

**Town of Marana
Impact Fee Study**

**Water Facilities
Infrastructure Improvements Plan**

**Public Report
FINAL**

As approved by the Marana Town Council, September 20, 2022

Prepared by



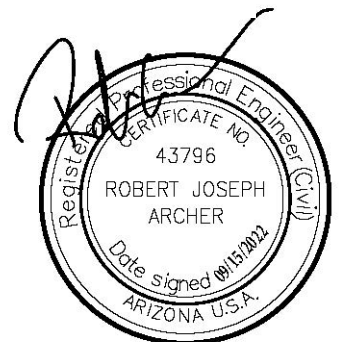
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I. INTRODUCTION

The Town of Marana (Town) through the Marana Water Department (Marana Water) serves water to the area shown in blue and orange in **Figure 1**. Marana Water's service to the areas in orange is enabled by water wheeled through Tucson Water's water system, pursuant to an Intergovernmental Agreement (IGA) with the City of Tucson. In addition, the Town provides renewable water resources to reconcile water use in several areas served by Tucson Water through an IGA with City of Tucson (**Figure 1**).

Currently, the Town has a designation of assured water supply (DAWS) from the Arizona Department of Water Resources (ADWR) which allows the Town to approve water supply for new development. To supply new development, Marana Water will expand its renewable water resources portfolio.

The water system is categorized into seven independent water systems as shown in **Figure 2**. Each water system is further defined by water pressure zones (**Figure 2**) so that all customers receive water at a reasonable pressure (between approximately 40 and 85 pounds per square inch [psi]).

There are seven individual water systems in the Marana Water Service Area:

- North Marana Water System
- Tangerine Business Park Water System
- Hartman Vistas Water System
- Picture Rocks Water System
- Saguaro Bloom Water System
- Marana Airport Water System
- Palo Verde Water System

The purpose of the Infrastructure Improvement Plan (IIP) is to determine the capital improvements and renewable water resource acquisitions required to meet the demands associated with the next 10 years of growth, and to estimate the costs of those improvements and acquisitions.

2. BENEFIT AREAS

Benefit areas are areas that derive benefit from unused existing capacity or proposed capacity improvements to the water system including water rights acquisition. **Figure 3** shows the approximate location of the five benefit areas defined in this IIP. New developments are subject to fees associated with the benefit area that is defined by the water system the new development is connecting to.

Some improvements will benefit multiple areas. For example, the acquisition of renewable water resources benefits all eleven benefit areas. The eleven benefit areas are:

- North Marana Benefit Area – developments connecting to the North Marana Water System or the Tangerine Business Park Water System.
- Twin Peaks Benefit Area – developments connecting to the Hartman Vistas Water System, Picture Rocks Water System, or the Marana Airport Water System.
- Saguaro Bloom Benefit Area – developments connecting to the Saguaro Bloom Water System.
- Palo Verde Benefit Area – developments connecting to the Palo Verde Water System.
- IGA Benefit Area – developments connecting to Tucson Water's water system through IGA with Marana, in one of two ways: 1) as a customer of Marana Water, in the Marana Water Wheeling Service Area or 2) as a customer of Tucson Water in the Tucson Non-Contracted Service Area.

3. LEVEL OF SERVICE

This section describes the level of service of the water supply, storage, and distribution system for each of the benefit areas, and for existing and future customers.

3.1. LEVEL OF SERVICE FOR EXISTING CUSTOMERS

The level of service for existing customers is generally:

- Storage Capacity > 1.5 times the average day demand (ADD) plus fire flow storage requirement, where the fire flow storage requirement is equal to the fire flow rate requirement times the fire flow duration requirement. For example, if the fire flow rate requirement is 1,000 gallons per minute (gpm) and the fire flow duration requirement is 2 hours (120 minutes), then the fire flow storage requirement is 1,000 gpm times 120 minutes, or 120,000 gallons.
- Well Capacity > peak day demand (PDD) with the largest well out of service, unless otherwise noted for specific zones. PDD = 2 times ADD.
 - The Hartman Vistas Water System is interconnected with the Oro Valley Water Utility, and since this interconnection can be used if a well is out of service, the well requirement for the Hartman Vista Water System is that the total well capacity must be greater than PDD.
 - The well capacity requirement for the Palo Verde and Tangerine Business Park Water Systems is that the well capacity be greater than PDD; there is no requirement for redundant well capacity currently.
- Booster Capacity

- For a pressure zone or zones without gravity storage, the booster requirement is the greater of PDD plus the fire flow rate requirement or peak hour demand (PHD), where PHD = 3.5 times ADD if ADD ≤ 1,000 gpm, and 3.0 times ADD if ADD > 1,000 gpm.
- For pressure zones with gravity storage sufficient to meet the greater of PDD plus fire flow or PHD, the booster capacity requirement is PDD. Under existing conditions, only the Twin Peaks Y and Z pressure zones have sufficient gravity capacity to supply PDD plus fire flow.
- Distribution System Capacity
 - During normal flow conditions, customers should receive water at between approximately 40 psi and 85 psi pressure.
 - The potable water distribution system must be capable of providing peak flow throughout the system while maintaining a minimum of 20 psi pressure throughout the system. Peak flow is the greater of PHD or PDD plus fire flow. If PDD plus fire flow is used, the system is modeled assuming an appropriate fire flow at all points in the system.

The fire flow rate and duration requirements are set by the fire marshal and are based on the International Fire Code (IFC) for each new development. The fire flow for a specific pressure zone is equal to the greatest individual fire flow/duration requirement within the pressure zone. If multiple pressure zones share a resource, such as storage, then the fire flow requirement is based on the largest fire flow/duration requirement within the connected pressure zones. **Table 1** shows the fire flow requirements for specific zones for the existing water system.

Table 1. Fire Flow Requirements for Existing Customers

Water System	Water Pressure Zone	Fire Flow (gpm)	Fire Flow Duration (hours)
North Marana	W+	2,875	2
	X	1,000	2
Tangerine Business Park	Y	1,750	2
Picture Rocks	CR	2,875	3
	PR	700	2
	Y	2,500	2
Hartman Vistas	Z	1,000	2
	Y	4,000	4
	Y+	1,875	4
Saguaro Bloom	Z	1,000	2
Saguaro Bloom	X	2,000	2
Palo Verde	PV	Note 1	Note 1
Marana Airport	X	2,750	2

Notes: 1. Palo Verde Water System does not have a fire flow requirement.

3.2. LEVEL OF SERVICE FOR FUTURE CUSTOMERS

The level of service in terms of water system engineering design criteria will be the same as stated above for all water systems. The Town will not address the lack of redundant well capacity or change the level of service for the Palo Verde Water System, and there is no growth projected for this area. Proposed projects will provide redundant well capacity in the Tangerine Business Park Water System; however, the purpose of these projects was to provide sufficient well capacity for future growth. No changes to fire flow and duration requirements are anticipated over the next 10 years.

4. 10-YEAR LAND USE ASSUMPTIONS

The Town provided land use assumptions for the 10-year study period including growth projections from 2023 through 2027 and from 2028 through 2032. The land use assumptions are in Equivalent Dwelling Units (EDU), where one EDU is equivalent to the water demand for one single-family residence.

Table 2 shows each development with the appropriate assignment of EDU. **Table 3** also shows which water system the development is assigned to. The location of each development is shown in **Figure 4**.

Table 2. Projected Growth in Equivalent Dwelling Units by Development Area

Development Area	Water System	Projected Growth, EDUs		
		2023-2027	2028-2032	2023-2032
Crossroads At Gladden	North Marana	160	328	488
Custom Homes		15	15	30
Cypress Gardens		100	117	217
Gladden Farms II		1,421	0	1,421
Heritage Park Shoppes		16	20	36
Mandarina (MU)		532	810	1,342
Mandarina South (MU)		40	150	190
Marana & I10 (Dahlstrom Commercial)		12	100	112
Marana Main St. (Commercial)		16	24	40
Marana Towne Center (MU)		40	80	120
Payson Farms (Remington Ranch)		457	0	457
Rancho Marana - West (MU)		150	4	154
Rancho Marana Town Center (Commercial)		0	20	20
Sanders Grove		100	600	700
Stonegate		300	700	1,000
Tangerine Commerce Park		60	60	120
Uptown		0	300	300

Development Area	Water System	Projected Growth, EDUs		
		2023-2027	2028-2032	2023-2032
Vanderbilt Farms (Monarch)		500	1,000	1,500
Villages of Barnett		50	0	50
Villages of Tortolita		0	300	300
Breakers Rd Industrial	Tangerine Business Park	160	0	160
Marana Technology Campus		36	0	36
Tangerine Business Park (Commercial)		20	8	28
Cortaro Ranch (Commercial)	Hartman Vistas	36	0	36
De Anza		150	0	150
Joplin Estates (MU)		0	185	185
Linda Vista Village (MU)		500	193	693
Marana Spectrum/Center (MU)		160	188	348
Preserve at Twin Peaks (Lennar)		50	0	50
Twin Peaks Crossing (Cardinal)(MU)		0	154	154
Twin Peaks Estates (Tivera)		82	0	82
Twin Peaks Rd (Future Rezones)		0	100	100
Twin Peaks Vista		58	0	58
Pima Farms North (Commercial)	Picture Rocks	88	4	92
La Puerta del Norte East (Summerset)	Saguaro Bloom	150	0	150
Saguaro Bloom		700	0	700
Airport	Marana Airport	20	20	40
Orange Grove Industrial (Commercial)	IGA	4	8	12
Riverside @ Silverbell (SE Ina/SB) (MU)		92	0	92
Silverbell Ridge (SW of Ina)		56	0	56
Sonoran Preserve at Bajada		14	0	14
Tang Thornydale SW Corner Rezone (MU)		145	40	185
Tangerine Thornydale (Villagio, HSL) (MU)		107	0	107
Tortolita 30 Rezone		40	0	40
Tortolita Vistas		40	0	40
		Total	6,677	5,528

Table 3 shows the 10-year projected growth in EDUs for each of the benefit areas with projected growth.

Table 3. 10-year Projected Growth by Benefit Area

Benefit Area	Projected Growth, EDUs		
	2023-2027	2028-2032	2023-2032
North Marana	4,185	4,636	8,821
Twin Peaks	1,144	844	1,988
Saguaro Bloom	850	0	850
Palo Verde	0	0	0
IGA	498	48	546
Total	6,677	5,528	12,205

Table 4 shows the projected annual growth in EDUs for each benefit area with projected growth. The annual growth is based on the number of existing EDUs and 5- and 10-year projected EDUs provided by the Town. The growth rate for intermediate years was estimated using a constant growth rate for each 5-year period and adjusted so each year has a whole number of EDUs.

Table 4. Projected Annual Growth for Each Benefit Area

Benefit Area	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total
North Marana	837	837	837	837	837	927	927	927	927	928	8,821
Twin Peaks	228	229	229	229	229	168	169	169	169	169	1,988
Saguaro Bloom	170	170	170	170	170	0	0	0	0	0	850
Palo Verde	0	0	0	0	0	0	0	0	0	0	0
IGA	99	99	100	100	100	9	9	10	10	10	546
Total	1,334	1,335	1,336	1,336	1,336	1,104	1,105	1,106	1,106	1,107	12,205

5. EXISTING CAPACITY REQUIREMENTS

In this section, the storage, well, and booster capacities are compared to existing demands. The existing water infrastructure is shown in **Figure 5**.

The following assumptions are used to calculate the flows generated from each EDU.

- Each EDU represents 2.7 persons per dwelling unit (ppdu) of equivalent population.
- The average demand per person or equivalent person is 100 gallons per capita per day (gpcd).
- The ADD per EDU is 2.7 ppdu times 100 gpcd or 270 gpd/EDU.
- The PDD is 2 times ADD or 540 gpd/EDU.
- The PHD is 3.5 times ADD or 945 gpd/EDU if ADD is ≤ 1,000 gpd, and 3.0 times ADD or 810 gpd/EDU if ADD > 1,000 gpd. For some areas, the PHD is based on an instantaneous demand requirement for the pressure zone.

Unless otherwise noted, the system requirements are:

- Storage capacity > 1.5 times ADD plus fire flow storage.

- Well capacity > PDD with the largest well out of service or PDD if interconnected with another water system.
- Booster capacity (without gravity storage) greater of PDD plus fire flow or PHD. Booster capacity (with gravity storage) is equal to PDD.
- During normal flow conditions, customers should receive water at between approximately 40 psi and 85 psi pressure.
- The distribution system must be capable of providing peak flow while maintaining 20 psi throughout the system.

Table 5 shows the existing EDUs in each Water System and pressure zone. The “existing” EDU value is based on the Town’s estimate of existing plus projected growth through November 2022.

Table 5. Existing Equivalent Dwelling Units

Water System	Water Pressure Zone	Existing EDUs
North Marana	W+	5,259
	X	195
Tangerine Business Park	Y	14
Picture Rocks	CR	2,322
	PR	233
	Y	114
	Z	86
Hartman Vistas	A	62
	A+	91
	Y	1,158
	Y+	687
	Z	359
Saguaro Bloom	X	1,699
Palo Verde	PV	60
Marana Airport	X	40
Total		12,383

5.1. EXISTING DEMANDS

Based on historical flow data, the average demand for the Marana water system is approximately 270 gpd per EDU. **Table 6** shows the existing ADD, PDD, and PHD for the system broken down by Water System and pressure zone.

Table 6. Existing Demands

Water System	Water Pressure Zone	Average Day Demand (gpd)	Peak Day Demand (gpm)	Peak Hour Demand (gpm)
North Marana	W+	1,419,930	1,972	3,451
	X	52,650	73	128
Tangerine Business Park	Y	3,780	5	9
Picture Rocks	CR	626,940	871	1,524
	PR	62,910	87	153
	Y	30,780	43	75
	Z	23,220	32	56
Hartman Vistas	Y	1,158	434	760
	Y+	687	258	451
	Z	359	135	236
	A	16,740	23	41
	A+	24,570	34	60
Saguaro Bloom	X	458,730	637	1,115
Palo Verde	PV	16,200	23	39
Marana Airport	X	11,880	17	29
Total		3,343,410	4,644	8,126

5.2. EXISTING STORAGE CAPACITY

The required minimum storage reservoir requirement is equal to 1.5 times ADD plus the fire flow/duration requirement. The fire flow requirement is equal to flowrate times duration which results in a volume of water. For example, 1,000 gpm for 2 hours (120 minutes) is 120,000 gallons. The Palo Verde Water System does not have a fire flow requirement.

If storage is shared by two or more zones, the highest fire flow requirement of the zones is used to calculate the storage requirement.

Table 7 shows the fire flow requirement (flow and duration), the current storage reservoir requirement, the existing reservoir capacity, and the amount of excess capacity for each pressure zone. Excess storage in a red font and parenthesis indicates a negative value, which means a deficiency in storage.

Table 7. Existing Storage Capacity

Water System	Zone	Potable Storage Required (gallons)	Fire Flow Storage Required (gallons)	Total Storage Required (gallons)	Total Available Storage (gallons)	Excess Storage (gallons)
North Marana	W+, X	2,208,870	345,000	2,553,870	2,084,000	(469,870)
Tangerine Business Park	Y	5,670	210,000	215,670	500,000	284,330
Picture Rocks	CR, PR, Z	1,069,605	517,500	1,587,105	1,250,000	(337,105)
	Y	46,170	300,000	346,170	1,000,000	653,830
Hartman Vistas	All	954,585	960,000	1,914,585	2,385,000	470,415
Saguaro Bloom	X	688,095	240,000	928,095	1,928,000	999,905
Palo Verde	PV	24,300	Note 1	24,300	45,000	20,700
Marana Airport	X	17,820	330,000	347,820	500,000	152,180

Notes: 1. Palo Verde Water System does not have a fire flow requirement.

All the zones have excess storage capacity except for the Picture Rocks CR and PR-Zones, which have a deficiency of 337,105 gallons, and North Marana Water System, which has a deficiency of 469,870 gallons.

5.3. EXISTING WELL CAPACITY

The minimum required well capacity is equal to PDD with the largest well out of service; however, the Tangerine Business Park Water System and the Palo Verde Water System do not require redundant well capacity and each is served by a single well. **Table 8** shows the current well capacity requirement, the existing well capacity, and the amount of excess capacity for each pressure zone.

Table 8. Existing Well Capacity

Water System	Required Capacity (gpm)	Total Well Capacity (gpm)	Largest Well (gpm)	Net Well Capacity (gpm)	Excess Well Capacity (gpm)
North Marana	2,045	2,721	1,009	1,712	(333)
Tangerine Business Park	5	55	Note 1	55	50
Picture Rocks	1,033	2,411	1,374	1,037	4
Hartman Vistas	884	2,590	986	1,604	720
Saguaro Bloom	637	1,522	1,100	422	(215)
Palo Verde	23	273	Note 2	273	250
Marana Airport	17	4,034	2,034	2,000	1,983

Notes: 1. Under current Marana Water policy, the Tangerine Business Park Water System does not require a redundant well.
2. Under current Marana Water policy, the Palo Verde Water System does not require a redundant well.

The North Marana Water System has a source deficiency of 333 gpm, and the Saguaro Bloom Water System has a source deficiency of 215 gpm.

5.4. EXISTING BOOSTER CAPACITY

The booster capacity requirement is the greater of PHD or PDD plus fire flow. If the pressure zone is served by gravity storage (Twin Peaks Y and Z Zones), then the booster capacity requirement is the combined PDD of the zones downstream of the current zone. **Table 9** shows the required booster capacity, the existing booster capacity, and the excess booster capacity for each zone. There is currently one booster deficiency of 446 gpm in the Picture Rocks CR Zone.

Table 9. Existing Booster Capacity

Water System	Zone	Required Booster Capacity (gpm)	Existing Booster Capacity (gpm)	Excess Booster Capacity (gpm)
North Marana	W+	4,847	5,520	673
	X	1,073	1,300	227
Tangerine Business Park	Y	1,755	1,850	95
Picture Rocks	CR	3,746	3,300	(446)
	PR	787	1,900	1,113
	Y	2,543	3,100	557
	Z	1,032	1,320	288
Hartman Vistas	Y	434	2,100	1,666
	Y+	258	2,100	1,842
	Z	1,135	2,500	1,365
	A	1,557	1,850	293
	A+			
Saguaro Bloom	X	2,637	4,430	1,793
Palo Verde	X	145	308	163
Airport	X	2,767	3,205	438

6. PROJECTED CAPACITY REQUIREMENTS AND UTILIZATION OF EXISTING FACILITIES

This section includes the projected capacity requirements and utilization of existing infrastructure over the 10-year study period ending in 2032. Water system infrastructure requirements are based on the level of service noted in **Section 3.2**.

6.1. PROJECTED 10-YEAR EDUs

The future land use from **Table 2** in **Section 4** was combined with the Water Systems and water pressure zones from **Figure 2**. The results were added to the existing EDUs from **Table 5** in **Section 5** to get the total EDUs by water pressure zone. The results are presented in **Table 10**.

Table 10. Projected Equivalent Dwelling Units

Water System	Water Pressure Zone	Existing EDUs	Projected Growth, EDU ¹		Existing and Projected 10-Year EDUs
			2023-2027	2028-2032	
North Marana	W+	5,259	3,037	2,908	11,204
	X-north	195			195
	X-south		932	1,720	2,652
Tangerine Business Park	Y	14	20	8	42
	X	0	196		196
Picture Rocks	CR	2,322	88	4	2,414
	Z	86			86
	PR	233			233
	Y	114			114
Hartman Vistas	Y	1,158	535	518	2,211
	Y+	687	156		843
	Z	359	155	48	562
	A	62	58	10	130
	A+	91	50		141
	B		82	25	107
	C			219	219
Saguaro Bloom	X	1,699	850		2,549
Palo Verde	PV	60	0		60
Marana Airport	X	44	20	20	84
Total		12,383	6,179¹	5,480¹	24,042

¹ Does not include IGA projection growth.

6.2. PROJECTED DEMANDS

Table 11 shows the projected demands for each water pressure zone. Projected demands are ADD, PDD, and PHD.

Table 11. Projected Demands

Water System	Water Pressure Zone	Average Day Demand (gpd)	Peak Day Demand (gpm)	Peak Hour Demand (gpm)
North Marana	W+	3,025,080	4,202	6,302
	X-north	52,650	73	128
	X-south	716,040	995	1,740
Tangerine Business Park	Y	11,340	90	28
	X	52,920	74	129
Picture Rocks	CR	651,780	905	1,584
	Z	23,220	32	56
	PR	62,910	87	153
	Y	30,780	43	75
Hartman Vistas	Y	596,970	829	1,451
	Y+	227,610	316	553
	Z	151,740	211	369
	A	35,100	49	85
	A+	38,070	53	93
	B	28,890	40	70
	C	59,130	82	144
Saguaro Bloom	X	688,230	956	1,673
Palo Verde	PV	16,200	23	39
Marana Airport	X	22,680	32	55
Total		6,491,340	9,090	14,727

6.3. PROJECTED STORAGE CAPACITY

The minimum storage reservoir requirement is equal to 1.5 times ADD plus fire flow. There are no plans to add fire flow requirements to the Palo Verde Water System, therefore its reservoir requirement is 1.5 times ADD. If storage is for more than one zone, the highest fire flow requirement of the multiple zones is used to calculate the storage requirement.

Table 12 shows the projected storage reservoir requirement, the existing reservoir capacity, and the amount of excess capacity for each pressure zone. Excess storage in a red font and parenthesis indicates a negative value, which means a deficiency in storage. It is projected that the North Marana Water System will have a 3,951,655-gallon storage deficiency, the Picture Rocks Water System will have a 374,365-gallon storage deficiency and the Hartman Vistas Water System will have a 281,265-gallon storage deficiency.

Table 12. Projected Storage Capacity

Water System	Water Pressure Zone	Required Storage (gallons)	Existing Storage (gallons)	Excess Storage (gallons)
North Marana	W+, X	5,690,655	2,084,000	(3,951,655)
Tangerine Business Park	X, Y	96,390	500,000	193,610
Picture Rocks	CR, PR, Z	1,106,865	1,250,000	(374,365)
	Y	46,170	1,000,000	653,830
Hartman Vistas	All	1,706,265	2,385,000	(281,265)
Saguaro Bloom	X	1,032,345	1,928,000	655,655
Palo Verde	PV	24,300	45,000	20,700
Marana Airport	X	34,020	500,000	135,980

6.4. PROJECTED WELL CAPACITY

The minimum required well capacity is equal to PDD with the largest well out of service; however, the Tangerine Water System and the Palo Verde Water System will not require redundant well capacity by 2032. **Table 13** shows the projected well capacity requirement, the existing well capacity, and the projected excess capacity for each pressure zone. Excess well capacity in a red font and parenthesis indicates a negative value, which means a deficiency in well capacity. The North Marana Water System will have a 3,557-gpm deficiency, the Tangerine Business Park Water System will have a 35-gpm deficiency, the Picture Rocks Water System will have a 31-gpm deficiency, and the Saguaro Bloom Water System will have a 533-gpm deficiency.

Table 13. Projected Well Capacity

Water System	Water Pressure Zone	Required Well Capacity (gpm)	Total Existing Well Capacity (gpm)	Largest Well (gpm)	Net Well Capacity (gpm)	Excess Well Capacity (gpm)
North Marana	W+	4,202	2,721	1,009	1,712	(3,557)
	X-north	73				
	X-south	995				
Tangerine Business Park	Y, X	90	55	Note 1	55	(35)
Picture Rocks	CR	905	2,411	1,374	1,037	(31)
	Z	32				
	PR	87				
	Y	43				
Hartman Vistas	Y	829	2,590	986	1,604	357
	Y+	316				
	Z	211				
	A	49				
	A+	53				
	B	40				
	C	82				
Saguaro Bloom	X	956	1,522	1,100	422	(534)
Palo Verde	PV	23	273	Note 2	273	251
Marana Airport	X	32	4,034	2,034	2,000	1,969

Notes 1. Tangerine Business Park Water System does not have redundant well requirement.
2. Palo Verde Water System does not have redundant well requirement.

6.5. PROJECTED BOOSTER CAPACITY

The booster capacity requirement is the greater of PHD or PDD plus fire flow. If the pressure zone is served by gravity storage (Hartman Vistas Y, Y+, and Z-Zones), then the booster capacity requirement is the combined PDD of the zones downstream of the zone being evaluated. **Table 14** shows the projected required booster capacity, the existing booster capacity, and the excess booster capacity for each zone. Excess booster capacity in a red font and parenthesis indicates a negative value, which means a deficiency in well capacity.

Table 14. Projected Booster Capacity

Water System	Water Pressure Zone	Fire Flow (gpm)	Required Booster Capacity (gpm)	Existing Booster Capacity (gpm)	Excess Booster Capacity (gpm)
North Marana	W+	2875	7,077	5,520	(1,557)
	X-north	1,000	1,073	1,300	227
	X-south	2,000	2,995	3,000	5
Tangerine Business Park	Y, X	1,750	1,914	1,850	(64)
Picture Rocks	CR	2,875	3,813	3,300	(513)
	Z	1,000	1,032	1,320	288
	PR	700	830	1,900	1,070
	Y	2,500	2,543	3,100	557
Hartman Vistas	Y	4,000	829	2,100	1,271
	Y+	1,500	316	2,100	1,784
	Z	1,000	2,103	2,500	397
	A	1,500	1,892	1,580	(42)
	A+	1,500			
	B	1,000	1,122	0	(1,122)
C	1,000	1,082	0	(1,082)	
Saguaro Bloom	X	2,000	2,956	4,780	1,474
Palo Verde	PV	N/A	145	308	163
Marana Airport	X	2,750	2,782	3,205	424

It is projected that four water systems will have booster deficiencies: North Marana Water System, Tangerine Business Park Water System, Picture Rocks Water System, and Hartman Vistas Water System.

6.6. OTHER DISTRIBUTION SYSTEM DEFICIENCIES

In addition to having adequate storage capacity, well capacity, and booster capacity, the distribution system must have adequate capacity to move water to the projected development areas while maintaining a minimum of 20 psi throughout the system. There are projected distribution system deficiencies in the North Marana Water System and the Hartman Vistas Water System. It is projected that an increased pipe capacity is required to connect the southern and northern portions of the North Marana Water System along Sanders Road. Developments in the Hartman Vistas will require a distribution pipe from the proposed B-Zone booster.

6.7. ADDITIONAL RENEWABLE RESOURCE ACQUISITIONS

An average of 270 gpd (approximately 0.3 acre-feet/year) of renewable water resources is required for each EDU. **Table 15** shows the projected additional renewable water resource required for each

benefit area. Projected growth over the next 10 years will require approximately 3,662 acre-feet (per year) of additional renewable water resource acquisitions.

Table 15. Projected Additional Renewable Resources Required for 2032

Benefit Area	Projected Growth (EDU)	Renewable Resource (acre-feet)
North Marana	8,821	2,646
Twin Peaks	1,988	596
Saguaro Bloom	850	255
Palo Verde	0	0
IGA	546	164
Total	12,205	3,662

6.8. SUMMARY OF PROJECTED CAPACITY DEFICIENCIES

Table 16 contains a summary of the projected infrastructure deficiencies in storage, well, and booster capacity for each benefit area. In addition to the infrastructure deficiencies shown in Table 16, 3,662 acre-feet of renewable water resources will be required to offset the ADWR safe yield requirements.

Table 16. Summary of Projected Infrastructure Deficiencies by Benefit Area

Benefit Area	Storage Capacity Deficiency (gallons)	Well Capacity Deficiency (gpm)	Booster Capacity Deficiency (gpm)	Other Deficiencies
North Marana	3,951,655	3,592	1,621	Note 1
Twin Peaks	655,630	0	2,759	Note 2
Saguaro Bloom		534		

- 1 North Marana Benefit Area will not meet the 20-psi pressure requirement for all flow conditions.
- 2 Twin Peaks Benefit Area will require new delivery pipeline from proposed B-Zone Booster.

7. CAPITAL INFRASTRUCTURE IMPROVEMENTS

Figure 7 shows the location of the 15 capital projects that are intended to make up the projected deficiencies discussed in Sections 7.3 through 7.6. The capital projects make up projected deficiencies in two of the defined benefit areas. Projects that are associated with water resources acquisition are presented in Section 9.2. Table 17 shows each project, the benefit area or areas benefiting from each project, and the projected EDUs affected by the project. See Section 3 for the level of service associated with each benefit area.

Table 17. Proposed Capital Improvements

Capital Improvement Project	Benefit Area Affected					Total Benefit EDUs
	North Marana	Twin Peaks	Saguaro Bloom	Palo Verde	IGA	
Airport Connection to NWRDRS Pipeline	✓	✓				10,809
Partnered NWRDRS Project	✓	✓				10,809
Marana Booster at NWRDRS	✓	✓				10,809
NWRDRS Blending Plan	✓	✓				10,809
B-Zone Booster and Transmission Line	✓	✓				10,809
B-Zone Reservoir	✓	✓				10,809
C-Zone Booster		✓				1,988
Tangerine 16" with Break Tanks	✓					8,821
Tangerine 16" at I-10	✓					8,821
Marana Park Well	✓					8,821
Marana Park Reservoir	✓					8,821
Sanders Road 24" Pipeline	✓					8,821
Twin Peaks Interconnect		✓				1,988
Picture Rocks Interconnect		✓				1,988
Honea East Improvements	✓					8,821
Heritage Park Water Plant	✓					8,821

Each of the projects is described in more detail in the following subsections. Seven of the projects create a loop that can move water from the Airport Water System to the Hartman Vistas Water System, the Tangerine Business Park Water System, and the North Marana Water System.

- Airport Connection to NWRDRS Pipeline
- Partnered NWRDRS Project
- Marana Booster at NWRDRS
- NWRDRS Blending Plan
- B-Zone Booster and Transmission Line
- B-Zone Reservoir
- Tangerine 16" with Break Tanks
- Tangerine 16" at I-10

The purpose of the loop is to address source (well) and storage deficiencies in the North Marana Benefit Area and the Twin Peaks Benefit area. Portions of the loop also address booster and delivery deficiencies in the Twin Peaks Benefit Area.

The Twin Peaks Interconnect and the Picture Rocks Interconnect combine to connect the existing Hartman Vistas Water System and the Picture Rocks Water System. The purpose of the Picture Rocks Interconnect is to adjust the zone boundaries, so the water pressure zones in the Picture Rocks Water System match the water pressure zones in the Hartman Vistas Water System. The purpose of the Twin Peaks Interconnect and the Picture Rocks Interconnect is to address the storage, well, and booster deficiencies in the Twin Peaks Benefit Area.

7.1. AIRPORT CONNECTION TO NWRRDS PIPELINE

The purpose of the Airport Connection to the Northwest Recharge, Recovery, and Delivery System (NWRRDS) Pipeline is to supply an average of 1,500 gpm from the Airport wells into the Partnered NWRRDS Project. The project includes a 1,500-gpm booster station, suction, and pressure side hydropneumatic tanks, upgrade of the existing booster station, upgrade of the existing southeast well, site piping, and controls.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana and Twin Peaks Benefit Areas by addressing projected storage and well capacity deficiencies.

Fifty percent of the cost of the Airport Connection to the NWRRDS Pipeline will be assigned to the IIP.

7.2. PARTNERED NWRRDS PROJECT

The Partnered NWRRDS Project is designed to take recovered recharged water from the area around the airport and deliver it to the three partners. The partners are Marana, Oro Valley, and Metro Water. The project includes a delivery pipeline and reservoir. Marana is responsible for 23 percent of the project cost, with 50 percent of Marana's portion being assigned to new development in this IIP.

The project includes a pipeline and one-million-gallon storage reservoir. Marana Water's portion of the storage reservoir is 230,000 gallons.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana and Twin Peaks Benefit Areas by addressing projected storage and well capacity deficiencies.

7.3. MARANA BOOSTER AT NWRDSD

The Marana Booster at NWRDSD will transfer water from the Partnered NWRDSD Project reservoir to Marana Water's Hartman Vista Water System. The Marana Booster at NWRDSD consists of a 1,500-gpm booster station and water main to connect to the water system.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana and Twin Peaks Benefit Areas by addressing projected storage and well capacity deficiencies.

Fifty percent of the cost of the Marana Booster at NWRDSD will be assigned to the IIP.

7.4. NWRDSD BLENDING PLAN

A blending plan, with an estimated cost of \$120,000, is required to ensure water quality is not degraded after connection of the NWRDSD source.

Fifty percent of the cost of the NWRDSD will be assigned to the IIP.

7.5. B-ZONE BOOSTER AND TRANSMISSION LINE

The purpose of the B-Zone Booster and Transmission Line is to move water from the Blue Bonnet Reservoir north to the proposed B-Zone reservoir near Tangerine Road. B-Zone Booster and Transmission Line consists of a 3,000-gpm booster station and approximately 9,000 feet of 16-inch diameter water main.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana and Twin Peaks Benefit Areas by addressing projected storage and well capacity deficiencies. This project also addresses projected booster and distribution deficiencies in the Twin Peaks Benefit Area.

7.6. B-ZONE RESERVOIR

The 210,000-gallon B-Zone Reservoir serves as part of the loop supplying the North Marana and Tangerine Business Park Systems, gravity storage for the B-Zone of the Hartman Vistas Water System, and as a forebay for the C-Zone Booster.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana and Twin Peaks Benefit Areas by addressing projected storage and well capacity deficiencies.

7.7. C-ZONE BOOSTER

The 1,200-gpm C-Zone Booster supports the Hartman Vistas Water System and consists of booster pumps and supporting equipment. This project addresses a projected booster deficiency in the Twin Peaks Benefit Area.

7.8. TANGERINE 16" WITH BREAK TANKS

The Tangerine 16-inch with Break Tanks project consists of 16,750 feet of 16-inch diameter water main and two 50,000-gallon water storage reservoirs or break tanks. The Tangerine 16-inch with Break Tanks is part of the loop from the Airport Water System to the North Marana Water System.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana Benefit Area by addressing projected well capacity deficiencies and storage deficiencies.

7.9. TANGERINE 16" AT INTERSTATE-10

The Tangerine 16-inch at Interstate 10 project consists of 6,547 feet of 16-inch water main and is part of the loop connecting the Airport Water System to the North Marana Water System.

As part of the loop connecting the Airport Water System to the North Marana Water System, this project benefits the North Marana Benefit Area by addressing projected well capacity and storage deficiencies.

7.10. MARANA PARK WELL

The proposed Marana Park 800-gpm well will provide groundwater to the North Marana Service Area and Tangerine Business Park Water System.

This project will benefit the North Marana Benefit Area by addressing projected well capacity deficiencies.

7.11. MARANA PARK RESERVOIR

The proposed Marana Park 1.5-million-gallon storage reservoir will address a portion of the storage deficiency in the North Marana Service Area.

This project will benefit the North Marana Benefit Area by addressing projected storage deficiencies.

Water rates will pay for \$1,000,000 of the cost of the proposed Marana Park Reservoir.

7.12. SANDERS ROAD 24-INCH PIPELINE

The proposed Sanders Road 24-inch Pipeline will alleviate projected distribution system deficiencies in the North Marana Water System. The improvement will allow the movement of water from source wells and storage reservoirs to and from new development areas during peak use periods, while maintaining a minimum 20-psi pressure throughout the system.

This project will benefit the North Marana Benefit Area by addressing projected distribution system deficiencies.

7.13. TWIN PEAKS INTERCONNECT

The proposed 24-inch Twin Peaks/Continental Reserve Interconnect will connect the Hartman Vistas and Picture Rocks Service Areas. The design has been completed and only the construction costs are included.

This project addresses projected storage and well capacity deficiencies in the Twin Peaks Benefit Area.

7.14. PICTURE ROCKS INTERCONNECT

The proposed Twin Peaks/Continental Reserve Interconnect will require a change in the pressure zone boundary between the Picture Rocks CR and PR pressure zones as the majority of the CR pressure zone becomes a Y pressure zone. With the connection of the two areas, the water pressure of about 222 existing customers would fall below the 40-psi minimum pressure during normal flow conditions. The proposed Picture Rocks Interconnect is required to maintain the existing level of service for existing customers that would be affected by the proposed Twin Peaks/Continental Reserve Interconnect.

This project addresses storage and projected well capacity deficiencies in the Twin Peaks Benefit Area.

7.15. HONEA EAST WELL

The Honea East Well project consists of reequipping the well with a new pump and motor to increase the well capacity by 250 gpm.

This project will benefit the North Marana Benefit Area by addressing projected well capacity deficiencies.

7.16. HERITAGE PARK WATER PLANT

The Heritage Park Water Plan Project consists of 1,800,000-gallon storage reservoir, a 1,000-gpm well, and a 1,200-gpm booster. The project will benefit the North Marana Benefit Area by addressing projected storage, well, and booster deficiencies.

8. COST OF CAPITAL IMPROVEMENTS AND WATER RESOURCE ACQUISITIONS

This section covers costs associated with infrastructure, water rights acquisitions, and Section 23 fees.

8.1. INFRASTRUCTURE

The discussion of infrastructure costs is divided into three sections: 1) the cost associated with planning for growth, 2) reimbursements for existing infrastructure, and 3) the costs associated with the capital infrastructure improvements presented in **Section 7**.

8.1.1. Planning

An update of the 2020 Potable Water Master Plan of the Marana water system will be completed in 2030 at an estimated cost of \$150,000. Master planning is performed periodically to plan for future growth.

8.1.2. Reimbursements

There are existing reimbursements required for the construction of infrastructure in the Hartman Vistas Water System, which comprises the Hartman Vistas Water System. The infrastructure was financed by the Town and \$1,573,010 in debt service payments are required during the 10-year impact fee period.

8.1.3. Infrastructure

Appendix A contains a detailed cost breakdown for each capital improvement. **Table 18** contains the portion of the capital improvement cost assigned to the impact fee and the period the cost will be realized. The second column contains the cost breakdown for years 2023 through 2027, and the third column contains the cost breakdown for years 2028 through 2032.

Table 18. Portion of Improvement Costs Assigned to Impact Fee

Capital Project	2023-2027	2028-2032
50% Airport Connection to NWRDRS Pipeline ¹	\$2,025,081	
50% Partnered NWRDRS Project ¹	\$3,735,894	
50% Marana Booster at NWRDRS ¹	2,107,775	
50% Blending Plan ¹	\$60,000	
B-Zone Booster and Transmission Line		\$4,413,278
B-Zone Reservoir		\$617,700
C-Zone Booster		\$1,819,375
Tangerine 16" with Break Tanks		\$5,307,960
Tangerine 16" at I-10	\$2,634,128	
Marana Park Well	\$991,302	
Marana Park Reservoir ²	\$3,566,723	
Sanders Road 24" Pipeline		\$4,878,502
Twin Peaks Interconnect	\$2,901,250	
Picture Rocks Interconnect		\$1,554,163
Honea East Well	\$216,550	
Heritage Park Water Plant	\$5,328,123	
Water Master Plan		\$150,000
Total	\$23,566,826	\$18,740,978

¹50 percent of OPCC applied to IIP

²\$1,000,000 of the cost of the Marana Park Reservoir will be paid by water rates.

8.2. RENEWABLE WATER RESOURCE ACQUISITIONS

Currently, there are three sources of renewable water resources foreseen in the next 10 years: Reallocated Non-Indian Agricultural (NIA) Priority Central Arizona Project (CAP) water, Municipal and Industrial (M&I) Priority CAP water, and effluent from two sources: the Marana Water Reclamation Facility (WRF) and Pima County's Tres Rios WRF.

The Town is a member service area of the Central Arizona Groundwater Replenishment District (CAGRDR). Reliance on the CAGRDR is an important alternative and backstop to the Town acquiring its own supplies. However, the Town having direct control and ownership of its water supplies is more beneficial and cost effective.

8.2.1. Integrated Water Resources Plan

An Integrated Water Resources Plan will be completed during the 2023 through 2032 period for a cost of \$435,000, which will be applied to all benefit areas. The Integrated Water Resources Plan will produce a long-term planning report to provide comprehensive guidelines for water supply, support modification to the Town's designation of assured water supply, support acquisition of additional renewable water supplies as needed, and support external communications regarding water resources.

8.2.2. Water Resource Acquisition

Water resource impact fees are applied to new development in all the benefit areas including the IGA Benefit Area. The projected growth from 2023 to 2032 is 12,205 EDUs. **Table 19** shows the water required for existing customers and future growth, the existing renewable supplies, the renewable water resources available due to the projects included in the IIP for each year from 2023 through 2032, and the renewable supplies that will need to be purchased by IIP projects.

Existing renewable resources are recognized in the Town’s designation of assured water supply and include an entitlement to 2,336 acre-feet per year of M&I Priority CAP water, the incidental recharge ADWR will credit to the Town’s groundwater allowance based on 4 percent of existing demand, long-term storage credits held at the start of 2020 (assuming average annual use over 100 years) and Marana WRF effluent (discussed further below). While not included in the designation of assured water supply, the Town also anticipates using its entitlement to Tres Rios WRF effluent to supply existing and future customers. The effluent entitlement is based on deliveries to customers within the Tres Rios sewershed and is used to accrue storage credits in the Lower Santa Cruz River Managed Recharge Project (LSCMRP).

Acquisitions include estimated volume of recharged effluent from the Marana WRF (calculated based on existing and future EDUs contributing to Marana WRF influent) and supplies to cover the remaining renewable resource required (discussed below).

Table 19. Renewable Resource Requirements and Sources for Impact Fee Period

Year	Water Required (acre-feet)	M&I Priority CAP Water (acre-feet)	Incidental Recharge Credit to Groundwater Allowance (acre-feet)	Long-Term Storage Credits (acre-feet)	Marana WRF Effluent	Tres Rios Effluent (acre-feet)	Remaining Renewable Resource Required (acre-feet)
2023	4,109	2,336	163	148	1,680	152	(370)
2024	4,509	2,336	174	148	1,680	161	10
2025	4,910	2,336	186	148	1,680	169	391
2026	5,311	2,336	195	148	1,680	176	776
2027	5,712	2,336	205	148	1,680	182	1,161
2028	6,043	2,336	215	148	1,680	189	1,475
2029	6,374	2,336	225	148	3,361	195	109
2030	6,707	2,336	235	148	3,361	202	425
2031	7,039	2,336	282	148	3,361	209	703
2032	7,371	2,336	295	148	3,361	216	1,015

In 2012, the Town purchased a 0.5 million gallon per day (mgd) Biolac[®] secondary treatment system from Pima County with a total of \$34,527,164 including debt service. Since the Marana WRF was

acquired for water reclamation as well as water resource recovery, future water customers will pay for one-half the cost of the acquisition plus debt service, and future sewer customers will pay for one-half the acquisition plus debt service.

In 2018, a 1.5-mgd expansion to the Marana WRF was constructed, including replacement of the existing 0.5-mgd Biolac[®] secondary treatment system. Since the Marana WRF was acquired for water reclamation as well as water resource recovery, future water customers will pay for one-half the cost of the expansion and associated debt service, and future sewer customers will pay for one-half the cost of the expansion and associated debt service.

To account for the contributions made by the current customer base toward the existing utilized capacity in the Biolac[®] secondary treatment system and acquisition of the WRF, the Town has contributed approximately \$3.0 million toward the cost to finance the expansion. This funding provided by the Town was not included and will not be reimbursed by new customers through impact fees. Additionally, while the Biolac[®] will not be utilized as part of the secondary treatment process in the current expansion of the WRF, it will not be clean closed at the time of the expansion to allow further consideration for its proposed future use.

A second WRF plant expansion is scheduled to start in 2024 with a design cost of \$2,900,823, half of which will be assigned to the water resource fee (\$1,450,411.50). Construction is scheduled to begin in 2027 with an estimated construction cost of \$36,260,290, half of which plus debt service will be assigned to the water resource fee, and half will be assigned to water reclamation fee (\$18,130,145).

Recharge basins were constructed for Marana WRF effluent. The recharge basins allow purified water to be recharged, and to then become available as groundwater recharge credits to offset groundwater pumping. Therefore, half of the cost, plus debt service will be assigned to the water resource fee, and half will be assigned to water reclamation fee. The total cost of the recharge basins was \$2,932,388.

An expansion of the recharge basins is planned during the next ten years and is projected to cost \$4,004,766.

The remaining renewable resource required to meet growth is 1,015 acre-feet, which will be supplied by two sources: 1) the purchase of NIA CAP water and 2) the purchase of another source or sources that have not been determined.

An NIA allocation of 515 acre-feet will be purchased; however, availability from year to year is uncertain. In 2012, ADWR estimated NIA supply as 43 to 67% available, with zero supply in some years. On March 2, 2021, CAP staff presented updated information related to contracting and availability for NIA. CAP presented that forecasting the future availability of NIA is not possible due to several factors, each of which has considerable uncertainty. However, staff from CAP presented

modeling scenarios and assumptions that indicated that over the next 25 years, the NIA may be only 18% available (averaging model traces with unfavorable assumptions) or may be up to 83% available (at the upper end of favorable assumptions). The average modeling results indicate availability between 44 and 63% and the mean for all modeled traces was presented as 47% available (CAP 2021).

Assuming NIA has a 47% availability, the 515 acre-feet of NIA water will cover 242 acre-feet of the remaining renewable resource requirement of 1,015 acre-feet of renewable resource. NIA water has a cost of \$1,072,743 spread over 5 years.

The current market cost for renewable water is \$11,000 to \$12,000 per acre-foot for a 100-year lease of the water based upon current negotiations between several Arizona Municipalities and entities owning groundwater outside of the AMA that have the legal right to deliver groundwater into the AMA. For the remaining 773 acre-feet required, an assumed cost of \$11,500 per acre-foot was used to calculate a cost for the IIP. The total cost for 773 acre-feet of renewable water or equivalent long-term storage credits, based on \$11,500 per acre-foot is \$8,889,500. Purchases will be made as supplies are available and contracts are negotiated. The costs of capital projects that are particularly designed and constructed to generate long-term water credits shall also be considered as eligible expenses for water resources acquisition.

8.3. SECTION 23 FEES

Pursuant to an IGA between Marana and Oro Valley dated April 3, 2001 (Marana Resolution 2001-36), Marana and Oro Valley share an overlapping service area. The area of overlap is shown in **Appendix B**, and is located within a portion of Section 23, Township 12 South, Range 12 East. Connections in the overlap area pay a fee in addition to the Twin Peaks Benefit Area impact fee. The additional fee was \$750 per EDU in 2001 and has increased by 3% per year every year thereafter. **Table 20** shows the fee over the next 10 years to the nearest dollar.

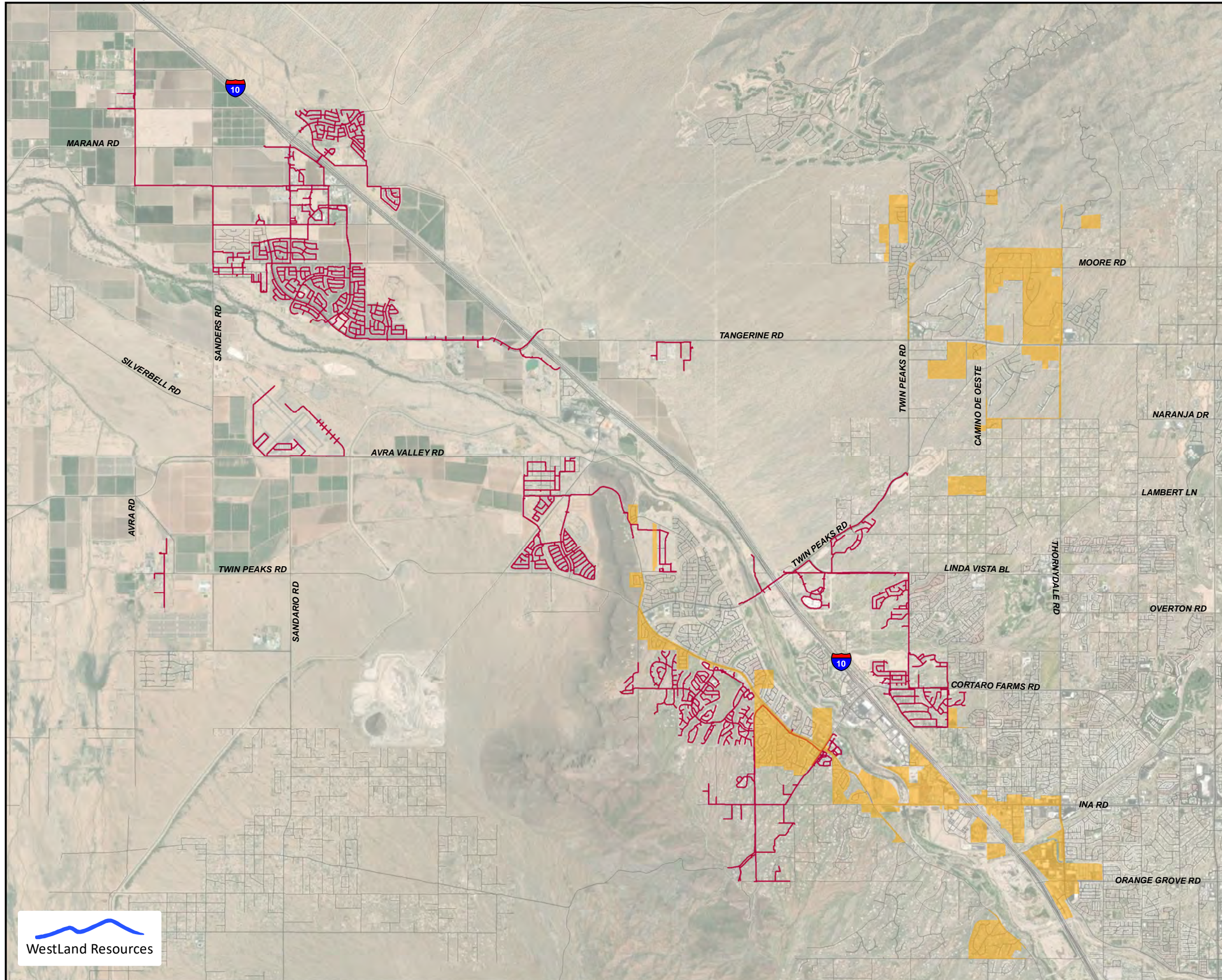
Table 20. Additional Section 23 Fees by Year

Year	Section 23 Fee	Year	Section 23 Fee
2023	\$1,437	2028	\$1,666
2024	\$1,480	2029	\$1,715
2025	\$1,525	2030	\$1,767
2026	\$1,570	2031	\$1,820
2027	\$1,617	2032	\$1,875

9. REFERENCES

Central Arizona Project (CAP). 2021. Stakeholder Meetings: NIA Briefing – March 2, 2021. <https://www.cap-az.com/stakeholder-meetings>. Accessed June 9, 2021.

FIGURES

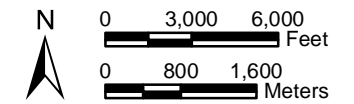


Legend

- Water Mains
- Streets
- IGA Areas

IGA Areas Include:

- 1) Marana Water Wheeling Service Area
- 2) Tucson Water Non-Contracted Service Area

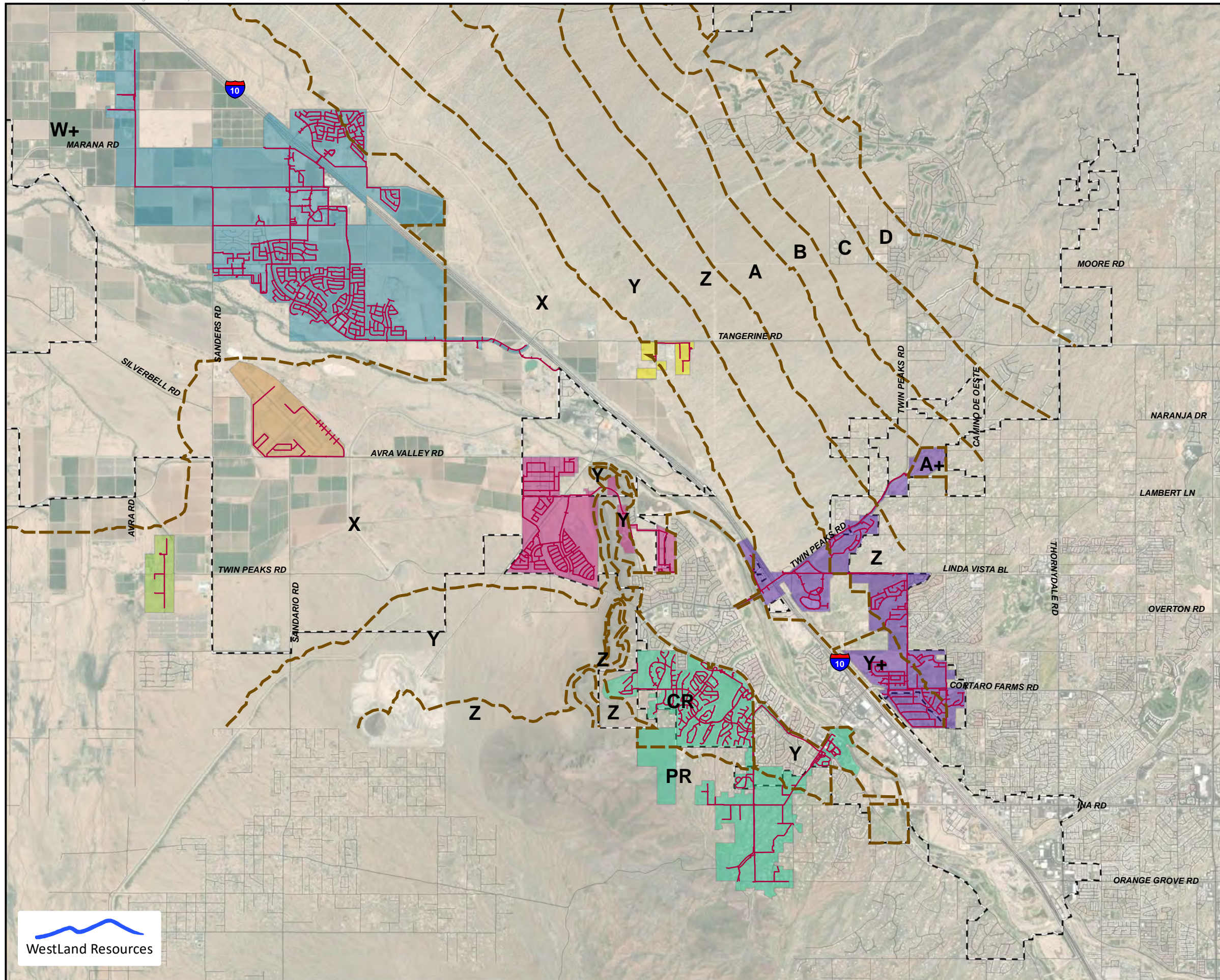


MARANA WATER DEPARTMENT
2022 Infrastructure Improvement Plan

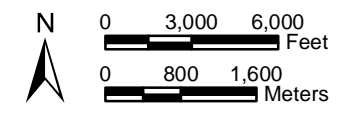
EXISTING WATER SERVICE AREA

Figure 1



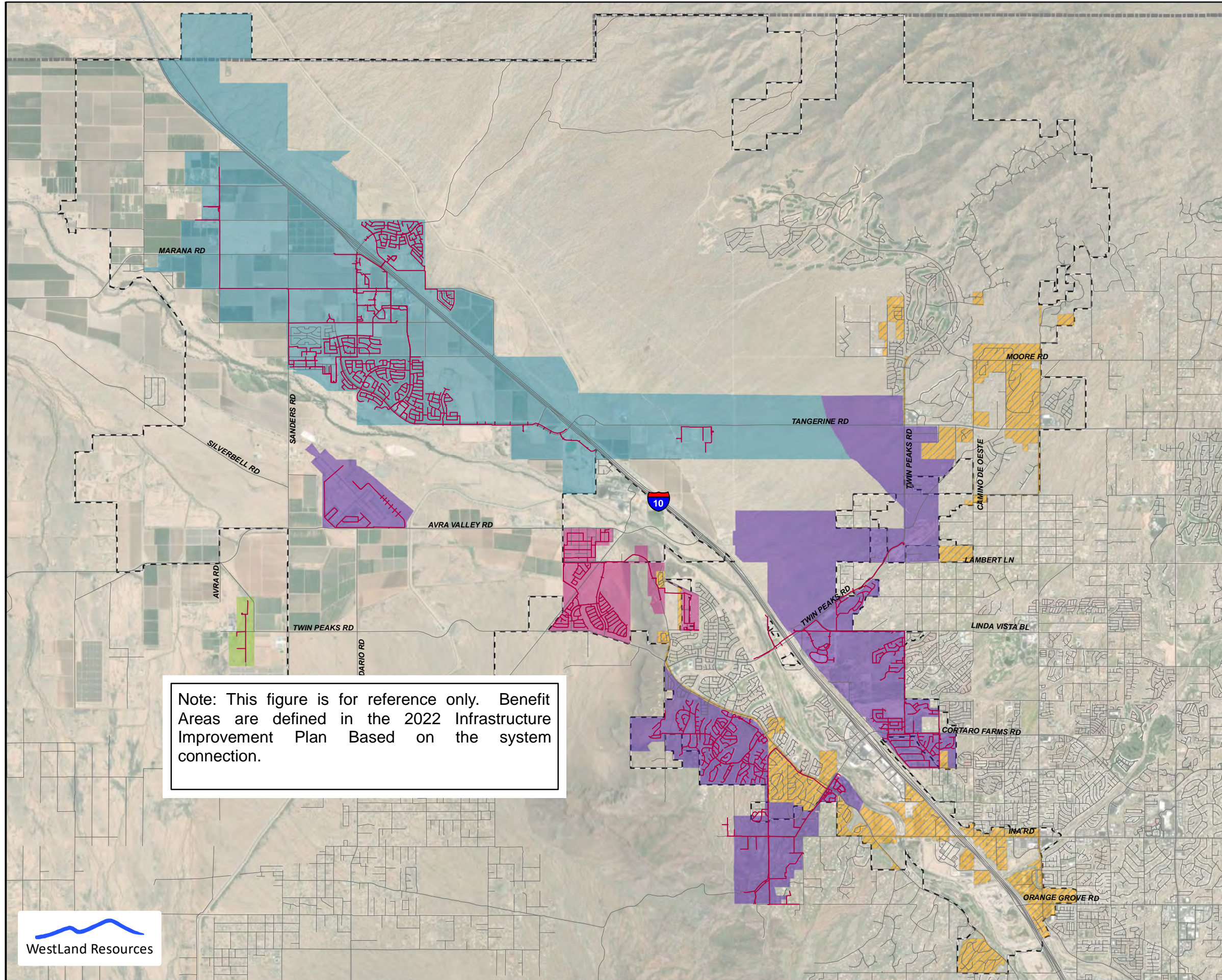


- Legend**
- Water System**
- Saguaro Bloom
 - Hartman Vistas
 - Marana Airport
 - North Marana
 - Palo Verde
 - Picture Rocks
 - Tangerine Business Park
 - Pressure Zone Boundary
- W+** Pressure Zone
- Water Mains
 - Marana Town Limits
 - Streets








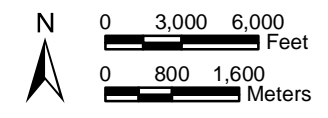
MARANA WATER DEPARTMENT
 2022 Infrastructure Improvement Plan
 EXISTING WATER SYSTEMS & PRESSURE ZONES
 Figure 2





Note: This figure is for reference only. Benefit Areas are defined in the 2022 Infrastructure Improvement Plan Based on the system connection.

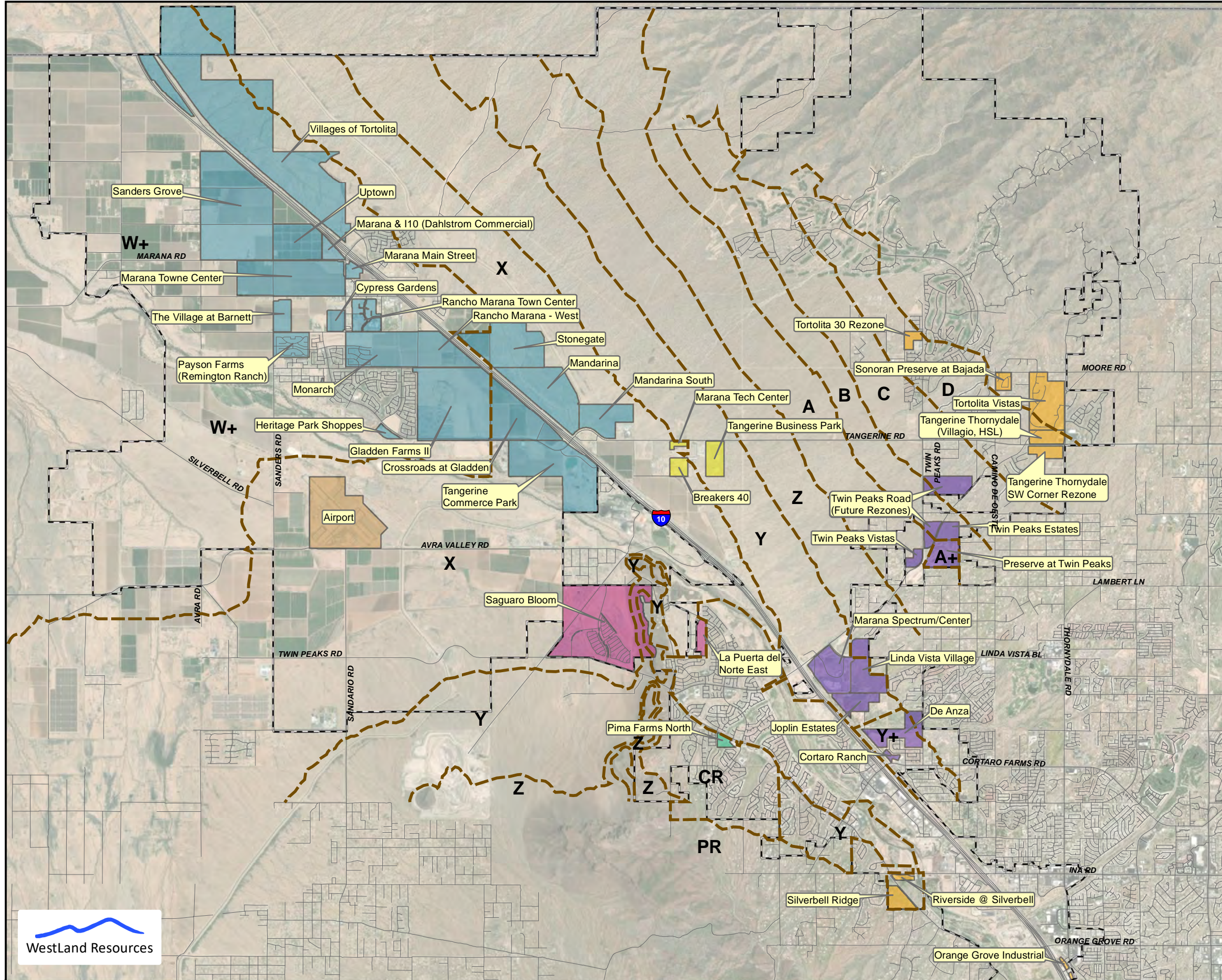
- Legend**
- Benefit Area**
-  IGA
 -  North Marana
 -  Palo Verde
 -  Twin Peaks
 -  Saguaro Bloom
 -  Water Mains
 -  Marana Town Limits
 -  Streets



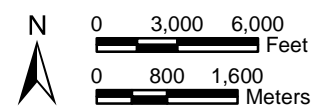
MARANA WATER DEPARTMENT
2022 Infrastructure Improvement Plan

BENEFIT AREAS
Figure 3



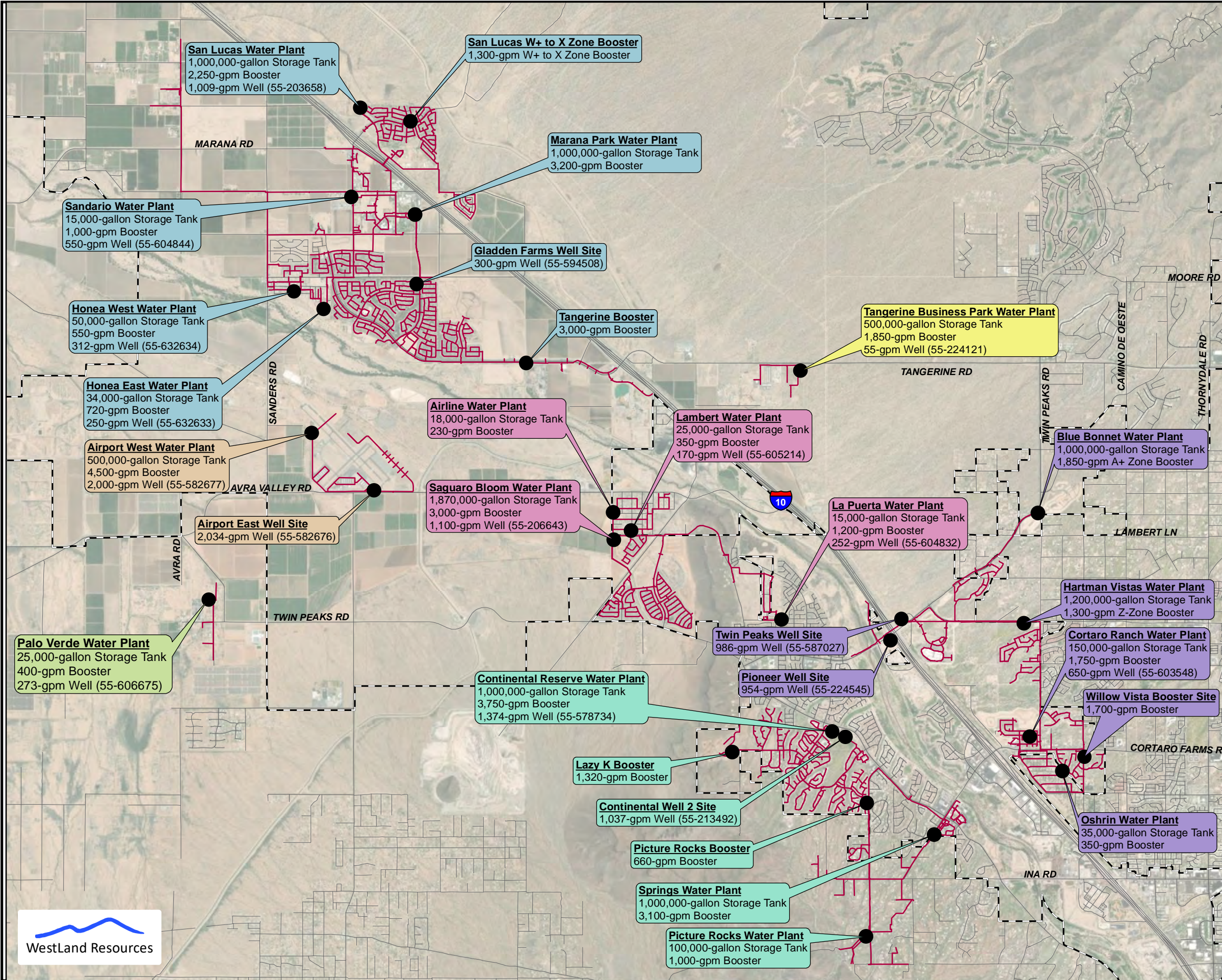


- Legend**
- Marana Town Limits
 - Streets
- Planned Developments**
- Water System**
- Saguaro Bloom
 - Hartman Vistas
 - IGA
 - Marana Airport
 - North Marana
 - Picture Rocks
 - Tangerine Business Park
 - Pressure Zone Boundary



MARANA WATER DEPARTMENT
 2022 Infrastrucure Improvement Plan
 PLANNED DEVELOPMENT AREAS
 Figure 4



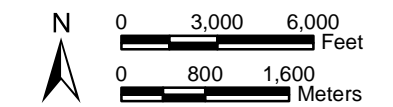


Legend

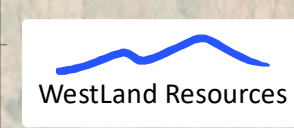
- Water Plants and Wells
- Water Mains
- ▭ Marana Town Limits

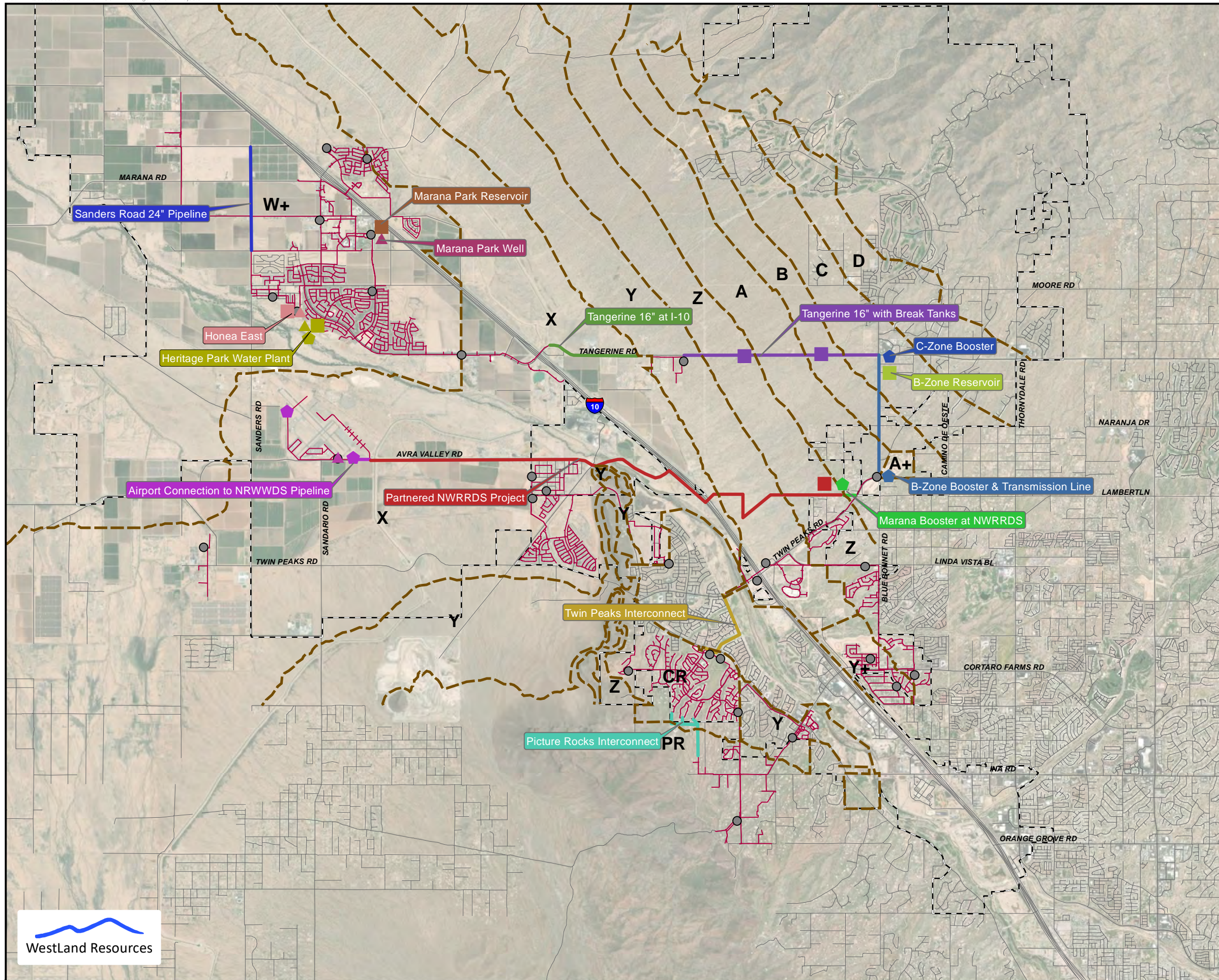
Label Color by Water System

- North Marana
- Picture Rocks
- Hartman Vistas
- Saguaro Bloom
- Palo Verde
- Marana Airport
- Tangerine Business Park

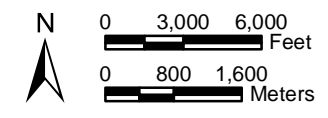


MARANA WATER DEPARTMENT
2022 Infrastructure Improvement Plan
EXISTING INFRASTRUCTURE
Exhibit 5





- Legend**
- Water Mains
 - Marana Town Limits
 - Streets
 - Pressure Zone Boundary
- Existing Water Plants**
-
- Proposed Infrastructure**
- ▲ Well
 - Reservoir
 - ◆ Booster



MARANA WATER DEPARTMENT
 2022 Infrastructure Improvement Plan
 CAPITAL IMPROVEMENT PROJECTS
 Figure 6



APPENDIX A

**Opinions of
Probable
Construction
Cost and
Site Plans**

Project Name: Marana CIP
Project No.: 527.141
Location: Town of Marana, AZ
Description: Airport Connection to NWRDRS Pipeline

Prepared by: EDC
Checked by:

Date: 4/8/22
Date: 3/1/22

Client: Town of Marana

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Mobilization	LS	2	\$31,250	\$62,500	
2	Site Preparation	LS	2	\$108,750	\$217,500	Includes masonry wall and steel gate.
3	Yard Piping - above and below ground	LS	2	\$147,500	\$295,000	Connection to existing suction and distribution system
4	1,500-gpm NWRDRS booster station	LS	1	\$318,750	\$318,750	
5	3,300-gpm Airport booster station	LS	1	\$540,000	\$540,000	
5	10,000-gallon Hydropneumatic Tank	LS	1	\$137,500	\$137,500	150 psi with appurtenances
6	5,000-gallon Hydropneumatic Tank	LS	1	\$106,250	\$106,250	300 psi with appurtenances
7	12-inch diameter DIP	LF	350	\$212.50	\$74,375	
8	Site Electrical and control	LS	2	\$312,500	\$625,000	NWRDRS Booster Site
9	Southeast Well Upgrades	LS	1	\$475,352	\$475,352	
Subtotal					\$2,852,227	
Design/Engineering (15%)					\$427,834	
Inspection (2%)					\$57,045	
Contingency (25%)					\$713,057	
TOTAL					\$4,050,163	

Project Name: <u>Marana CIP</u> Project No.: <u>527.141</u> Location: <u>Town of Marana, AZ</u> Description: <u>Partnered NWRDSD Project</u>	Prepared by: <u>EDC</u> Date: <u>4/8/22</u> Checked by: _____ Date: _____ Client: <u>Town of Marana</u>
---	--

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Design and Construction	LS	1	7,471,788	\$7,471,788	Estimate Provided by Town of Marana
TOTAL					\$7,471,788	

Project Name: <u>Marana CIP</u>	Prepared by: <u>EDC</u>	Date: <u>4/8/22</u>
Project No.: <u>527.141</u>	Checked by: _____	Date: _____
Location: <u>Town of Marana, AZ</u>	Client: <u>Town of Marana</u>	
Description: <u>Marana Booster at NWRDSD</u>		

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Design and Construction	LS	1	4,215,549	\$4,215,549	Estimate Provided by Town of Marana
TOTAL					\$4,215,549	

Project Name: Marana CIP

Project No.: 527.141

Location: Town of Marana, AZ

Description: B-Zone Booster and Transmission Line

Prepared by: MDO

Checked by: EDC

Client: Town of Marana

Date: 3/1/22

Date: 3/1/22

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Mobilization	LS	1	\$31,250	\$31,250	
2	Site Preparation	LS	1	\$108,750	\$108,750	
3	New Booster Station with pad and shade structure	LS	1	\$418,750	\$418,750	
4	Yard Piping - above and below ground	LS	1	\$147,500	\$147,500	
5	Site Electrical and Control	LS	1	\$450,000	\$450,000	Includes RTU
6	200 KVA Generator and automatic transfer switch	LS	1	\$100,000	\$100,000	
7	5,000-gallon Hydropneumatic Tank	LS	1	\$81,250	\$81,250	
8	16-inch water main	LF	8,920	\$206	\$1,837,520	
Subtotal					\$3,175,020	
Design/Engineering (12%)					\$381,002	
Inspection (2%)					\$63,500	
Contingency (25%)					\$793,755	
TOTAL					\$4,413,278	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No.: 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: B-Zone reservoir

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Install 210,000 gallon Reservoir	LS	210,000	\$1.88	\$393,750	
2	120X120 Parcel Acquisition	LS	1	\$18,750	\$18,750	
3	Site Piping	LS	1	\$22,500	\$22,500	
Subtotal					\$435,000	
	Design/Engineering (15%)				\$65,250	
	Inspection (2%)				\$8,700	
	Contingency (25%)				\$108,750	
TOTAL					\$617,700	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No.: 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: C-Zone Booster

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Mobilization	LS	1	\$31,250	\$31,250	
2	Site Preparation	LS	1	\$108,750	\$108,750	
3	New 1200 gpm Booster Station with Shade Structure	LS	1	\$362,500	\$362,500	
4	Yard Piping - above and below ground	LS	1	\$147,500	\$147,500	
5	Site Electrical and Control	LS	1	\$450,000	\$450,000	includes RTU
6	200 KVA Generator and automatic transfer switch	LS	1	\$100,000	\$100,000	
7	5,000-gallon Hydropneumatic Tank	LS	1	\$81,250	\$81,250	
Subtotal					\$1,281,250	
Design/Engineering (15%)					\$192,188	
Inspection (2%)					\$25,625	
Contingency (25%)					\$320,313	
TOTAL					\$1,819,375	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No.: 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: Tangerine 16-inch with Break Tanks

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	16-inch water main	LF	16,750	\$206	\$3,450,500	
2	50,000 Gallon Break Tank	EA	2	\$93,750	\$187,500	
3	Parcel Acquisition	EA	2	\$50,000	\$100,000	
Subtotal					\$3,738,000	
	Design/Engineering (15%)				\$560,700	
	Inspection (2%)				\$74,760	
	Contingency (10%)				\$934,500	
TOTAL					\$5,307,960	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No.: 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: Tangerine 16-inch at I-10

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	16-inch water main	LF	8,920	\$206	\$1,837,520	
2	Tie into existing water main	EA	2	\$6,875	\$13,750	
3	Pavement removal and replacement	LS	2	\$1,875	\$3,750	
Subtotal					\$1,855,020	
Design/Engineering (15%)					\$278,253	
Inspection (2%)					\$37,100	
Contingency (25%)					\$463,755	
TOTAL					\$2,634,128	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No.: 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: Marana Park Well

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
Marana Park Reservoir						
1	Well Drilling	LS	1	\$488,100	\$488,100	
2	Vertical Turbine Pump	LS	1	\$81,250	\$81,250	
3	8" DIP site piping and manifold	LS	1	\$78,750	\$78,750	
4	Electric and Controls	LS	1	\$50,000	\$50,000	Includes pump panel (no RTU)
	Subtotal				\$698,100	
	Design/Engineering (15%)				\$104,715	
	Inspection (2%)				\$13,962	
	Contingency (25%)				\$174,525	
TOTAL					\$991,302	

Project Name: Marana CIP

Project No.: 527.141

Location: Town of Marana, AZ

Description: Marana Park Reservoir

Prepared by: MDO

Checked by: EDC

Client: Town of Marana

Date: 3/1/22

Date: 3/1/22

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Mobilization and Demobilization	LS	2	\$43,750	\$87,500	
2	Demolition	LS	1	\$18,750	\$18,750	
3	Tank and ring wall	Gall	1,500,000	\$1.88	\$2,820,000	
4	Site Piping	LS	1	\$280,000	\$280,000	
5	Site Grading and imported materials	LS	1	\$130,258	\$130,258	
6	Chlorinator	LS	1	\$46,250	\$46,250	
7	Subtotal				\$3,382,758	
	Design/Engineering (8%)				\$270,621	
	Inspection (2%)				\$67,655	
	Contingency (25%)				\$845,689	
TOTAL					\$4,566,723	

Project Name: Marana CIP
Project No.: 527.141
Location: Town of Marana, AZ
Description: Sanders 24-inch Pipeline

Prepared by: MDO **Date:** 3/1/22
Checked by: EDC **Date:** 3/1/22
Client: Town of Marana

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	24-inch water main	LF	8,700	\$406	\$3,532,200	Excludes hard rock excavation
2	Tie into existing water main	EA	2	\$14,375	\$28,750	
Subtotal					\$3,560,950	
	Design/Engineering (10%)				\$356,095	
	Inspection (2%)				\$71,219	
	Contingency (25%)				\$890,238	
TOTAL					\$4,878,502	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No.: 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: Twin Peaks Interconnect

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Construction	LS	1	2,901,250	\$2,901,250	Estimate Provided by Town of Marana
TOTAL					\$2,901,250	

Project Name: Marana CIP

Prepared by: MDO

Date: 3/1/22

Project No. 527.141

Checked by: EDC

Date: 3/1/22

Location: Town of Marana, AZ

Client: Town of Marana

Description: Picture Rocks Interconnect

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
Picture Rocks Interconnect						
1	12-inch water main	LF	9,000	\$135	\$1,215,000	
2	Tie into existing water main	EA	1	\$6,875	\$6,875	
3	Pavement removal and replacement	LS	1	\$1,875	\$1,875	
	Subtotal				\$1,223,750	
	Design/Engineering (15%)				\$183,563	
	Inspection (2%)				\$24,475	
	Contingency (25%)				\$122,375	
	TOTAL				\$1,554,163	

Project Name: Marana CIP	Prepared by: MDO	Date: 3/1/22
Project No. 527.141	Checked by: EDC	Date: 3/1/22
Location: Town of Marana, AZ	Client: Town of Marana	
Description: Honea East Well		

Item No.	Item Description	Unit	Quantity	Unit Price	Amount	Remarks
1	Re-equip well to add 250 gpm	LS	1	\$75,000	\$75,000	250 gpm pump inc starter cabinet
2	Pump and Motor	LS	1	\$15,000	\$15,000	Grundfos
3	Piping	LS	1	\$62,500	\$62,500	
Subtotal					\$152,500	
Design/Engineering (15%)					\$22,875	
Inspection (2%)					\$3,050	
Contingency (25%)					\$38,125	
TOTAL					\$216,550	

Project Name: Marana CIP
Project No. 527.141
Location: Town of Marana, AZ
Description: Heritage Park Water Plant

Prepared by: MDO **Date:** 3/1/22
Checked by: EDC **Date:** 3/1/22
Client: Town of Marana

Item No.	Item Description	Units	Quantity	Unit Price	Amount	Remarks
1	Mobilization and Demobilization	LS	2	\$43,750	\$87,500	
2	Demolition	LS	1	\$18,750	\$18,750	
3	Tank and ring wall	Gall	1,800,000	\$1.88	\$3,384,000	
4	Site Piping	LS	1	\$280,000	\$280,000	
5	Site Grading and imported materials	LS	1	\$130,258	\$130,258	
6	Chlorinator	LS	1	\$46,250	\$46,250	
7	New 1250 gpm Booster Station with Shade Structure	LS	1	\$362,500	\$362,500	
8	Yard Piping - above and below ground	LS	1	\$147,500	\$147,500	
9	Site Electrical and Control	LS	1	\$450,000	\$450,000	includes RTU
10	200 KVA Generator and automatic transfer switch	LS	1	\$100,000	\$100,000	
11	5,000-gallon Hydropneumatic Tank	LS	1	\$81,250	\$81,250	
12	Well Drilling	LS	1	\$488,108	\$488,108	
13	1000 gpm Vertical Turbine Pump	LS	1	\$81,250	\$81,250	
14	8" DIP site piping and manifold	LS	1	\$78,750	\$78,750	
15	Electric and Controls	LS	1	\$50,000	\$50,000	Includes pump panel (no RTU)
16	Subtotal				\$3,946,758	
	Design/Engineering (8%)				\$315,741	
	Inspection (2%)				\$78,935	
	Contingency (25%)				\$986,689	
TOTAL					\$5,328,123	

APPENDIX B

**Marana and
Oro Valley
Water Service
Overlap Area**

EXHIBIT A

