CMP	3470.80	3465.72
811	24"	CMP	3465.62	3462.06
813	N/A	(3) 10'x8' BOX CULVERT	3453.52	3447.86
814	24"	CMP	3461.76	3475.35
816	48"	CMP	3481.28	3475.23
818	27"	RCP	3482.05	3481.45
819	27"	RCP	3483.66	3482.31
821	27"	RCP	3482.11	3481.94
823	27"	RCP	3481.72	3480.81
824A	48"	CMP	3480.99	3480.16
824B	48"	CMP	3480.87	3480.31
827	24"	CMP	3486.66	3486.74
828	24"	CMP	3485.84	3485.36
837	48"	CMP	3479.80	3475.23
839	12"	PVC	3475.45	3474.45
973	27"	RCP	3476.24	3472.83

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1680	N/A	4"x36" SIDEWALK SCUPPER	3462.00	3461.93
1681	N/A	4"x36" SIDEWALK SCUPPER	3472.46	3472.51
1682	N/A	4"x36" SIDEWALK SCUPPER	3470.45	3471.07
1683	N/A	4"x36" SIDEWALK SCUPPER	3466.85	3467.37
1684	N/A	4"x36" SIDEWALK SCUPPER	3449.28	3449.35
1685	N/A	4"x36" SIDEWALK SCUPPER	3434.66	3434.59
1686	N/A	3'x8' BOX CULVERT	6.52	3415.50
1688	12"	CMP	3415.79	3415.49
1689	N/A	3'x8' BOX CULVERT	3.73	3412.76
1691	24"	CMP	3412.77	3412.78
1692A	36"	CMP	3411.79	3414.75
1692B	36"	CMP	3414.73	3411.77
1695	N/A	3'x8' BOX CULVERT	9.61	3408.86
1696	N/A	3'x8' BOX CULVERT	7.40	3406.47
1697	N/A	3'x8' BOX CULVERT	3.07	3402.52

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
458	32" SDMH RIM = 3491.16 INV IN = 3482.48 INV OUT = 3482.27
530	5"x36" CURB INLET 18"x36" GRATE RIM = 3455.38 INV OUT = 3449.59
533	5"x42" CURB INLET RIM = 3445.36
568	4"x92" CURB INLET RIM = 3438.36
613	4"x96" CURB INLET BOTH SIDES 26" STEEL MANHOLE LID RIM = 3496.54 INV OUT = 3490.22
615	4"x96" CURB INLET 21"x21" STEEL ACCESS LID RIM = 3496.73 INV IN = 3489.39 INV OUT = 3489.44
633	32" CURB DEPRESSION RIM = 3493.81
639	40"x40" STEEL GRATE RIM = 3438.80 INV OUT = 3432.06
672	7"x158" CURB INLET 28"x42" GRATE RIM = 3403.96 INV IN = 3399.91 INV OUT = 3399.39
675	24" MANHOLE SLOTTED LID RIM = 3400.26 INV IN = 3392.43
797	3'x40" CURB INLET 24"x40" GRATE RIM = 3478.28
799	7"x24' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3470.00 INV OUT = 3464.01
802	7"x24' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3473.20 INV OUT = 3467.23
804	7"x18' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3479.66 INV IN = 3471.70 INV OUT = 3471.73
806	8"x23' CURB INLET 26" STEEL ACCESS LID RIM = 3479.50 INV OUT = 3475.12
808	26" SDMH RIM = 3479.78 INV IN = 3469.90 INV IN = 3470.00 INV OUT = 3469.80
810	7"x25' CURB INLET 26"x40" ACCESS LID RIM = 3475.12 INV IN = 3464.72 INV IN = 3464.82 INV OUT = 3464.62
812	7"x25' CURB INLET 26"x40" ACCESS LID RIM = 3471.88 INV IN = 3461.06 INV IN = 3460.96 INV OUT = 3460.76
815	7"x25' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3481.36 INV IN = 3471.06 INV OUT = 3470.86
817	7"x25' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3487.29 INV IN = 3480.32 INV OUT = 3479.28

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
EXPIRES 6/30/2018

DRAWING NO.
M6

SHT NO. 6 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-6.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017–9:43am

STORM DRAIN MAP #7

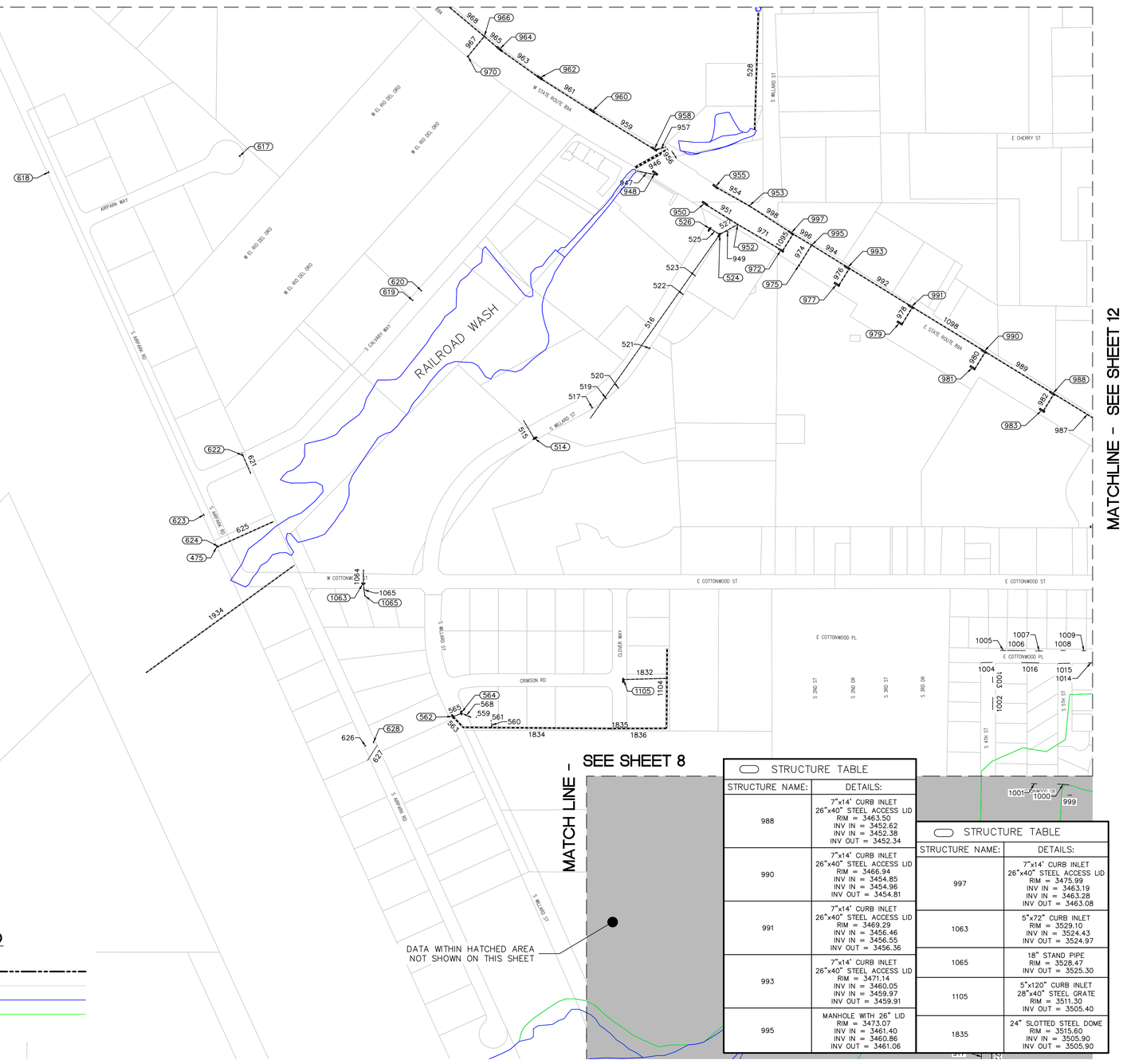
MATCHLINE - SEE SHEET 6

MATCHLINE - SEE SHEET 3

MATCHLINE - SEE SHEET 4

MATCHLINE - SEE SHEET 12

MATCH LINE - SEE SHEET 8



LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
475	MANHOLE 36" STEEL GRATE RIM = 3528.27 INV OUT = 3524.26
514	5"x120" CURB INLET 24"x40" GRATE RIM = 3505.86 INV OUT = 3500.58
524	5"x92" CURB INLET 24"x40" GRATE RIM = 3473.62 INV IN = 3470.17 INV OUT = 3469.84 INV OUT = 3469.64
526	5"x92" CURB INLET 24"x40" GRATE RIM = 3473.62 INV IN = 3469.22
559	12" CMU WALL WITH (4) 4"x4" WEEP HOLES RIM = 3520.05
561	GROUTED ROCK DETENSION RIM = 3524.20
562	4"x92" CURB OPENING NO GRATE RIM = 3526.94 INV IN = 3520.00
564	4"X92" CURB OPENING NO GRATE RIM = 3526.96
617	54" CURB DEPRESSION RIM = 3513.65
618	64" CURB DEPRESSION RIM = 3531.70
619	24" CURB DEPRESSION RIM = 3501.19
622	54" CURB DEPRESSION CONCRETE SPILLWAY RIM = 3522.36
623	58" CURB DEPRESSION RIM = 3526.67
624	42" CURB DEPRESSION RIM = 3527.26
628	4' CURB DEPRESSION RIM = 3540.90
948	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3476.45 INV OUT = 3466.37
950	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3475.12 INV OUT = 3467.51
952	MANHOLE 26" LID RIM = 3474.85 INV IN = 3465.75 INV IN = 3466.36 INV OUT = 3465.67
953	MANHOLE 26" LID RIM = 3474.72 INV IN = 3465.13 INV OUT = 3465.05
955	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3474.96 INV OUT = 3467.74
958	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3476.70 INV IN = 3468.51 INV OUT = 3468.38
960	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3478.45 INV IN = 3470.18 INV OUT = 3470.06
962	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3479.37 INV IN = 3471.84 INV OUT = 3471.77
964	7"x21' CURB INLET 26"40" STEEL ACCESS LID RIM = 3480.52 INV IN = 3473.24 INV OUT = 3473.17
966	MANHOLE WITH 26" LID RIM = 3481.95 INV IN = 3474.67 INV IN = 3474.54 INV OUT = 3474.38
970	24"x82" STEEL GRATE CATCH BASIN RIM = 3484.01 INV OUT = 3479.41
972	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3472.94 INV IN = 3464.16 INV OUT = 3464.13
975	24"X82" STEEL GRATE CATCH BASIN RIM = 3470.30 INV OUT = 3462.11
977	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3471.24 INV OUT = 3461.78
979	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3469.52 INV OUT = 3460.92
981	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3467.09 INV OUT = 3458.24
983	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3463.45 INV OUT = 3453.57

PIPE TABLE

PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
515	18"	CMP	3501.33	3499.41
516	16"	CMP	3502.68	3470.84
517	N/A	1.5"x48" SIDEWALK SCUPPER	3502.18	3502.07
519	N/A	3"x27" SIDEWALK SCUPPER	3500.08	3499.89
520	N/A	2"x26" SIDEWALK SCUPPER	3498.16	3497.86
521	N/A	2"x44" SIDEWALK SCUPPER	3491.38	3491.09
522	N/A	4"x30" SIDEWALK SCUPPER	3481.66	3482.02
523	N/A	5"x30" SIDEWALK SCUPPER	3478.60	3478.63
525	24"	CMP	3470.84	3470.22
527	24"	CMP	3470.64	3467.36
528	54"	CMP	3458.41	3450.29
560	24"	CMP	3525.26	3522.90
563	60"	CMP	3521.05	3522.50
565	18"	CMP	3522.54	3522.50
568	36"	CMP	3518.01	3522.40
621	24"	CMP	3518.93	3517.88
625	36"	CMP	3525.76	3519.45
626	N/A	6"x18" SIDEWALK SCUPPER	3540.77	3540.59
627	8"	PVC	3538.84	3537.49
629	12"	CMP	3547.26	3546.82
946	N/A	(2) 4'x8' BOX CULVERT	3468.09	3465.47
947	24"	CMP	3467.37	3468.81
949	24"	HDPE	3473.08	3469.76
951	36"	RCP	3469.01	3467.25
954	36"	RCP	3469.24	3466.63
956	27"	RCP	3469.17	3467.08
957	36"	RCP	3469.88	3466.54
959	36"	RCP	3471.56	3470.01
961	36"	RCP	3473.27	3471.68
963	36"	RCP	3474.67	3473.34
965	36"	RCP	3475.88	3474.74
967	30"	RCP	3480.66	3475.92
968	36"	RCP	3483.16	3476.04
971	36"	RCP	3467.17	3465.66
974	30"	RCP	3463.36	3462.65
976	36"	RCP	3463.28	3461.47
978	36"	RCP	3462.42	3457.96
980	36"	RCP	3459.74	3456.35
982	36"	RCP	3455.07	3453.88
987	36"	RCP	3453.84	3449.51
989	36"	RCP	3456.31	3454.12
992	36"	RCP	3461.41	3458.05
994	36"	RCP	3462.56	3461.55
996	36"	RCP	3464.58	3462.36
998	36"	RCP	3466.55	3464.78
1002	12"	CMP	3484.63	3483.54
1003	12"	CMP	3481.31	3480.84
1004	12"	CMP	3480.06	3478.94
1005	12"	DIP	3477.75	3477.20
1006	12"	DIP	3476.51	3474.90
1007	12"	DIP	3473.78	3473.19
1008	12"	DIP	3470.83	3470.63
1009	12"	DIP	3468.80	3468.69
1014	12"	CMP	3470.33	3469.98
1015	12"	CMP	3471.95	3471.04
1016	12"	CMP	3475.82	3474.65
1064	18"	CMP	3525.72	3524.49
1065	18"	CMP	3526.05	3525.18
1095	36"	RCP	3465.63	3464.69
1098	36"	RCP	3457.86	3456.46
1104	60"	CMP	3506.77	3500.12
1832	24"	CMP	3506.40	3502.62
1834	60"	CMP	3508.40	3521.05
1836	60"	CMP	3506.77	3508.40
1934	36"	CMP	3538.46	3523.27

STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
988	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3463.50 INV IN = 3452.62 INV IN = 3452.38 INV OUT = 3452.34
990	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3466.94 INV IN = 3454.85 INV IN = 3454.96 INV OUT = 3454.81
991	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3469.29 INV IN = 3456.46 INV IN = 3456.55 INV OUT = 3456.36
993	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3471.14 INV IN = 3460.05 INV IN = 3459.97 INV OUT = 3459.91
995	MANHOLE WITH 26" LID RIM = 3473.07 INV IN = 3461.40 INV IN = 3460.86 INV OUT = 3461.06

STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
997	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3475.99 INV IN = 3463.19 INV IN = 3463.28 INV OUT = 3463.08
1063	5"x72" CURB INLET RIM = 3529.10 INV IN = 3524.43 INV OUT = 3524.97
1065	18" STAND PIPE RIM = 3528.47 INV OUT = 3525.30
1105	5"x120" CURB INLET 28"x40" STEEL GRATE RIM = 3511.30 INV OUT = 3505.40
1835	24" SLOTTED STEEL DOME RIM = 3515.60 INV IN = 3505.90 INV OUT = 3505.90

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928-282-2058 fax

www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
EXPIRES 9/30/2018

DRAWING NO.
M7

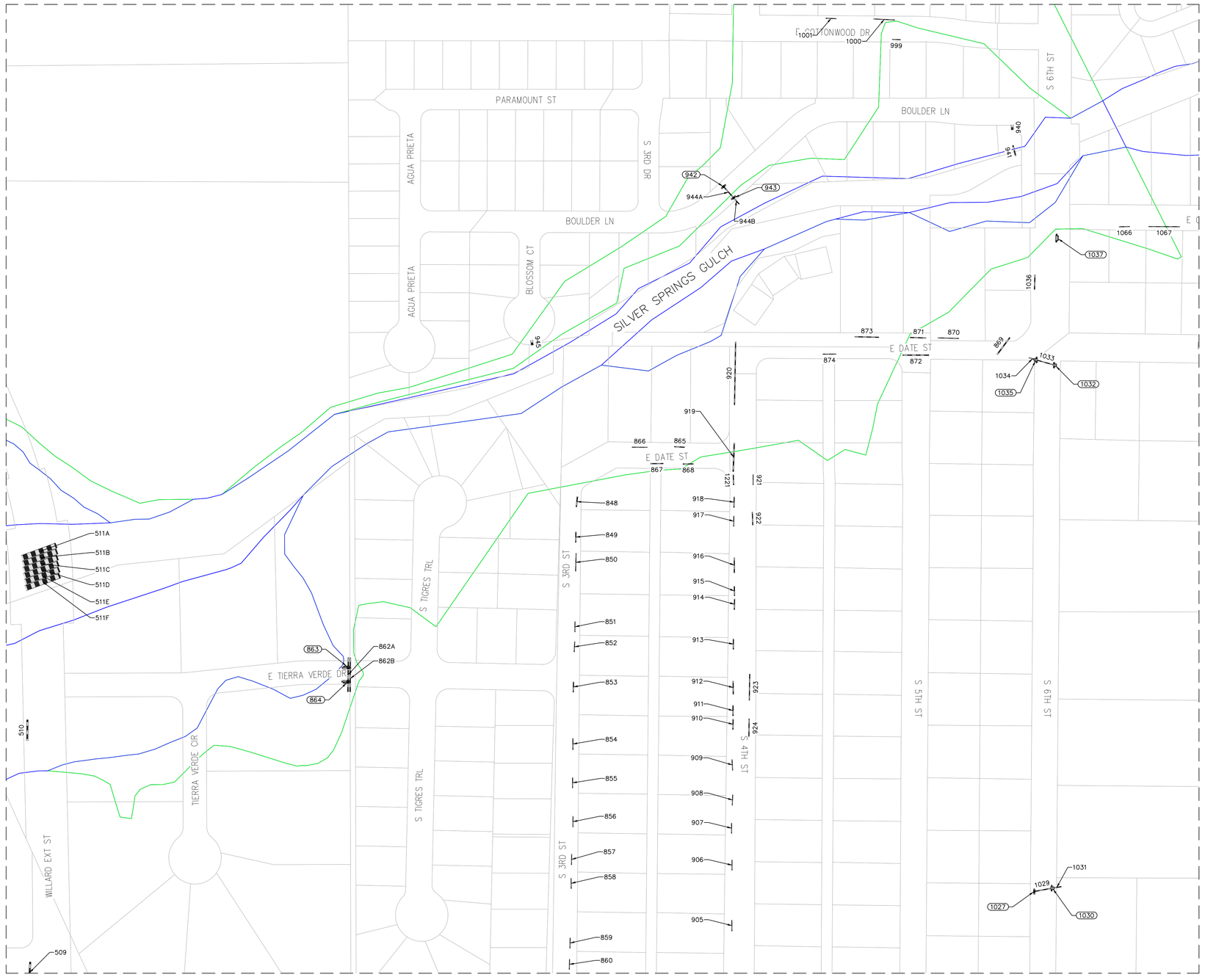
SHT NO. 7 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-7.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017-9:45am

STORM DRAIN MAP #8

MATCH LINE - SEE SHEET 7



MATCH LINE - SEE SHEET 13

MATCH LINE - SEE SHEET 14

MATCH LINE - SEE SHEET 10

MATCH LINE - SEE SHEET 7

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
509	36"	CMP	3549.22	3548.59
510	36"	CMP	3539.96	3539.00
511A	N/A	8'x10' BOX CULVERT	3531.11	3528.44
511B	N/A	8'x10' BOX CULVERT	3531.11	3528.44
511C	N/A	8'x10' BOX CULVERT	3531.11	3528.44
511D	N/A	8'x10' BOX CULVERT	3531.11	3528.44
511E	N/A	8'x10' BOX CULVERT	3531.11	3528.44
511F	N/A	8'x10' BOX CULVERT	3531.11	3528.44
848	24"	CMP	3506.72	3505.80
849	18"	CMP	3508.06	3507.54
850	12"	CMP	3508.78	3508.22
851	12"	CMP	3512.17	3511.88
852	12"	CMP	3512.67	3512.36
853	18"	CMP	3513.42	3513.27
854	12"	CMP	3514.70	3514.48
855	12"	CMP	3516.39	3516.12
856	12"	CMP	3517.47	3516.94
857	12"	CMP	3519.02	3518.75
858	12"	CMP	3520.04	3519.42
859	12"	CMP	3523.06	3522.42
860	12"	CMP	3524.01	3523.78
862A	24"	CMP	3520.61	3520.28
862B	24"	CMP	3520.56	3520.13
865	16"	CMP	3501.08	3500.75
866	12"	CMP	3503.85	3502.87
867	16"	CMP	3502.50	3502.44
868	16"	CMP	3500.03	3499.14
869	24"	CMP	3479.67	3479.11
870	12"	CMP	3484.57	3483.42
871	16"	CMP	3485.62	3485.44
872	24"	CMP	3484.96	3483.93
873	16"	CMP	3487.64	3486.49
874	12"	CMP	3490.15	3489.72
905	12"	CMP	3515.32	3515.06
906	12"	CMP	3513.71	3512.94
907	12"	CMP	3512.05	3511.76
908	12"	CMP	3511.03	3510.43
909	12"	CMP	3508.50	3508.51
910	18"	CMP	3506.72	3506.48
911	18"	CMP	3505.47	3505.04
912	18"	CMP	3504.12	3503.70
913	18"	CMP	3502.40	3502.25
914	18"	CMP	3501.43	3501.35
915	18"	CMP	3500.91	3500.46
916	18"	CMP	3500.64	3500.38
917	12"	CMP	3499.36	3499.25
918	16"	CMP	3498.73	3498.52
919	24"	CMP	3497.21	3496.82
920	18"	CMP	3496.90	3495.07
921	12"	CMP	3497.96	3497.74
922	16"	CMP	3499.05	3499.16
923	16"	CMP	3504.75	3503.44
924	16"	CMP	3507.37	3506.31
940	N/A	5"x48" SIDEWALK SCUPPER	3473.92	3473.56
941	24"	CMP	3472.26	3472.11
944A	18"	CMP	3490.06	3489.62
944B	18"	CMP	3489.62	3485.50
945	N/A	5"x48" SIDEWALK SCUPPER	3511.70	3511.53
999	12"	CMP	3480.64	3480.14
1000	12"	CMP	3481.17	3480.42
1001	12"	CMP	3482.19	3481.90
1029	18"	CMP	3498.28	3497.13
1031	18"	CMP	3497.07	3495.73
1033	16"	CMP	3481.92	3482.26
1034	16"	CMP	3481.76	3481.65
1036	18"	CMP	3477.78	3477.44
1066	12"	CMP	3474.28	3474.27
1067	12"	CMP	3473.29	3472.86
1221	18"	CMP	3497.87	3497.34

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
863	5"x120" CURB INLET 28"x40" STEEL GRATE RIM = 3523.48
864	5"x120" CURB INLET 28"x40" STEEL GRATE RIM = 3523.63
942	3"x20" CURB INLET 20"x20" STEEL GRATE RIM = 3493.40 INV OUT = 3489.31
943	3"x20" CURB INLET 20"x20" STEEL GRATE RIM = 3493.30 INV IN = 3488.87 INV OUT = 3488.87
1027	16"x40" STEEL GRATE RIM = 3500.55 INV OUT = 3497.53
1030	4"x44" CURB INLET RIM = 3500.55 INV IN = 3496.38 INV OUT = 3496.32
1032	4"x44" CURB OPENING RIM = 3484.17 INV IN = 3481.60
1035	4"x40" CURB OPENING 16"x40" STEEL GRATE RIM = 3483.72 INV IN = 3480.98 INV OUT = 3481.25
1037	4"x44" CURB INLET RIM = 3477.29

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 100

0 50 100

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JOB NO:	14267
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SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, U.S.A.
EXPIRES 9/30/2018

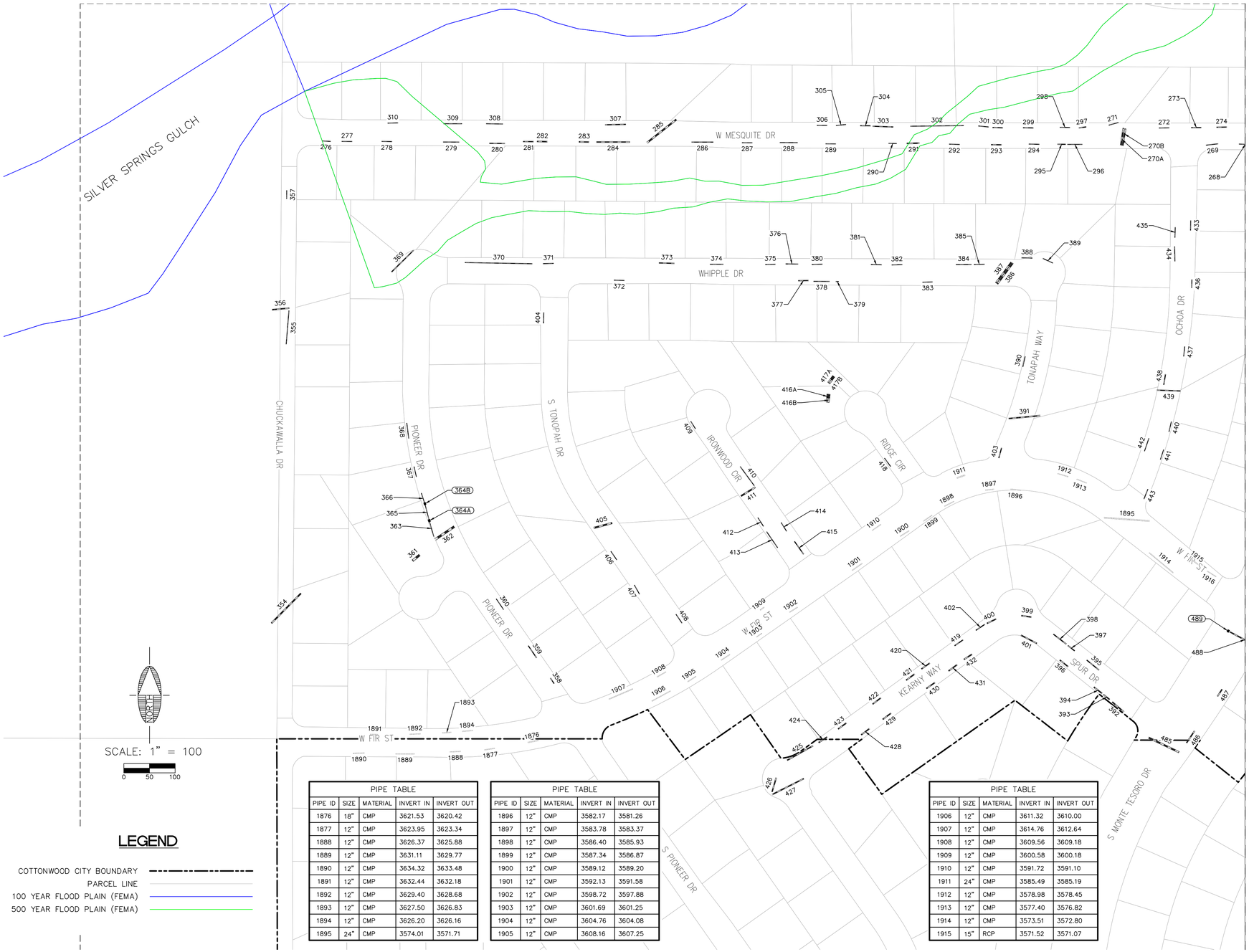
DRAWING NO.
M8

SHT NO. 8 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-8.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017-9:03am

STORM DRAIN MAP #9



MATCH LINE - SEE SHEET 10

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
386	30"	Elliptical CMP	3576.32	3575.40
387	30"	Elliptical CMP	3576.65	3575.42
388	12"	CMP	3575.48	3575.17
389	12"	CMP	3575.73	3575.24
390	12"	CMP	3579.94	3579.64
391	24"	Elliptical CMP	3579.96	3578.04
392	24"	CMP	3577.86	3577.23
393	24"	CMP	3579.01	3578.37
394	24"	CMP	3580.18	3579.45
395	18"	CMP	3580.20	3579.41
396	24"	CMP	3582.56	3581.92
397	18"	CMP	3581.65	3581.21
398	18"	CMP	3582.79	3582.16
399	24"	CMP	3583.45	3583.10
400	24"	CMP	3585.93	3585.22
401	24"	CMP	3584.02	3583.51
402	16"	CMP	3587.67	3587.03
403	16"	CMP	3582.98	3582.49
404	12"	CMP	3616.43	3615.86
405	36"	CMP	3607.77	3607.56
406	12"	CMP	3610.08	3609.87
407	12"	CMP	3608.85	3608.99
408	12"	CMP	3607.30	3606.82
409	12"	CMP	3605.44	3605.01
410	12"	CMP	3600.40	3599.61
411	32"	DIP	3598.21	3596.98
412	12"	CMP	3600.00	3599.80
413	12"	CMP	3599.27	3598.53
414	12"	CMP	3598.46	3598.30
415	16"	CMP	3597.12	3596.48
416A	36"	CMP	3590.52	3590.47
416B	36"	CMP	3590.42	3590.72
417A	30"	CMP	3589.85	3588.47
417B	30"	CMP	3588.94	3588.58
418	12"	CMP	3590.71	3590.13
419	18"	CMP	3589.59	3588.14
420	24"	CMP	3591.95	3591.42
421	24"	CMP	3593.25	3592.96
422	24"	CMP	3596.30	3595.64
423	24"	CMP	3599.06	3598.71
424	24"	CMP	3600.13	3599.61
425	24"	CMP	3602.14	3600.81
426	24"	CMP	3603.79	3603.33
427	24"	CMP	3603.68	3601.28
428	24"	CMP	3596.86	3596.54
429	24"	CMP	3595.21	3594.67
430	24"	CMP	3593.15	3592.43
431	24"	CMP	3592.01	3590.38
432	24"	CMP	3588.85	3588.36
433	12"	CMP	3566.32	3566.49
434	12"	CMP	3568.59	3568.35
435	12"	CMP	3568.02	3568.11
436	12"	CMP	3567.93	3567.73
437	12"	CMP	3570.50	3570.18
438	16"	CMP	3571.84	3572.00
439	18"	CMP	3570.56	3569.36
440	12"	CMP	3571.61	3571.69
441	12"	CMP	3571.93	3571.81
442	12"	CMP	3572.83	3572.75
443	12"	CMP	3573.18	3573.09
485	36"	Elliptical CMP	3575.29	3574.75
486	24"	CMP	3574.43	3573.38
487	24"	CMP	3571.20	3571.09
488	24"	CMP	3566.43	3564.96

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
268	12"	CMP	3560.36	3559.80
269	12"	CMP	3562.16	3561.90
270A	30"	Elliptical CMP	3563.40	3562.36
270B	30"	Elliptical CMP	3562.98	3561.97
271	12"	CMP	3564.09	3563.38
272	12"	CMP	3562.48	3561.74
273	16"	HDPE	3561.64	3560.90
274	16"	HDPE	3560.27	3559.84
276	12"	CMP	3610.83	3610.51
277	12"	CMP	3609.38	3608.52
278	12"	CMP	3607.22	3606.31
279	12"	CMP	3603.41	3602.83
280	16"	CMP	3601.00	3600.69
281	18"	CMP	3597.70	3597.00
282	24"	CMP	3596.63	3596.02
283	24"	CMP	3594.66	3594.14
284	24"	CMP	3592.56	3590.85
285	36"	Elliptical CMP	3589.25	3586.45
286	12"	CMP	3588.43	3586.82
287	12"	CMP	3585.30	3584.69
288	12"	CMP	3583.06	3582.36
289	12"	CMP	3579.97	3579.12
290	12"	CMP	3576.62	3576.05
291	24"	CMP	3574.51	3573.23
292	12"	CMP	3574.27	3574.03
293	18"	CMP	3572.31	3571.36
294	12"	CMP	3570.69	3569.97
295	16"	DIP	3567.76	3567.04
296	12"	CMP	3567.23	3566.61
297	18"	CMP	3566.41	3565.86
298	12"	CMP	3567.40	3566.64
299	16"	CMP	3569.55	3568.98
300	16"	CMP	3570.84	3569.87
301	12"	CMP	3571.75	3571.18
302	12"	CMP	3574.85	3572.44
303	16"	CMP	3576.60	3575.82
304	16"	CMP	3577.18	3577.18
305	12"	CMP	3578.19	3577.46
306	12"	CMP	3579.63	3579.22
307	18"	CMP	3593.68	3592.11
308	12"	CMP	3601.03	3599.80
309	10"	RCP	3603.11	3601.88
310	12"	CMP	3605.67	3605.10
354	30"	CMP	3629.32	3628.41
355	12"	CMP	3619.51	3618.58
356	24"	CMP	3617.72	3617.38
357	12"	CMP	3614.94	3614.66
358	16"	CMP	3618.18	3617.90
359	16"	CMP	3618.82	3618.28
360	12"	CMP	3619.95	3619.82
361	48"	CMP	3622.48	3621.79
362	48"	CMP	3617.38	3616.75
363	12"	CMP	3622.88	3622.16
365	12"	CMP	3623.28	3622.99
366	12"	CMP	3623.88	3623.28
367	12"	CMP	3624.83	3624.54
368	12"	CMP	3626.20	3625.75
369	18"	CMP	3610.68	3609.13
370	12"	CMP	3612.28	3610.18
371	12"	CMP	3612.02	3611.99
372	12"	CMP	3608.83	3608.15
373	18"	CMP	3605.54	3604.32
374	12"	CMP	3601.72	3600.15
375	12"	CMP	3596.99	3595.94
376	12"	CMP	3595.10	3594.24
377	18"	CMP	3593.42	3593.27
378	12"	CMP	3592.14	3590.22
379	12"	CMP	3589.80	3589.63
380	12"	CMP	3593.08	3591.89
381	12"	CMP	3585.95	3584.77
382	12"	CMP	3584.35	3583.69
383	12"	CMP	3583.04	3582.36
384	12"	CMP	3580.48	3579.42
385	12"	CMP	3579.12	3577.14

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1876	18"	CMP	3621.53	3620.42
1877	12"	CMP	3623.95	3623.34
1888	12"	CMP	3626.37	3625.88
1889	12"	CMP	3631.11	3629.77
1890	12"	CMP	3634.32	3633.48
1891	12"	CMP	3632.44	3632.18
1892	12"	CMP	3629.40	3628.68
1893	12"	CMP	3627.50	3626.83
1894	12"	CMP	3626.20	3626.16
1895	24"	CMP	3574.01	3571.71

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1896	12"	CMP	3582.17	3581.26
1897	12"	CMP	3583.78	3583.37
1898	12"	CMP	3586.40	3585.93
1899	12"	CMP	3587.34	3586.87
1900	12"	CMP	3589.12	3589.20
1901	12"	CMP	3592.13	3591.58
1902	12"	CMP	3598.72	3597.88
1903	12"	CMP	3601.69	3601.25
1904	12"	CMP	3604.76	3604.08
1905	12"	CMP	3608.16	3607.25

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1906	12"	CMP	3611.32	3610.00
1907	12"	CMP	3614.76	3612.64
1908	12"	CMP	3609.56	3609.18
1909	12"	CMP	3600.58	3600.18
1910	12"	CMP	3591.72	3591.10
1911	24"	CMP	3585.49	3585.19
1912	12"	CMP	3578.98	3578.45
1913	12"	CMP	3577.40	3576.82
1914	12"	CMP	3573.51	3572.80
1915	15"	RCP	3571.52	3571.07

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
364A	18"x60" STEEL GRATE RIM = 3624.71 INV IN = 3622.49 INV OUT = 3622.38
364B	18"x36" STEEL GRATE RIM = 3625.10 INV IN = 3622.78 INV OUT = 3622.78
489	CATCH BASIN 24"x36" STEEL GRATE RIM = 3569.95 INV OUT = 3565.43

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.

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Cottonwood, AZ 86326
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928-282-2058 fax

www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
EXPIRES 9/30/2018

DRAWING NO.
M9

SHT NO. 9 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-9.dwg AMR-C3D-17

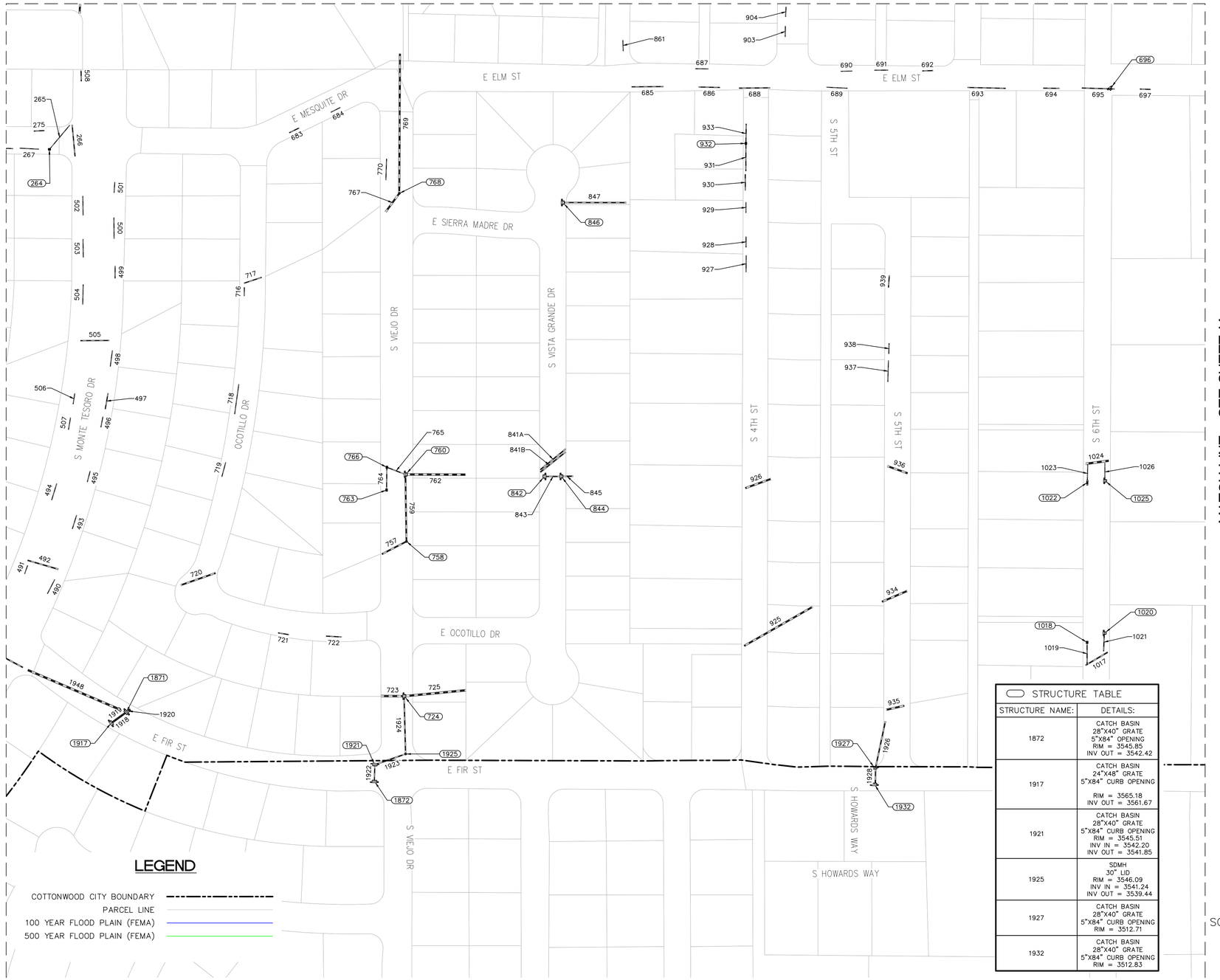
PLOTTED: Jun 29, 2017–9:47am

STORM DRAIN MAP #10

MATCH LINE - SEE SHEET 8

MATCH LINE - SEE SHEET 9

MATCH LINE - SEE SHEET 14



LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
929	12"	CMP	3521.54	3521.20
930	16"	CMP	3521.11	3521.08
931	16"	CMP	3520.93	3519.26
933	16"	CMP	3519.30	3520.81
934	36"	CMP	3508.08	3506.10
935	36"	CMP	3507.20	3505.98
936	36"	CMP	3504.55	3503.46
937	12"	CMP	3513.46	3511.84
938	12"	CMP	3515.55	3514.80
939	16"	CMP	3516.35	3516.16
1017	24"	CMP	3494.46	3494.50
1019	16"	CMP	3495.70	3495.65
1021	16"	CMP	3495.54	3494.97
1023	12"	CMP	3495.96	3494.81
1024	42"	Elliptical CMP	3494.33	3492.89
1026	12"	CMP	3495.70	3493.91
1918	36"	CMP	3557.56	3563.17
1919	36"	CMP	3563.17	3561.70
1920	54"	CMP	3557.08	3557.00
1922	18"	CMP	3543.18	3542.95
1923	24"	CMP	3542.85	3542.24
1924	24"	CMP	3540.44	3538.24
1926	24"	CMP	3509.86	3508.11
1928	24"	CMP	3511.65	3511.36
1948	42"	CMP	3562.33	3557.12

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1872	CATCH BASIN 28"X40" GRATE 5"X84" OPENING RIM = 3545.85 INV OUT = 3542.42
1917	CATCH BASIN 24"X48" GRATE 5"X84" CURB OPENING RIM = 3565.18 INV OUT = 3561.67
1921	CATCH BASIN 28"X40" GRATE 5"X84" CURB OPENING RIM = 3545.51 INV IN = 3542.20 INV OUT = 3541.85
1925	SDMH 30" LID RIM = 3546.09 INV IN = 3541.24 INV OUT = 3539.44
1927	CATCH BASIN 28"X40" GRATE 5"X84" CURB OPENING RIM = 3512.71
1932	CATCH BASIN 28"X40" GRATE 5"X84" CURB OPENING RIM = 3512.83

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
264	36" SQUARE GRATE RIM = 3558.76 INV OUT = 3556.72
696	5"x42" CURB INLET RIM = 3504.91
724	5"x66" CURB OPENING RIM = 3542.95 INV IN = 3536.05 INV IN = 3537.24 INV OUT = 3536.01
758	24" SD MANHOLE RIM = 3544.10 INV IN = 3538.59 INV OUT = 3538.79
760	5"x66" CURB INLET RIM = 3542.18 INV IN = 3537.36 INV IN = 3537.81 INV OUT = 3536.86
763	28"x52" STEEL GRATE RIM = 3541.97 INV OUT = 3540.13
766	28"x52" STEEL GRATE RIM = 3543.18 INV IN = 3539.92 INV OUT = 3539.77
768	36" SD MANHOLE RIM = 3542.44 INV IN = 3537.52 INV OUT = 3537.42
842	4"x66" CURB INLET RIM = 3530.73 INV OUT = 3527.08
844	4"x66" CURB INLET RIM = 3530.80 INV IN = 3526.44 INV OUT = 3526.43
846	4"x66" CURB INLET RIM = 3530.93 INV OUT = 3527.34
932	24"x36" STEEL GRATE RIM = 3521.17 INV IN = 3518.59 INV OUT = 3518.63
1018	30"x42" STEEL GRATE RIM = 3497.73 INV OUT = 3495.03
1020	4"x44" CURB INLET RIM = 3497.41 INV OUT = 3494.88
1022	4"x40" CURB INLET 16"x40" STEEL GRATE RIM = 3497.90 INV OUT = 3495.46
1025	4"x44" CURB INLET RIM = 3497.92 INV OUT = 3495.20
1871	CATCH BASIN 24"X48" GRATE 5"X84" CURB OPENING RIM = 3563.71 INV IN = 3560.20 INV OUT = 3556.06

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
265	12"	CMP	3557.22	3556.01
266	18"	CMP	3556.12	3555.65
267	12"	CMP	3559.27	3558.65
268	12"	CMP	3560.36	3559.80
275	16"	HDPE	3557.58	3556.76
490	12"	CMP	3564.64	3564.03
491	12"	CMP	3565.97	3565.81
492	24"	Elliptical CMP	3563.69	3560.44
493	12"	CMP	3563.47	3563.15
494	12"	CMP	3564.96	3564.72
495	12"	CMP	3562.11	3561.80
496	12"	CMP	3560.95	3560.88
497	18"	CMP	3560.83	3560.49
498	12"	CMP	3560.19	3559.55
499	12"	CMP	3558.17	3557.95
500	12"	CMP	3558.33	3557.98
501	12"	CMP	3557.61	3557.51
502	12"	CMP	3559.20	3559.11
503	12"	CMP	3559.42	3559.22
504	12"	CMP	3559.74	3559.36
505	18"	CMP	3559.69	3558.52
506	12"	CMP	3562.93	3562.69
507	12"	CMP	3562.94	3563.00
508	18"	CMP	3553.45	3553.22
683	16"	CMP	3546.49	3546.02
684	12"	CMP	3544.41	3543.66
685	16"	Elliptical CMP	3526.29	3525.09
686	16"	Elliptical CMP	3522.51	3521.44
687	12"	CMP	3523.46	3522.61
688	18"	CMP	3519.74	3518.04
689	12"	CMP	3514.73	3513.40
690	10"	DIP	3514.25	3513.66
691	12"	CMP	3512.41	3511.31
692	16"	CMP	3509.47	3509.36
693	16"	Elliptical CMP	3507.47	3506.98
694	16"	Elliptical CMP	3506.08	3505.41
695	16"	Elliptical CMP	3504.19	3502.58
697	16"	Elliptical CMP	3501.84	3501.53
716	12"	CMP	3551.66	3551.29
717	18"	CMP	3550.36	3550.03
718	12"	PVC	3552.35	3552.34
719	12"	CMP	3553.58	3553.08
720	30"	CMP	3553.65	3551.69
721	16"	CMP	3550.94	3550.74
722	16"	CMP	3548.22	3546.98
723	42"	CMP	3539.93	3537.80
725	42"	CMP	3537.76	3534.28
757	30"	CMP	3541.17	3539.84
759	30"	CMP	3540.04	3538.60
762	42"	CMP	3538.60	3537.71
764	16"	CMP	3540.80	3540.58
765	18"	CMP	3540.52	3538.56
767	36"	CMP	3538.81	3539.02
769	36"	CMP	3538.92	3535.94
770	12"	CMP	3542.19	3541.34
841A	24"	CMP	3528.33	3527.66
841B	24"	CMP	3528.60	3527.70
843	24"	CMP	3528.08	3527.44
845	24"	CMP	3527.43	3524.52
847	24"	CMP	3528.34	3526.93
861	12"	CMP	3526.91	3526.67
903	12"	CMP	3517.38	3517.32
904	12"	CMP	3517.39	3516.76
925	36"	RCP	3516.86	3513.44
926	36"	CMP	3513.91	3511.91
927	12"	CMP	3522.32	3522.26
928	12"	CMP	3522.29	3522.09

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

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928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
EXPIRES 9/30/2018

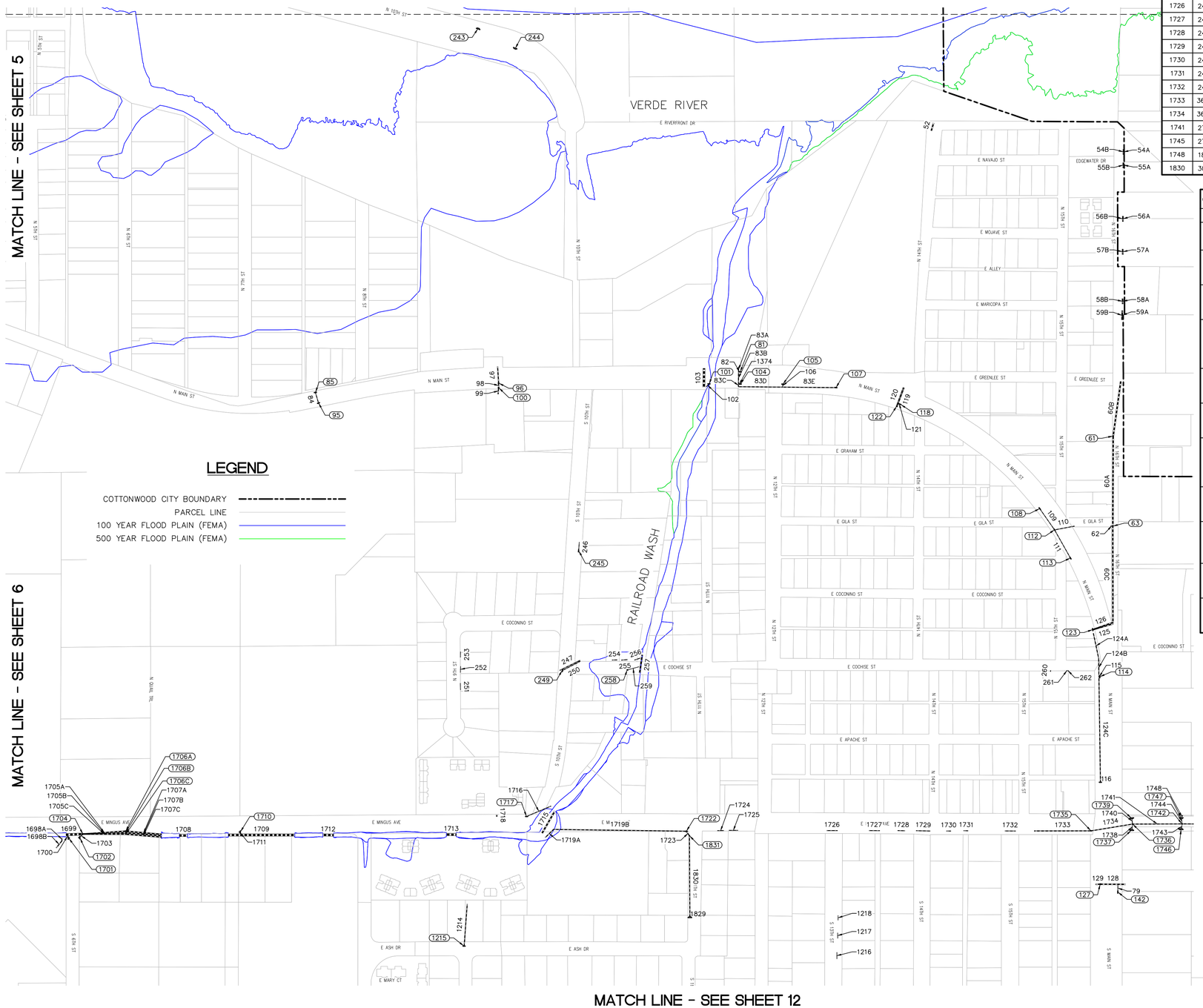
DRAWING NO.
M10

SHT NO. 10 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-10.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017–9:18am

STORM DRAIN MAP #11



MATCH LINE - SEE SHEET 12

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1718	32"	SCUPPER	3355.70	3355.83
1719A	30"	CMP	3345.47	3346.38
1719B	30"	CMP	3346.38	3350.94
1724	18"	CMP	3349.90	3349.56
1725	18"	RCP	3349.26	3348.92
1726	24"	CMP	3342.94	3343.07
1727	24"	CMP	3340.90	3340.88
1728	24"	CMP	3340.54	3340.43
1729	24"	CMP	3339.28	3338.56
1730	24"	CMP	3336.63	3336.30
1731	24"	CMP	3334.76	3334.46
1732	24"	CMP	3329.47	3328.67
1733	36"	CMP	3326.49	3321.40
1734	36"	CMP	3321.23	3315.71
1741	27"	RCP	3315.62	3308.58
1745	27"	RCP	3308.16	3303.38
1748	18"	CMP	3312.20	3313.38
1830	30"	CMP	3351.72	3352.18

STRUCTURE TABLE	
NAME:	DETAILS:
1717	24"X80" GRATE RIM = 3353.24 INV OUT = 3348.48
1722	34"X36" GRATE – IRREGULAR RIM = 3354.22 INV IN = 3349.69 INV OUT = 3349.65
1735	MANHOLE 32" LID RIM = 3326.70 INV IN = 3319.53 INV OUT = 3319.35
1736	MANHOLE 26" LID RIM = 3324.63 INV IN = 3320.50 INV IN = 3313.84 INV OUT = 3314.49 INV OUT = 3315.03
1737	7"X7" CURB OPENING NO GRATE RIM = 3320.42 INV IN = 3316.07
1739	7"X7" CURB OPENING NO GRATE RIM = 3320.63 INV OUT = 3316.06
1742	MANHOLE 26" LID RIM = 3315.74 INV IN = 3307.46 INV OUT = 3307.04 INV IN = 3309.33 INV OUT = 3308.81
1746	6"X7" CURB OPENING NO GRATE RIM = 3315.10 INV IN = 3309.15
1747	6"X7" CURB OPENING NO GRATE RIM = 3315.24 INV IN = 3310.56 INV OUT = 3311.46
1829	6"X7" CURB OPENING NO GRATE RIM = 3354.28 INV IN = 3350.93
1831	MANHOLE 26" SQUARE LID RIM = 3355.81 INV IN = 3350.37 INV OUT = 3350.47

STRUCTURE TABLE	
NAME:	DETAILS:
61	18"x36" GRATE RIM = 3309.44 INV IN = 3303.35 INV OUT = 3303.35
63	MANHOLE 45" SQUARE LID LOCKED – NO INVERT DATA RIM = 3316.62 INV IN = 3308.75 INV IN = 3308.50 INV OUT = 3308.50
81	20"x40" GRATE RIM = 3315.78 INV OUT = 3311.48
85	20"x40" GRATE RIM = 3309.49 INV IN = 3305.06
95	20"x40" GRATE RIM = 3309.57 INV OUT = 3305.86
96	28"x42" GRATE RIM = 3317.94 INV IN = 3312.42 INV OUT = 3312.39
100	54"x45" GRATE RIM = 3317.93 INV IN = 3312.62 INV OUT = 3312.54
101	20"x40" GRATE RIM = 3315.80 INV OUT = 3312.53
104	20"x40" GRATE RIM = 3316.77 INV OUT = 3313.85
105	20"x40" GRATE RIM = 3315.23 INV IN = 3311.97
107	20"x40" GRATE RIM = 3317.22 INV IN = 3314.31
108	20"x40" GRATE RIM = 3315.56 INV OUT = 3311.75
112	20"x82" GRATE RIM = 3315.29 INV IN = 3311.52 INV IN = 3311.64 INV OUT = 3311.42
113	20"x40" GRATE RIM = 3315.62
114	CATCH BASIN 20"X40" GRATE 5"X40" CURB OPENING RIM = 3317.07 INV IN = 3314.76
116	20"x40" GRATE RIM = 3321.03 INV IN = 3317.01
118	20"x40" GRATE RIM = 3315.83 INV OUT = 3311.96
122	28"x166" GRATE RIM = 3315.08
123	26"X35' GRATE RIM = 3316.48 INV IN = 3309.76 INV OUT = 3309.79
127	26"x42" CATCH BASIN RIM = 3324.90 INV IN = 3317.37 INV OUT = 3317.44
142	20"40" GRATE RIM = 3325.38 INV OUT = 3321.20
243	5"x96" SIDEWALK SCUPPER RIM = 3292.38
244	5"x96" SIDEWALK SCUPPER RIM = 3291.62
245	13"x41" CURB INLET RIM = 3329.99 INV OUT = 3327.44
249	24"x42" CURB INLET RIM = 3337.94 INV OUT = 3334.24
258	22" SQUARE GRATE RIM = 3332.47 INV OUT = 3330.38
1215	36"X32" CATCH BASIN RIM = 3369.90 INV OUT = 3364.21
1701	5"X72" CURB INLET NO GRATE RIM = 3399.51 INV IN = 3394.98
1702	5"X72" CURB INLET NO GRATE RIM = 3399.23 INV OUT = 3394.78
1704	72"X216" GRATE – IRREGULAR RIM = 3401.81 INV IN = 3390.97 INV IN = 3388.84 INV IN = 3390.02 INV OUT = 3397.30 INV OUT = 3388.78
1706A	MANHOLE 36" SLOTTED LID RIM = 3394.75 INV OUT = 3386.33 INV OUT = 3386.26
1706B	MANHOLE 36" SLOTTED LID RIM = 3394.83 INV IN = 3386.02 INV IN = 3386.43
1706C	MANHOLE 36" SLOTTED LID RIM = 3394.68 INV IN = 3386.43 INV OUT = 3387.04
1710	4"X40" CURB INLET NO GRATE RIM = 3382.41

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
52	54"	FLOW THRU CATTLE GUARD	3302.77	3302.19
54A	24"	Elliptical CMP	3298.22	3298.33
54B	24"	Elliptical CMP	3298.42	3298.36
55A	24"	Elliptical CMP	3298.73	3298.40
55B	24"	Elliptical CMP	3298.67	3298.61
56A	24"	Elliptical CMP	3299.71	3299.87
56B	24"	Elliptical CMP	3299.87	3299.81
57A	24"	Elliptical CMP	3300.76	3300.99
57B	24"	Elliptical CMP	3301.05	3301.01
58A	24"	Elliptical CMP	3302.66	3302.29
58B	24"	Elliptical CMP	3302.68	3302.24
59A	24"	Elliptical CMP	3303.49	3303.14
59B	24"	Elliptical CMP	3303.46	3303.38
60A	60"	RCP	3311.00	3305.85
60B	60"	RCP	3305.85	3305.42
60C	54"	RCP	3312.09	3311.00
79	15"	RCP	3321.82	3321.54
83A	27"	RCP	3310.12	3312.20
83B	27"	RCP	3312.20	3310.55
83C	27"	RCP	3310.55	3311.00
83D	27"	RCP	3311.00	3312.02
83E	27"	RCP	3312.02	3315.43
84	24"	CMP	3306.86	3306.06
97	36"	CMP	3313.89	3312.55
99	36"	CMP	3319.29	3314.12
102	16"	CMP	3313.20	3311.13
103	N/A	BOX CULVERT	3308.44	3308.43
106	16"	CMP	3312.02	3312.64
109	18"	RCP	3312.50	3312.27
110	24"	RCP	3312.42	3312.49
111	18"	RCP	3312.44	3312.38
119	24"	RCP	3312.13	3311.56
120	24"	RCP	3312.10	3311.43
121	18"	CMP	3312.71	3312.68
124A	27"	RCP	3312.46	3313.08
124B	27"	RCP	3313.08	3313.83
124C	27"	RCP	3313.83	3318.14
125	54"	RCP	3312.07	3312.01
126	54"	RCP	3312.04	3312.09
128	48"	RCP	3319.44	3319.71
246	16"	CMP	3328.11	3327.15
247	24"	CMP	3335.41	3333.11
250	24"	CMP	3335.24	3333.20
251	12"	CMP	3353.08	3352.70
252	12"	CMP	3351.58	3351.24
253	12"	CMP	3350.69	3350.40
254	24"	CMP	3330.56	3330.19
255	24"	CMP	3330.80	3329.12
256	24"	CMP	3330.40	3327.88
257	60"	CMP	3326.55	3324.85
259	12"	CMP	3330.88	3328.54
260	N/A	3"x20" SIDEWALK SCUPPER	3319.94	3319.72
261	N/A	4"x20" SIDEWALK SCUPPER	3319.82	3319.68
262	N/A	4"x20" SIDEWALK SCUPPER	3319.94	3319.66
1214	30"	CMP	3365.46	3361.54
1216	12"	CMP	3346.03	3345.77
1217	12"	CMP	3345.69	3345.44
1218	12"	CMP	3346.35	3345.98
1374	27"	RCP	3314.98	3310.55
1698A	N/A	4"x32" SIDEWALK SCUPPER	3399.62	3400.34
1698B	N/A	4"x32" SIDEWALK SCUPPER	3400.34	3400.71
1699	N/A	3'x8' BOX CULVERT	3395.38	3393.47
1700	18"	CMP	3395.38	3395.73
1703	18"	CMP	3395.53	3390.78
1705A	48"	CMP	3388.33	3390.84
1705B	48"	CMP	3399.30	3388.02
1705C	48"	CMP	3390.78	3388.43
1707A	48"	CMP	3388.26	3387.75
1707B	48"	CMP	3387.69	3388.43
1707C	48"	CMP	3389.04	3387.34
1708	N/A	3'x8' BOX CULVERT	3385.23	3384.82
1709	N/A	3'x8' BOX CULVERT	3378.68	3373.34
1711	18"	CMP	3378.50	3378.38
1712	N/A	3'x8' BOX CULVERT	3370.83	3369.43
1713	N/A	3'x8' BOX CULVERT	3357.06	3356.52
1715	60"	CMP	3342.51	3341.02
1716	24"	CMP	3349.48	3343.57

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Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M. REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

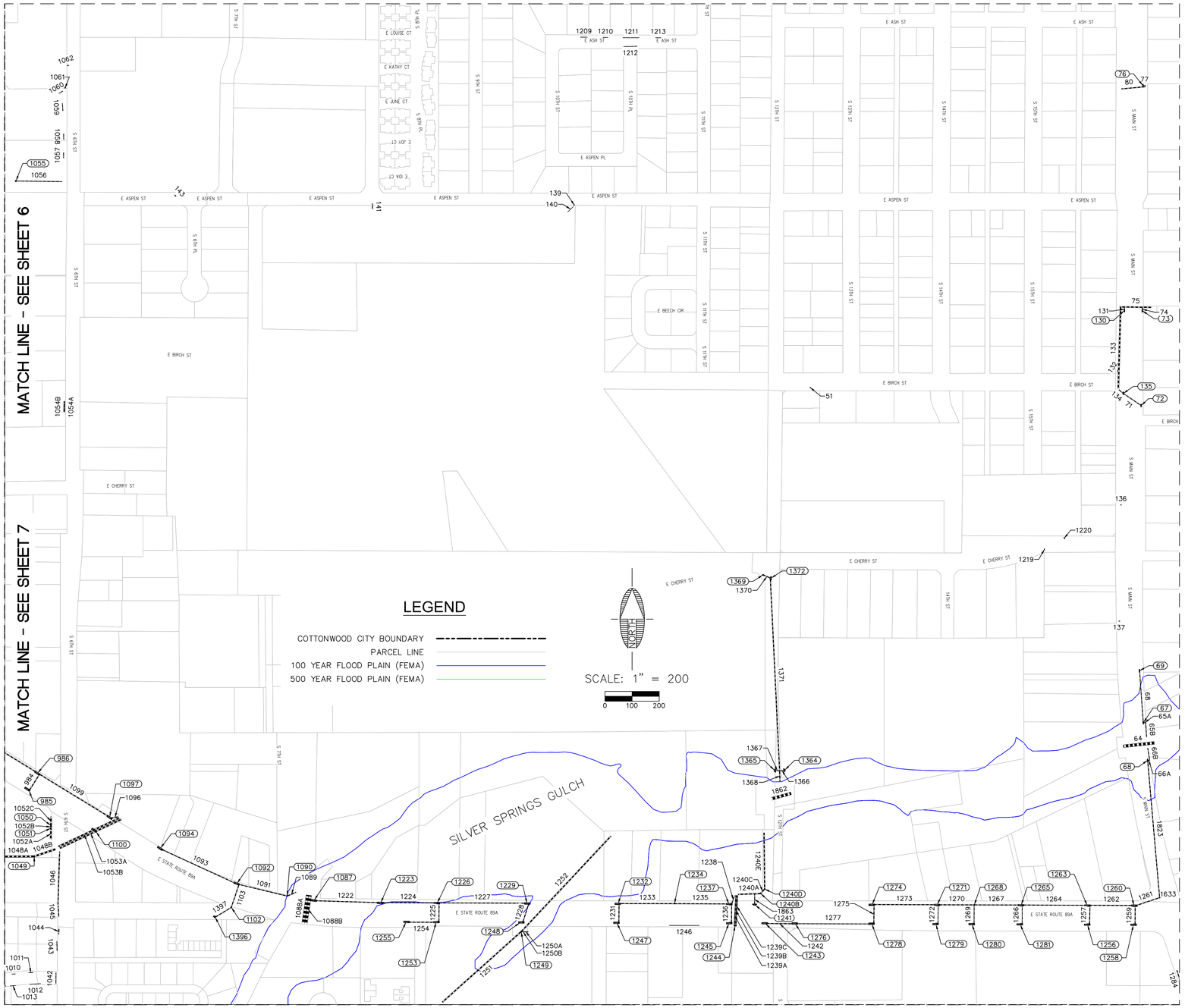
DRAWING NO.
M11

SHT NO. 11 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-11.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017–9:23am

STORM DRAIN MAP #12



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
51	N/A	4"x20" SIDEWALK SCUPPER	3375.57	3375.33
64	N/A	BOX CULVERT	3347.88	3335.76
65A	24"	RCP	3341.62	3341.49
65B	24"	RCP	3341.49	3339.19
66A	24"	RCP	3344.26	3343.94
66B	24"	RCP	3343.94	3339.40
68	24"	RCP	3344.39	3346.97
71	24"	RCP	3341.39	3340.03
74	24"	RCP	3333.68	3329.00
75	N/A	4'x5' BOX CULVERT	3335.70	3324.66
77	18"	RCP	3329.87	3328.95
80	30"	RCP	3330.06	3329.09
131	18"	RCP	3337.84	3335.00
132	24"	CMP	3340.38	3339.14
133	60"	CMP	3341.76	3337.20
134	24"	RCP	3340.61	3339.46
136	N/A	6"x18" SIDEWALK SCUPPER	3351.52	3351.33
137	N/A	6"x18" SIDEWALK SCUPPER	3350.51	3350.50
139	N/A	6"x24" SIDEWALK SCUPPER	3379.32	3379.34
140	6"	PVC	3379.05	3379.08
141	N/A	6"x24" SIDEWALK SCUPPER	3387.90	3387.81
143	N/A	4"x36" SIDEWALK SCUPPER	3403.35	3402.91
984	36"	RCP	3449.99	3449.11
987	36"	RCP	3453.84	3449.51
1010	12"	DIP	3468.07	3467.66
1011	16"	CMP	3465.79	3465.03
1012	12"	CMP	3466.83	3466.48
1013	12"	CMP	3469.41	3469.20
1042	18"	CMP	3463.85	3463.41
1043	18"	CMP	3461.46	3461.40
1044	30"	Elliptical CMP	3460.63	3460.59
1045	30"	Elliptical CMP	3459.38	3458.35
1046	30"	CMP	3458.43	3454.52
1048A	72"	CMP	3452.32	3451.80
1048B	72"	CMP	3451.80	3450.99
1052A	60"	CMP	3451.20	3451.14
1052B	60"	CMP	3451.14	3451.15
1052C	60"	CMP	3451.15	3452.20
1053A	60"	CMP	3450.71	3441.89
1053B	60"	CMP	3450.78	3441.97
1054A	18"	CMP	3422.81	3421.89
1054B	18"	CMP	3422.67	3421.69
1056	18"	CMP	3415.16	3414.03
1057	18"	CMP	3413.48	3413.40
1058	18"	CMP	3413.00	3412.99
1059	18"	CMP	3412.34	3412.13
1060	18"	CMP	3412.00	3411.53
1061	N/A	4"x48" SIDEWALK SCUPPER	3411.54	3411.37
1062	N/A	5"x24" SIDEWALK SCUPPER	3409.99	3409.99
1088A	N/A	5'x10' BOX CULVERT	3430.40	3426.99
1088B	N/A	5'x10' BOX CULVERT	3430.71	3427.41
1089	36"	RCP	3430.43	3432.07
1091	27"	RCP	3434.39	3430.54
1093	27"	RCP	3440.61	3434.47
1096	36"	RCP	3452.80	3444.47
1099	36"	RCP	3449.02	3445.32
1103	27"	RCP	3436.60	3434.44
1209	12"	CMP	3365.90	3365.76
1210	10"	DIP	3365.57	3365.56
1211	10"	DIP	3364.88	3363.94
1212	12"	CMP	3365.34	3364.82
1213	10"	PVC	3363.77	3363.51
1219	N/A	3"x24" SIDEWALK SCUPPER	3361.73	3361.67
1220	N/A	4"x24" SIDEWALK SCUPPER	3359.61	3359.31
1222	27"	RCP	3426.71	3426.52
1224	27"	RCP	3426.41	3420.63
1225	27"	RCP	3420.98	3420.58
1227	27"	RCP	3420.55	3414.53
1228	27"	RCP	3414.55	3414.41
1231	27"	RCP	3407.92	3407.43
1233	27"	RCP	3407.42	3403.68
1235	27"	RCP	3403.42	3398.75
1236	27"	RCP	3401.30	3405.24
1238	27"	RCP	3405.28	3390.92
1239A	24"	CMP	3401.15	3390.60
1239B	24"	CMP	3400.95	3391.10
1239C	24"	CMP	3400.86	3391.20
1240A	42"	CMP	3390.43	3387.91

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1240E	42"	CMP	3387.20	3380.20
1242	27"	RCP	3392.90	3394.99
1246	12"	CMP	3410.59	3407.58
1251	48"	CMP	3406.23	3419.12
1252	48"	CMP	3406.15	3404.66
1254	27"	RCP	3423.82	3421.41
1257	27"	RCP	3354.10	3361.34
1259	27"	RCP	3350.46	3349.05
1261	27"	RCP	3348.91	3354.23
1262	27"	RCP	3353.33	3349.33
1264	27"	RCP	3361.38	3353.55
1266	18"	RCP	3362.17	3361.49
1267	27"	RCP	3367.44	3361.64
1269	18"	RCP	3368.28	3367.49
1270	27"	RCP	3370.58	3367.51
1272	18"	RCP	3375.85	3370.64
1273	27"	RCP	3380.40	3370.88
1275	27"	RCP	3383.73	3380.50
1277	18"	RCP	3394.52	3383.96
1366	18"	CMP	3380.69	3378.45
1367	18"	CMP	3380.79	3378.45
1368	36"	CMP	3378.45	3373.51
1370	30"	CMP	3377.44	3376.58
1371	36"	CMP	3376.44	3378.45
1397	27"	RCP	3441.30	3436.72
1823	27"	RCP	3355.20	3345.35
1862	N/A	(6) 10'x10" BOX CULVERT	3373.27	3370.99
1863	24"	CMP	3391.00	3390.00

STRUCTURE TABLE	
NAME:	DETAILS:
1241	6"X 62' CURB OPENING NO GRATE RIM = 3401.82 INV OUT = 3390.00
1243	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3400.38 INV OUT = 3391.77
1244	42"x22" V-CHANNEL INLET 26"x40" STEEL GRATE RIM = 3404.70 INV OUT = 3400.15 INV OUT = 3399.95 INV OUT = 3399.86
1245	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3404.74 INV OUT = 3400.17
1247	7"x21' CURB INLET 26"x40" sTEEL ACCESS LID RIM = 3415.38 INV OUT = 3406.80
1248	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3421.87 INV OUT = 3413.42
1249	52"x52" STEEL GRATE RIM = 3422.31 INV IN = 3415.95 INV IN = 3415.97 INV OUT = 3404.15 INV OUT = 3404.23
1253	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3427.79 INV IN = 3420.29 INV OUT = 3419.85
1255	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3430.32 INV OUT = 3422.69
1256	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3360.65 INV OUT = 3352.98
1258	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3356.52 INV OUT = 3349.33
1260	7"x10' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3356.36 INV IN = 3347.92 INV OUT = 3347.78
1263	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3363.13 INV IN = 3352.43 INV IN = 3360.22 INV OUT = 3352.20
1265	7"x14' CURB INLET 26"x40' STEEL ACCESS LID RIM = 3368.80 INV IN = 3360.52 INV IN = 3360.74 INV OUT = 3360.26
1268	MANHOLE 26" LID RIM = 3375.39 INV IN = 3366.39 INV IN = 3366.74

STRUCTURE TABLE	
NAME:	DETAILS:
1087	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3435.60 INV OUT = 3425.58
1090	MANHOLE 26" SOLID LID RIM = 3437.98 INV IN = 3429.42 INV OUT = 3428.93
1092	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3441.20 INV IN = 3433.34 INV IN = 3433.31 INV OUT = 3433.26
1094	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3447.50 INV OUT = 3439.48
1097	7"x20' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3455.22 INV IN = 3443.82 INV OUT = 3451.30
1100	7"x20' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3453.02
1102	MANHOLE 26" LID RIM = 3445.36 INV IN = 3435.60
1223	7"x20' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3431.62 INV IN = 3425.40 INV OUT = 3425.29
1226	7"x20' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3427.70 INV IN = 3419.45 INV OUT = 3419.42
1229	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3421.43 INV IN = 3413.28
1232	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3415.21 INV IN = 3406.30 INV OUT = 3406.29
1234	MANHOLE 26" LID RIM = 3411.51 INV IN = 3402.56 INV OUT = 3402.30
1237	7"x20' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3407.07 INV IN = 3397.62 INV IN = 3404.12 INV OUT = 3404.15
1240B	24" STANDPIPE RIM = 3390.67 INV IN = 3386.16 INV OUT = 3386.16
1240D	24" STANDPIPE RIM = 3389.96 INV IN = 3385.46 INV OUT = 3385.46

STRUCTURE TABLE	
NAME:	DETAILS:
65	PIPE BEND RIM = 3342.91 INV IN = 3340.49 INV OUT = 3340.49
67	20"x82" CURB INLET RIM = 3346.97
68	20"x40" CURB INLET RIM = 3347.34 INV OUT = 3354.08 INV OUT = 3343.26
69	20"x40" CURB INLET RIM = 3347.62 INV OUT = 3343.39
72	20"x40" CURB INLET RIM = 3344.04
73	20"x82" CURB INLET RIM = 3340.37 INV OUT = 3332.68
76	20"x40" GRATE RIM = 3332.66
130	26"x82" CURB INLET RIM = 3340.26 INV OUT = 3337.09
135	20"x40" CURB INLET RIM = 3343.06 INV IN = 3339.03 INV OUT = 3339.61
985	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3458.02 INV OUT = 3448.49
986	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3461.03 INV IN = 3447.61 INV IN = 3448.01 INV OUT = 3447.52
1049	28" SLOTTED MANHOLE RIM = 3460.17 INV IN = 3448.80 INV OUT = 3448.80
1050	40" SLOTTED MANHOLE RIM = 3458.57 INV IN = 3448.65 INV OUT = 3448.65
1051	40" SLOTTED MANHOLE RIM = 3458.39 INV IN = 3448.64 INV OUT = 3448.64
1055	30"x40" GRATE RIM = 3418.07 INV OUT = 3414.41

STRUCTURE TABLE	
NAME:	DETAILS:
1271	7"x14' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3379.17 INV IN = 3369.76 INV IN = 3369.88 INV OUT = 3369.45
1274	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3387.16 INV IN = 3379.38
1276	7"x14" CURB INLET 26"x40" STEEL ACCESS LID RIM = 3396.80 INV IN = 3393.86 INV OUT = 3393.77
1278	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3387.19 INV IN = 3383.22 INV OUT = 3382.60
1279	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3379.41 INV OUT = 3375.10
1280	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3374.91 INV OUT = 3367.53
1281	7"x21' CURB INLET 26"x40" STEEL ACCESS LID RIM = 3368.78 INV OUT = 3361.42
1364	6"x72" CURB INLET RIM = 3386.24 INV OUT = 3379.94
1365	6"x72" CURB INLET RIM = 3386.31 INV OUT = 3380.04
1369	2'x24' STEEL GRATE RIM = 3380.55 INV OUT = 3376.19
1372	5"x72" CURB INLET RIM = 3380.91 INV IN = 3375.33 INV OUT = 3374.94
1396	5"x42" CURB INLET 21"x21" STEEL ACCESS LID 9"x42" SIDEWALK SCUPPER RIM = 3446.76 INV OUT = 3440.18
1633	MANHOLE 26" LID RIM = 3358.36 INV IN = 3353.11 INV IN = 3344.22
9999	PIPE BEND RIM = 3345.36 INV IN = 3342.94 INV OUT = 3342.94

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Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
ARIZONA, USA
Expires 9/30/2018

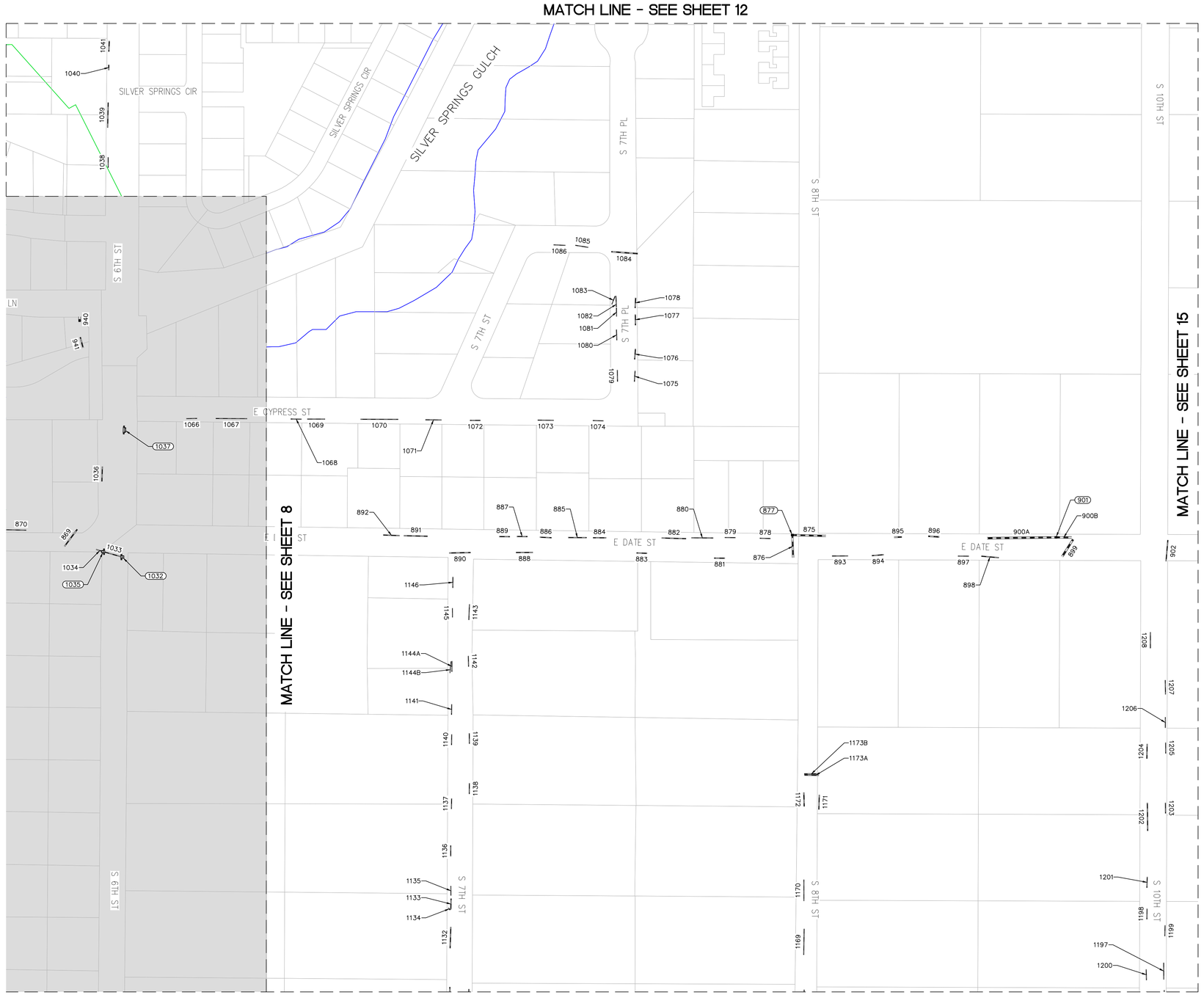
DRAWING NO.
M12

SHT NO. 12 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-12.dwg AMR-C30-17

PLOTTED: Jun 29, 2017-9:31am

STORM DRAIN MAP #13



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
875	36"	CMP	3436.65	3435.51
876	36"	Elliptical CMP	3441.17	3438.84
878	12"	CMP	3447.18	3446.13
879	12"	CMP	3451.85	3450.55
880	12"	CMP	3457.99	3454.43
881	16"	CMP	3452.84	3451.28
882	16"	CMP	3463.85	3459.83
883	16"	CMP	3467.29	3466.44
884	16"	CMP	3471.15	3470.50
885	16"	CMP	3471.54	3471.36
886	16"	CMP	3471.86	3471.86
887	16"	CMP	3472.05	3471.86
888	16"	CMP	3472.59	3472.44
889	16"	CMP	3472.13	3471.92
890	18"	CMP	3473.06	3472.98
891	16"	CMP	3473.51	3473.49
892	16"	CMP	3474.27	3473.67
893	12"	CMP	3438.32	3437.58
894	16"	CMP	3434.21	3433.32
895	24"	CMP	3430.81	3429.82
896	24"	CMP	3427.02	3424.41
897	12"	CMP	3423.14	3422.51
898	16"	CMP	3420.23	3418.26
899	42"	Elliptical CMP	3412.86	3412.30
900A	42"	Elliptical CMP	3418.44	3412.93
900B	42"	Elliptical CMP	3412.93	3412.48
902	18"	CMP	3420.59	3417.78
1038	12"	CMP	3472.56	3472.44
1039	16"	CMP	3471.09	3470.70
1040	18"	CMP	3468.74	3468.70
1041	18"	CMP	3467.74	3467.85
1068	12"	CMP	3471.46	3471.32
1069	12"	CMP	3470.74	3470.22
1070	12"	CMP	3468.32	3466.79
1071	12"	CMP	3466.03	3465.21
1072	12"	CMP	3463.65	3463.56
1073	12"	CMP	3461.91	3462.01
1074	12"	CMP	3461.07	3460.64
1075	12"	DIP	3458.02	3457.34
1076	16"	CMP	3455.68	3454.25
1077	18"	CMP	3449.58	3448.77
1078	18"	CMP	3447.55	3446.57
1079	12"	CMP	3458.16	3457.35
1080	12"	CMP	3452.21	3450.73
1081	12"	CMP	3448.39	3447.39
1082	12"	CMP	3447.21	3446.38
1083	12"	CMP	3446.74	3446.01
1084	24"	CMP	3443.33	3442.24
1085	12"	CMP	3448.68	3447.21
1086	10"	PVC	3450.98	3450.18
1132	16"	CMP	3484.71	3483.13
1133	16"	CMP	3486.73	3486.09
1134	N/A	18" SCUPPER	3487.15	3486.76
1135	12"	CMP	3487.85	3487.49
1136	12"	CMP	3490.65	3490.21
1137	12"	CMP	3491.65	3491.38
1138	12"	CMP	3491.43	3490.93
1139	12"	CMP	3487.31	3487.05
1140	12"	CMP	3487.18	3486.69
1141	12"	CMP	3484.52	3484.28
1142	12"	CMP	3481.10	3480.94
1143	12"	CMP	3477.52	3476.61
1144A	12"	CMP	3481.71	3481.05
1144B	8"	DIP	3481.52	3481.50
1145	8"	PVC	3477.52	3476.89
1146	12"	CMP	3475.18	3474.67
1169	12"	CMP	3461.64	3461.33

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1170	12"	CMP	3459.11	3455.66
1171	16"	CMP	3444.52	3443.04
1172	18"	CMP	3444.14	3442.97
1173A	18"	CMP	3439.83	3439.26
1173B	18"	CMP	3439.80	3439.00
1197	12"	CMP	3441.93	3441.84
1198	12"	CMP	3442.81	3442.74
1199	12"	CMP	3441.66	3441.57
1200	12"	CMP	3443.72	3443.43
1201	12"	CMP	3441.51	3441.11
1202	16"	CMP	3439.78	3439.67
1203	12"	CMP	3439.53	3439.46
1204	16"	CMP	3438.67	3438.56
1205	12"	CMP	3438.15	3438.14
1206	12"	CMP	3437.55	3437.40
1207	12"	CMP	3435.68	3436.38
1208	12"	CMP	3434.54	3432.86

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
877	60"x86" STEEL GRATE RIM = 3443.61 INV IN = 3437.34 INV OUT = 3435.15
901	24"x32" STEEL GRATE RIM = 3416.87 INV IN = 3411.18 INV OUT = 3411.18

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

N

SCALE: 1" = 100'

0 50 100

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NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

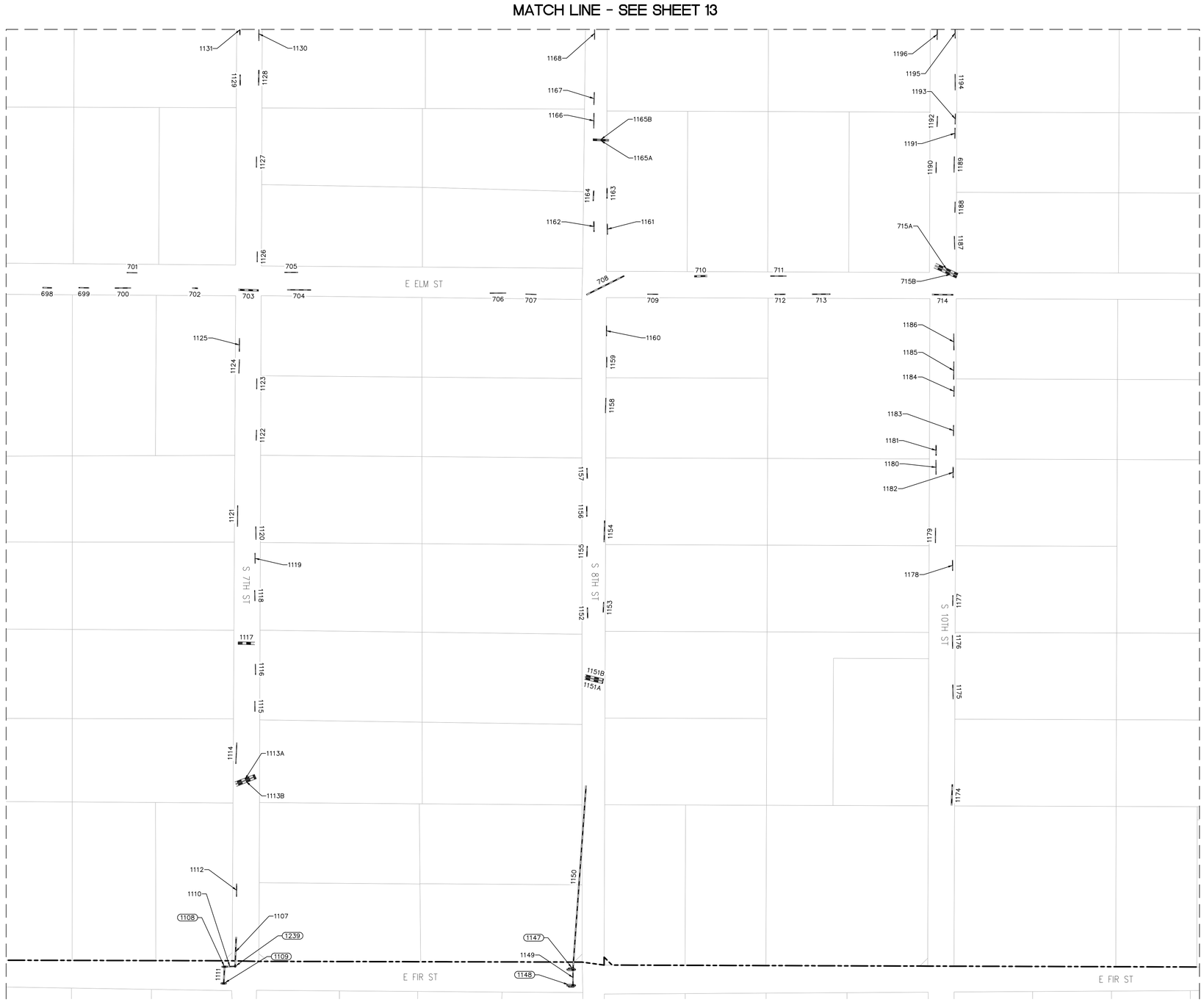
DRAWING NO.
M13

SHT NO. 12 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-13.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017-9:49am

STORM DRAIN MAP #14



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
698	21"	Elliptical CMP	3496.96	3496.80
699	16"	CMP	3494.96	3494.36
700	16"	CMP	3492.62	3491.98
701	12"	CMP	3492.28	3491.79
702	21"	Elliptical CMP	3487.51	3486.92
703	36"	CMP	3482.47	3480.32
704	16"	CMP	3480.35	3479.43
705	12"	DIP	3480.63	3479.62
706	12"	CMP	3468.19	3467.36
707	12"	CMP	3465.85	3465.62
708	24"	Elliptical CMP	3460.71	3458.78
709	12"	CMP	3457.64	3456.90
710	36"	CMP	3451.18	3450.84
711	16"	CMP	3446.67	3446.17
712	16"	CMP	3446.51	3446.07
713	18"	CMP	3443.48	3442.38
714	24"	CMP	3434.29	3432.95
715A	48"	Elliptical CMP	3432.02	3431.08
715B	48"	Elliptical CMP	3431.10	3431.18
1107	24"	CMP	3491.67	3487.92
1110	24"	CMP	3492.16	3491.78
1111	24"	CMP	3492.92	3492.33
1112	12"	CMP	3484.14	3482.92
1113A	48"	Elliptical CMP	3472.18	3471.21
1113B	48"	Elliptical CMP	3472.18	3471.19
1114	12"	CMP	3475.50	3475.01
1115	12"	CMP	3477.52	3476.98
1116	12"	CMP	3477.23	3477.16
1117	60"	Elliptical CMP	3480.20	3474.81
1118	12"	CMP	3485.12	3483.92
1119	12"	CMP	3487.09	3486.61
1120	12"	CMP	3486.91	3486.26
1121	12"	CMP	3487.23	3486.89
1122	12"	CMP	3486.07	3485.80
1123	12"	CMP	3485.76	3485.63
1124	12"	CMP	3486.11	3485.85
1125	12"	CMP	3485.95	3485.75
1126	12"	CMP	3482.30	3481.52
1127	12"	CMP	3477.75	3477.63
1128	16"	CMP	3478.20	3477.46
1129	16"	CMP	3478.40	3477.84
1130	12"	CMP	3480.10	3479.44
1131	16"	CMP	3480.81	3480.12
1149	18"	CMP	3457.86	3457.17
1150	24"	CMP	3457.08	3453.93
1151A	48"	CMP	3450.05	3449.34
1151B	48"	CMP	3450.23	3449.34
1152	16"	CMP	3459.60	3459.18
1153	16"	CMP	3460.67	3460.12
1154	16"	CMP	3462.37	3462.08
1155	16"	CMP	3462.41	3461.97
1156	18"	CMP	3463.09	3463.04
1157	18"	CMP	3463.67	3463.30
1158	12"	CMP	3463.48	3463.39
1159	12"	CMP	3463.83	3463.78
1160	12"	CMP	3463.39	3463.33
1161	12"	CMP	3458.60	3458.30
1162	18"	CMP	3459.09	3458.89
1163	18"	CMP	3457.62	3457.58
1164	18"	CMP	3458.14	3457.77
1165A	18"	CMP	3456.89	3456.14
1165B	18"	CMP	3456.93	3456.07
1166	12"	CMP	3458.16	3458.07
1167	12"	CMP	3459.24	3458.81
1168	12"	CMP	3461.91	3461.41
1174	24"	CMP	3432.72	3432.19
1175	12"	CMP	3440.14	3438.46

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1176	12"	CMP	3444.07	3442.93
1177	12"	CMP	3444.20	3444.00
1178	12"	CMP	3443.75	3443.58
1179	12"	CMP	3443.56	3443.48
1180	12"	CMP	3443.15	3442.78
1181	18"	CMP	3442.89	3442.49
1182	16"	CMP	3442.07	3441.95
1183	12"	CMP	3442.29	3442.27
1184	12"	CMP	3441.83	3441.34
1185	12"	CMP	3441.22	3440.15
1186	12"	CMP	3439.50	3438.87
1187	12"	CMP	3435.64	3434.74
1188	12"	CMP	3438.74	3438.21
1189	12"	CMP	3440.55	3440.33
1190	12"	CMP	3441.65	3441.33
1191	12"	CMP	3441.50	3441.36
1192	12"	CMP	3443.00	3442.79
1193	12"	CMP	3442.07	3442.03
1194	12"	CMP	3442.79	3442.75
1195	12"	CMP	3442.94	3442.94
1196	12"	CMP	3443.54	3443.20

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1108	5'x80" CURB INLET 26"x40" STEEL GRATE RIM = 3495.07 INV IN = 3491.33 INV OUT = 3491.16
1109	5'x80" CURB INLET 26"x40" STEEL GRATE RIM = 3495.05 INV OUT = 3491.92
1147	5'x80" CURB INLET 28"x40" STEEL GRATE RIM = 3459.74 INV IN = 3456.42 INV OUT = 3456.08
1148	5'x80" CURB INLET 28"x40" STEEL GRATE RIM = 3459.70
1239	MANHOLE 32" LID RIM = 3494.35 INV IN = 3490.78 INV OUT = 3490.67

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 100'

0 50 100

CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT

REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

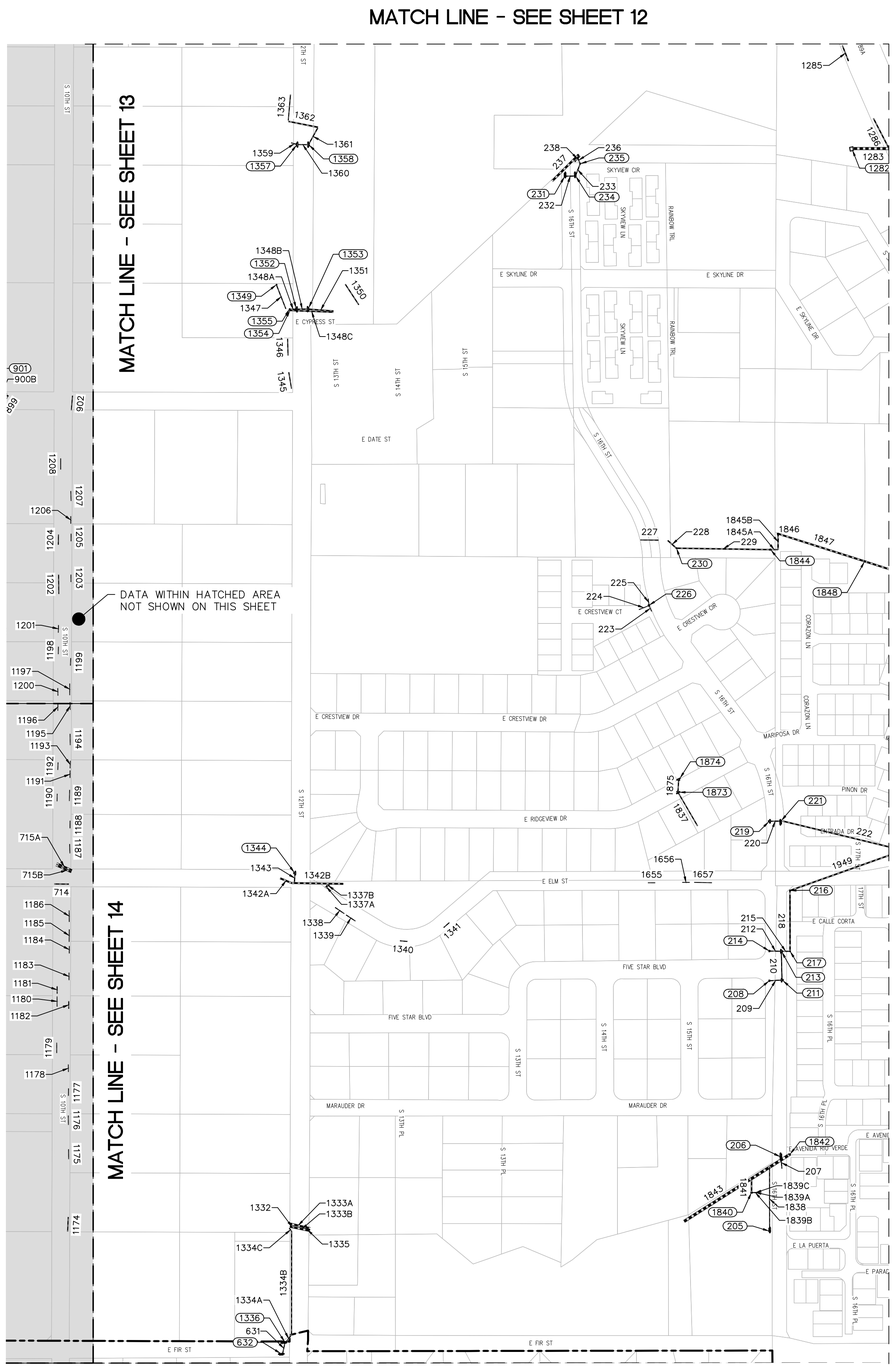
DRAWING NO.
M14

SHT NO. 14 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-14.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017–10:06am

STORM DRAIN MAP #15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MATCH LINE - SEE SHEET 13
MATCH LINE - SEE SHEET 14
MATCH LINE - SEE SHEET 16
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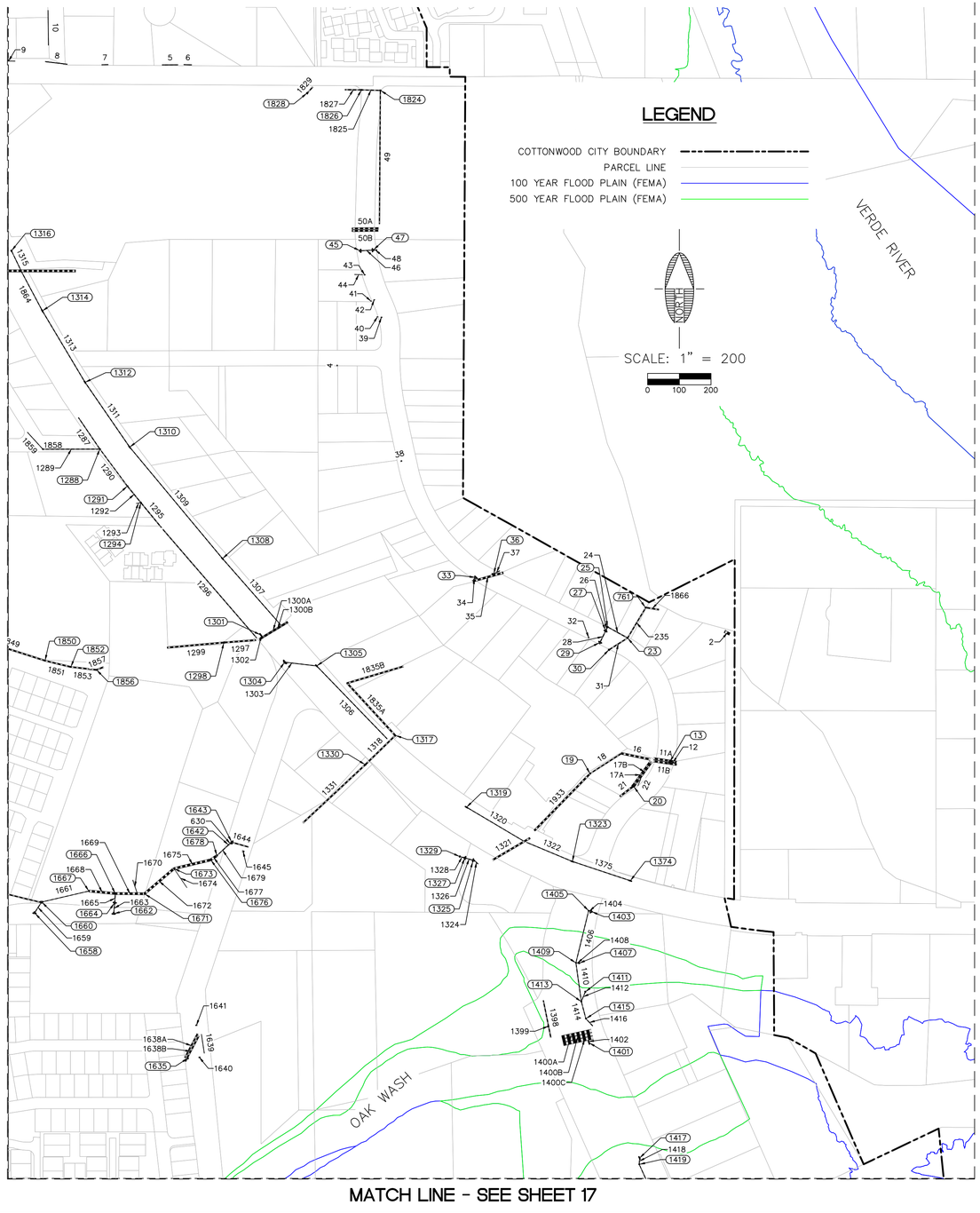
STORM DRAIN MAP #16



STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1824	60"x60" STEEL GRATE RIM = 3313.91 INV IN = 3309.59 INV OUT = 3309.47
1826	60"x60" STEEL GRATE RIM = 3316.00 INV IN = 3311.46 INV OUT = 3310.66
1828	28"x82" STEEL GRATE RIM = 3319.59 INV OUT = 3315.06
1850	SDMH 24" SLOTTED LID RIM = 4.84 INV OUT = -2.00
1852	SDMH 24" SLOTTED LID RIM = 4.84 INV OUT = -2.00
1856	SDMH 24" SLOTTED LID RIM = 0.00
1858	MANHOLE 24" SLOTTED LID RIM = 3344.90 INV OUT = 3340.31 INV OUT = 3340.06

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1398	30"	CMP	3320.86	3317.21
1399	N/A	5"x60" SIDEWALK SCUPPER	3325.53	3325.40
1400A	N/A	10'x7' BOX CULVERT	3316.05	3313.78
1400B	N/A	10'x7' BOX CULVERT	3316.05	3313.78
1400C	N/A	10'x7' BOX CULVERT	3316.05	3313.78
1402	27"	RCP	3317.17	3314.18
1406	18"	RCP	0.00	0.00
1410	18"	RCP	0.00	0.00
1414	18"	RCP	0.00	0.00
1416	18"	RCP	0.00	0.00
1420	18"	RCP	0.00	0.00
1638A	48"	CMP	3343.81	3342.37
1638B	48"	CMP	3344.02	3341.66
1639	12"	CMP	3345.82	3343.27
1640	N/A	4"x32" SIDEWALK SCUPPER	3348.66	3348.64
1641	N/A	4"x32" SIDEWALK SCUPPER	3348.49	3348.47
1644	36"	CMP	3329.09	3327.57
1645	N/A	5"x48" SIDEWALK SCUPPER	3334.10	3334.00
1659	18"	CMP	3349.10	3347.72
1661	18"	CMP	3347.64	3340.49
1663	18"	CMP	3345.26	3344.07
1665	24"	CMP	3344.05	3338.99
1668	84"	CMP	3340.44	3338.89
1669	84"	CMP	3349.75	3340.76
1670	12"	CMP	3341.30	3345.27
1672	84"	CMP	3338.07	3334.90
1674	6"	PVC	3340.34	3339.89
1675	84"	CMP	3334.88	3332.43
1679	24"	CMP	3331.31	3330.81
1825	30"	CMP	3311.91	3310.84
1827	36"	CMP	3313.93	3312.96
1829	36"	Elliptical CMP	3316.56	3313.60
1835A	54"	RCP	3319.34	3312.00
1835B	54"	RCP	3312.00	3308.70
1849	48"	CMP	3352.78	3343.13
1851	48"	CMP	0.00	0.00
1853	48"	CMP	0.00	0.00
1857	48"	CMP	0.00	0.00
1859	12"	CMP	3340.81	3342.94
1864	18"	RCP	3332.93	3332.75
1933	60"	CMP	3309.66	3306.50

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
13	4"x48" CURB INLET RIM = 3308.13 INV OUT = 3303.88
19	Eccentric Cylindrical Structure RIM = 3314.13 INV IN = 3304.00 INV OUT = 3304.00
20	32"x10' STEEL GRATE RIM = 3311.78 INV IN = 3303.93 INV OUT = 3303.89 INV OUT = 3304.01
23	MANHOLE 45° SQUARE LID RIM = 3304.56 INV IN = 3299.22 INV IN = 3298.68 INV IN = 3298.72
25	42"x54" STEEL GRATE RIM = 3299.58 INV IN = 3294.48 INV OUT = 3294.61
27	4'x42" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3299.91 INV IN = 3294.91 INV OUT = 3294.90
29	4'x42" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3299.25 INV OUT = 3295.78
30	52"x52" STEEL GRATE RIM = 3299.29 INV OUT = 3293.89
33	4'x42" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3309.11 INV OUT = 3306.80
36	4'x42" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3307.92 INV OUT = 3305.22
45	4'x42" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3314.43 INV OUT = 3311.22
47	4'x42" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3314.21 INV IN = 3311.09
761	72"X72" GRATE RIM = 3298.39 INV OUT = 3291.54 INV OUT = 3290.80
1288	MANHOLE 26" LID RIM = 3337.66 INV IN = 3332.82 INV IN = 3333.22 INV OUT = 3332.80
1291	MANHOLE 26" SLOTTED LID RIM = 3334.77 INV IN = 3329.92
1294	32"x42" STEEL GRATE RIM = 3332.60 INV IN = 3329.37 INV OUT = 3328.69
1298	24"x24" STEEL GRATE RIM = 3327.81 INV IN = 3320.27 INV OUT = 3320.24
1301	7'x42" CURB INLET 22'x42" STEEL GRATE RIM = 3322.85 INV OUT = 3318.52
1304	7'x84" CURB INLET 22'x84" STEEL GRATE RIM = 3322.34
1305	3'x42" CURB INLET 22'x42" STEEL GRATE RIM = 3321.98
1308	7'x42" CURB INLET 22'x42" STEEL GRATE RIM = 3325.95 INV IN = 3322.49 INV OUT = 3322.38
1310	22"x42" STEEL GRATE RIM = 3334.17 INV IN = 3330.74 INV OUT = 3330.59
1312	7'x42" CURB INLET 22'x42" STEEL GRATE RIM = 3337.18 INV IN = 3333.87 INV OUT = 3333.70
1314	7'x42" CURB INLET 22'x42" STEEL GRATE RIM = 3338.84 INV OUT = 3332.18 INV OUT = 3332.18
1317	22"x42" STEEL GRATE RIM = 3322.34 INV OUT = 3317.08
1319	7'x42" CURB INLET 22'x42" STEEL GRATE RIM = 3318.89 INV OUT = 3315.61
1323	5'x84" CURB INLET 22'x84" STEEL GRATE RIM = 3317.95 INV IN = 3313.00 INV OUT = 3312.89

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1325	5'x42" CURB INLET RIM = 3322.14
1327	5'x42" CURB INLET RIM = 3322.46
1329	30"x30" STEEL GRATE RIM = 3324.10 INV OUT = 3318.54
1330	26"x62" STEEL GRATE RIM = 3323.01 INV IN = 3314.08 INV OUT = 3313.98
1374	5'x40" CURB INLET 24'x40" STEEL GRATE RIM = 3318.68 INV OUT = 3316.43
1401	6'x40" CURB INLET 24'x40" STEEL GRATE RIM = 3321.79 INV OUT = 3316.04
1403	5'x40" CURB INLET 24'x40" STEEL GRATE RIM = 3322.47 INV OUT = 3320.22
1405	MANHOLE 26" LID RIM = 3322.83 INV IN = -0.75 INV OUT = -0.75
1407	5'x40" CURB INLET 24'x40" STEEL GRATE RIM = 3322.01 INV OUT = 3319.76
1409	MANHOLE 26" LID RIM = 3324.81 INV IN = -0.75 INV IN = -0.75 INV OUT = -0.75
1411	26"x36" STEEL GRATE RIM = 3320.74 INV OUT = 3318.49
1413	MANHOLE 26" LID RIM = 3325.60 INV IN = -0.75 INV IN = -0.75 INV OUT = -0.75
1415	MANHOLE 26" LID RIM = 3325.55 INV IN = -0.75 INV OUT = -0.75
1417	24"x40" STEEL GRATE RIM = 3323.09 INV OUT = 3320.84
1635	32"x32" STEEL GRATE RIM = 3347.87
1642	18" STEEL GRATE RIM = 3334.31 INV IN = 3329.81 INV OUT = 3329.31
1643	6'x60" CURB INLET 21'x21" STEEL ACCESS LID RIM = 3334.93 INV IN = 3327.71 INV OUT = 3327.59
1658	16"X40" GRATE 5"x40" OPENING RIM = 3355.69 INV OUT = 3348.35
1660	16"X40" GRATE 5"x40" OPENING RIM = 3354.67 INV IN = 3346.97 INV OUT = 3346.89
1662	16"X40" GRATE 5"x40" CURB INLET 40"x40" GRATE BEHIND CURB RIM = 3348.63 INV OUT = 3344.51
1664	16"X40" GRATE 5"x40" OPENING RIM = 3348.43 INV IN = 3343.32 INV OUT = 3343.05
1666	MANHOLE 24" SLOTTED LID RIM = 3355.59 INV IN = 3337.99 INV IN = 3335.39 INV OUT = 3346.25
1667	MANHOLE 24" SLOTTED LID RIM = 3347.89 INV IN = 3339.74 INV OUT = 3336.94
1671	MANHOLE 24" SLOTTED LID RIM = 3355.05 INV IN = 3337.26 INV OUT = 3334.57
1673	MANHOLE 36" SLOTTED LID RIM = 3351.19 INV IN = 3331.40 INV IN = 3339.64 INV OUT = 3331.38
1676	MANHOLE 36" SLOTTED LID RIM = 3350.73 INV IN = 3328.93 INV OUT = 3328.90
1678	MANHOLE 36" SLOTTED LID RIM = 3349.48 INV IN = 3327.85 INV OUT = 3330.31

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
2	N/A	4'x8' BOX CULVERT	3295.58	3295.61
4	N/A	2"x30" SIDEWALK SCUPPER	3322.71	3322.67
5	18"	CMP	3332.52	3331.42
6	18"	CMP	3330.92	3330.30
7	18"	CMP	3339.01	3338.05
8	18"	CMP	3342.50	3341.68
9	12"	CMP	3346.94	3345.74
10	12"	CMP	3343.26	3342.47
11A	72"	CMP	3300.41	3298.99
11B	72"	CMP	3300.44	3299.01
12	18"	CMP	3304.63	3301.78
16	72"	CMP	3302.40	3299.92
17A	48"	Elliptical CMP	3306.01	3300.22
17B	48"	Elliptical CMP	3305.89	3300.26
18	36"	CMP	3305.50	3300.90
21	60"	Elliptical CMP	3307.23	3306.43
22	8"	PVC	3309.18	3308.91
24	24"	CMP	3295.61	3300.22
28	24"	CMP	3296.78	3295.91
31	36"	CMP	3295.39	3300.18
32	N/A	3"x30" SIDEWALK SCUPPER	3299.80	3299.70
34	18"	CMP	3307.55	3306.33
35	72"	CMP	3301.06	3299.91
37	18"	CMP	3305.97	3304.78
38	N/A	3"x32" SIDEWALK SCUPPER	3317.28	3317.06
39	N/A	3"x32" SIDEWALK SCUPPER	3317.04	3316.86
40	6"	PVC	3317.85	3317.44
41	6"	PVC	3316.34	3316.29
42	N/A	4"x20" SIDEWALK SCUPPER	3316.32	3316.11
43	N/A	4"x20" SIDEWALK SCUPPER	3315.41	3315.07
44	6"	PVC	3315.93	3315.68
46	18"	CMP	3311.98	3311.84
48	24"	CMP	3311.75	3311.16
49	30"	CMP	3310.72	3306.42
50A	60"	CMP	3306.62	3305.62
50B	60"	CMP	3306.76	3305.57
235	36"	CMP	3293.04	3300.22
630	36"	CMP	3330.81	3329.21
1283	84"	RCP	3341.17	3326.74
1287	24"	CMP	3337.11	3333.82
1289	24"	CMP	3341.06	3334.22
1290	24"	CMP	3333.80	3330.92
1292	24"	CMP	3330.93	3329.94
1295	27"	RCP	3329.82	3328.08
1296	24"	CMP	3327.76	3319.38
1297	54"	Elliptical CMP	3322.49	3319.48
1299	54"	Elliptical CMP	3328.25	3322.52
1300A	27"	RCP	3318.97	3317.39
1300B	27"	RCP	3318.87	3317.12
1302	18"	RCP	3319.27	3322.94
1303	18"	RCP	0.00	0.00
1306	18"	RCP	3317.53	3319.20
1307	18"	RCP	3323.13	3319.51
1309	18"	RCP	3331.34	3323.24
1311	18"	RCP	3334.44	3331.49
1313	18"	RCP	3332.93	3334.62
1315	18"	RCP	3339.64	3334.81
1318	48"	CMP	3315.98	3312.90
1320	18"	RCP	3316.36	3313.49
1321	N/A	5'x8' BOX CULVERT	3312.47	3311.00
1322	18"	RCP	3313.64	3312.46
1324	18"	CMP	3320.57	3318.41
1326	18"	CMP	3321.01	3320.76
1331	48"	CMP	3322.19	3316.08
1375	18"	RCP	3317.18	3313.75

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

DRAWING NO.
M16

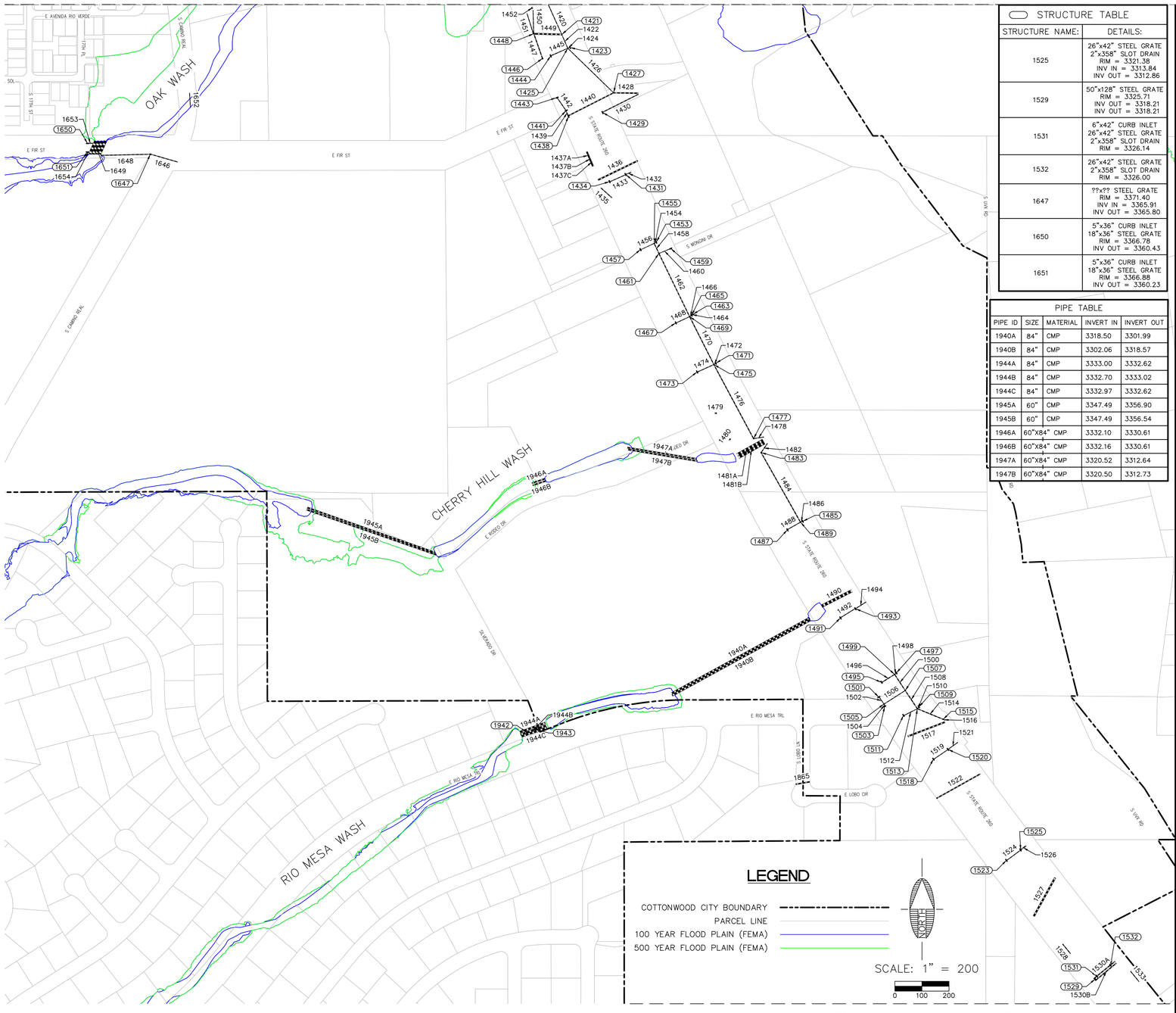
SHT NO. 16 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-16.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017–10:24am

STORM DRAIN MAP #17

MATCH LINE - SEE SHEET 16



MATCH LINE - SEE SHEET 18

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1525	26"x42" STEEL GRATE 2"x358" SLOT DRAIN RIM = 3321.38 INV IN = 3313.84 INV OUT = 3312.86
1529	50"x128" STEEL GRATE RIM = 3325.71 INV OUT = 3318.21 INV OUT = 3318.21
1531	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x358" SLOT DRAIN RIM = 3326.14
1532	26"x42" STEEL GRATE 2"x358" SLOT DRAIN RIM = 3326.00
1647	??x?? STEEL GRATE RIM = 3371.40 INV IN = 3365.91 INV OUT = 3365.80
1650	5"x36" CURB INLET 18"x36" STEEL GRATE RIM = 3366.78 INV OUT = 3360.43
1651	5"x36" CURB INLET 18"x36" STEEL GRATE RIM = 3366.88 INV OUT = 3360.23

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1940A	84"	CMP	3318.50	3301.99
1940B	84"	CMP	3302.06	3318.57
1944A	84"	CMP	3333.00	3332.62
1944B	84"	CMP	3332.70	3333.02
1944C	84"	CMP	3332.97	3332.62
1945A	60"	CMP	3347.49	3356.90
1945B	60"	CMP	3347.49	3356.54
1946A	60"X84"	CMP	3332.10	3330.61
1946B	60"X84"	CMP	3332.16	3330.61
1947A	60"X84"	CMP	3320.52	3312.64
1947B	60"X84"	CMP	3320.50	3312.73

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1473	2"x42" CURB INLET 26"42" STEEL GRATE RIM = 3318.38 INV OUT = 3312.63
1475	MANHOLE 26" LID RIM = 3321.37 INV IN = –1.12 INV IN = –0.75 INV IN = –0.75 INV OUT = –1.12
1477	MANHOLE 26" LID RIM = 3321.91 INV IN = –1.12 INV OUT = –1.12
1483	MANHOLE 26" LID RIM = 3318.09 INV IN = –1.12 INV OUT = –1.12
1485	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x230" SLOT DRAIN RIM = 3318.20 INV OUT = 3312.45
1487	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x230" SLOT DRAIN RIM = 3318.02 INV OUT = 3315.77
1489	MANHOLE 26" LID RIM = 3321.20 INV IN = –0.75 INV IN = 3316.35 INV OUT = –1.12
1491	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x174" SLOT DRAIN RIM = 3315.69 INV OUT = 3310.24
1493	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x178" SLOT DRAIN RIM = 3316.02 INV IN = 3305.70 INV OUT = 3305.53
1495	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x120" SLOT DRAIN RIM = 3314.32 INV OUT = 3308.20
1497	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x178" SLOT DRAIN RIM = 3313.90 INV OUT = 3308.15
1499	MANHOLE 26" LID RIM = 3316.97 INV IN = –0.75 INV IN = –1.12 INV OUT = –1.12
1501	5"x42" CURB INLET 26"x42" STEEL GRATE RIM = 3313.60 INV OUT = 3308.15
1503	6"x42" CURB INLET 26"x42" STEEL GRATE RIM = 3313.30 INV OUT = 3307.81
1505	MANHOLE 26" LID RIM = 3316.15 INV IN = –0.75 INV IN = –0.75 INV OUT = –0.75
1507	MANHOLE 26" LID RIM = 3316.47 INV IN = –1.12 INV IN = –0.75 INV OUT = –1.12
1509	6"x42" CURB INLET 26"x42" STEEL GRATE (2) 2"x76" SLOT DRAIN RIM = 3311.86 INV OUT = 3307.61
1511	6"x42" CURB INLET 26"x42" STEEL GRATE (2) 2"x76" SLOT DRAIN RIM = 3311.97
1513	MANHOLE 26" LID RIM = 3316.27 INV IN = –1.12 INV IN = –0.75 INV IN = –0.75 INV OUT = –1.12
1515	MANHOLE 26" LID RIM = 3308.46 INV IN = –1.12 INV OUT = –1.12
1518	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x358" SLOT DRAIN RIM = 3313.05 INV OUT = 3309.10
1520	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x358" SLOT DRAIN RIM = 3314.80 INV IN = 3305.53 INV OUT = 3305.37
1523	6"x42" CURB INLET 26"x42" STEEL GRATE 2"x358" SLOT DRAIN RIM = 3319.09 INV OUT = 3315.14

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1421	MANHOLE 26" LID RIM = 3326.62 INV IN = –0.75 INV IN = –2.50 INV OUT = –0.75
1423	6"x40" CURB INLET 24"x40" STEEL GRATE RIM = 3320.36 INV OUT = 3316.11
1425	MANHOLE 26" LID RIM = 3324.81 INV IN = –0.75 INV IN = –0.75 INV IN = –0.75 INV OUT = –0.75
1427	MANHOLE 26" LID RIM = 3317.16 INV IN = 3300.71 INV IN = 3300.32 INV OUT = 3299.60
1429	6"x40" CURB INLET 24"x40" STEEL GRATE RIM = 3319.58 INV OUT = 3312.48
1431	5"x40" CURB INLET 24"x40" STEEL GRATE 2"x120" SLOT DRAIN RIM = 3318.69 INV IN = 3313.84 INV OUT = 3313.75
1434	5"x40" CURB INLET 24"x40" STEEL GRATE 2"x120" SLOT DRAIN RIM = 3318.81 INV OUT = 3314.86
1438	50"x130" STEEL GRATE RIM = 3316.49 INV IN = 3311.42 INV OUT = 3310.48
1441	7"x40" CURB INLET 26"x40" STEEL GRATE RIM = 3319.57 INV IN = 3315.70 INV OUT = 3315.14
1443	7"x40" CURB INLET 26"x40" STEEL GRATE RIM = 3319.65 INV OUT = 3316.40
1444	5"x42" CURB INLET 24"x42" STEEL GRATE 2"x120" SLOT DRAIN RIM = 3320.36
1446	48"x96" STEEL GRATE RIM = 3319.11 INV OUT = 3316.20
1448	50"x130" STEEL GRATE RIM = 3318.02 INV IN = 3311.70 INV IN = 3313.08 INV IN = 3311.48 INV OUT = 3309.85
1453	5"x42" CURB INLET 24"x42" STEEL GRATE 2"x120" SLOT DRAIN RIM = 3319.02 INV OUT = 3313.27
1455	MANHOLE 26" LID RIM = 3321.89 INV IN = –0.75 INV IN = –0.75 INV OUT = –1.12
1457	3"x42" CURB INLET 26"x42" STEEL GRATE 2"x120" SLOT DRAIN RIM = 3317.72 INV OUT = 3313.47
1459	5"x42" CURB INLET 24"x42" STEEL GRATE RIM = 3317.09
1461	MANHOLE 26" LID RIM = 3317.84 INV IN = –1.12 INV IN = –0.75 INV OUT = –1.12
1463	26"x36" STEEL GRATE RIM = 3316.04 INV OUT = 3312.29
1465	5"x42" CURB INLET 26"42" STEEL GRATE (2) 2"x72" SLOT DRAIN RIM = 3316.31 INV IN = 3312.06 INV OUT = 3311.97
1467	5"x42" CURB INLET 26"x42" STEEL GRATE (2) 2"x72" SLOT DRAIN RIM = 3316.29 INV OUT = 3312.54
1469	MANHOLE 26" LID RIM = 3320.58 INV IN = –0.75 INV IN = –0.75 INV IN = –1.12 INV OUT = –1.12
1471	5"x42" CURB INLET 26"x42" STEEL GRATE RIM = 3318.71 INV OUT = 3312.96

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1420	18"	RCP	0.00	0.00
1422	18"	RCP	0.00	0.00
1426	18"	RCP	0.00	3301.46
1428	42"	CMP	3301.34	3300.06
1430	24"	CMP	3313.48	3300.03
1432	18"	RCP	3314.50	3314.48
1433	18"	RCP	3315.61	3314.59
1435	24"	CMP	3317.38	3316.74
1436	54"	CMP	3310.06	3304.72
1437A	18"	CMP	3316.78	3315.98
1437B	18"	CMP	3316.72	3315.94
1437C	18"	CMP	3316.91	3315.86
1439	27"	RCP	3316.26	3312.55
1440	36"	RCP	3311.98	3301.82
1442	18"	RCP	3317.15	3316.45
1445	18"	RCP	3316.96	0.00
1447	27"	RCP	3317.32	3312.61
1449	60"	RCP	3312.35	0.00
1450	18"	RCP	3322.28	3312.45
1451	18"	RCP	3316.51	3313.83
1452	N/A	6"x60" SIDEWALK SCUPPER	3321.32	3321.25
1456	18"	RCP	3314.22	0.00
1458	27"	RCP	0.00	0.00
1460	18"	RCP	3313.89	0.00
1462	27"	RCP	0.00	0.00
1468	18"	RCP	3313.29	0.00
1470	27"	RCP	0.00	0.00
1474	18"	RCP	3313.38	0.00
1476	27"	RCP	0.00	0.00
1478	27"	RCP	0.00	3308.06
1479	N/A	4"x48" SIDEWALK SCUPPER	3317.12	3317.04
1480	N/A	4"x48" SIDEWALK SCUPPER	3317.11	3317.20
1481A	N/A	10'x7' BOX CULVERT	3309.40	3307.16
1481B	N/A	10'x7' BOX CULVERT	3309.40	3307.16
1482	27"	RCP	0.00	3307.95
1484	27"	RCP	0.00	0.00
1488	18"	RCP	3316.52	3317.10
1490	N/A	10'x10' BOX CULVERT	3300.92	3299.89
1492	18"	RCP	3310.99	3306.45
1494	18"	RCP	3306.28	3300.00
1496	27"	RCP	3309.33	0.00
1500	27"	RCP	0.00	0.00
1502	18"	RCP	3308.90	0.00
1506	18"	RCP	0.00	0.00
1508	27"	RCP	0.00	0.00
1512	18"	RCP	3308.77	0.00
1514	27"	RCP	0.00	0.00
1517	60"	CMP	3303.60	3297.76
1519	18"	RCP	3309.85	3306.28
1521	18"	RCP	3306.12	3299.96
1522	36"	CMP	3302.78	3296.24
1524	18"	RCP	3315.89	3314.59
1526	36"	ELLIPTICAL RCP	3314.36	3309.60
1527	72"	CMP	3305.82	3299.06
1528	24"	CMP	3322.88	3322.01
1530A	36"	CMP	3319.71	3317.56
1530B	36"	CMP	3319.71	3317.50
1533	18"	CMP	3320.44	3317.28
1646	24"	CMP	3374.01	3366.91
1648	24"	CMP	3366.80	3359.74
1649	N/A	10'x6' BOX CULVERT	3358.50	3357.86
1649A	N/A	10'x6' BOX CULVERT	3358.50	3357.86
1649C	N/A	10'x6' BOX CULVERT	3358.50	3357.86
1649D	N/A	10'x6' BOX CULVERT	3358.50	3357.86
1652	15"	HDPE	3361.14	3357.77
1653	18"	RCP	3361.18	3360.00
1654	18"	RCP	3360.98	3360.00
1865	42"	CMP	3321.00	3319.92

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REVISIONS			
NO.	DESCRIPTION	DATE	BY

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Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	JUNE 2017
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

DRAWING NO.
M17

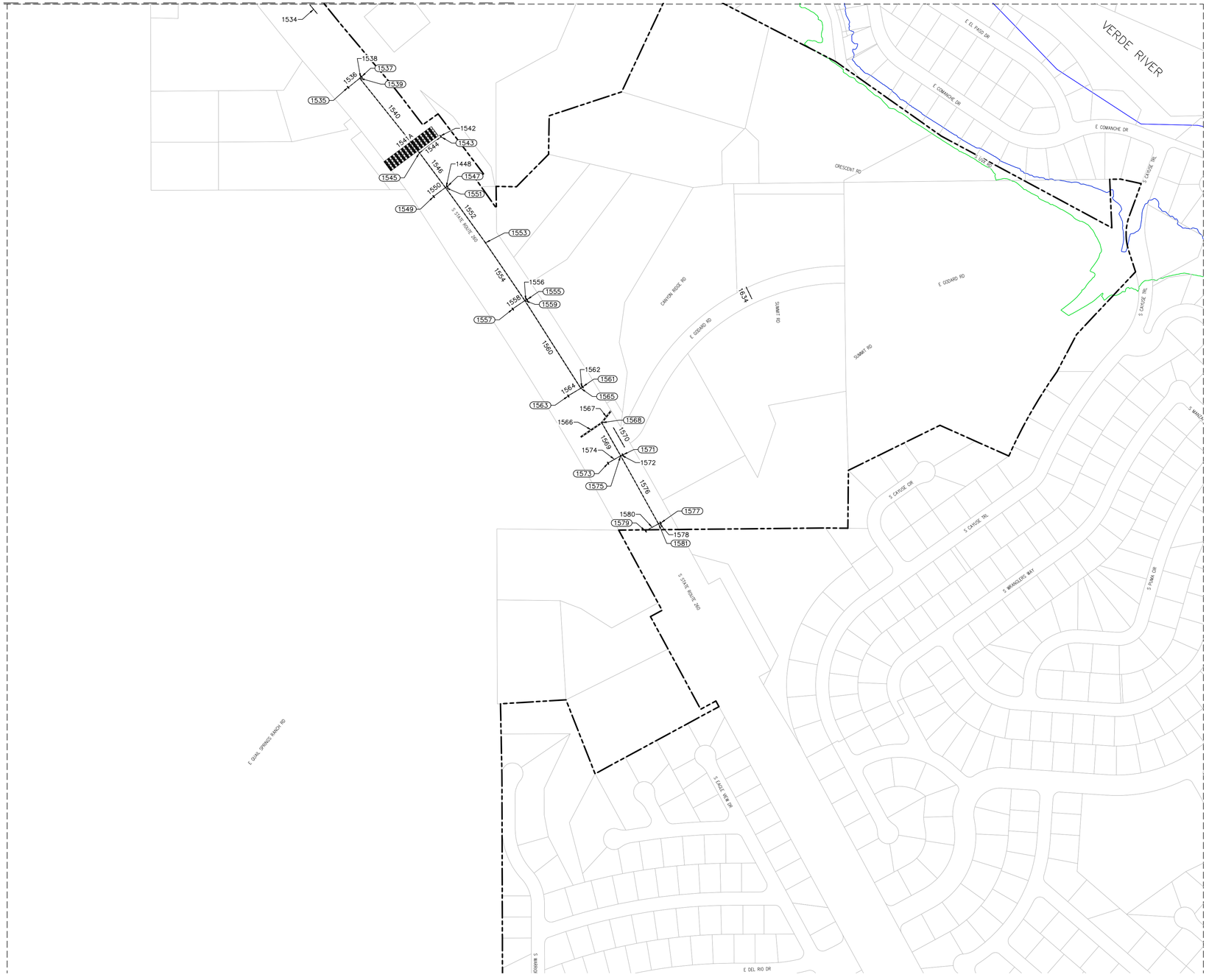
SHT NO. 17 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-17.dwg AMR-C30-17

PLOTTED: Jun 29, 2017–10:33am

STORM DRAIN MAP #18

MATCH LINE - SEE SHEET 17



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1534	18"	CMP	3327.47	3327.15
1536	18"	RCP	3329.12	0.00
1540	27"	RCP	0.00	0.00
1541A	N/A	10'x8' BOX CULVERT	3293.77	3288.32
1541B	N/A	10'x8' BOX CULVERT	3293.77	3288.32
1541C	N/A	10'x8' BOX CULVERT	3293.77	3288.32
1541D	N/A	10'x8' BOX CULVERT	3293.77	3288.32
1544	27"	RCP	0.00	3290.35
1546	27"	RCP	0.00	0.00
1550	18"	RCP	3335.10	0.00
1552	27"	RCP	0.00	0.00
1554	27"	RCP	0.00	0.00
1558	18"	RCP	3341.30	0.00
1560	27"	RCP	0.00	0.00
1564	18"	RCP	3346.74	0.00
1566	60"	CMP	3341.25	0.00
1567	60"	CMP	0.00	3335.29
1569	27"	RCP	0.00	0.00
1570	24"	CMP	3349.85	3349.01
1574	18"	RCP	3349.87	0.00
1576	27"	RCP	0.00	0.00
1580	18"	RCP	3351.90	0.00
1634	18"	CMP	3342.96	3342.52

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
205	3"x9" CURB INLET 28"x42" STEEL GRATE RIM = 3378.79
206	3"x7" CURB INLET 28"x42" STEEL GRATE RIM = 3384.58 INV OUT = 3379.18
208	20"X28" GRATE RIM = 3378.43 INV OUT = 3374.45
211	5"x42" CURB INLET RIM = 3378.67 INV IN = 3374.06 INV OUT = 3374.06
213	5"x42" CURB INLET RIM = 3380.02 INV IN = 3373.95 INV IN = 3373.52 INV OUT = 3373.69
214	20"x28" GRATE RIM = 3377.83 INV OUT = 3373.70
216	36" SLOTTED LID RIM = 3380.21 INV IN = 3360.50 INV OUT = 3360.50
217	36" SLOTTED LID RIM = 3368.55 INV IN = 3363.30 INV OUT = 3363.09
219	28"x52" STEEL GRATE RIM = 3376.86 INV OUT = 3373.00
221	5"x21' CURB INLET 28"x52" STEEL GRATE RIM = 3376.89 INV IN = 3372.85
226	32"x42" STEEL GRATE RIM = 3397.35 INV OUT = 3395.68 INV OUT = 3395.51
230	36" SLOTTED MANHOLE RIM = 3382.08 INV IN = 3378.57 INV OUT = 3378.57
231	5"x20' CURB INLET 28"42" STEEL GRATE RIM = 3368.61 INV OUT = 3363.80
234	5"x20' CURB INLET 28"x42" STEEL GRATE RIM = 3368.66 INV IN = 3363.12 INV OUT = 3362.95
235	36" SLOTTED MANHOLE RIM = 3368.45 INV IN = 3356.42 INV OUT = 3356.42
632	6"x78" CURB INLET 26"x40" STEEL GRATE RIM = 3422.54 INV OUT = 3419.61
1336	6"x78" CURB INLET 26"x40" STEEL GRATE RIM = 3421.97 INV IN = 3419.04
1344	7"x48" CURB OPENING RIM = 3415.66 INV OUT = 3410.04
1349	18" SLOTTED MANHOLE RIM = 3393.10 INV OUT = 3388.64
1352	7"xx13" CURB OPENING 26"x40" STEEL GRATE RIM = 3394.93 INV IN = 3384.35 INV OUT = 3384.22
1353	7"x13' CURB OPENING 26"x40" STEEL GRATE RIM = 3394.87 INV IN = 3381.56 INV OUT = 3381.32
1355	30" SLOTTED MANHOLE RIM = 3393.26 INV OUT = 3385.26
1357	7"x13' CURB OPENING 26"x40" STEEL GRATE RIM = 3393.16 INV IN = 3385.52 INV OUT = 3385.64
1358	7"x13' CURB OPENING 26"x40" STEEL GRATE RIM = 3393.25 INV IN = 3384.32 INV OUT = 3384.02

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200'

0 100 200

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DESIGN:	JTL
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COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

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M18

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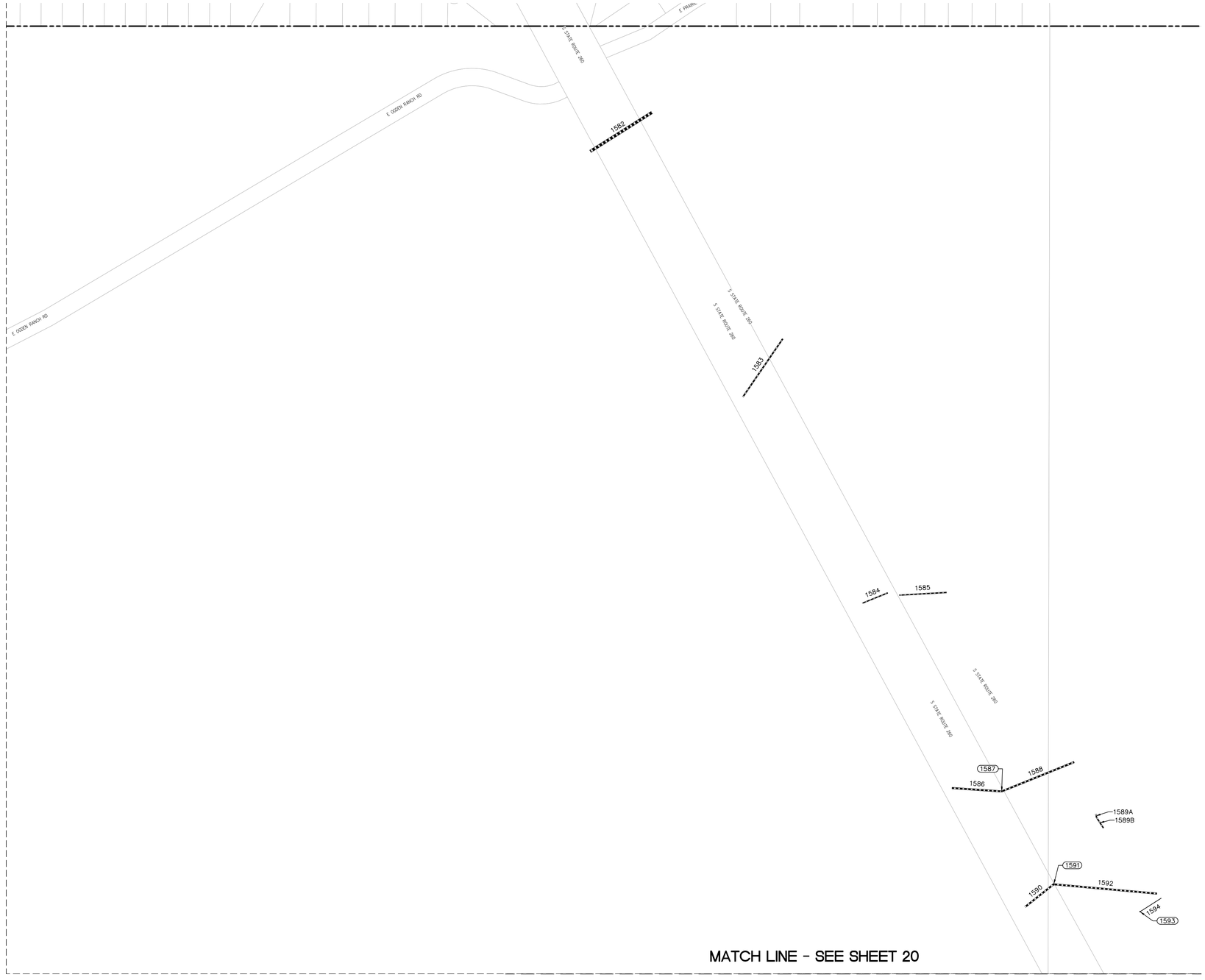
FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-18.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017-10:42am

STORM DRAIN MAP #19



MATCH LINE - SEE SHEET 20

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1582	N/A	10'x8' BOX CULVERT	3330.24	3328.98
1583	54"	CMP	3358.08	3352.38
1584	42"	CMP	3369.68	3365.63
1585	42"	CMP	3363.80	3355.90
1586	72"	CMP	3318.06	3346.86
1588	72"	CMP	3297.48	3295.53
1589A	N/A	48" CONCRETE SPILLWAY	3342.43	3337.95
1589B	N/A	48" CONCRETE SPILLWAY	3337.95	3323.53
1590	72"	CMP	3309.25	0.00
1592	72"	CMP	0.00	3284.48
1594	12"	CMP	3330.04	3286.78

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1587	MANHOLE 32" LID RIM = 3352.70 INV IN = 3343.86 INV OUT = 3294.48
1591	MANHOLE 32" LID RIM = 3320.36 INV IN = -3.00 INV OUT = -3.00
1593	24" STEEL GRATE RIM = 3333.24 INV OUT = 3329.54

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

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CITY OF COTTONWOOD
STORM DRAIN MAP

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M19

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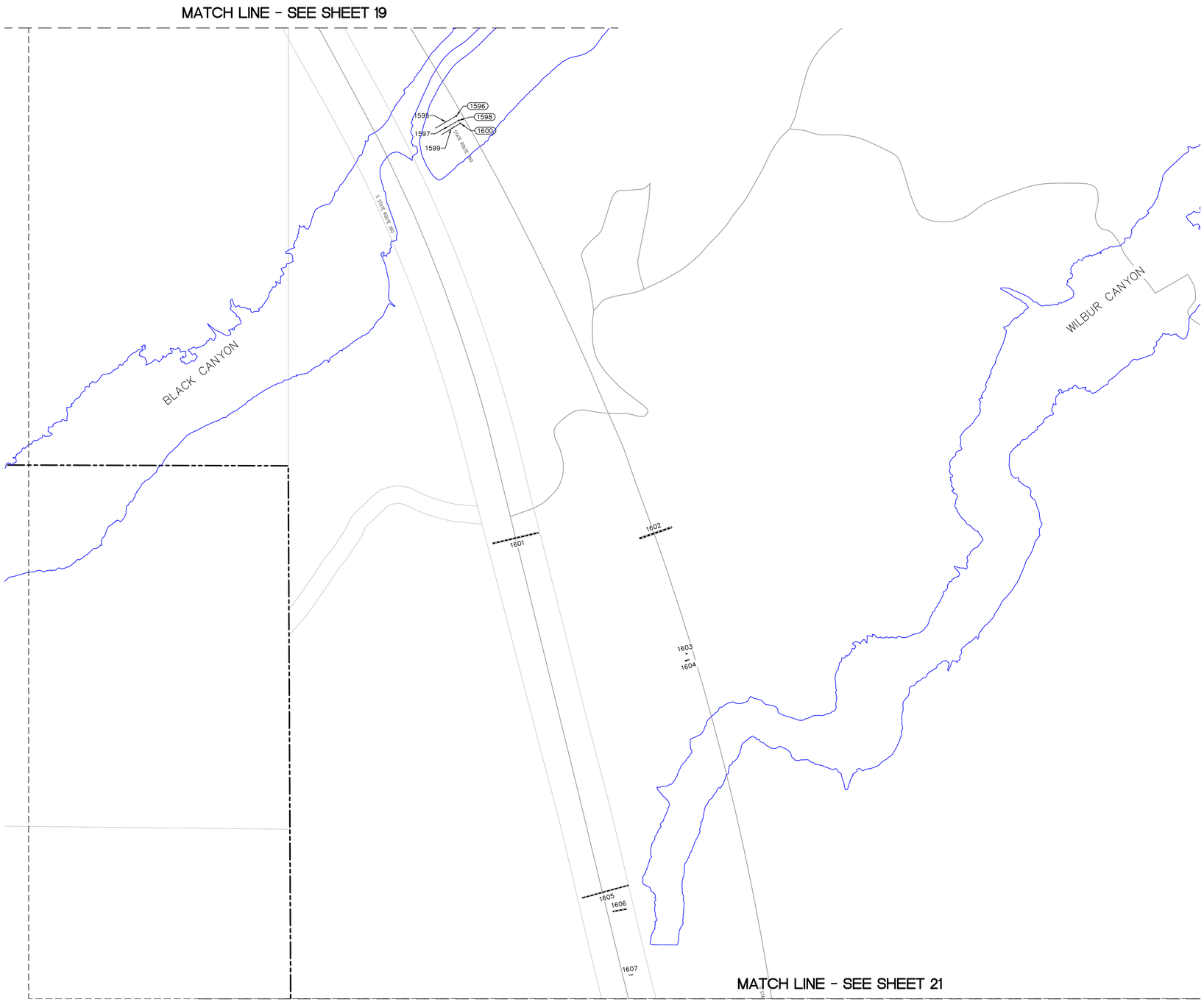
PLOTTED: Jun 29, 2017-10:55am

STORM DRAIN MAP #20



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1595	12"	CMP	3279.07	3321.18
1597	12"	CMP	3320.95	3283.45
1599	12"	CMP	3321.09	3287.32
1601	60"	CMP	3354.53	3358.68
1602	72"	CMP	3343.66	3339.75
1603	48"	SCUPPER	3372.55	3372.85
1604	48"	SCUPPER	3372.94	3371.75
1605	48"	CMP	3319.10	3330.34
1606	48"	SCUPPER	3362.62	3343.39
1607	12"	CMP	3359.42	3350.34

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1596	24" GRATE RIM = 3324.36 INV IN = 3320.68
1598	24" GRATE RIM = 3324.28 INV OUT = 3320.45
1600	24" GRATE RIM = 3324.35 INV OUT = 3320.59

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

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COTTONWOOD
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CITY OF COTTONWOOD
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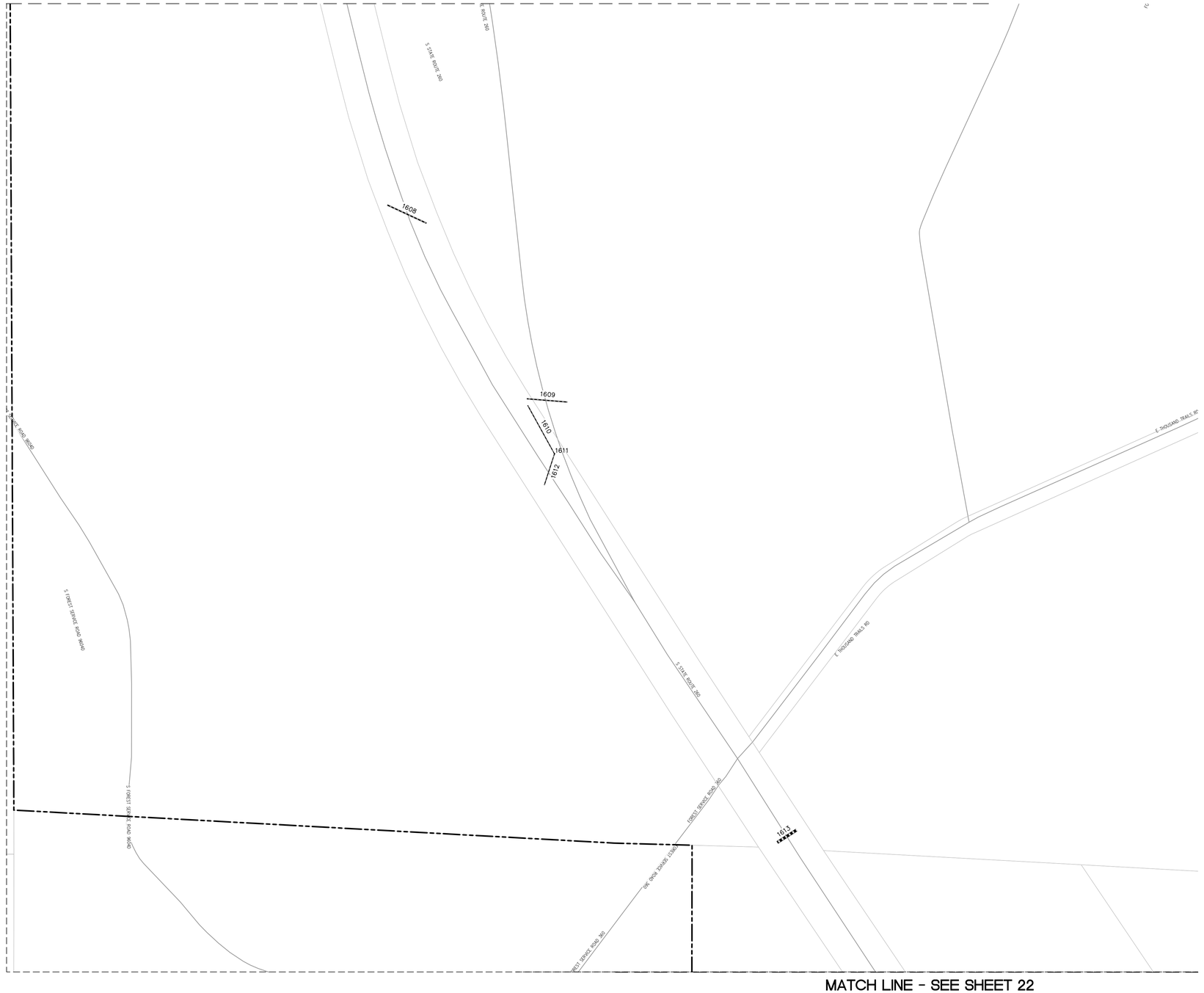
STORM DRAIN MAP #21

MATCH LINE - SEE SHEET 20



MATCH LINE - SEE SHEET 22

PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1608	42"	CMP	3360.77	3372.12
1609	36"	CMP	3424.24	3429.64
1610	24"	CMP	3427.59	3445.08
1612	24"	CMP	3445.09	3444.22
1613	48"	SCUPPER	3451.53	3450.24

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1611	MANHOLE 32" LID RIM = 3448.93 INV IN = 3444.08 INV OUT = 3444.09

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

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CITY OF COTTONWOOD
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DRAWING NO.
M21

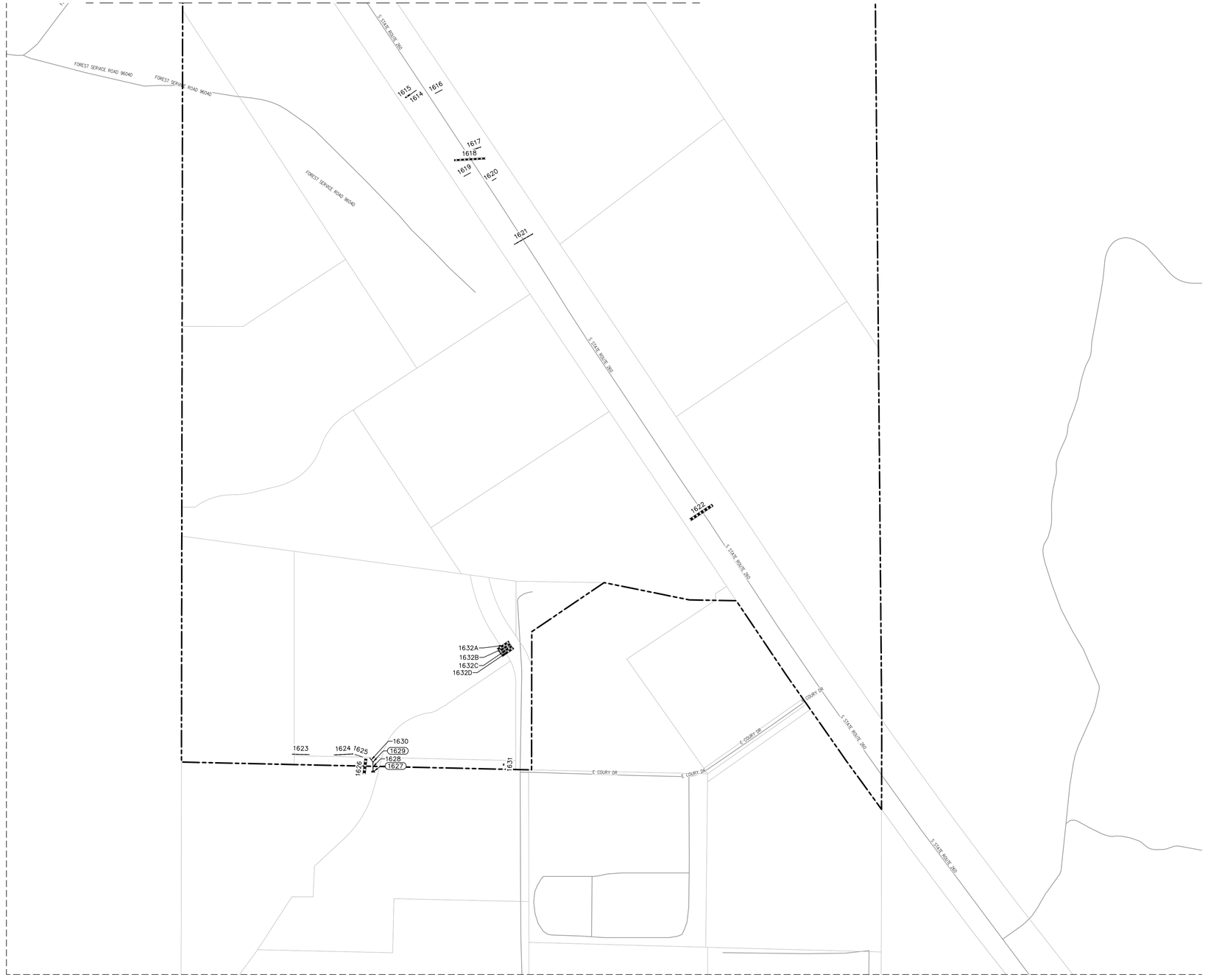
SHT NO. 21 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-21.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017-11:13am

STORM DRAIN MAP #22

MATCH LINE - SEE SHEET 21



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1614	12"	CMP	3409.09	3422.96
1615	48"	SCUPPER	3403.95	3408.94
1616	12"	CMP	3420.37	3403.83
1617	24"	CMP	3407.81	3391.90
1618	6'x4'	BOX CUL.	3385.65	3384.00
1619	12"	CMP	3393.16	3405.88
1620	12"	CMP	3403.25	3393.45
1621	24"	CMP	3390.29	3386.66
1622	10'x10'	BOX CUL.	3360.63	3355.55
1623	18"	RCP	3411.96	3410.14
1624	18"	RCP	3407.93	3404.79
1625	8"	PVC	3404.40	3403.42
1626	6'x10'	BOX CUL.	3398.91	3399.47
1628	18"	RCP	3403.41	3404.04
1630	18"	RCP	3403.26	3402.81
1631	48"	SCUPPER	3405.24	3405.94
1632A	84"	CMP	3382.13	3382.93
1632B	84"	CMP	3382.91	3382.21
1632C	84"	CMP	3382.76	3382.17
1632D	84"	CMP	3382.02	3382.56

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1627	5'X72" CURB OPENING NO GRATE RIM = 3407.99 INV IN = 3403.29
1629	Eccentric Cylindrical Structure RIM = 3407.86 INV OUT = 3402.51 INV OUT = 3402.66

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

NORTH

SCALE: 1" = 200

0 100 200

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CITY OF COTTONWOOD
STORM DRAIN MAP

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DRAWING NO.
M22

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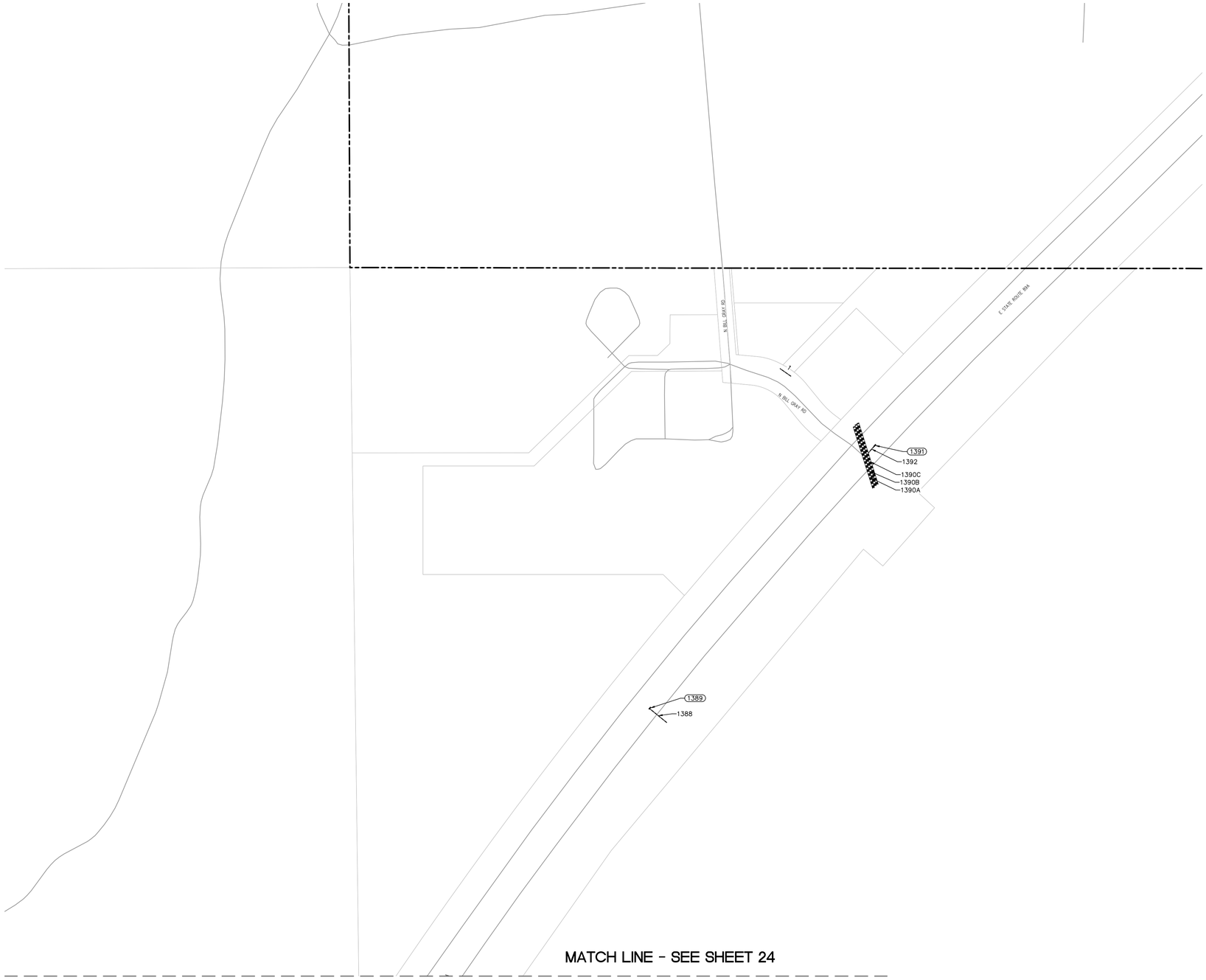
FILE: \\VP-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-22.dwg AMR-C3D-17

PLOTTED: Jun 29, 2017-11:24am

STORM DRAIN MAP #23



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1	18"	CMP	3491.59	3491.29
1388	24"	CMP	3462.71	3461.47
1390A	N/A	8'x8' BOX CULVERT	3481.04	3474.49
1390B	N/A	8'x8' BOX CULVERT	3481.04	3474.49
1390C	N/A	8'x8' BOX CULVERT	3481.04	3474.49
1392	24"	CMP	3484.91	3478.50

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1389	36"x72" STEEL GRATE RIM = 3464.57
1391	36"x72" STEEL GRATE RIM = 3486.42 INV OUT = 3483.91

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

MATCH LINE - SEE SHEET 24

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STORM DRAIN MAP

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M23

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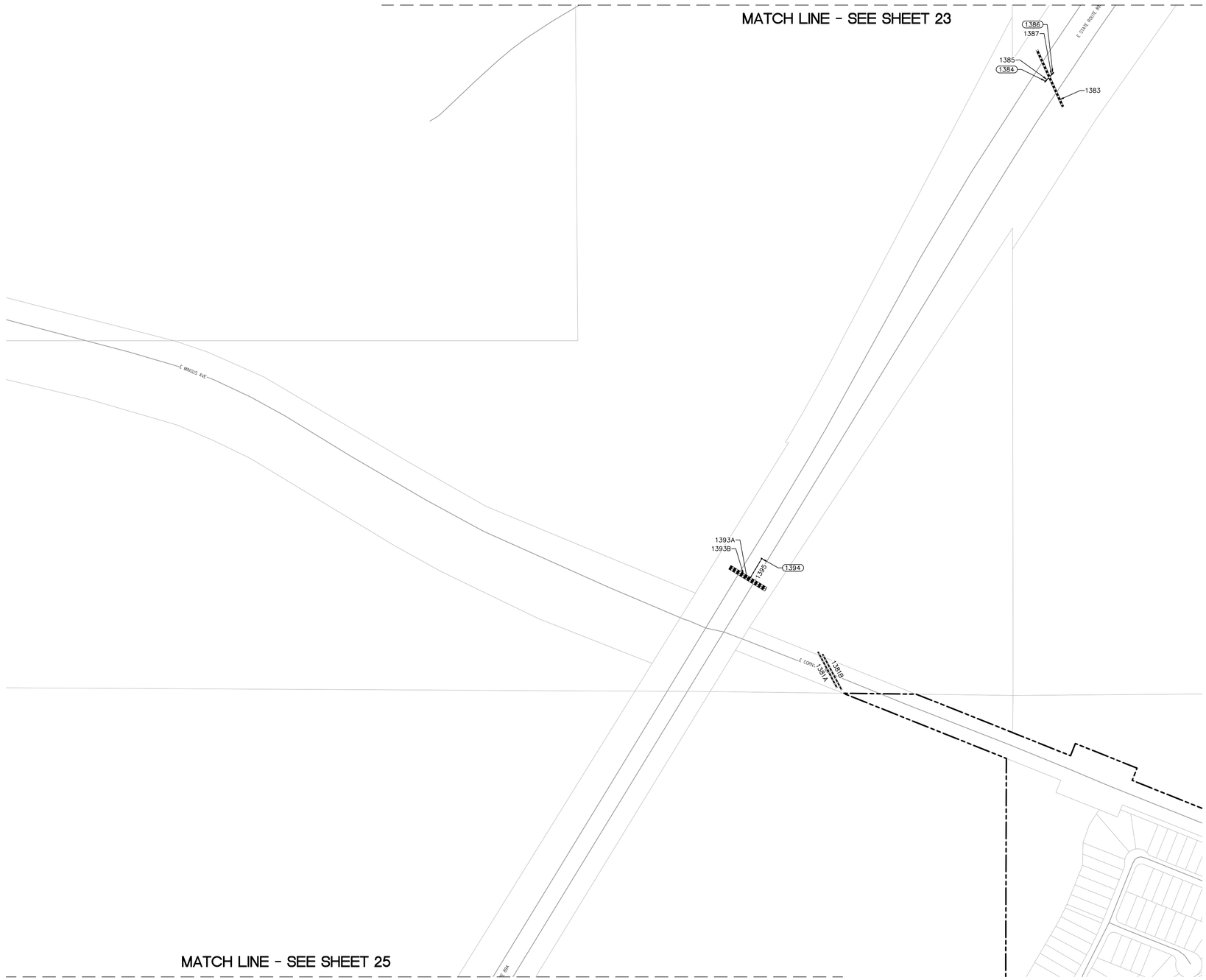
STORM DRAIN MAP #24



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1381A	54"	CMP	3387.97	3385.01
1381B	54"	CMP	3387.74	3384.55
1383	N/A	8'x4' BOX CULVERT	3429.47	3424.08
1385	24"	CMP	3428.81	3427.71
1387	24"	CMP	3426.66	3427.71
1393A	N/A	8'x4' BOX CULVERT	3396.50	3395.49
1393B	N/A	8'x4' BOX CULVERT	3396.50	3395.49
1395	24"	CMP	3401.61	3397.79

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1384	36"x72" STEEL GRATE RIM = 3430.32 INV OUT = 3427.81
1386	36"x72" STEEL GRATE RIM = 3429.16 INV OUT = 3425.66
1394	24"x36" STEEL GRATE RIM = 3405.45 INV OUT = 3400.61

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

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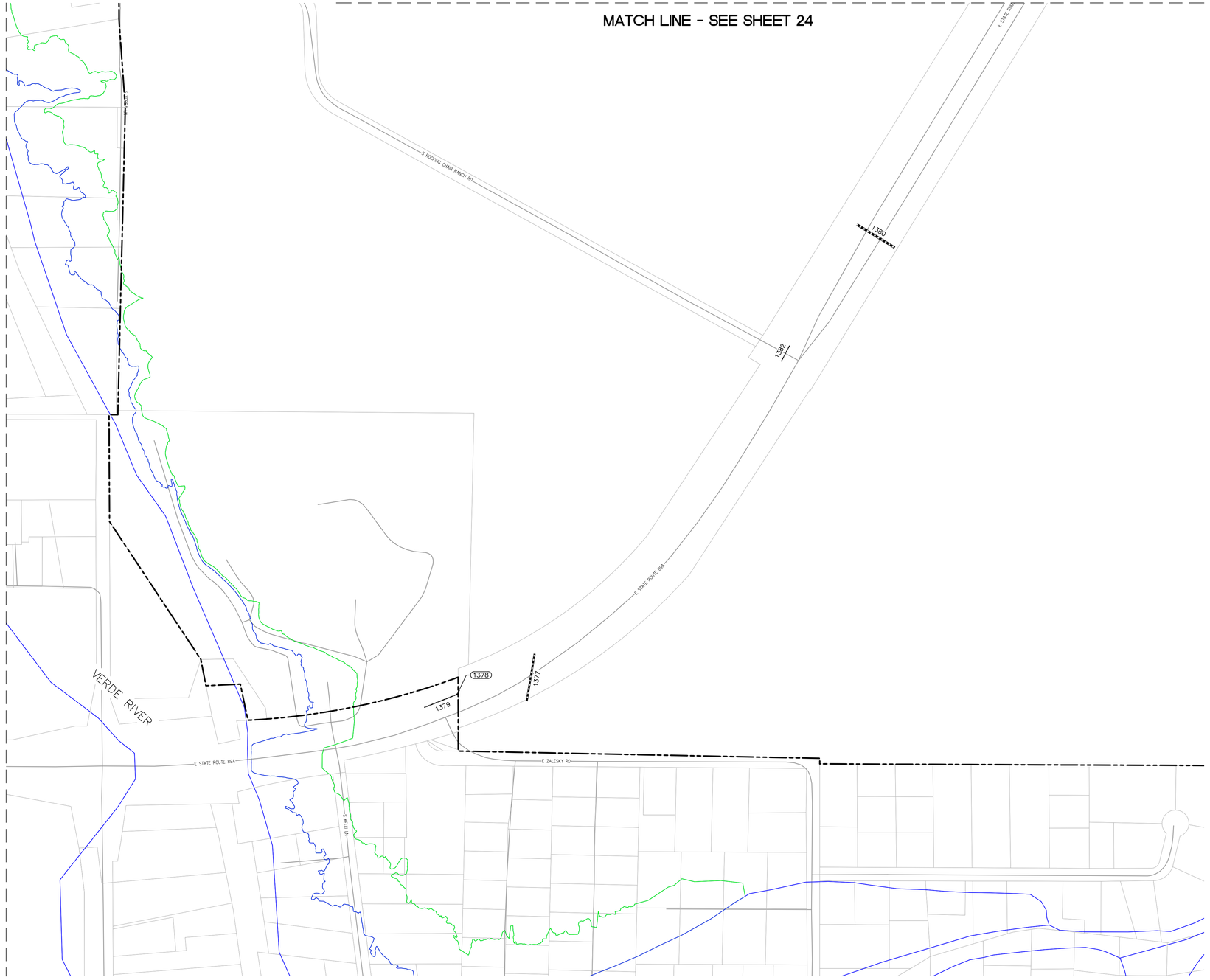
STORM DRAIN MAP #25

MATCH LINE - SEE SHEET 24

MATCH LINE - SEE SHEET 16



PIPE TABLE				
PIPE ID	SIZE	MATERIAL	INVERT IN	INVERT OUT
1377	N/A	6'x4' BOX CULVERT	3299.17	3299.76
1379	27"	RCP	3283.85	3280.77
1380	N/A	8'x4' BOX CULVERT	3341.18	3347.88
1382	24"	CMP	3341.29	3341.25

STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
1378	24"x36" STEEL GRATE RIM = 3287.32 INV OUT = 3282.73

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

N

SCALE: 1" = 200

0 100 200

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STORM DRAIN MAP

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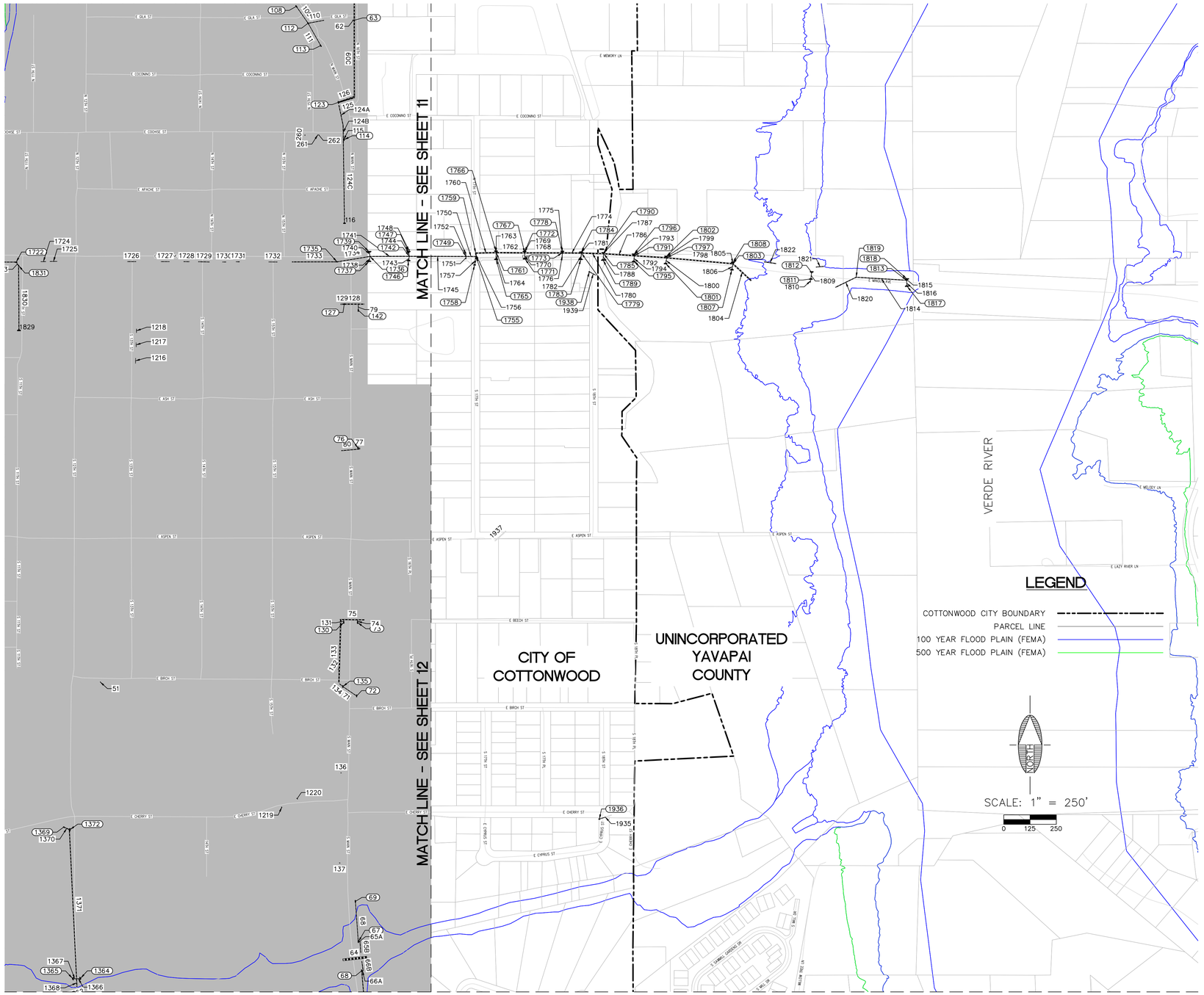
STORM DRAIN MAP #26


MATCH LINE - SEE SHEET 11
MATCH LINE - SEE SHEET 12
MATCH LINE - SEE SHEET 3
CITY OF COTTONWOOD
UNINCORPORATED YAVAPAI COUNTY
VERDE RIVER
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E APACHE ST
E ASH ST
E ASPEN ST
E BIRCH ST
E CHERRY ST
E CYPRUS ST
E MEMORY LN
E MELODY LN
E LAZY RIVER LN
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PLOTTED: Jun 29, 2017 - 2:43pm

STORM DRAIN MAP #27

UNINCORPORATED YAVAPAI COUNTY

CITY OF COTTONWOOD

MATCH LINE - SEE SHEET 5

DATA WITHIN HATCHED AREA NOT SHOWN ON THIS SHEET

MATCH LINE - SEE SHEET 5

MATCH LINE - SEE SHEET 11

SCALE: 1" = 300'

0 150 300

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT

REVISIONS			
NO.	DESCRIPTION	DATE	BY

Shephard Wesnitzer, Inc.
1756 E. Villa Drive
Suite C-11
Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	DECEMBER 2016
SCALE:	AS SHOWN
DRAWN:	AMR
DESIGN:	JTL
CHECKED:	JTL

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
STORM DRAIN MAP

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
60237
ARON M.
REAY
6/29/17
Date Signed
ARIZONA, USA
Expires 9/30/2018

DRAWING NO.
M27

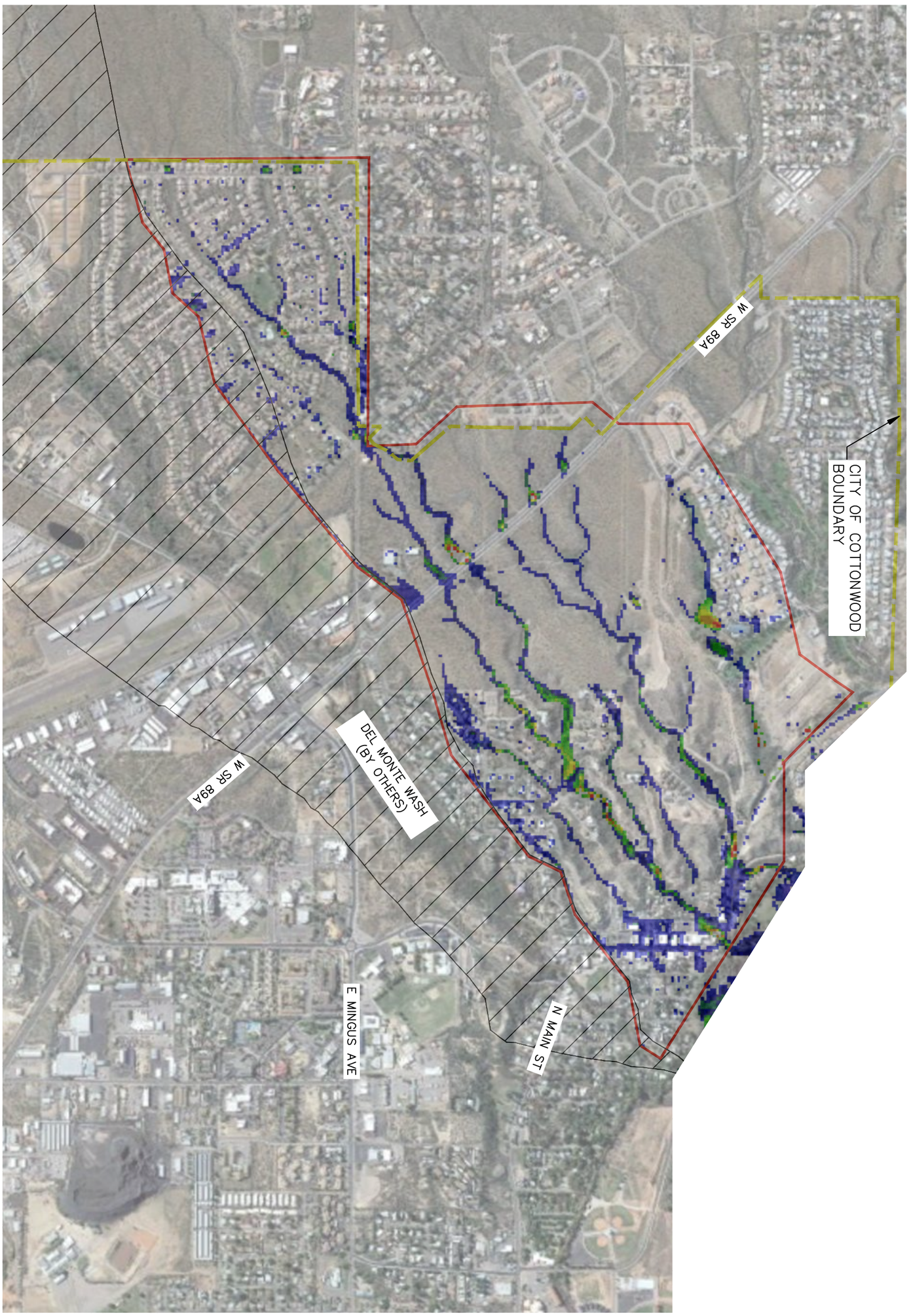
SHT NO. 27 OF 27

FILE: \\VR-FILESEDONA\projects\2014\14267\Survey\Storm Drain Mapping\14267-MAP-27.dwg AMR-C3D-17

Appendix 4: Peak Flow Rate Summary

FILE: P:\2014\14267\DRAWINGS\C3D\NORTH STUDY AREA\NORTH STUDY AREA.DWG JWARNE

PLOTTED: Jun 30, 2020–8:29am



SCALE 1" : 1,000'
0 500 1000

NORTH

feet
<= 0.2 1.1 1.9 2.8 3.7 4.5 5.4 6.3 7.1 8.0

Call at least two full working days before you begin excavation.
ARIZONA 811 Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)

Shephard Wesnitzer, Inc.

221 N. Marina St.
Suite 102
Prescott, AZ 86301
928.541.0443
928.541.1075 fax
www.swiaz.com

JOB NO:	14267
DATE:	JAN 20
SCALE:	1"=1000'
DRAWN:	JRW
DESIGN:	JRW
CHECKED:	JTL

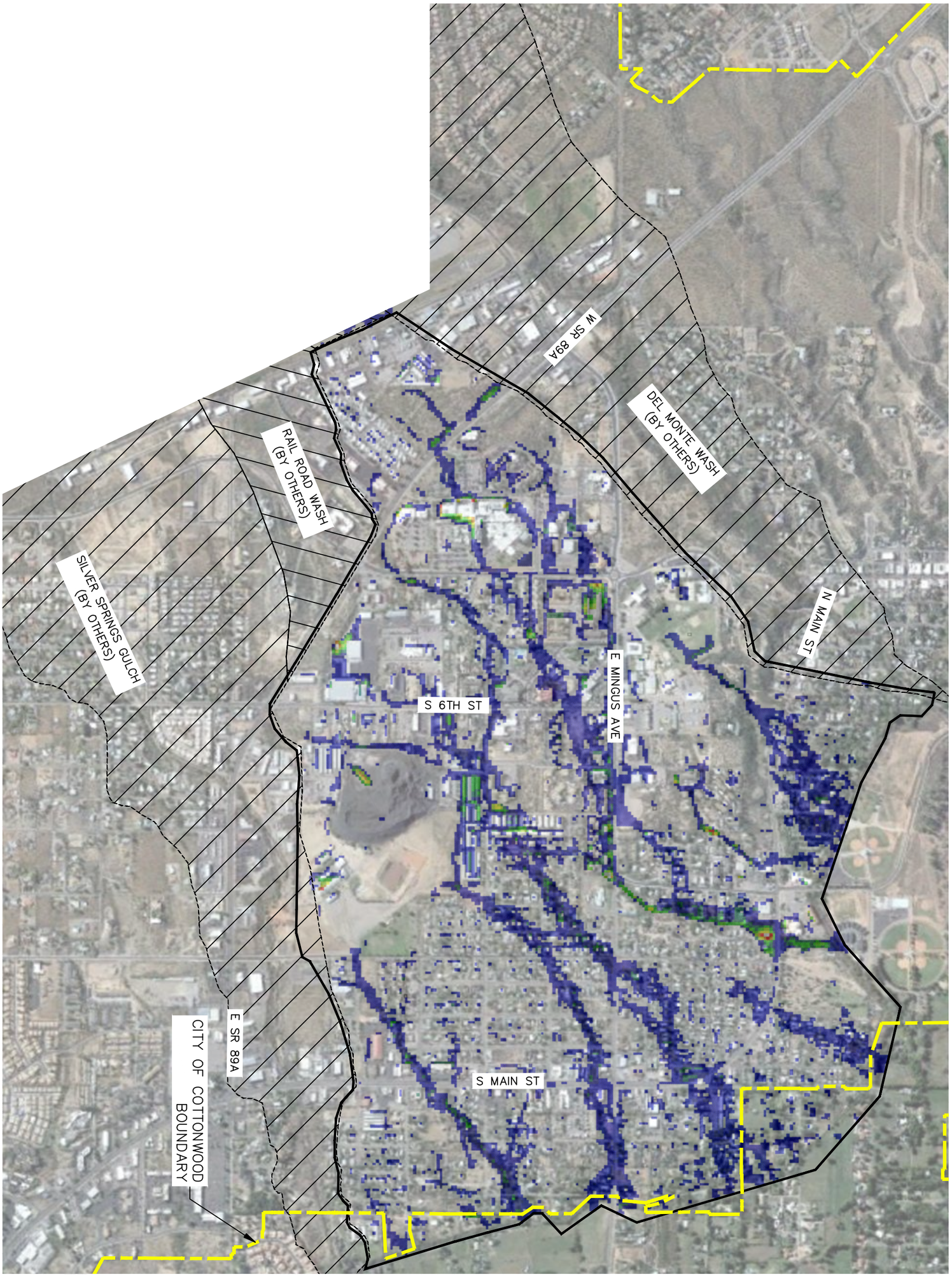
COTTONWOOD DRAINAGE MASTER PLAN COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE MASTER PLAN
NORT□ STUDY AREA RUNOFF DEPT□ E□□IBIT

SHEET
A□1
OF

FILE: P:\2014\14267\DRAWINGS\C3D\MIDDLE STUDY AREA\MIDDLE STUDY AREA.DWG JWARNE

PLOTTED: Jun 30, 2020–8:34am



SCALE 1" : 1,000'
0 500 1000

NORTH

feet
<= 0.2 0.6 1.0 1.5 1.9 2.3 2.7 3.2 3.6 4.0

Call at least two full working days before you begin excavation.
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Shephard Wesnitzer, Inc.

221 N. Marina St.
Suite 102
Prescott, AZ 86301
928.541.0443
928.541.1075 fax
www.swiaz.com

JOB NO:	14267
DATE:	JAN 20
SCALE:	1"=1000'
DRAWN:	JRW
DESIGN:	JRW
CHECKED:	JTL

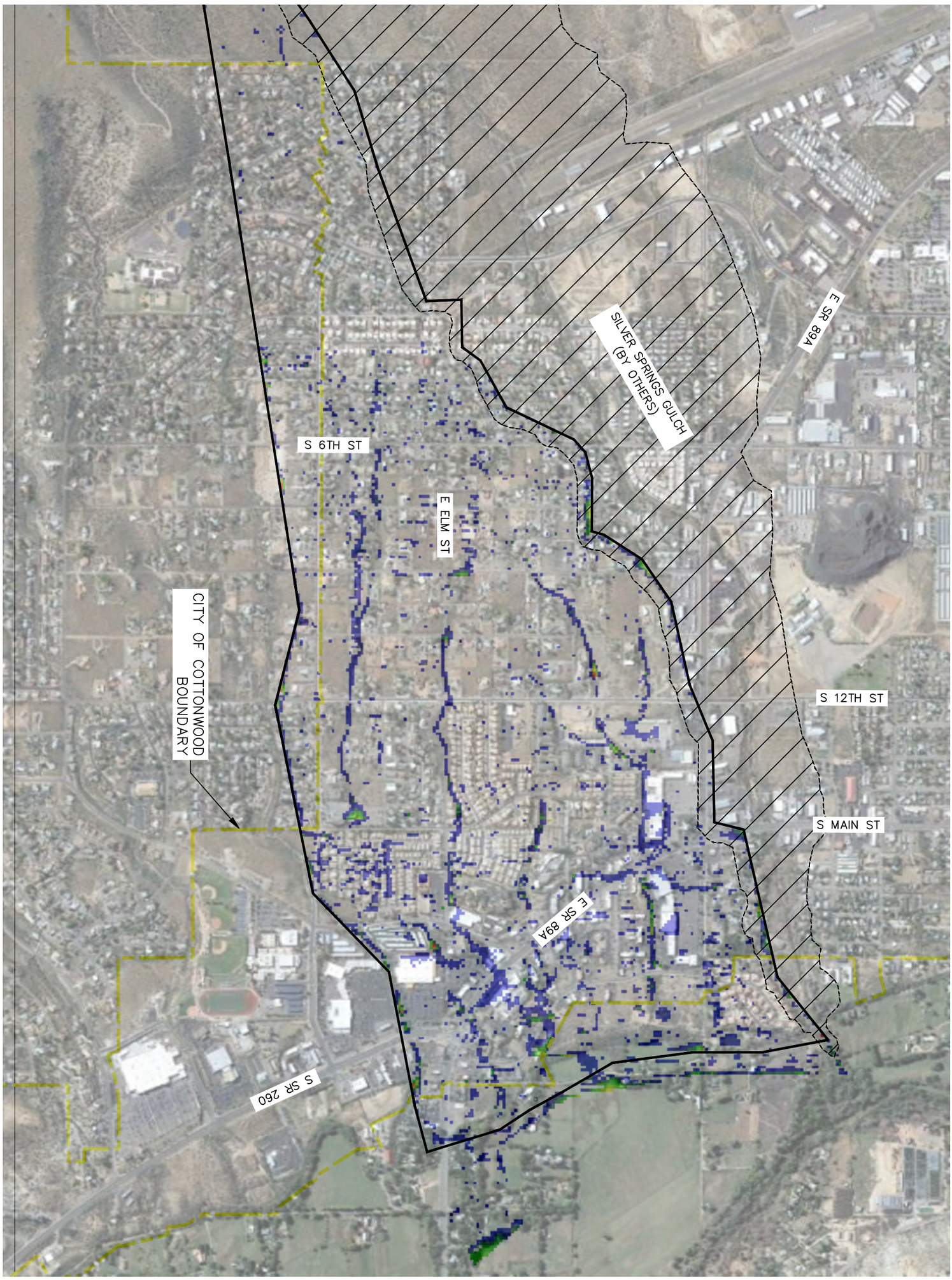
COTTONWOOD DRAINAGE MASTER PLAN COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE MASTER PLAN
CENTRAL STUDY AREA RUNOFF DEPT□ E□□IBIT

SHEET A□2 OF

FILE: P:\2014\14267\DRAWINGS\C3D\SOUTH STUDY AREA\SOUTH STUDY AREA.DWG JWARNE

PLOTTED: Jun 24, 2020–9:58am



SCALE 1" : 1,000'
0 500 1000

NORTH

feet
<=0.2 0.8 1.5 2.1 2.8 3.4 4.1 4.7 5.4 6.0

Call at least two full working days before you begin excavation.
ARIZONA 811 Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)

Shephard Wesnitzer, Inc.

221 N. Marina St.
Suite 102
Prescott, AZ 86301
928.541.0443
928.541.1075 fax
www.swiaz.com

JOB NO:	14267
DATE:	FEB 20
SCALE:	1"=1000'
DRAWN:	JRW
DESIGN:	JRW
CHECKED:	JTL

COTTONWOOD DRAINAGE MASTER PLAN COTTONWOOD ARIZONA

COTTONWOOD DRAINAGE MASTER PLAN
SOUT□ STUDY AREA RUNOFF DEPT□ E□□IBIT

SHEET
A□□□
OF

Appendix 5: Concentration Point Maps

PLOTTED: Jun 29, 2020 - 2:16pm

CONCENTRATION POINT INDEX MAP #1

COORDINATE SYSTEM DETAILS

LINEAR UNIT: INTERNATIONAL FOOT
GEODETIC DATUM: NAD83 (2011)
VERTICAL DATUM: NAVD 88 (SEE BELOW)
SYSTEM: SPCS 83
ZONE: ARIZONA CENTRAL (0202)

PROJECTION:
TRANSVERSE MERCATOR
LATITUDE OF GRID ORIGIN: 31°00'00" N
LONGITUDE OF CENTRAL MERIDIAN: 111°55'00" W
NORTHING AT GRID ORIGIN: 0.00 FT
EASTING AT CENTRAL MERIDIAN: 70000.00 FT
CENTRAL MERIDIAN SCALE FACTOR: 0.9999

ALL MEASURED DISTANCES AND BEARINGS SHOWN HEREON ARE GRID VALUES BASED ON THE PRECEDING PROJECTION DEFINITION. GRID DISTANCES ARE NOT EQUIVALENT TO "GROUND" DISTANCES IN THE PROJECT AREA.

THE BASIS OF BEARINGS IS TRUE GEODETIC NORTH. NOTE THAT THE MEASURED GRID BEARINGS SHOWN HEREON (OR IMPLIED BY GRID COORDINATES) DO NOT EQUAL GEODETIC BEARINGS DUE TO MERIDIAN CONVERGENCE.

ORTHOMETRIC HEIGHTS (ELEVATIONS) WERE TRANSFERRED TO THE SITE FROM NGS POINT "PANORAMA" (NGS PID DH5792) USING GPS WITH NGS GEOID MODEL "GEOID 12A". ELEVATIONS SHOWN HEREON ARE REFERENCED THE PUBLISHED ELEVATION OF THIS STATION.

CONTROL POINTS:

POINT ID	DESCRIPTION	NORTHING	EASTING	ELEVATION
PANORAMA	NGS PID: DH5792	1368390.95	653848.04	3936.56
B 31	NGS PID: ET0839	1342101.21	674189.26	3508.02
R 18	NGS PID: ES0478	1356417.67	680773.08	3367.37

NOTES:

1. ALL REFERENCE DATA UTILIZED IN THIS DOCUMENT INCLUDING PARCEL LINES, FLOOD PLAINS AND CITY BOUNDARIES PROVIDED BY YAVAPAI COUNTY ON JANUARY 17, 2016. SHEPHARD–WESNITZER, INC. AND ARON M. REAY, RLS MAKE NO WARRANTIES TO THE ACCURACY OF THE INFORMATION PROVIDED BY YAVAPAI COUNTY. SEE NOTE 5 FOR EXPLANATION OF FLOOD DATA.

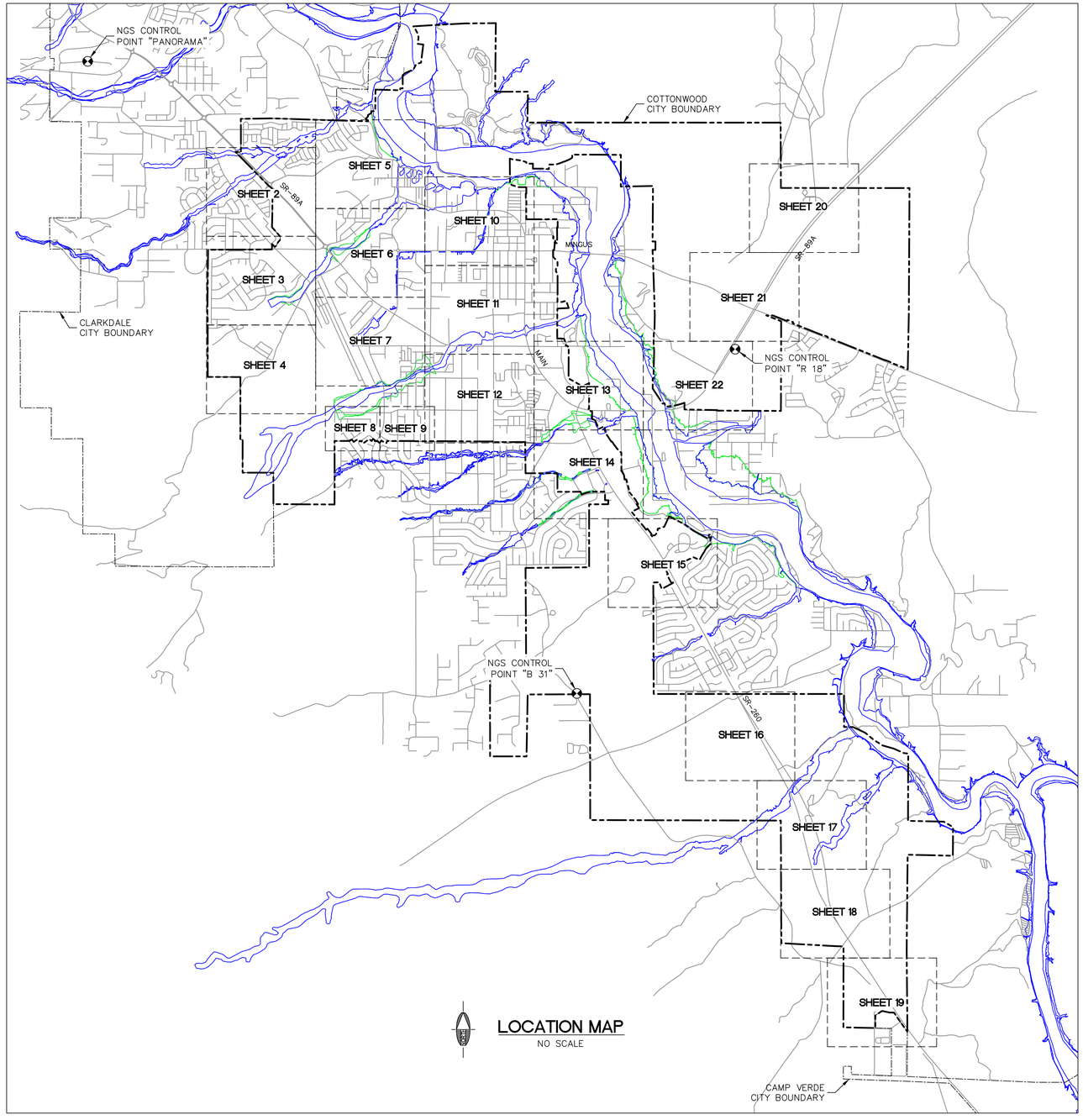
2. SURVEY DATA FOR STORM DRAIN STRUCTURES SHOWN HEREON OBTAINED FROM FIELD SURVEYS CONDUCTED BY SHEPHARD–WESNITZER, INC. COMPLETED IN JUNE 2017.

3. COTTONWOOD IS LOCATED IN THE VERDE RIVER WATERSHED AND THE VERDE RIVER IS THE RECEIVING WATER AS STATED IN THE CITY OF COTTONWOOD STORM WATER MANAGEMENT PROGRAM PREPARED BY WOOD/PATEL DATED JANUARY 30, 2014, OBTAINED FROM THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY.

4. STORM DRAIN PIPES AND STRUCTURES SHOWN HEREON ARE NUMBERED IN THE SAME SEQUENCE. WHERE MULTIPLE PIPES HAVE BEEN INSTALLED PARALLEL, THEY ARE COUNTED AS PART OF THE SAME PIPE RUN. FOR THE PURPOSES OF THIS SURVEY, BOX CULVERTS AND OTHER MISCELLANEOUS STORM WATER CONVEYANCE STRUCTURES HAVE BEEN COUNTED AS PIPES IN THE TABLES SHOWN HEREON.

5. THE Q3 FLOOD DATA ARE DERIVED FROM THE FLOOD INSURANCE RATE MAPS (FIRMS) PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA). THE FILE IS GEOREFERENCED TO THE EARTH'S SURFACE USING THE UNIVERSAL TRANSVERSE MERCATOR (UTM) PROJECTION AND A ZONAL COORDINATE SYSTEM (UNITS IN METERS). SPECIFICATIONS FOR THE HORIZONTAL CONTROL OF Q3 FLOOD DATA FILES ARE CONSISTENT WITH THOSE REQUIRED FOR MAPPING AT A SCALE OF 1:24000. FLOOD HAZARD AREAS FROM YAVAPAI COUNTY BY THE US DEPARTMENT OF AGRICULTURE AND THE NATURAL RESOURCES CONSERVATION SERVICE COMBINED WITH FEMA 1996 DATA.

6. STORM DRAIN PIPES AND STRUCTURES SHOWN HEREON ARE LOCATED WITHIN PUBLIC RIGHTS OF WAY WITHIN THE CITY OF COTTONWOOD MUNICIPAL BOUNDARIES. STORM DRAIN PIPES AND STRUCTURES WITHIN PRIVATE PROPERTIES ARE NOT A PART OF THIS PROJECT AND ARE NOT SHOWN HEREON.



LOCATION MAP
NO SCALE

LEGEND

COTTONWOOD CITY BOUNDARY
STREET CENTER LINE
100 YEAR FLOOD PLAIN (FEMA)
500 YEAR FLOOD PLAIN (FEMA)

CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT

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Cottonwood, AZ 86326
928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	MAY 2020
SCALE:	AS SHOWN
DRAWN:	SAS
DESIGN:	JRW
CHECKED:	JRW

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT INDEX MAP

PRELIMINARY
NOT FOR CONSTRUCTION, BIDDING OR RECORDING

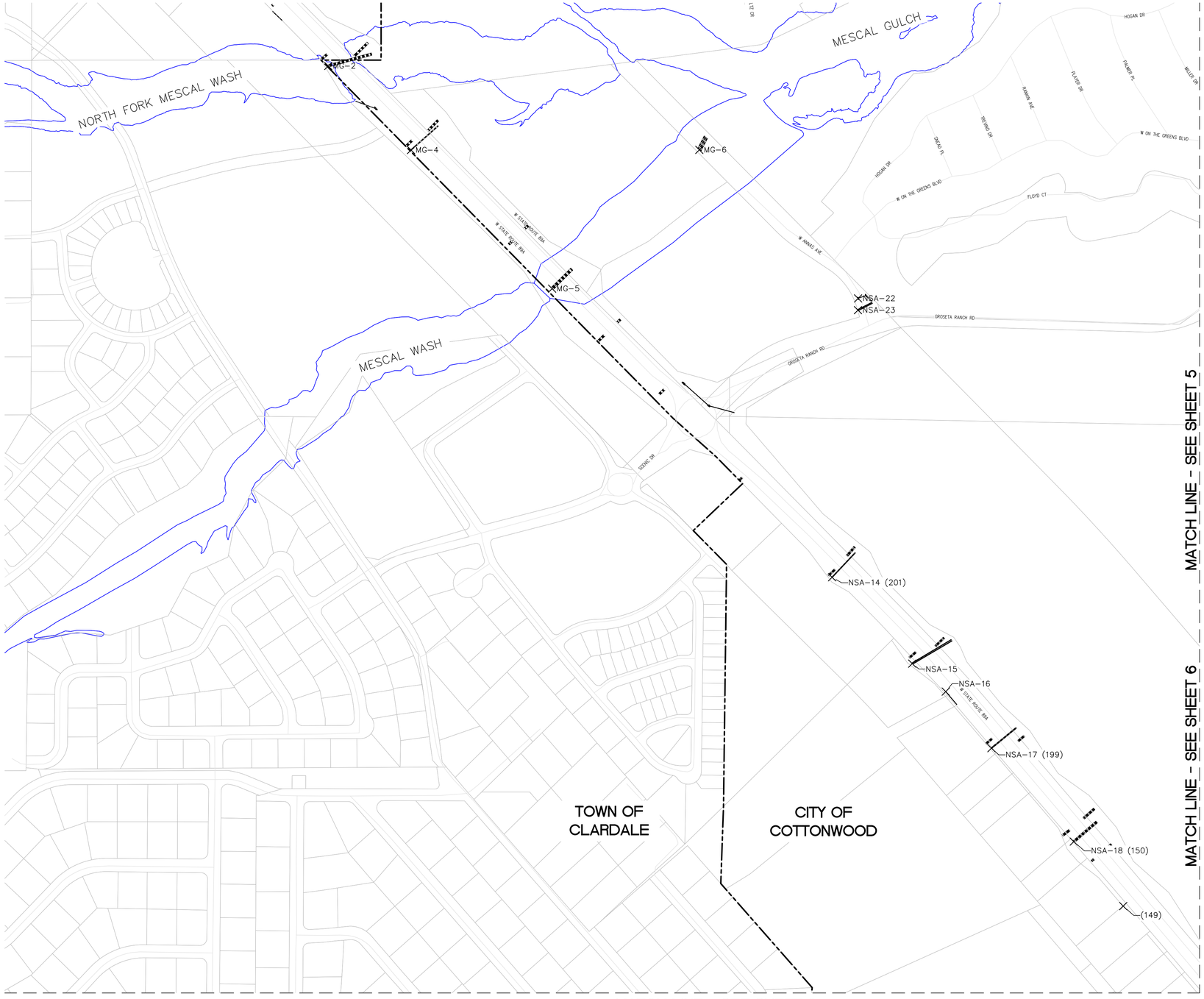
DRAWING NO. M1

SHT NO. 1 OF 22

FILE: P:\2014\14267\Drawings\Exhibits\Concentration Point Plans\14267-MAP-1-COVER.dwg SW-C3D-18

PLOTTED: Jun 30, 2020 - 2:19pm

CONCENTRATION POINT MAP #2



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
101	MG-2	128	188	313	534	746	999
103	MG-4	17.1	25.1	43.1	76.5	109	148
104	MG-5	336	494	843	1520	2230	3090
105	MG-6	337	496	846	1530	2230	3090
121	NSA-14	3.8	5.3	6.9	7.7	8.8	10.1
122	NSA-15	8	9.1	11.2	14.3	17.5	18.8
124	NSA-17	13.7	16.7	17.2	18.5	21	23.4
125	NSA-18	35.2	47.9	56.2	65.6	74.1	83.7
129	NSA-21	13.9	14.4	17.5	25.2	34.5	43.7
130	NSA-23	8.8	11	12.7	15.1	16.9	18.8

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
149	19.5	35.1
150	399	753
199	29.5	57.1
201	36.5	69.3

SCALE: 1" = 200

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT

REVISIONS			
NO.	DESCRIPTION	DATE	BY

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928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	MAY 2020
SCALE:	AS SHOWN
DRAWN:	SAS
DESIGN:	JRW
CHECKED:	JRW

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT MAP

PRELIMINARY
NOT FOR CONSTRUCTION, BIDDING OR RECORDING

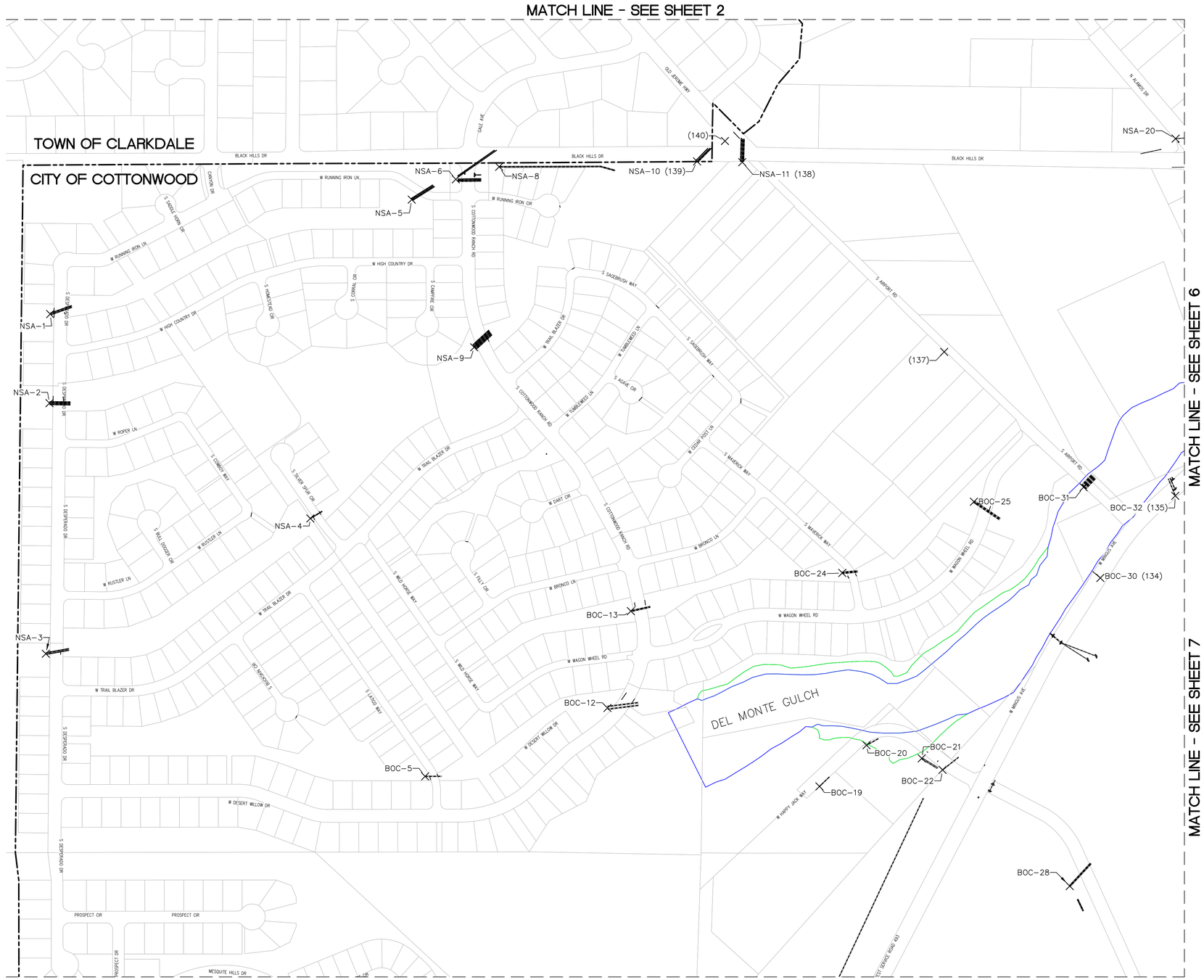
DRAWING NO. M2

SHT NO. 2 OF 27

FILE: P:\2014\14267\Drawings\Exhibits\Concentration Point Plans\14267-MAP-2.dwg SW-C3D-18

PLOTTED: Jun 30, 2020 - 2:22pm

CONCENTRATION POINT MAP #3



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		1-YR	5-YR	10-YR	25-YR	50-YR	100-YR
108	NSA-1	26.7	39.2	67.3	120.0	170.0	232.0
109	NSA-2	47.0	69.1	118.0	209.0	297.0	404.0
110	NSA-3	14.7	21.6	37.7	68.2	98.0	135.0
111	NSA-4	13.3	19.7	22.8	26.9	30.0	33.5
112	NSA-5	9.4	13.8	15.8	18.1	20.2	22.3
113	NSA-6	20.0	50.7	53.4	57.0	57.6	59.3
115	NSA-8	1.9	3.1	3.8	4.6	5.3	6.1
116	NSA-9	77.8	89.2	98.4	110.0	123.0	133.0
117	NSA-10	57.5	87.8	103.0	124.0	138.0	152.0
118	NSA-11	48.3	56.9	68.7	85.0	95.4	107.0
178	BOC-5	22.3	25.0	30.4	43.9	60.1	76.0
185	BOC-12	32.3	36.2	44.0	63.5	86.9	110.0
186	BOC-13	14.4	16.2	19.7	28.4	38.9	49.2
192	BOC-19	9.3	10.4	12.6	18.2	25.0	31.6
193	BOC-20	12.0	13.4	16.3	23.5	32.2	40.7
194	BOC-21	10.8	12.2	14.8	21.4	29.1	36.9
195	BOC-22	23.0	33.8	57.6	101.0	143.0	194.0
197	BOC-24	22.1	24.9	30.3	43.8	59.5	75.4
198	BOC-25	52.1	58.6	71.3	103.2	140.1	177.6
201	BOC-28	16.1	18.1	22.0	31.8	43.2	54.8
202	BOC-28	16.1	18.1	22.0	31.8	43.2	54.8
204	BOC-31	304.0	447.0	743.0	1270.0	1790.0	2410.0
205	BOC-32	20.0	22.5	27.4	39.5	53.6	68.0

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
134	42.3	90.4
135	49.8	90.4
137	18.8	35
138	29.4	55.5
139	211	401
140	219	417

SCALE: 1" = 200

0 100 200

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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CONCENTRATION POINT MAP #4

MATCH LINE - SEE SHEET 3



MATCH LINE - SEE SHEET 7

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
175	BOC-2	37.7	55.4	94.7	167.0	237.0	323.0
176	BOC-3	12.5	12.9	15.7	22.6	30.9	39.2
177	BOC-4	8.2	8.5	10.3	14.9	20.4	25.9
179	BOC-6	162	238	402	706	1010	1370
184	BOC-6	162	238	402	706	1010	1370
191	BOC-18	14.6	21.4	36.9	65.9	94.0	129.0

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

SCALE: 1" = 200

0 100 200

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DRAWN:	SAS
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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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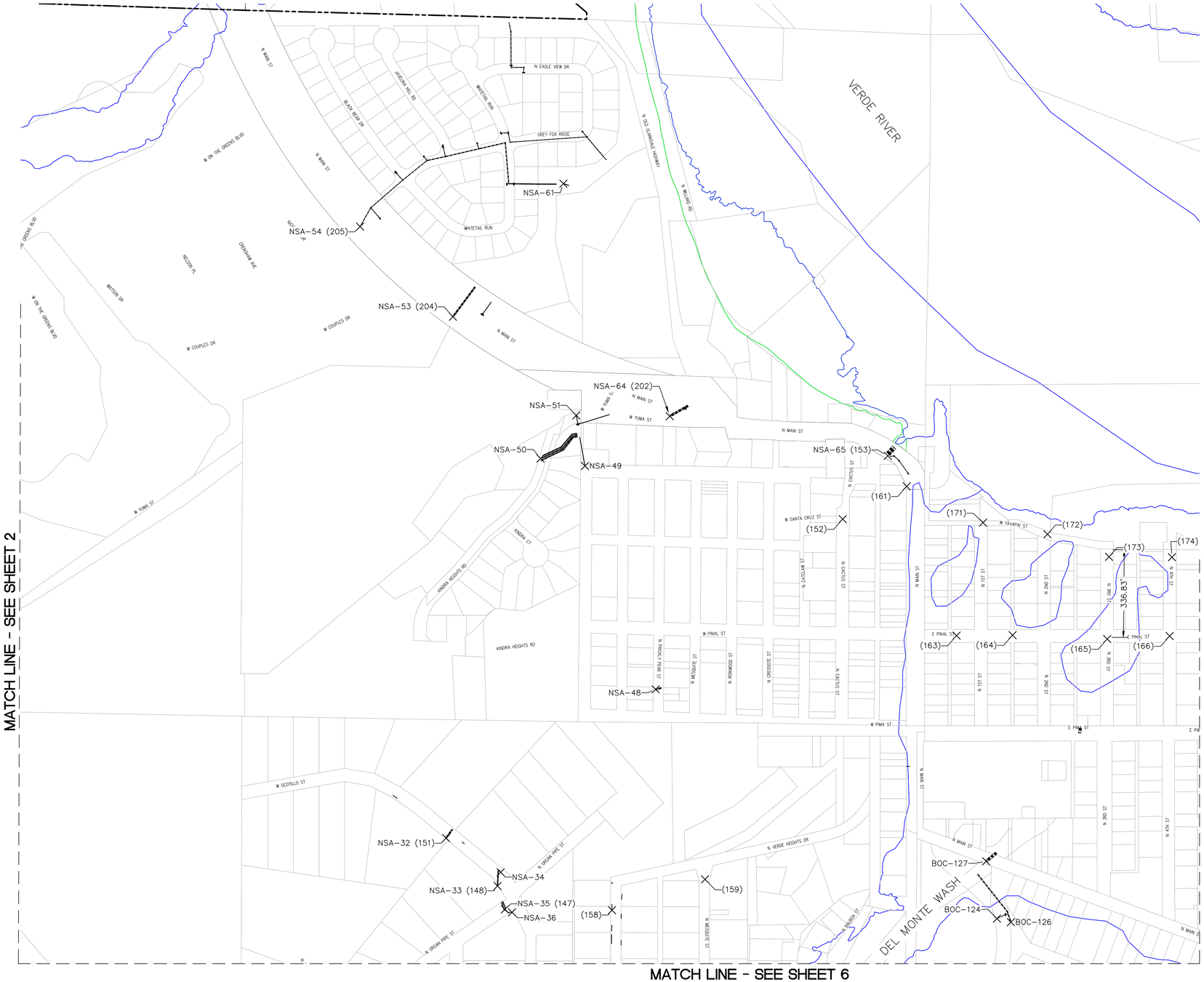
CONCENTRATION POINT MAP #5



MATCH LINE - SEE SHEET 2

MATCH LINE - SEE SHEET 6

MATCH LINE - SEE SHEET 10

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
139	NSA-32	67.7	89.6	106.0	128.0	145.0	163.0
140	NSA-33	7.8	9.5	12.0	14.6	16.5	19.0
141	NSA-34	12.7	15.5	19.5	23.5	26.7	30.8
142	NSA-35	14.6	19.2	22.6	27.8	32.2	36.8
155	NSA-48	114.0	161.0	189.0	227.0	252.0	278.0
156	NSA-49	123.0	162.0	195.0	237.0	276.0	316.0
157	NSA-50	121.0	153.0	180.0	210.0	236.0	262.0
160	NSA-53	87.5	98.3	108.0	146.0	172.0	216.0
161	NSA-54	62.6	101.0	114.0	121.0	168.0	195.0
168	NSA-61	11.8	14.8	17.3	40.5	58.5	68.4
171	NSA-64	71.9	95.3	114.0	140.0	162.0	183.0
172	NSA-65	173.0	237.0	286.0	356.0	409.0	463.0
299	BOC-124	39.2	44.0	53.6	77.6	105.3	133.5
301	BOC-126	3.8	3.9	4.7	6.8	9.3	11.8
302	BOC-127	325.0	478.0	792.0	1350.0	1890.0	2540.0

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
147	47.04	86
148	46.5	85.9
151	220	415
152	254	477
153	252	474
158	7.2	13
159	13.8	25.2
160	20.6	37.7
161	23.9	43.6
163	4.4	7.9
164	4.1	7.5
165	3.1	5.5
166	7.1	12.8
171	8.8	15.8
172	8.4	15.1
173	6.7	12.1
174	3.9	6.9
202	124	230
204	89.3	166
205	22.2	40.1

SCALE: 1" = 200

0 100 200

LEGEND

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- PARCEL LINE
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- 500 YEAR FLOOD PLAIN (FEMA)

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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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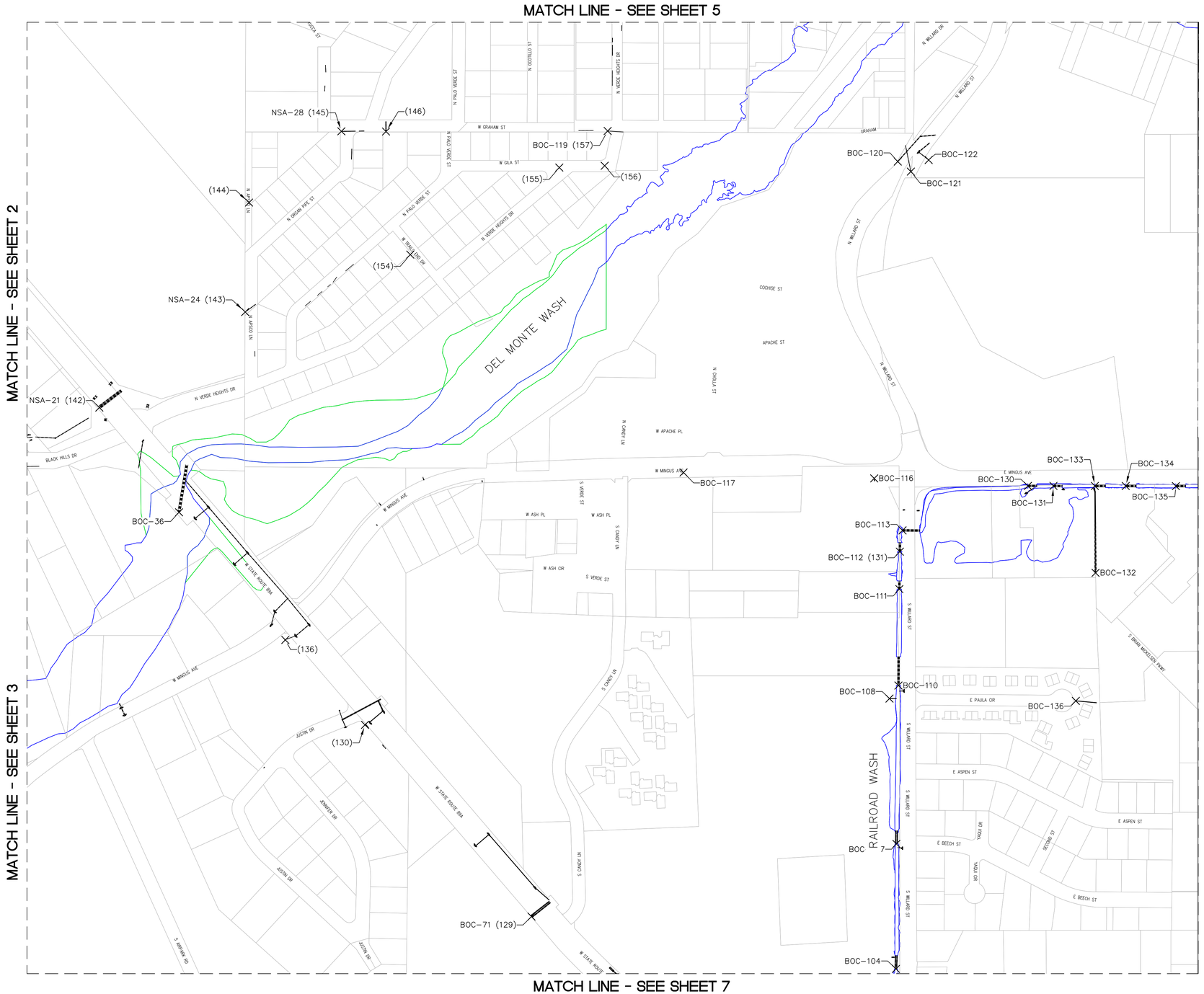
CONCENTRATION POINT MAP #6



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
128	NSA-21	13.9	14.4	17.5	25.2	34.5	43.7
131	NSA-24	18.1	20.3	24.7	35.8	48.6	61.6
135	NSA-28	8.6	9.9	11.8	14.1	16.9	19.8
210	BOC-32	16.5	22.5	27.4	39.5	53.6	68.0
211	BOC-36	310.1	456.0	757.0	1300.0	1820.0	2450.0
239	BOC-57	2.1	2.1	2.6	3.7	5.1	6.5
246	BOC-71	13.5	18.0	21.4	26.7	30.6	34.3
279	BOC-104	63.0	78.1	96.8	131.3	166.4	199.5
282	BOC-107	64.6	80.4	99.7	135.1	171.0	205.1
283	BOC-108	4.6	6.4	7.7	9.8	11.7	13.8
285	BOC-110	75.4	87.0	107.6	145.2	183.1	219.4
286	BOC-111	75.8	88.5	109.7	148.0	186.7	223.5
287	BOC-112	80.7	96.7	120.0	161.3	202.2	241.1
288	BOC-113	81.2	97.4	120.9	162.3	203.4	242.4
291	BOC-116	0.1	0.2	0.2	0.2	0.3	0.3
294	BOC-119	3.6	8.6	10.3	12.7	14.6	16.6
295	BOC-120	22.7	25.5	31.0	44.9	61.0	77.3
296	BOC-121	15.7	16.3	19.8	28.5	39.1	49.4
297	BOC-122	3.5	3.6	4.4	6.3	8.7	11.0
305	BOC-130	81.9	99.3	124.2	167.8	211.9	253.0
306	BOC-131	98.3	120.2	152.4	207.4	259.7	308.1
307	BOC-132	2.9	4.3	5.4	6.2	7.5	8.8
308	BOC-133	127.8	158.0	201.7	271.4	334.5	392.5
309	BOC-134	147.8	185.7	238.5	322.7	395.1	462.1
310	BOC-135	160.4	203.8	260.9	353.1	431.9	504.8
311	BOC-136	17.6	25.3	32.5	40.8	46.9	53.8

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
129	54.5	98.6
130	41.5	75
131	170	308
136	20.1	36.3
142	22.4	40.3
143	29.3	52.9
144	12.8	23.1
145	15.8	28.7
146	32.7	59.3
154	6	10.8
155	9.4	17.3
156	14.1	26.1
157	3.9	7.1

NORTH

SCALE: 1" = 200

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY
PARCEL LINE
100 YEAR FLOOD PLAIN (FEMA)
500 YEAR FLOOD PLAIN (FEMA)

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928-282-2058 fax
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JOB NO:	14267
DATE:	MAY 2020
SCALE:	AS SHOWN
DRAWN:	SAS
DESIGN:	JRW
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COTTONWOOD
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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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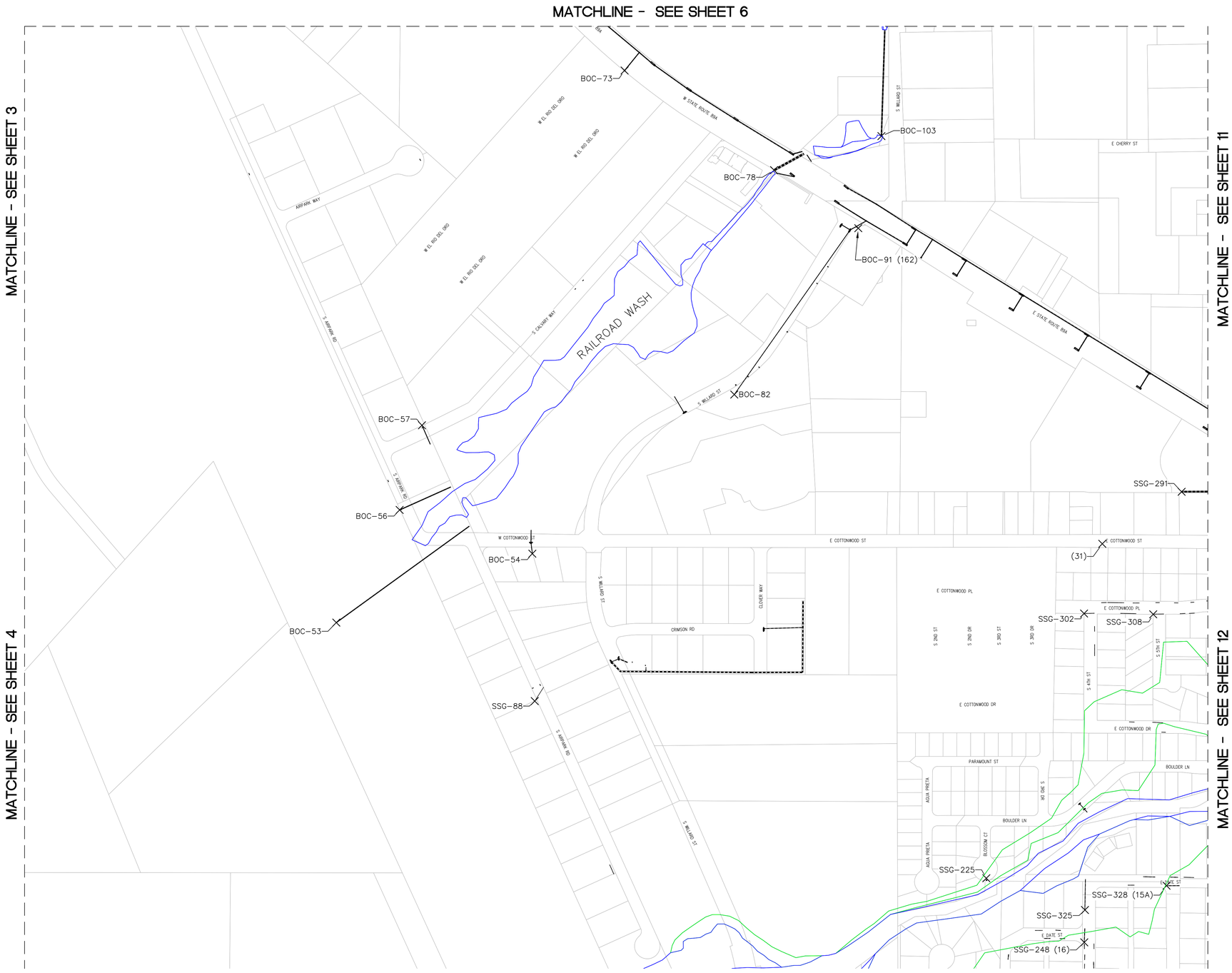
CONCENTRATION POINT MAP #7



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
228	BOC-36	310.1	456.0	757.0	1300.0	1820.0	2450.0
229	BOC-54	1.2	1.2	1.5	2.1	2.9	3.7
231	BOC-56	8.4	8.7	10.6	15.3	20.9	26.5
248	BOC-73	1.6	2.3	2.4	2.9	3.4	3.8
253	BOC-78	55.9	68.5	85.6	117.8	151.1	182.4
257	BOC-82	5.3	5.5	6.6	9.6	13.1	16.6
266	BOC-91	20.7	21.4	25.9	37.4	51.3	64.9
278	BOC-103	61.9	76.3	94.8	128.9	163.7	196.5
532	SSG-88	28.3	41.6	70.7	124.0	175.0	237.0
667	SSG-221	33.5	38.0	46.1	66.0	88.8	112.4
690	SSG-248	13.8	14.3	17.3	25.0	34.2	43.3
732	SSG-291	48.8	71.8	120.0	206.0	288.0	387.0
743	SSG-302	2.0	2.3	2.7	3.9	5.4	6.8
749	SSG-308	5.9	6.1	7.5	10.8	14.7	18.6
766	SSG-325	14.8	15.3	18.6	26.9	36.8	46.6
769	SSG-328	11.1	11.4	13.9	20.0	27.4	34.7

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
15A	9.1	16.7
31	78.5	143

SCALE: 1" = 200

0 100 200

LEGEND

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CONCENTRATION POINT MAP

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CONCENTRATION POINT MAP #8



MATCH LINE - SEE SHEET 9

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
446	SSG-1	41.9	56.9	69.3	100.1	135.7	172.2
448	SSG-3	18.8	27.7	47.7	85.0	121.0	166.0
454	SSG-9	18.8	27.7	47.7	85.0	121.0	166.0
460	SSG-15	44.2	60.0	73.1	105.6	143.2	181.6
482	SSG-37	60.9	63.2	76.9	111.1	150.6	191.1
494	SSG-49	22.8	33.5	57.3	101.0	144.0	196.0
499	SSG-54	63.2	66.0	80.3	116.1	157.4	199.7
507	SSG-62	31.6	35.5	43.2	62.5	84.8	108.0
525	SSG-81	48.8	66.3	80.7	116.6	158.2	200.6
561	SSG-118	55.5	75.5	91.9	132.7	180.0	228.4
576	SSG-133	51.9	70.5	85.8	123.9	168.1	213.2
600	SSG-157	1.4	1.5	1.8	2.6	3.6	4.5
604	SSG-161	5.3	5.5	6.7	9.7	13.2	16.8
609	SSG-167	1.6	1.7	2.0	2.9	3.9	4.9
642	SSG-200	32.5	36.7	44.6	64.2	86.7	110.1
645	SSG-203	0.1	0.2	0.2	0.2	0.3	0.3

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
21	5.3	9.7
28	8.3	15.2
29	47.2	86.5
32	77.1	146
33	76.4	145
34	53.6	102
35	30.1	56.6
36	22.4	42.4
37	3.5	6.3
38	27	50.7
39	79.4	150
40	77.8	148
41	45.3	83.4

SCALE: 1" = 100

0 50 100

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

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CONCENTRATION POINT MAP #9



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
540	SSG-97	58.0	78.8	95.9	138.6	188.0	238.4
541	SSG-98	57.6	78.3	95.3	137.7	186.7	236.9
569	SSG-118	55.5	75.5	91.9	132.7	180.0	228.4
570	SSG-127	0.4	0.5	0.6	0.8	1.1	1.4
589	SSG-146	2.5	2.8	3.3	4.5	5.6	6.8
591	SSG-148	2.1	2.3	2.7	3.8	4.9	6.0
616	SSG-174	5.7	6.0	7.3	10.4	13.9	17.6
627	SSG-185	7.1	7.8	9.4	12.9	16.7	20.8
646	SSG-204	0.9	1.1	1.3	1.6	1.8	2.0
652	SSG-210	2.6	3.0	3.5	4.7	5.8	7.1
654	SSG-212	0.4	0.5	0.6	0.7	0.8	0.8
655	SSG-213	0.5	0.6	0.7	0.9	1.0	1.1
657	SSG-215	7.6	8.5	10.2	13.8	17.7	22.0
658	SSG-216	9.4	10.7	12.8	17.0	21.3	25.9
663	SSG-221	33.5	38.0	46.1	66.0	88.8	112.4
685	SSG-243	1.8	1.8	2.2	3.2	4.4	5.5
721	SSG-280	11.5	14.4	17.2	22.2	27.2	32.6
722	SSG-281	13.8	17.3	20.7	26.4	31.9	37.9
723	SSG-282	35.4	40.5	49.0	69.5	92.7	116.8
724	SSG-283	36.3	41.5	50.2	71.0	94.4	118.7
725	SSG-284	0.7	0.9	1.1	1.3	1.5	1.7
780	SSG-339	2.3	2.5	3.0	4.2	5.5	6.7
786	SSG-345	2.8	3.2	3.8	5.2	6.6	8.0
793	SSG-352	15.2	18.8	22.4	28.4	34.2	40.4
797	SSG-356	1.3	1.6	2.0	2.4	2.7	3.1

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
9	25.8	47.6
17	18.5	34.1
17A	19.2	35.4
18	16	29.4
19	14	25.5
20	10.8	19.7
22	37.1	68.6
23	34.6	63.9
24	32.1	59.3
25	28.3	51.7
26	20.4	37.4
27	12.1	22.2
42	52.3	95.3
43	59.3	111
44	58.8	110
45	2.3	4.1
46	58.3	109
47	5.8	10.6
48	59.3	111

NORTH

SCALE: 1" = 100

0 100 100

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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JOB NO:	14267
DATE:	MAY 2020
SCALE:	AS SHOWN
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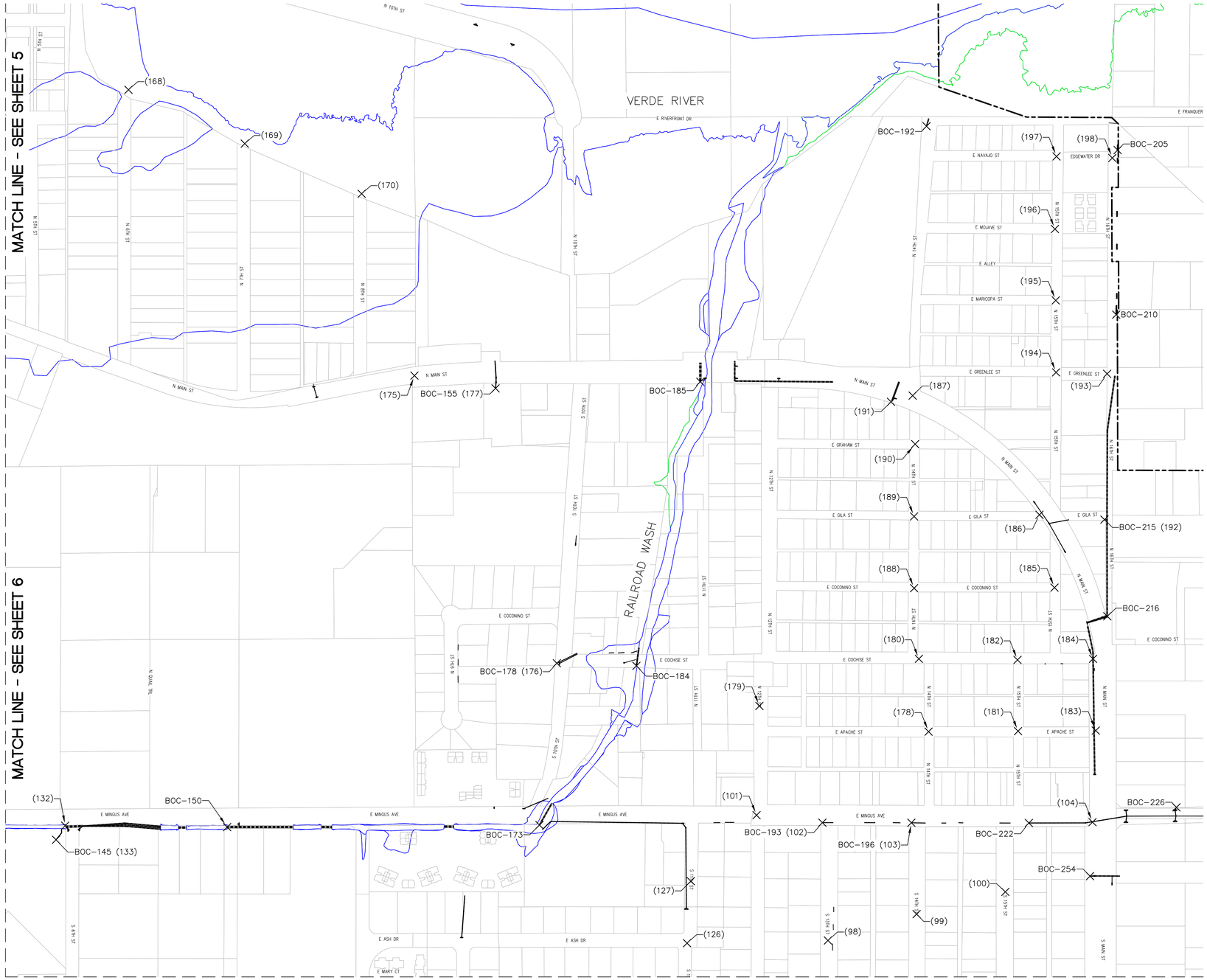
CONCENTRATION POINT MAP #10



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
321	BOC-145	173	220	285	381	465	543
326	BOC-150	192	244	317	421	510	592
331	BOC-155	7.6	10.7	13	15.8	17.9	20
349	BOC-173	241	311	397	522	629	728
354	BOC-178	4	5.6	7.2	9.4	11.6	13.9
360	BOC-184	260	333	423	558	674	781
361	BOC-185	298	385	483	634	761	884
368	BOC-192	4.7	6.2	7.3	8.2	10	10.7
369	BOC-193	8.1	10.4	12.6	15.2	17.1	19.2
372	BOC-196	5.6	7.2	8.8	10.8	12.2	14
381	BOC-205	0.1	0.1	0.1	0.1	0.2	0.2
384	BOC-205	0.1	0.1	0.1	0.1	0.2	0.2
386	BOC-210	0.9	1.2	1.5	1.8	2.1	2.4
391	BOC-215	8.1	10.3	12.2	14.3	16	17.6
398	BOC-222	13.2	15.3	19.6	23.3	26.4	29.4
430	BOC-254	20.2	26.2	30.9	36.8	41.7	46.3

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
98	4.4	8
99	10.6	19.2
100	26.5	48.8
101	13	24.1
102	14.1	26.1
103	14.8	27.2
104	53.3	97.5
126	33.1	61.3
127	35.3	65.3
133	153	277
167	14.5	26.1
168	12.9	23.3
169	16.3	29.4
170	11.1	19.9
175	75.2	137
176	13.1	23.6
177	68.8	124
178	9	16.2
179	6.8	12.3
180	21.1	38.1
181	5.1	9.1
182	23.5	42.5
183	4.9	8.7
184	29.1	52.7
185	6.1	11
186	35.8	64.7
187	34.1	61.7
188	6.8	12.3
189	11.6	20.9
190	17.7	31.9
191	49	88.6
192	2.4	4.4
193	6.6	12
194	6.8	12.2
195	12.1	21.7
196	17	30.6
197	20.7	37.4
198	10.7	19.3

SCALE: 1" = 200

0 100 200

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

CALL TWO WORKING DAYS BEFORE YOU DIG
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JOB NO:	14267
DATE:	MAY 2020
SCALE:	AS SHOWN
DRAWN:	SAS
DESIGN:	JRW
CHECKED:	JRW

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT MAP

PRELIMINARY
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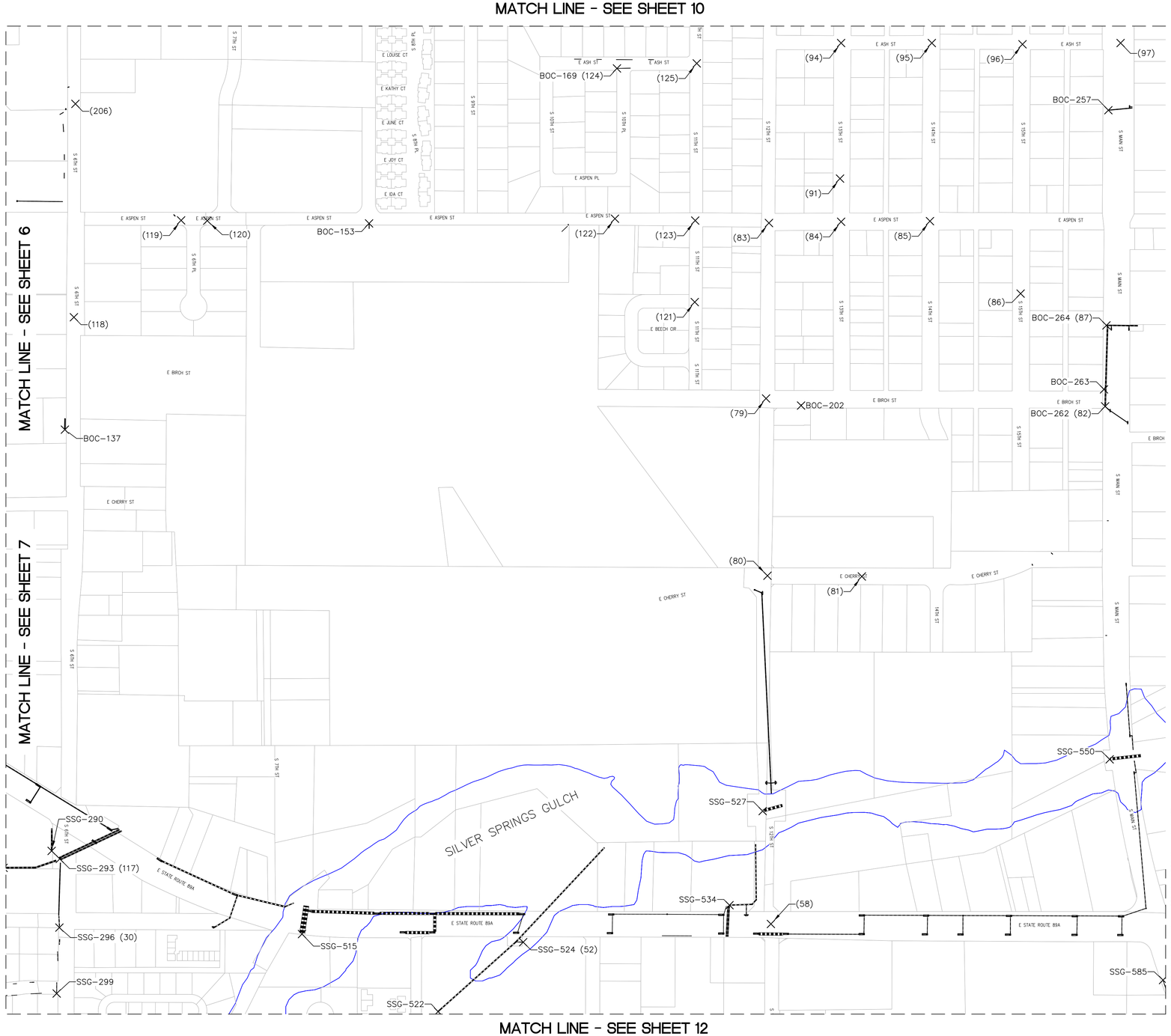
DRAWING NO. M10

SHT NO. 10 OF 22

FILE: P:\2014\14267\Drawings\Exhibits\Concentration Point Plans\14267-MAP-10.dwg SWI-C3D-18

PLOTTED: Jun 30, 2020–2:39pm

CONCENTRATION POINT MAP #11



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off 2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
312	BOC-136	17.6	25.3	32.5	40.8	46.9	53.8
345	BOC-169	5.4	9.8	13.5	18.0	22.2	25.7
378	BOC-196	5.6	7.2	8.8	10.8	12.2	14.0
433	BOC-257	2.8	4.7	5.7	6.9	7.9	9.4
438	BOC-259	31.2	43.0	51.1	58.4	63.3	71.7
439	BOC-263	4.3	7.0	9.1	12.4	16.2	19.2
440	BOC-264	22.9	30.5	35.1	41.3	46.4	51.5
729	SSG-284	0.7	0.9	1.1	1.3	1.5	1.7
731	SSG-290	2.6	2.7	3.3	4.7	6.4	8.1
733	SSG-291	48.8	71.8	120.0	206.0	288.0	387.0
734	SSG-293	48.8	71.8	120.0	206.0	288.0	387.0
737	SSG-296	15.7	16.3	19.8	28.5	39.1	49.4
740	SSG-299	10.5	10.8	13.1	19.0	26.0	32.9
956	SSG-515	284	418	698	1210	1710	2320
963	SSG-522	23.9	24.7	30.0	43.3	59.3	75.1
968	SSG-527	305	449	747	1290	1810	2450
975	SSG-534	9.3	9.6	11.7	16.9	23.1	29.2
991	SSG-550	309	454	756	1300	1840	2480
1026	SSG-585	0.2	0.3	0.4	0.5	0.6	0.6

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off 10-YR	50-YR
30	22.9	41.5
58	9.3	16.7
79	12.9	23.6
80	26.2	47.9
81	28	51
83	6.2	11.3
84	6.3	11.4
85	12.9	23.6
86	17.4	32
91	1	1.8
92	5.9	3.2
93	6.4	11.6
94	6.5	11.9
95	11.9	21.7
96	15.1	27.6
97	26.6	48.6
117	125	226
118	66.4	120
119	69.4	125
120	9.3	16.7
121	2.9	5.2
122	16.1	29.5
123	20.2	37.2
125	27	49.8
206	14.9	27

SCALE: 1" = 200

0 100 200

LEGEND

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DRAWN:	SAS
DESIGN:	JRW
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COTTONWOOD
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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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CONCENTRATION POINT MAP #12


MATCH LINE - SEE SHEET 11
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MATCH LINE - SEE SHEET 9
MATCH LINE - SEE SHEET 13
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SILVER SPRINGS GULCH
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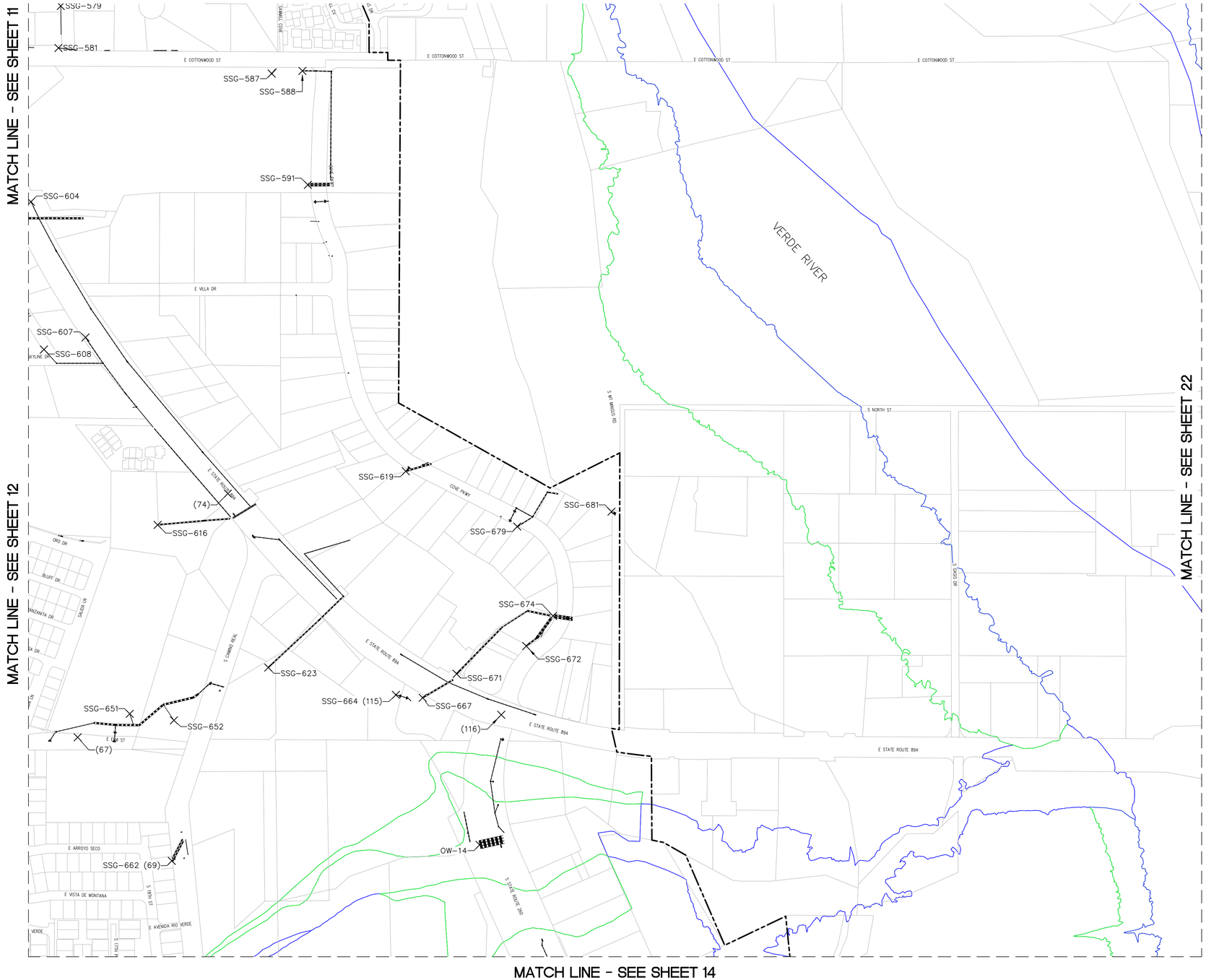
CONCENTRATION POINT MAP #13



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1020	SSG-577	68.5	82.2	98.5	129.9	162.8	197.3
1022	SSG-581	1.2	1.4	1.6	1.9	2.1	2.3
1028	SSG-586	0.3	0.4	0.5	0.6	0.7	0.9
1029	SSG-588	32.4	33.4	40.6	56.6	67.3	77.8
1032	SSG-591	43.3	51.2	61.2	77.4	93.6	109.3
1045	SSG-604	3.2	4.5	5.8	7.5	9.1	10.5
1048	SSG-607	0.9	1.3	1.5	1.9	2.2	2.5
1049	SSG-608	1.6	2.1	2.5	3.1	3.5	3.9
1057	SSG-616	9.8	12.2	14.1	16.2	18.1	20.0
1060	SSG-619	72.2	97.5	113.7	128.4	139.4	158.0
1064	SSG-623	65.6	88.8	103.3	116.9	126.5	143.7
1091	SSG-651	30.2	43.4	48.9	50.4	51.2	58.8
1092	SSG-652	6.8	8.7	10.5	13.0	14.4	16.2
1101	SSG-662	74.2	89.7	107.4	140.0	173.5	209.1
1103	SSG-664	0.1	0.2	0.2	0.3	0.4	0.5
1106	SSG-667	76.6	93.2	111.4	144.6	178.0	213.8
1110	SSG-671	78.5	96.3	115.2	149.4	183.5	219.9
1111	SSG-672	1.0	1.6	2.3	3.0	3.6	4.2
1113	SSG-674	83.0	102.7	123.8	160.3	196.2	234.5
1118	SSG-679	4.7	5.6	6.1	6.8	7.0	7.1
1120	SSG-681	4.8	5.7	6.2	6.9	7.1	7.2
1135	OW-14	272	400	681	1210	1750	2410

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
67	23.6	43.4
68	84.5	157
69	95.2	177
74	30.9	55.7
115	83.9	155
116	162	301

SCALE: 1" = 200'

0 100 200

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

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928-282-1061
928-282-2058 fax
www.swiaz.com

JOB NO:	14267
DATE:	MAY 2020
SCALE:	AS SHOWN
DRAWN:	SAS
DESIGN:	JRW
CHECKED:	JRW

COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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DRAWING NO. M13

SHT NO. 13 OF 22

FILE: P:\2014\14267\Drawings\Exhibits\Concentration Point Plans\14267-MAP-13.dwg SWI-C3D-18

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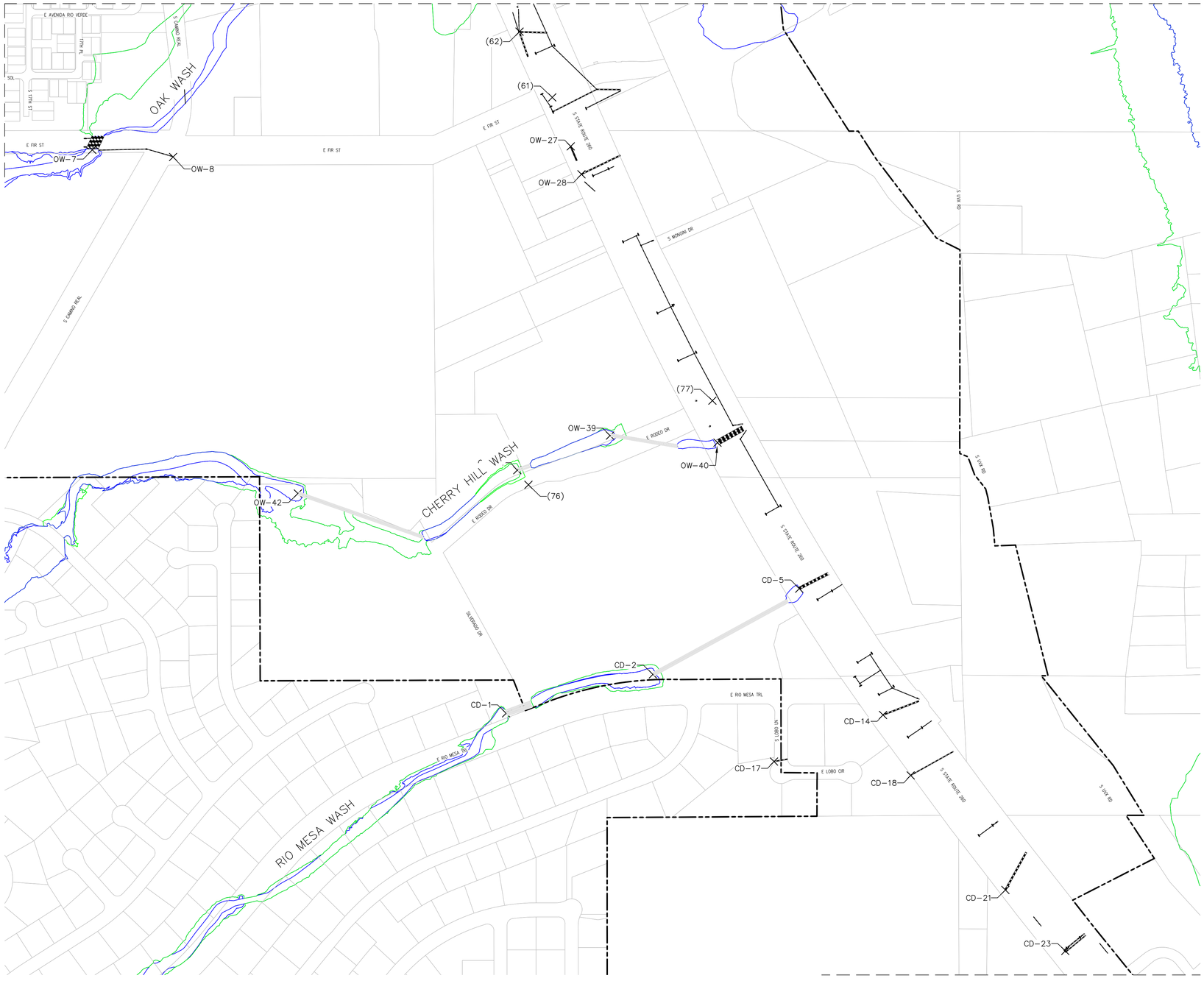
CONCENTRATION POINT MAP #14

MATCH LINE - SEE SHEET 13

MATCH LINE - SEE SHEET 12



MATCH LINE - SEE SHEET 15

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1128	OW-7	269	395	671	1200	1730	2370
1129	OW-8	6.5	6.8	8.2	11.8	16.2	20.5
1138	OW-14	272	400	681	1210	1750	2410
1148	OW-27	1.8	1.9	2.3	3.3	4.5	5.7
1149	OW-28	15.2	22.4	38.5	68.2	96.7	132.0
1160	OW-39	135	199	328	553	766	1020
1161	OW-40	136	200	330	556	771	1030
1162	OW-41	135	198	327	551	765	1020
1163	OW-42	133	195	322	544	755	1010
1164	CD-1	95.9	141.0	234.0	395.0	547.0	728.0
1165	CD-2	97.2	143.0	236.0	398.0	551.0	733.0
1168	CD-5	99.3	146.0	241.0	406.0	561.0	747.0
1177	CD-14	34.6	50.9	85.9	149.0	208.0	280.0
1180	CD-17	27.5	40.5	68.7	120.0	168.0	227.0
1181	CD-18	17.5	25.7	44.0	77.6	110.0	149.0
1184	CD-21	17.5	25.8	44.1	77.8	110.0	149.0
1186	CD-23	4.6	4.8	5.8	8.4	11.5	14.5

CONCENTRATION POINT TABLE		
1985 DRAINAGE REPORT		
Concentration Point Number	Storm Event Run-off	
	10-YR	50-YR
61	29.9	54.1
62	61.2	110
76	230	437
77	245	469

SCALE: 1" = 200'

0 100 200

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

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SCALE:	AS SHOWN
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CONCENTRATION POINT MAP

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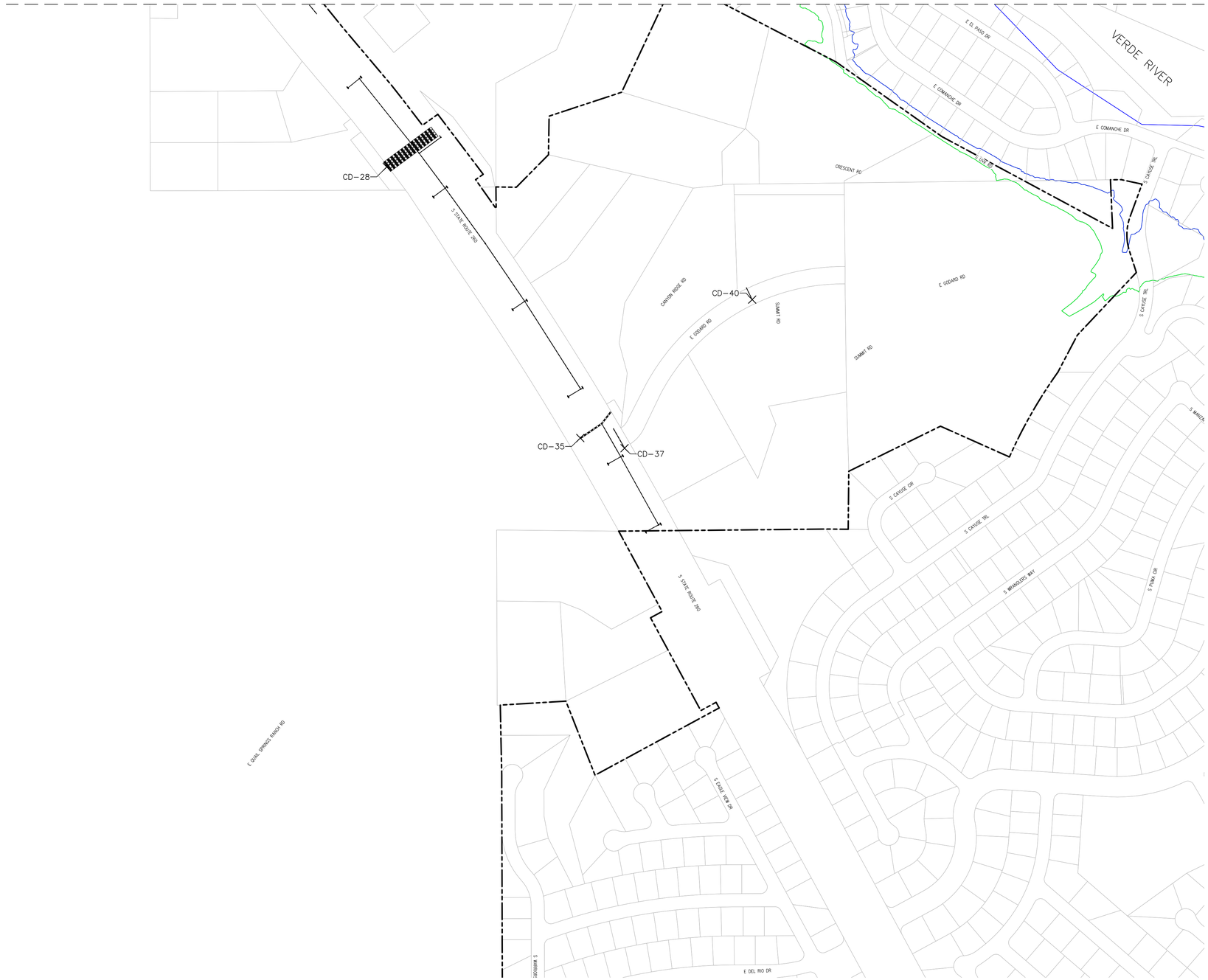
CONCENTRATION POINT MAP #15

MATCH LINE - SEE SHEET 14



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1191	CD-28	311	458	753	1270	1770	2360
1198	CD-35	15.2	22.3	38.4	68.0	96.5	131.0
1200	CD-37	0.5	0.5	0.6	0.9	1.3	1.6
1203	CD-40	3.7	3.8	4.7	6.7	9.2	11.6

NORTH

SCALE: 1" = 200'

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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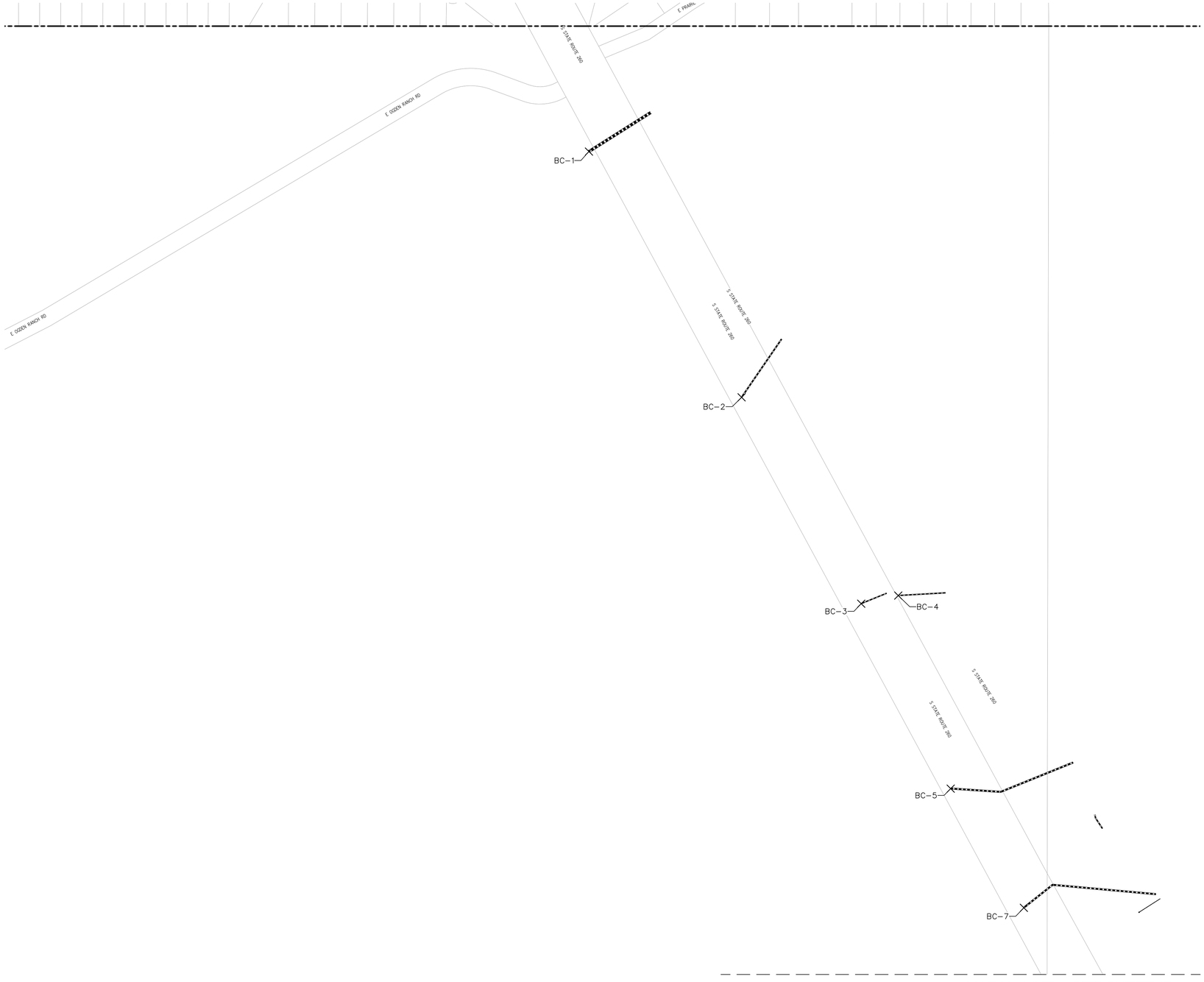
PLOTTED: Jun 30, 2020 - 2:51pm

CONCENTRATION POINT MAP #16



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1206	BC-1	92.5	136.0	226.0	382.0	530.0	707.0
1207	BC-2	19.9	29.3	50.2	88.6	125.0	170.0
1208	BC-3	20.3	22.7	27.6	39.8	54.6	69.0
1209	BC-4	21.1	23.7	28.8	41.6	57.0	72.1
1210	BC-5	42.5	62.5	105.0	182.0	255.0	343.0
1212	BC-7	20.2	29.7	51.0	90.2	128.0	174.0

SCALE: 1" = 200'

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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COTTONWOOD
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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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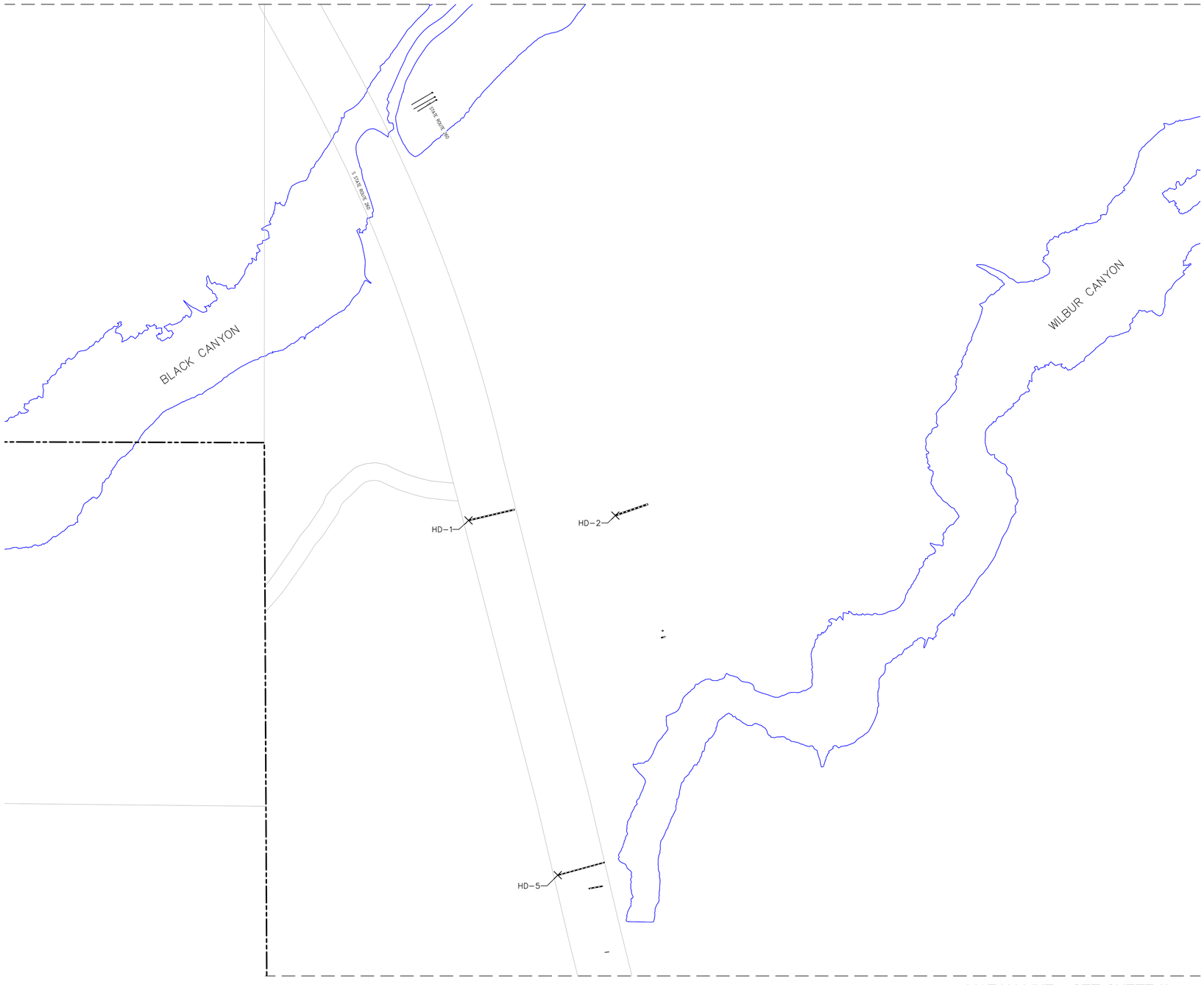
CONCENTRATION POINT MAP #17

MATCH LINE – SEE SHEET 16



MATCH LINE – SEE SHEET 18

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1217	HD-1	26.2	38.5	65.7	115.0	163.0	220.0
1218	HD-2	28.1	41.3	70.4	123.0	174.0	235.0
1221	HD-5	17.7	26.1	45.0	79.8	113.0	154.0

SCALE: 1" = 200'

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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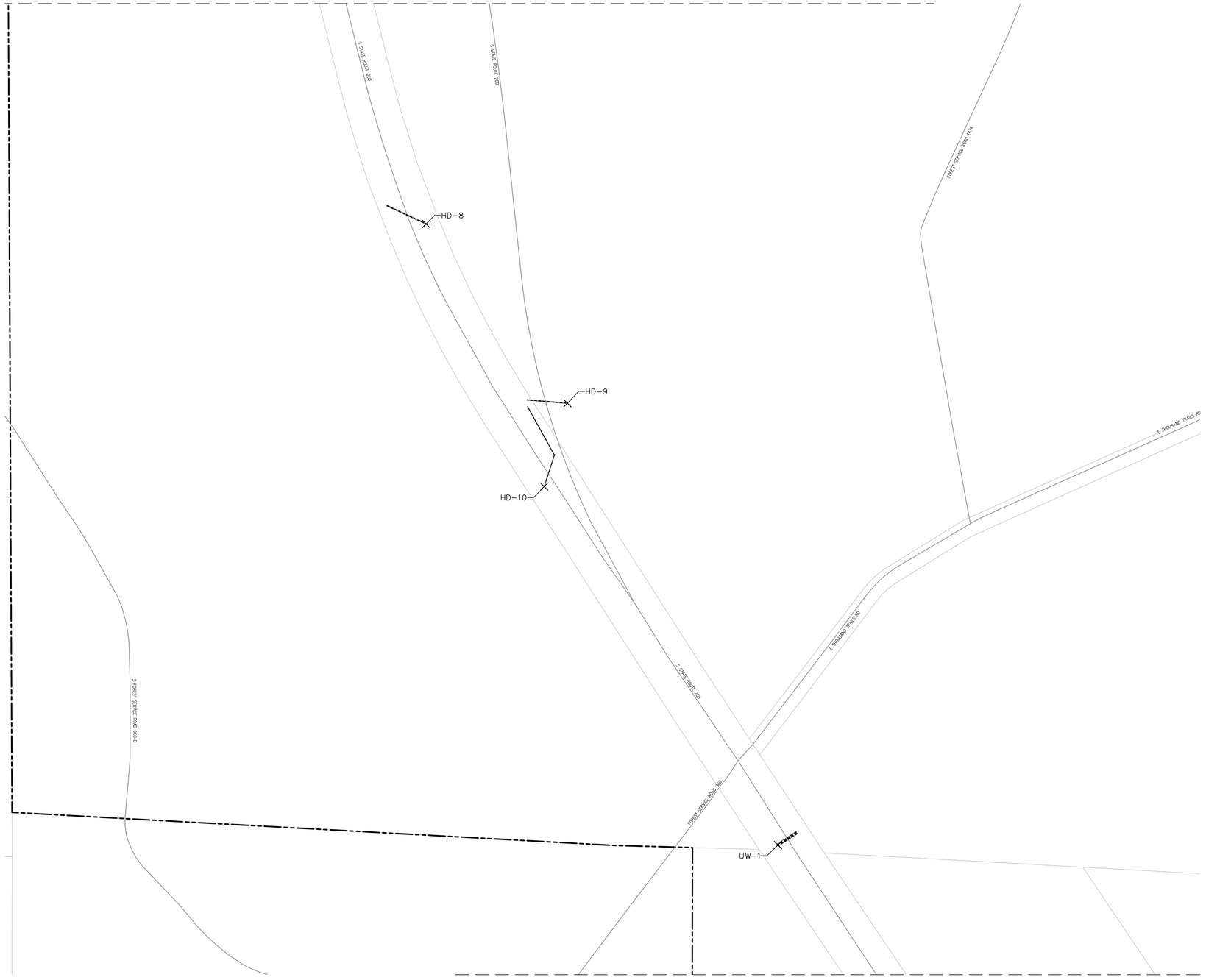
PLOTTED: Jun 30, 2020–2:55pm

CONCENTRATION POINT MAP #18



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1224	HD-8	15.3	22.5	38.8	69.2	98.6	135.0
1225	HD-9	5.1	7.5	12.9	23.1	32.9	45.0
1226	HD-10	3.1	4.5	7.8	13.8	19.7	27.0
1227	UW-1	15.1	22.2	38.3	68.2	97.1	133.0

SCALE: 1" = 200'

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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COTTONWOOD
ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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CONCENTRATION POINT MAP #19



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1231	UW-5	25.8	37.9	64.8	114.0	161.0	218.0
1234	UW-8	15.2	22.4	38.8	68.4	98.9	135.0
1235	UW-9	94.5	139.0	232.0	393.0	545.0	728.0
1236	UW-10	90.4	133.0	222.0	377.0	523.0	698.0
1240	UW-14	80.9	119.0	199.0	339.0	472.0	632.0

SCALE: 1" = 200'

0 100 200

LEGEND

- COTTONWOOD CITY BOUNDARY
- PARCEL LINE
- 100 YEAR FLOOD PLAIN (FEMA)
- 500 YEAR FLOOD PLAIN (FEMA)

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ARIZONA

CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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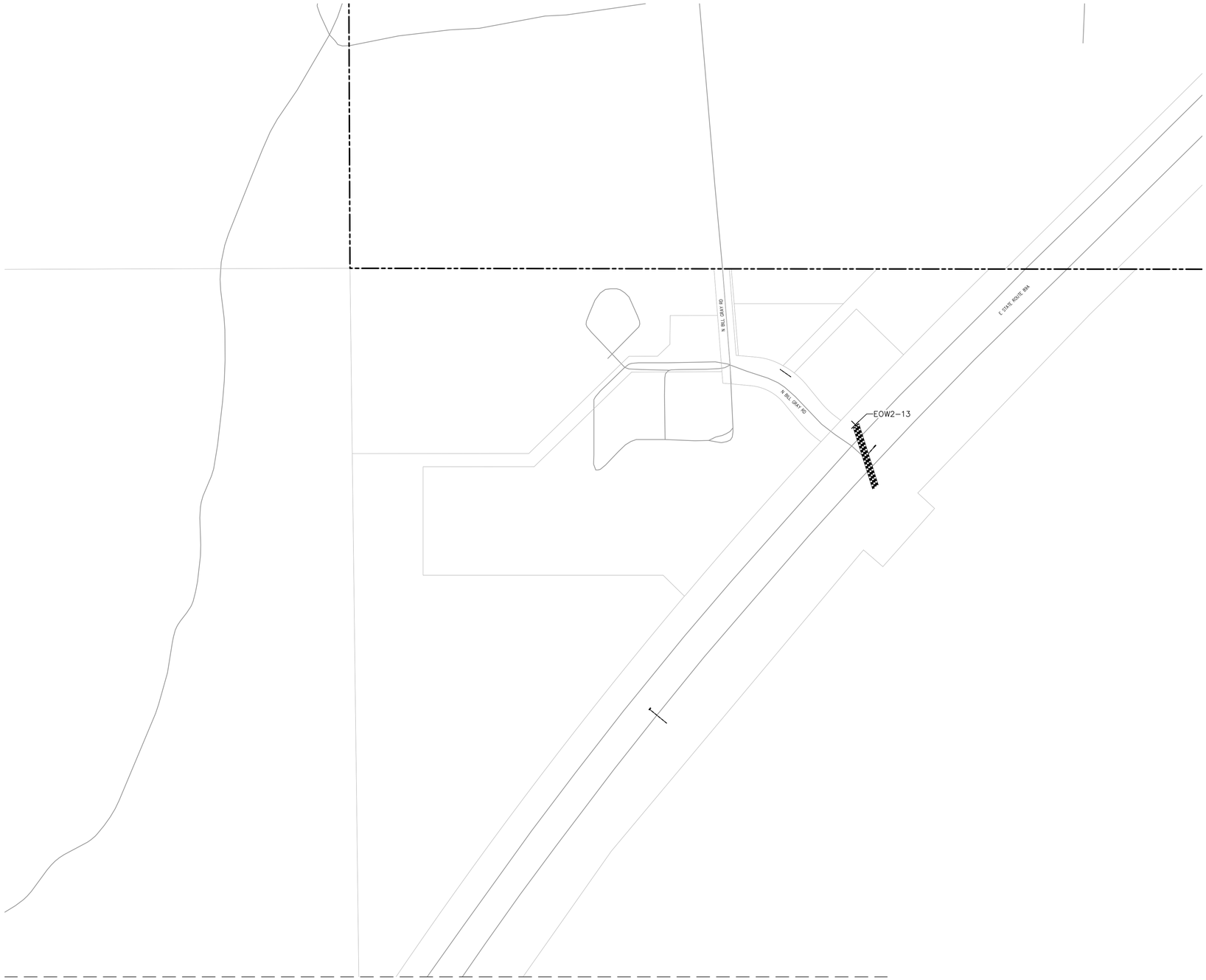
PLOTTED: Jun 30, 2020–3:06pm

CONCENTRATION POINT MAP #20

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1255	EOW2-13	280	412	686	1160	1610	2150



MATCH LINE - SEE SHEET 21

SCALE: 1" = 200

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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DRAWN:	SAS
DESIGN:	JRW
CHECKED:	JRW

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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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SHT NO. 20 OF 22

FILE: P:\2014\14267\Drawings\Exhibits\Concentration Point Plans\14267-MAP-20.dwg SW-C3D-18

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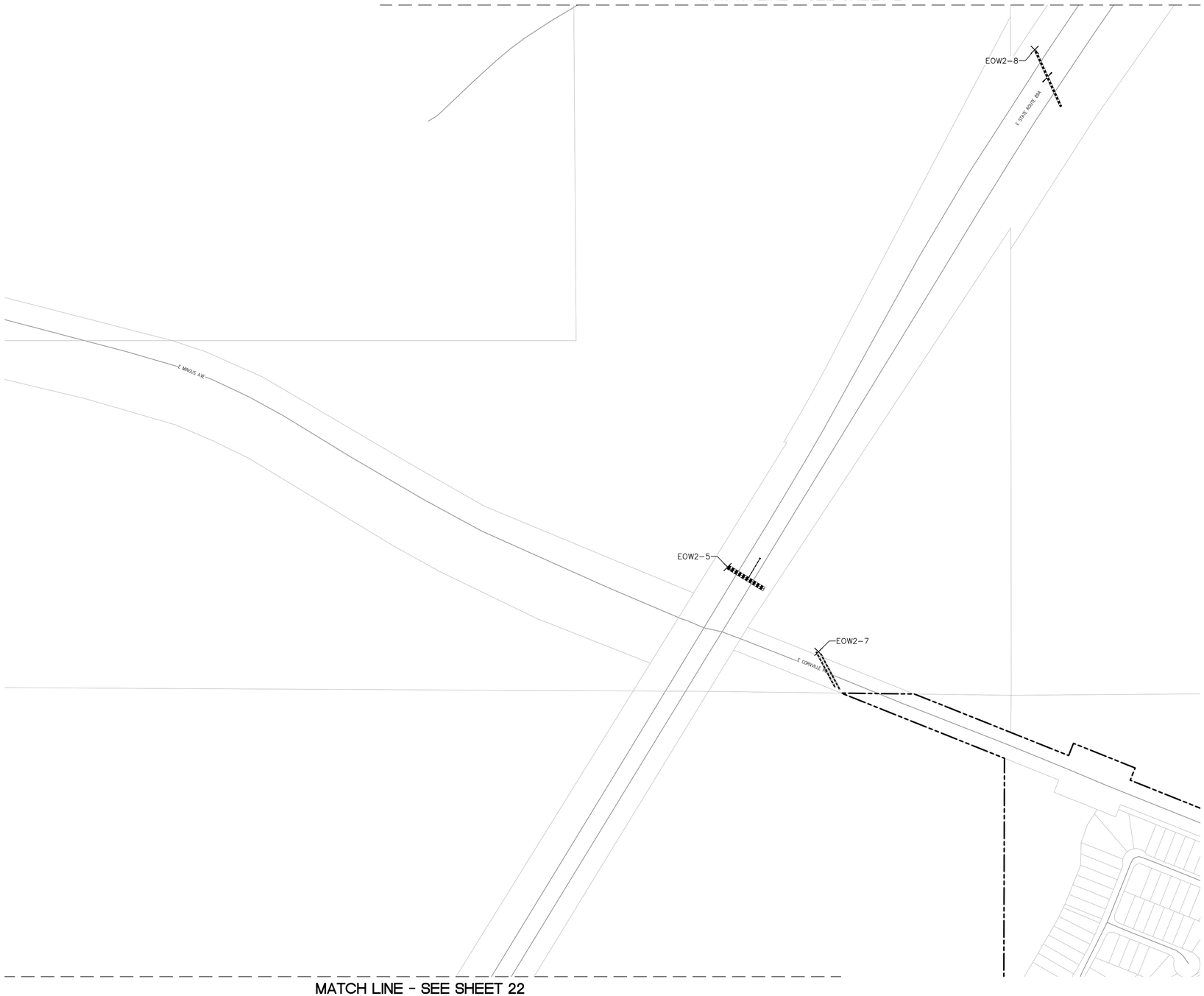
CONCENTRATION POINTS MAP #21

MATCH LINE – SEE SHEET 20



MATCH LINE – SEE SHEET 22

CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1247	EOW2-5	13.1	19.3	33.5	59.9	85.0	116.5
1249	EOW2-7	15.4	22.7	39.4	70.5	100.0	137.0
1250	EOW2-8	58.5	86.0	146.0	253.0	355.0	477.0

SCALE: 1" = 200

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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CITY OF COTTONWOOD
CONCENTRATION POINT MAP

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SHT NO. 21 OF 22

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PLOTTED: Jun 30, 2020–3:04pm

CONCENTRATION POINT MAP #22

MATCH LINE – SEE SHEET 21

MATCH LINE – SEE SHEET 13



CONCENTRATION POINT TABLE							
Point #	Point Description	Storm Event Run-off					
		2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
1243	EOW2-1	1.6	1.8	2.2	3.1	4.3	5.4
1244	EOW2-2	34.8	51.2	86.3	149.0	209.0	281.0
1245	EOW2-3	12.3	13.8	16.8	24.2	33.1	41.9
1246	EOW2-4	69.4	102.0	170.0	288.0	400.0	535.0

NORTH

SCALE: 1" = 200

0 100 200

LEGEND

COTTONWOOD CITY BOUNDARY

PARCEL LINE

100 YEAR FLOOD PLAIN (FEMA)

500 YEAR FLOOD PLAIN (FEMA)

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CONCENTRATION POINT MAP

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DRAWING NO. M22

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Appendix 6: Priority Cost Estimates

Priority 1:

Site # 7 Cost Estimate

14267- Cottonwood Master Drainage Study						
Main Street at Railroad Wash						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Clear & Grub	1	LSUM	$4,000.00	$4,000.00
2		Channel Excavation	50	CY	$50.00	$2,500.00
3		Mobilization (20%)	1	LS	$1,300.00	$1,300.00
				30% Contingency		*$2,340.00*
					Total	*$10,140.00*

Priority 2:

Site # 26 Cost Estimate

14267- Cottonwood Master Drainage Study						
E. Date Street at S. 7th						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$3,000.00	$3,000.00
2		Channel Excavation	1	LS	$5,000.00	$5,000.00
3		Culvert 24"	50	LF	$50.00	$2,500.00
4		AC Pavement with ABC Base	160	SF	$10.00	$1,600.00
5		Mobilization (20%)	1	LS	$2,420.00	$2,420.00
				30% Contingency		*$4,356.00*
					Total	*$18,876.00*

Priority 3:

Site # 29 Cost Estimate

14267- Cottonwood Master Drainage Study						
N. Apsco Lane						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Channel Excavation	500	CY	$50.00	$25,000.00
2		Channel Lining-Flexamat	3,500	SF	$6.00	$21,000.00
3		Mobilization (20%)	1	LS	$9,200.00	$9,200.00
				30% Contingency		*$16,560.00*
					Total	*$71,760.00*

Priority 4:

Site # 2 Cost Estimate

14267- Cottonwood Master Drainage Study						
6th St. - Boulder to Cypress St.						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Channel Excavation	300	CY	$40.00	$12,000.00
2		Gabions	200	CY	$250.00	$50,000.00
3		Riprap, 12"	200	CY	$100.00	$20,000.00
4		Multi Barrel Box Culvert	1	LS	$400,000.00	$400,000.00
5		Grading for Roadway	1	LS	$ 50,000.00	$50,000.00
5		AC Pavement with Aggregate Base Course	14,000	SF	$15.00	$210,000.00
6		Traffic Control	1	LS	$5,000.00	$5,000.00
7		Mobilization (20%)	1	LS	$149,400.00	$149,400.00
				30% Contingency		*$268,920.00*
					Total	*$1,165,320.00*

Priority 5:

Site # 4 Cost Estimate

14267- Cottonwood Master Drainage Study						
Camino Real & Fir Street						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$5,000.00	$5,000.00
2		Drop Inlet	1	EA	$15,000.00	$15,000.00
3		Storm Sewer 36"	100	LF	$200.00	$20,000.00
4		Grading for Detention Pond & Ditches	300	CY	$50.00	$15,000.00
5		Riprap, 12"	300	CY	$100.00	$30,000.00
6		Grading for Paving	1	LS	$2,000.00	$2,000.00
7		AC Pavement with Aggregate Base Course	250	SF	$20.00	$5,000.00
8		Traffic Control	1	LS	$5,000.00	$5,000.00
9		Mobilization (20%)	1	LS	$8,000.00	$19,400.00
				30% Contingency		*$34,920.00*
					Total	*$151,320.00*

Priority 6:

Site # 11 Cost Estimate

14267- Cottonwood Master Drainage Study						
E. Cochise Street - 10th to 11th						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$15,000.00	$15,000.00
2		Catch Basins	3	EA	$4,000.00	$12,000.00
3		Storm Sewer Double 36"	225	LF	$400.00	$90,000.00
4		Storm Sewer 18"	75	LF	$100.00	$7,500.00
5		Grading for Ditches	100	CY	$50.00	$5,000.00
6		Grading for Paving	1	LS	$3,000.00	$3,000.00
7		AC Pavement with Aggregate Base Course	250	SF	$20.00	$5,000.00
8		Traffic Control	1	LS	$5,000.00	$5,000.00
10		Mobilization (20%)	1	LS	$23,400.00	$28,500.00
				30% Contingency		*$51,300.00*
					Total	*$222,300.00*

Priority 7:

Site #13 & #25 Cost Estimate

14267- Cottonwood Master Drainage Study						
8th Street Wash & 6th Street Storm Sewer						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Channel Excavation	1,000	CY	$30.00	$30,000.00
2		Flexamat Channel Lining	22,000	SF	$6.00	$132,000.00
3		Catch Basins	12	EA	$4,000.00	$48,000.00
4		Storm Sewer, 60 Inch	1,800	LF	$300.00	$540,000.00
5		Storm Sewer, 18 Inch	180	LF	$100.00	$18,000.00
6		AC Pavement with Aggregate Base Course	18,000	SF	$15.00	$270,000.00
7		Grading for Pavement	1	LS	$75,000.00	$75,000.00
8		Pedestrian Bridge	1	LS	$25,000.00	$25,000.00
9		Erosion Control	1	LS	$15,000.00	$15,000.00
10		Traffic Control	1	LS	$35,000.00	$35,000.00
11		Riprap, 12"	500	SY	$100.00	$50,000.00
12		Mobilization (10%)	1	LS	$123,800.00	$123,800.00
				25% Contingency		*$340,450.00*
					Total	*$1,702,250.00*

Priority 8:

Site # 10 Cost Estimate

14267- Cottonwood Master Drainage Study						
N. Cactus Street at Santa Cruz Street						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$20,000.00	$20,000.00
2		Headwalls	2	EA	$15,000.00	$30,000.00
3		Storm Sewer Triple 48"	80	LF	$600.00	$48,000.00
4		Concrete for Low Water Crossing	1	LSUM	$45,000.00	$45,000.00
5		Channel Excavation	1,000	CY	$30.00	$30,000.00
6		Riprap, 18"	500	CY	$150.00	$75,000.00
7		Grading for Paving	1	LS	$20,000.00	$20,000.00
8		AC Pavement with Aggregate Base Course	4,800	SF	$15.00	$72,000.00
9		Traffic Control	1	LS	$5,000.00	$5,000.00
10		Mobilization (20%)	1	LS	$19,600.00	$69,000.00
				30% Contingency		*$124,200.00*
					Total	*$538,200.00*

Priority 9:

Site # 30 Cost Estimate

14267- Cottonwood Master Drainage Study						
E. Cottonwood Street - 203 through 320						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$20,000.00	$20,000.00
2		Drop Inlet	1	EA	$15,000.00	$15,000.00
3		Storm Sewer Double 48"	200	LF	$400.00	$80,000.00
4		Grading for Roadway Profile(Fill)	1,600	CY	$30.00	$48,000.00
5		Riprap, 12"	50	CY	$100.00	$5,000.00
6		Grading for Paving	1	LS	$20,000.00	$20,000.00
7		AC Pavement with Aggregate Base Course	14,000	SF	$15.00	$210,000.00
8		Traffic Control	1	LS	$5,000.00	$5,000.00
9		Mobilization (20%)	1	LS	$23,000.00	$80,600.00
				30% Contingency		*$145,080.00*
					Total	*$628,680.00*

Priority 10:

Site # 19 Cost Estimate

14267- Cottonwood Master Drainage Study						
Outlet Channel near E. Navajo						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Construction Staking	1	LSUM	$1,500.00	$1,500.00
2		Channel Excavation	300	CY	$50.00	$15,000.00
3		Mobilization (20%)	1	LS	$3,300.00	$3,300.00
				30% Contingency		*$5,940.00*
					Total	*$25,740.00*

Priority 11:

Site # 1 Cost Estimate

14267- Cottonwood Master Drainage Study						
Calvary Way - Storm Sewer						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$3,000.00	$3,000.00
2		Catch Basin	2	EA	$4,000.00	$8,000.00
4		Storm Sewer 30"	60	LF	$300.00	$18,000.00
5		Grading for Ditches	200	CY	$50.00	$10,000.00
6		Grading for Paving	1	LS	$3,000.00	$3,000.00
7		AC Pavement with Aggregate Base Course	250	SF	$20.00	$5,000.00
8		Traffic Control	1	LS	$1,000.00	$1,000.00
10		Mobilization (20%)	1	LS	$2,200.00	$9,600.00
				30% Contingency		*$17,280.00*
					Total	*$74,880.00*

Priority 12:

Site # 6 Cost Estimate

14267- Cottonwood Master Drainage Study						
Main Street - Graham St. to Gila St.						
Line No.	**Item**	**Description**	**Qty**	**Unit**	**Unit Cost**	**Amount**
1		Demolition	1	LS	$35,000.00	$35,000.00
2		Catch Basins	4	EA	$10,000.00	$40,000.00
3		Storm Sewer 36"	750	LF	$200.00	$150,000.00
4		Storm Sewer 24"	50	LF	$125.00	$6,250.00
5		Replace Sidewalk	400	SF	$15.00	$6,000.00
6		Replace Curb & Gutter	80	LF	$30.00	$2,400.00
7		Grading for Paving	1	LS	$15,000.00	$15,000.00
8		AC Pavement with Aggregate	4,500	SF	$15.00	$67,500.00
9		Traffic Control	1	LS	$30,000.00	$30,000.00
10		Mobilization (20%)	1	LS	$47,450.00	$70,430.00
				30% Contingency		*$126,774.00*
					Total	*$549,354.00*

Appendix 7: Hydraulic Analysis Output

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Issue Area 1 - 100 yr

Headwater Elevation (ft)	Total Discharge (cfs)	8x6 Double Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3308.44	0.00	0.00	0.00	1
3310.12	87.60	87.60	0.00	1
3311.08	175.20	175.20	0.00	1
3311.88	262.80	262.80	0.00	1
3312.60	350.40	350.40	0.00	1
3313.26	438.00	438.00	0.00	1
3313.88	525.60	525.60	0.00	1
3314.46	613.20	613.20	0.00	1
3315.02	700.80	700.80	0.00	1
3315.55	788.40	788.40	0.00	1
3316.07	876.00	876.00	0.00	1
3316.43	939.33	939.33	0.00	Overtopping

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Issue Area 2 - 25 yr

Headwater Elevation (ft)	Total Discharge (cfs)	18 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3473.08	0.00	0.00	0.00	1
3473.63	1.32	1.32	0.00	1
3473.85	2.64	2.64	0.00	1
3474.03	3.96	3.96	0.00	1
3474.18	5.28	5.28	0.00	1
3474.33	6.60	6.60	0.00	1
3474.47	7.92	7.92	0.00	1
3474.62	9.24	9.24	0.00	1
3474.73	10.56	10.18	0.35	10
3474.76	11.88	10.49	1.37	5
3474.79	13.20	10.73	2.44	4
3474.70	9.96	9.96	0.00	Overtopping

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Issue Area 3 -100 yr

Headwater Elevation (ft)	Total Discharge (cfs)	18 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3464.44	0.00	0.00	0.00	1
3465.45	6.16	6.16	0.00	1
3466.05	12.32	12.18	0.07	21
3466.20	18.48	12.57	5.85	8
3466.29	24.64	13.55	11.06	5
3466.36	30.80	14.51	16.26	4
3466.42	36.96	15.36	21.51	3
3466.49	43.12	15.89	27.13	3
3466.55	49.28	16.35	32.86	3
3466.61	55.44	16.77	38.63	3
3466.66	61.60	17.17	44.42	3
3466.04	12.10	12.10	0.00	Overtopping

Issue Area 4 - 2 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.03010	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	30.00	ft
Discharge	96.40	ft^3/s

Results

Normal Depth	0.65	ft
Flow Area	20.51	ft^2
Wetted Perimeter	32.93	ft
Hydraulic Radius	0.62	ft
Top Width	32.62	ft
Critical Depth	0.67	ft
Critical Slope	0.02732	ft/ft
Velocity	4.70	ft/s
Velocity Head	0.34	ft
Specific Energy	1.00	ft
Froude Number	1.05	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.65	ft
Critical Depth	0.67	ft
Channel Slope	0.03010	ft/ft

Issue Area 4 - 2 yr

GVF Output Data

Critical Slope	0.02732	ft/ft

Issue Area 4 - 5 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.03010	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	30.00	ft
Discharge	413.00	ft^3/s

Results

Normal Depth	1.55	ft
Flow Area	51.41	ft^2
Wetted Perimeter	36.94	ft
Hydraulic Radius	1.39	ft
Top Width	36.21	ft
Critical Depth	1.74	ft
Critical Slope	0.02065	ft/ft
Velocity	8.03	ft/s
Velocity Head	1.00	ft
Specific Energy	2.56	ft
Froude Number	1.19	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.55	ft
Critical Depth	1.74	ft
Channel Slope	0.03010	ft/ft

Issue Area 4 - 5 yr

GVF Output Data

Critical Slope	0.02065	ft/ft

Issue Area 4 - 10 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.03010	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	30.00	ft
Discharge	689.00	ft³/s

Results

Normal Depth	2.10	ft
Flow Area	71.69	ft²
Wetted Perimeter	39.38	ft
Hydraulic Radius	1.82	ft
Top Width	38.39	ft
Critical Depth	2.40	ft
Critical Slope	0.01887	ft/ft
Velocity	9.61	ft/s
Velocity Head	1.44	ft
Specific Energy	3.53	ft
Froude Number	1.24	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.10	ft
Critical Depth	2.40	ft
Channel Slope	0.03010	ft/ft

Issue Area 4 - 10 yr

GVF Output Data

Critical Slope	0.01887	ft/ft

Issue Area 4 - 25 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.03010	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	30.00	ft
Discharge	1190.00	ft³/s

Results

Normal Depth	2.88	ft
Flow Area	102.96	ft²
Wetted Perimeter	42.88	ft
Hydraulic Radius	2.40	ft
Top Width	41.52	ft
Critical Depth	3.38	ft
Critical Slope	0.01725	ft/ft
Velocity	11.56	ft/s
Velocity Head	2.08	ft
Specific Energy	4.96	ft
Froude Number	1.29	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.88	ft
Critical Depth	3.38	ft
Channel Slope	0.03010	ft/ft

Issue Area 4 - 25 yr

GVF Output Data

Critical Slope	0.01725	ft/ft

Issue Area 4 - 50 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.03010	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	30.00	ft
Discharge	1690.00	ft³/s

Results

Normal Depth	3.52	ft
Flow Area	130.42	ft²
Wetted Perimeter	45.75	ft
Hydraulic Radius	2.85	ft
Top Width	44.08	ft
Critical Depth	4.19	ft
Critical Slope	0.01633	ft/ft
Velocity	12.96	ft/s
Velocity Head	2.61	ft
Specific Energy	6.13	ft
Froude Number	1.33	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.52	ft
Critical Depth	4.19	ft
Channel Slope	0.03010	ft/ft

Issue Area 4 - 50 yr

GVF Output Data

Critical Slope	0.01633	ft/ft

Issue Area 4 - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.03010	ft/ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	30.00	ft
Discharge	2290.00	ft³/s

Results

Normal Depth	4.18	ft
Flow Area	160.47	ft²
Wetted Perimeter	48.71	ft
Hydraulic Radius	3.29	ft
Top Width	46.73	ft
Critical Depth	5.03	ft
Critical Slope	0.01560	ft/ft
Velocity	14.27	ft/s
Velocity Head	3.16	ft
Specific Energy	7.35	ft
Froude Number	1.36	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.18	ft
Critical Depth	5.03	ft
Channel Slope	0.03010	ft/ft

Issue Area 4 - 100 yr

GVF Output Data

Critical Slope	0.01560	ft/ft

Issue Area 5 - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.040	
Channel Slope	0.04880	ft/ft
Normal Depth	1.50	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	1.00	ft

Results

Discharge	57.70	ft^3/s
Flow Area	8.25	ft^2
Wetted Perimeter	10.49	ft
Hydraulic Radius	0.79	ft
Top Width	10.00	ft
Critical Depth	1.71	ft
Critical Slope	0.02544	ft/ft
Velocity	6.99	ft/s
Velocity Head	0.76	ft
Specific Energy	2.26	ft
Froude Number	1.36	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.50	ft
Critical Depth	1.71	ft
Channel Slope	0.04880	ft/ft

Issue Area 5 - 100 yr

GVF Output Data

Critical Slope	0.02544	ft/ft

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Issue Area 5 - 100 yr

Headwater Elevation (ft)	Total Discharge (cfs)	24 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3374.01	0.00	0.00	0.00	1
3374.49	2.05	2.05	0.00	1
3374.69	4.10	4.10	0.00	1
3374.86	6.15	6.15	0.00	1
3375.00	8.20	8.20	0.00	1
3375.14	10.25	10.25	0.00	1
3375.28	12.30	12.30	0.00	1
3375.41	14.35	14.35	0.00	1
3375.54	16.40	16.40	0.00	1
3375.67	18.45	18.45	0.00	1
3375.80	20.50	20.50	0.00	1
3376.51	30.54	30.54	0.00	Overtopping

Issue Area 6 - Ditch Full Capacity

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.02100	ft/ft
Normal Depth	3.00	ft
Bottom Width	2.00	ft

Results

Discharge	30.47	ft^3/s
Flow Area	6.00	ft^2
Wetted Perimeter	8.00	ft
Hydraulic Radius	0.75	ft
Top Width	2.00	ft
Critical Depth	1.93	ft
Critical Slope	0.06015	ft/ft
Velocity	5.08	ft/s
Velocity Head	0.40	ft
Specific Energy	3.40	ft
Froude Number	0.52	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.00	ft
Critical Depth	1.93	ft
Channel Slope	0.02100	ft/ft
Critical Slope	0.06015	ft/ft

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Issue Area 6 - 100 yr

Headwater Elevation (ft)	Total Discharge (cfs)	24 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
3335.41	0.00	0.00	0.00	1
3336.87	7.24	7.24	0.00	1
3337.84	14.48	14.48	0.00	1
3338.06	21.72	15.88	5.76	8
3338.17	28.96	16.51	12.39	6
3338.26	36.20	17.01	19.11	5
3338.33	43.44	17.45	25.94	5
3338.41	50.68	17.84	32.71	4
3338.48	57.92	18.25	39.74	4
3339.00	65.16	20.71	44.43	9
3339.60	72.40	22.02	50.33	6
3337.90	14.88	14.88	0.00	Overtopping

Issue Area 7 - Ditch Full Capacity

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00700	ft/ft
Normal Depth	2.00	ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	16.00	ft

Results

Discharge	227.10	ft^3/s
Flow Area	40.00	ft^2
Wetted Perimeter	24.94	ft
Hydraulic Radius	1.60	ft
Top Width	24.00	ft
Critical Depth	1.71	ft
Critical Slope	0.01213	ft/ft
Velocity	5.68	ft/s
Velocity Head	0.50	ft
Specific Energy	2.50	ft
Froude Number	0.78	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.00	ft
Critical Depth	1.71	ft
Channel Slope	0.00700	ft/ft

Issue Area 7 - Ditch Full Capacity

GVF Output Data

Critical Slope	0.01213	ft/ft

Issue Area 7 - Ditch .5 Free Board Capacity

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00700	ft/ft
Normal Depth	1.50	ft
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	16.00	ft

Results

Discharge	137.42	ft^3/s
Flow Area	28.50	ft^2
Wetted Perimeter	22.71	ft
Hydraulic Radius	1.26	ft
Top Width	22.00	ft
Critical Depth	1.25	ft
Critical Slope	0.01318	ft/ft
Velocity	4.82	ft/s
Velocity Head	0.36	ft
Specific Energy	1.86	ft
Froude Number	0.75	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.50	ft
Critical Depth	1.25	ft
Channel Slope	0.00700	ft/ft

Issue Area 7 - Ditch .5 Free Board Capacity

GVF Output Data

Critical Slope	0.01318	ft/ft

Issue Area 8 - 2 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00700	ft/ft
Left Side Slope	100.00	ft/ft (H:V)
Right Side Slope	40.00	ft/ft (H:V)
Bottom Width	25.00	ft
Discharge	125.00	ft^3/s

Results

Normal Depth	0.76	ft
Flow Area	59.67	ft^2
Wetted Perimeter	131.66	ft
Hydraulic Radius	0.45	ft
Top Width	131.65	ft
Critical Depth	0.57	ft
Critical Slope	0.02525	ft/ft
Velocity	2.10	ft/s
Velocity Head	0.07	ft
Specific Energy	0.83	ft
Froude Number	0.55	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.76	ft
Critical Depth	0.57	ft
Channel Slope	0.00700	ft/ft

Issue Area 8 - 2 yr

GVF Output Data

Critical Slope	0.02525	ft/ft

Issue Area 8 - 5 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00700	ft/ft
Left Side Slope	100.00	ft/ft (H:V)
Right Side Slope	40.00	ft/ft (H:V)
Bottom Width	25.00	ft
Discharge	216.00	ft^3/s

Results

Normal Depth	0.97	ft
Flow Area	89.65	ft^2
Wetted Perimeter	160.41	ft
Hydraulic Radius	0.56	ft
Top Width	160.39	ft
Critical Depth	0.74	ft
Critical Slope	0.02341	ft/ft
Velocity	2.41	ft/s
Velocity Head	0.09	ft
Specific Energy	1.06	ft
Froude Number	0.57	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.97	ft
Critical Depth	0.74	ft
Channel Slope	0.00700	ft/ft

Issue Area 8 - 5 yr

GVF Output Data

Critical Slope	0.02341	ft/ft

Issue Area 8 - 10 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00700	ft/ft
Left Side Slope	100.00	ft/ft (H:V)
Right Side Slope	40.00	ft/ft (H:V)
Bottom Width	25.00	ft
Discharge	253.00	ft^3/s

Results

Normal Depth	1.03	ft
Flow Area	100.85	ft^2
Wetted Perimeter	169.91	ft
Hydraulic Radius	0.59	ft
Top Width	169.89	ft
Critical Depth	0.80	ft
Critical Slope	0.02291	ft/ft
Velocity	2.51	ft/s
Velocity Head	0.10	ft
Specific Energy	1.13	ft
Froude Number	0.57	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.03	ft
Critical Depth	0.80	ft
Channel Slope	0.00700	ft/ft

Issue Area 8 - 10 yr

GVF Output Data

Critical Slope	0.02291	ft/ft

Issue Area 8 - 25 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00700	ft/ft
Left Side Slope	100.00	ft/ft (H:V)
Right Side Slope	40.00	ft/ft (H:V)
Bottom Width	25.00	ft
Discharge	304.00	ft^3/s

Results

Normal Depth	1.12	ft
Flow Area	115.66	ft^2
Wetted Perimeter	181.71	ft
Hydraulic Radius	0.64	ft
Top Width	181.69	ft
Critical Depth	0.87	ft
Critical Slope	0.02234	ft/ft
Velocity	2.63	ft/s
Velocity Head	0.11	ft
Specific Energy	1.23	ft
Froude Number	0.58	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.12	ft
Critical Depth	0.87	ft
Channel Slope	0.00700	ft/ft

Issue Area 8 - 25 yr

GVF Output Data

Critical Slope	0.02234	ft/ft

Issue Area 8 - 50 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00700	ft/ft
Left Side Slope	100.00	ft/ft (H:V)
Right Side Slope	40.00	ft/ft (H:V)
Bottom Width	25.00	ft
Discharge	340.00	ft^3/s

Results

Normal Depth	1.17	ft
Flow Area	125.74	ft^2
Wetted Perimeter	189.32	ft
Hydraulic Radius	0.66	ft
Top Width	189.29	ft
Critical Depth	0.92	ft
Critical Slope	0.02201	ft/ft
Velocity	2.70	ft/s
Velocity Head	0.11	ft
Specific Energy	1.29	ft
Froude Number	0.58	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.17	ft
Critical Depth	0.92	ft
Channel Slope	0.00700	ft/ft

Issue Area 8 - 50 yr

GVF Output Data

Critical Slope	0.02201	ft/ft

Issue Area 8 - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00700	ft/ft
Left Side Slope	100.00	ft/ft (H:V)
Right Side Slope	40.00	ft/ft (H:V)
Bottom Width	25.00	ft
Discharge	376.00	ft³/s

Results

Normal Depth	1.22	ft
Flow Area	135.56	ft²
Wetted Perimeter	196.44	ft
Hydraulic Radius	0.69	ft
Top Width	196.42	ft
Critical Depth	0.96	ft
Critical Slope	0.02171	ft/ft
Velocity	2.77	ft/s
Velocity Head	0.12	ft
Specific Energy	1.34	ft
Froude Number	0.59	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.22	ft
Critical Depth	0.96	ft
Channel Slope	0.00700	ft/ft

Issue Area 8 - 100 yr

GVF Output Data

Critical Slope	0.02171	ft/ft

Issue Area 9 - 2 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01570	ft/ft
Left Side Slope	10.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Bottom Width	50.00	ft
Discharge	47.80	ft³/s

Results

Normal Depth	0.32	ft
Flow Area	17.09	ft²
Wetted Perimeter	56.45	ft
Hydraulic Radius	0.30	ft
Top Width	56.42	ft
Critical Depth	0.30	ft
Critical Slope	0.01999	ft/ft
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energy	0.44	ft
Froude Number	0.90	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.32	ft
Critical Depth	0.30	ft
Channel Slope	0.01570	ft/ft

Issue Area 9 - 2 yr

GVF Output Data

Critical Slope	0.01999	ft/ft

Issue Area 9 - 5 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01570	ft/ft
Left Side Slope	10.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Bottom Width	50.00	ft
Discharge	53.70	ft³/s

Results

Normal Depth	0.34	ft
Flow Area	18.39	ft²
Wetted Perimeter	56.92	ft
Hydraulic Radius	0.32	ft
Top Width	56.88	ft
Critical Depth	0.32	ft
Critical Slope	0.01952	ft/ft
Velocity	2.92	ft/s
Velocity Head	0.13	ft
Specific Energy	0.48	ft
Froude Number	0.91	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.34	ft
Critical Depth	0.32	ft
Channel Slope	0.01570	ft/ft

Issue Area 9 - 5 yr

GVF Output Data

Critical Slope	0.01952	ft/ft

Issue Area 9 - 10 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01570	ft/ft
Left Side Slope	10.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Bottom Width	50.00	ft
Discharge	65.30	ft^3/s

Results

Normal Depth	0.39	ft
Flow Area	20.79	ft^2
Wetted Perimeter	57.76	ft
Hydraulic Radius	0.36	ft
Top Width	57.72	ft
Critical Depth	0.37	ft
Critical Slope	0.01875	ft/ft
Velocity	3.14	ft/s
Velocity Head	0.15	ft
Specific Energy	0.54	ft
Froude Number	0.92	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.37	ft
Channel Slope	0.01570	ft/ft

Issue Area 9 - 10 yr

GVF Output Data

Critical Slope	0.01875	ft/ft

Issue Area 9 - 25 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01570	ft/ft
Left Side Slope	10.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Bottom Width	50.00	ft
Discharge	94.50	ft³/s

Results

Normal Depth	0.48	ft
Flow Area	26.29	ft²
Wetted Perimeter	59.64	ft
Hydraulic Radius	0.44	ft
Top Width	59.60	ft
Critical Depth	0.47	ft
Critical Slope	0.01741	ft/ft
Velocity	3.59	ft/s
Velocity Head	0.20	ft
Specific Energy	0.68	ft
Froude Number	0.95	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.48	ft
Critical Depth	0.47	ft
Channel Slope	0.01570	ft/ft

Issue Area 9 - 25 yr

GVF Output Data

Critical Slope	0.01741	ft/ft

Issue Area 9 - 50 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01570	ft/ft
Left Side Slope	10.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Bottom Width	50.00	ft
Discharge	128.00	ft³/s

Results

Normal Depth	0.57	ft
Flow Area	31.94	ft²
Wetted Perimeter	61.52	ft
Hydraulic Radius	0.52	ft
Top Width	61.46	ft
Critical Depth	0.57	ft
Critical Slope	0.01640	ft/ft
Velocity	4.01	ft/s
Velocity Head	0.25	ft
Specific Energy	0.82	ft
Froude Number	0.98	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.57	ft
Critical Depth	0.57	ft
Channel Slope	0.01570	ft/ft

Issue Area 9 - 50 yr

GVF Output Data

Critical Slope	0.01640	ft/ft

Issue Area 9 - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01570	ft/ft
Left Side Slope	10.00	ft/ft (H:V)
Right Side Slope	10.00	ft/ft (H:V)
Bottom Width	50.00	ft
Discharge	163.00	ft³/s

Results

Normal Depth	0.66	ft
Flow Area	37.32	ft²
Wetted Perimeter	63.25	ft
Hydraulic Radius	0.59	ft
Top Width	63.19	ft
Critical Depth	0.66	ft
Critical Slope	0.01565	ft/ft
Velocity	4.37	ft/s
Velocity Head	0.30	ft
Specific Energy	0.96	ft
Froude Number	1.00	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.66	ft
Critical Depth	0.66	ft
Channel Slope	0.01570	ft/ft

Issue Area 9 - 100 yr

GVF Output Data

Critical Slope	0.01565	ft/ft

Issue Area 10 - 10 yr Ditch Capacity

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01050	ft/ft
Normal Depth	1.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft

Results

Discharge	18.07	ft^3/s
Flow Area	5.00	ft^2
Wetted Perimeter	8.32	ft
Hydraulic Radius	0.60	ft
Top Width	8.00	ft
Critical Depth	0.90	ft
Critical Slope	0.01665	ft/ft
Velocity	3.61	ft/s
Velocity Head	0.20	ft
Specific Energy	1.20	ft
Froude Number	0.81	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.00	ft
Critical Depth	0.90	ft
Channel Slope	0.01050	ft/ft

Issue Area 10 - 10 yr Ditch Capacity

GVF Output Data

Critical Slope	0.01665	ft/ft

Issue Area 10 - 25 yr Ditch Capacity

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01050	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	26.70	ft³/s

Results

Normal Depth	1.20	ft
Flow Area	6.68	ft²
Wetted Perimeter	9.56	ft
Hydraulic Radius	0.70	ft
Top Width	9.17	ft
Critical Depth	1.09	ft
Critical Slope	0.01580	ft/ft
Velocity	4.00	ft/s
Velocity Head	0.25	ft
Specific Energy	1.44	ft
Froude Number	0.83	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.20	ft
Critical Depth	1.09	ft
Channel Slope	0.01050	ft/ft

Issue Area 10 - 25 yr Ditch Capacity

GVF Output Data

Critical Slope	0.01580	ft/ft

Issue Area 12 - Inlet 112

Project Description

Solve For	Spread

Input Data

Discharge		26.85	ft³/s
Gutter Width		2.00	ft
Gutter Cross Slope		0.02	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.67	ft
Grate Length		6.83	ft
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	53.25	ft
Depth	1.07	ft
Gutter Depression	0.00	ft
Total Depression	0.00	ft
Open Grate Area	5.13	ft²
Active Grate Weir Length	8.50	ft

Issue Area 12 - Inlet 113

Project Description

Solve For	Efficiency

Input Data

Discharge		26.85	ft³/s
Slope		0.00500	ft/ft
Gutter Width		2.00	ft
Gutter Cross Slope		0.02	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.013	
Grate Width		1.67	ft
Grate Length		4.83	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency	22.78	%
Intercepted Flow	6.12	ft³/s
Bypass Flow	20.73	ft³/s
Spread	26.08	ft
Depth	0.52	ft
Flow Area	6.80	ft²
Gutter Depression	0.00	ft
Total Depression	0.00	ft
Velocity	3.95	ft/s
Splash Over Velocity	8.95	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.08	
Grate Flow Ratio	0.16	
Active Grate Length	2.42	ft

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Issue Area 12 - Inlet 118

Project Description

Solve For	Efficiency

Input Data

Discharge		9.20	ft³/s
Slope		0.01000	ft/ft
Gutter Width		2.00	ft
Gutter Cross Slope		0.02	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.013	
Grate Width		1.67	ft
Grate Length		3.33	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency	29.08	%
Intercepted Flow	2.68	ft³/s
Bypass Flow	6.52	ft³/s
Spread	15.33	ft
Depth	0.31	ft
Flow Area	2.35	ft²
Gutter Depression	0.00	ft
Total Depression	0.00	ft
Velocity	3.92	ft/s
Splash Over Velocity	7.39	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.04	
Grate Flow Ratio	0.26	
Active Grate Length	1.67	ft

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Issue Area 12 - Inlet 122

Project Description

Solve For	Efficiency

Input Data

Discharge		9.20	ft³/s
Slope		0.01000	ft/ft
Gutter Width		2.33	ft
Gutter Cross Slope		0.02	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.013	
Grate Width		2.33	ft
Grate Length		13.83	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Options

Grate Flow Option	Exclude None

Results

Efficiency		67.41	%
Intercepted Flow		6.20	ft³/s
Bypass Flow		3.00	ft³/s
Spread		15.33	ft
Depth		0.31	ft
Flow Area		2.35	ft²
Gutter Depression		0.00	ft
Total Depression		0.00	ft
Velocity		3.92	ft/s
Splash Over Velocity		17.43	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.49	
Grate Flow Ratio		0.36	
Active Grate Length		6.92	ft

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Issue Area 12 - Pipe 110

Project Description

Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00100	ft/ft
Normal Depth	2.00	ft
Diameter	2.00	ft
Discharge	7.15	ft³/s

Results

Discharge	7.15	ft³/s
Normal Depth	2.00	ft
Flow Area	3.14	ft²
Wetted Perimeter	6.28	ft
Hydraulic Radius	0.50	ft
Top Width	0.00	ft
Critical Depth	0.95	ft
Percent Full	100.0	%
Critical Slope	0.00478	ft/ft
Velocity	2.28	ft/s
Velocity Head	0.08	ft
Specific Energy	2.08	ft
Froude Number	0.00	
Maximum Discharge	7.69	ft³/s
Discharge Full	7.15	ft³/s
Slope Full	0.00100	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%

Issue Area 12 - Pipe 110

GVF Output Data

Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.00	ft
Critical Depth	0.95	ft
Channel Slope	0.00100	ft/ft
Critical Slope	0.00478	ft/ft

Issue Area 12 - Pipe 120

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00900	ft/ft
Diameter	2.00	ft
Discharge	3.52	ft³/s

Results

Normal Depth	0.55	ft
Flow Area	0.70	ft²
Wetted Perimeter	2.20	ft
Hydraulic Radius	0.32	ft
Top Width	1.78	ft
Critical Depth	0.66	ft
Percent Full	27.4	%
Critical Slope	0.00447	ft/ft
Velocity	5.04	ft/s
Velocity Head	0.39	ft
Specific Energy	0.94	ft
Froude Number	1.42	
Maximum Discharge	23.08	ft³/s
Discharge Full	21.46	ft³/s
Slope Full	0.00024	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	27.39	%
Downstream Velocity	Infinity	ft/s

Issue Area 12 - Pipe 120

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.55	ft
Critical Depth	0.66	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00447	ft/ft

Issue Area 13 - 2 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00850	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	8.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	5.30	ft³/s

Results

Normal Depth	0.26	ft
Flow Area	3.16	ft²
Wetted Perimeter	14.22	ft
Hydraulic Radius	0.22	ft
Top Width	14.18	ft
Critical Depth	0.19	ft
Critical Slope	0.02365	ft/ft
Velocity	1.68	ft/s
Velocity Head	0.04	ft
Specific Energy	0.31	ft
Froude Number	0.63	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.26	ft
Critical Depth	0.19	ft
Channel Slope	0.00850	ft/ft

Issue Area 13 - 2 yr

GVF Output Data

Critical Slope	0.02365	ft/ft

Issue Area 13 - 5 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00850	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	8.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	8.40	ft³/s

Results

Normal Depth	0.34	ft
Flow Area	4.31	ft²
Wetted Perimeter	15.47	ft
Hydraulic Radius	0.28	ft
Top Width	15.43	ft
Critical Depth	0.26	ft
Critical Slope	0.02173	ft/ft
Velocity	1.95	ft/s
Velocity Head	0.06	ft
Specific Energy	0.40	ft
Froude Number	0.65	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.34	ft
Critical Depth	0.26	ft
Channel Slope	0.00850	ft/ft

Issue Area 13 - 5 yr

GVF Output Data

Critical Slope	0.02173	ft/ft

Issue Area 13 - 10 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00850	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	8.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	10.20	ft^3/s

Results

Normal Depth	0.38	ft
Flow Area	4.92	ft^2
Wetted Perimeter	16.09	ft
Hydraulic Radius	0.31	ft
Top Width	16.05	ft
Critical Depth	0.29	ft
Critical Slope	0.02099	ft/ft
Velocity	2.07	ft/s
Velocity Head	0.07	ft
Specific Energy	0.44	ft
Froude Number	0.66	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.38	ft
Critical Depth	0.29	ft
Channel Slope	0.00850	ft/ft

Issue Area 13 - 10 yr

GVF Output Data

Critical Slope	0.02099	ft/ft

Issue Area 13 - 25 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00850	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	8.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	12.00	ft^3/s

Results

Normal Depth	0.41	ft
Flow Area	5.50	ft^2
Wetted Perimeter	16.67	ft
Hydraulic Radius	0.33	ft
Top Width	16.61	ft
Critical Depth	0.32	ft
Critical Slope	0.02039	ft/ft
Velocity	2.18	ft/s
Velocity Head	0.07	ft
Specific Energy	0.49	ft
Froude Number	0.67	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.41	ft
Critical Depth	0.32	ft
Channel Slope	0.00850	ft/ft

Issue Area 13 - 25 yr

GVF Output Data

Critical Slope	0.02039	ft/ft

Issue Area 13 - 50 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00850	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	8.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	13.40	ft³/s

Results

Normal Depth	0.44	ft
Flow Area	5.94	ft²
Wetted Perimeter	17.08	ft
Hydraulic Radius	0.35	ft
Top Width	17.03	ft
Critical Depth	0.35	ft
Critical Slope	0.02001	ft/ft
Velocity	2.26	ft/s
Velocity Head	0.08	ft
Specific Energy	0.52	ft
Froude Number	0.67	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.44	ft
Critical Depth	0.35	ft
Channel Slope	0.00850	ft/ft

Issue Area 13 - 50 yr

GVF Output Data

Critical Slope	0.02001	ft/ft

Issue Area 13 - 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00850	ft/ft
Left Side Slope	8.00	ft/ft (H:V)
Right Side Slope	8.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	14.60	ft³/s

Results

Normal Depth	0.46	ft
Flow Area	6.30	ft²
Wetted Perimeter	17.43	ft
Hydraulic Radius	0.36	ft
Top Width	17.37	ft
Critical Depth	0.37	ft
Critical Slope	0.01971	ft/ft
Velocity	2.32	ft/s
Velocity Head	0.08	ft
Specific Energy	0.54	ft
Froude Number	0.68	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.46	ft
Critical Depth	0.37	ft
Channel Slope	0.00850	ft/ft

Issue Area 13 - 100 yr

GVF Output Data

Critical Slope	0.01971	ft/ft

Appendix 8: User's Flowchart

User's Flowchart for CDMP

