# WATER FACILITIES IIP

ARS § 9-463.05 (T)(7)(a) defines the eligible facilities and assets for the Water Facilities IIP:

"Water facilities, including the supply, transportation, treatment, purification and distribution of water, and any appurtenances for those facilities."

The Water Facilities IIP includes components for wells, arsenic treatment, pump stations, storage tanks, water campus land, water lines, and the cost of preparing the Water Facilities IIP and related Development Fee Report. The plan-based methodology is used for the central service area and the cost recovery methodology is used for the Tartesso West service area.

### **PROPORTIONATE SHARE**

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate future development. The Water Facilities IIP and development fees will allocate the cost of necessary public services between both residential and nonresidential development using max day demand factors.

### **SERVICE AREA**

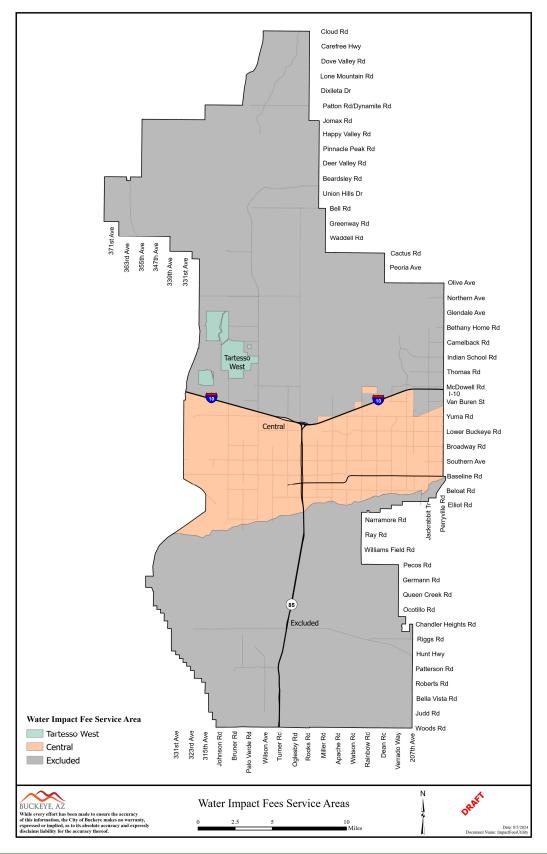
Buckeye's existing water facilities consist of two separate systems with limited potential for interconnection. As shown in Figure W1, there are two service areas for the Water Facilities IIP.

- 1. Central: South of Interstate 10 and north of the Gila River
- 2. Tartesso West: Tartesso West development

The water service areas are acceptable for these facilities as they are defined as the incorporated area or Buckeye utility service area. The water system relies on groundwater, which is pumped to the surface by wells. The wells are connected by transmission lines that convey the water to a water campus where the water is treated, stored in tanks, and pumped into a system of pressurized distribution lines. The water campuses in the central service area are interconnected to provide emergency backup, so it is reasonable to consolidate these water campuses into a single service area. Buckeye is not the only water provider within the city limits, and the proposed water service areas do not include areas served by Arizona Water and EPCOR.









### **RATIO OF SERVICE UNIT TO DEVELOPMENT UNIT**

#### ARS § 9-463.05(E)(4) requires:

"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."

According to Buckeye's Water Engineering Design Standards, average day demand from residential development equals 113 gallons per person. The analysis includes a peaking factor of 1.8 to account for max day demand. As shown below, max day demand from residential development includes a range from 407 gallons per day for active adult units to 652 gallons per day for low and medium density units.

#### Figure W2: Water Demand Factors

Residential Land Use	Dwelling Units per Acre	Persons per Dwelling Unit	Average Day Demand/Person	Average Day Gallons
Low and Medium Density	less than 8	3.20	113	362
High Density (includes apartments)	8 or more	2.50	113	283
Active Adult	max 8	2.00	113	226

Residential Land Use	Dwelling Units per Acre	Average Day Gallons	Maximum Day Peaking Factor	Maximum Day Gallons
Low and Medium Density	less than 8	362	1.8	652
High Density (includes apartments)	8 or more	283	1.8	509
Active Adult	max 8	226	1.8	407

Source: Buckeye Water Engineering Design Standards, Section 3-1.202

Figure W3 includes the demand indicators for residential and nonresidential land uses. For residential development, the table displays maximum day gallons per housing unit. For nonresidential development, the table displays maximum day gallons per meter by size. For meters larger than 1.5 inches, maximum day demand is calculated from (1) City of Buckeye Engineering Standards, (2) a submitted water study, or (3) other estimated water demand.

#### Figure W3: Ratio of Service Unit to Development Unit

Residential Demand per Housing Unit			
Residential Land Use	Max Day		
	Gallons		
Low/Med Density (<8 DU/Acre)	652		
High Density (≥8 DU/Acre)	509		
Age Restricted (≤8 DU/Acre)	407		

Nonresidential Demand per Meter				
Motor Cizo	Capacity	Maximum Day		
Meter Size	Ratio <sup>1</sup>	Gallons		
1.0-inch	1.0	652		
1.5-inch	2.0	1,304		

1. Buckeye Water Engineering Design Standards



## ANALYSIS OF CAPACITY, USAGE, AND COSTS OF EXISTING PUBLIC SERVICES

ARS § 9-463.05(E)(2) requires:

"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."

## **Existing Demand**

According to Water Resources Department estimates, 2024 average day demand equals 8.50 million gallons per day (mgd). Using the maximum day peaking factor from Buckeye's Water Engineering Design Standards, maximum day demand is 15.30 mgd. Maximum day demand is 12.51 mgd in the central service area and 2.79 mgd in the Tartesso West area.

#### Figure W4: Existing Demand

Existing Demand	Central	Tartesso West	Total
Average Day Demand (mgd), 2024	6.95	1.55	8.50
x Max Day Peaking Factor <sup>1</sup>	1.80	1.80	1.80
Max Day Demand (mgd), 2024	12.51	2.79	15.30

Source: Buckeye Water Resources Department

1. Buckeye Water Engineering Design Standards, 2020

### **System Components**

Level of service (LOS) generally refers to the ratio of capacity to demand. One of the principles of development fee analysis is that future development should not be required to pay for a higher LOS than existing development currently receives. Consequently, it is important to determine the existing LOS.

For water facilities, the capacity of water production facilities is generally used as reflective of the capacity of the entire water system. However, some components of the system may have more capacity or less capacity than needed for full utilization of production facilities. The existing water system consists of wells (and the associated transmission lines to connect the wells to the distribution system), arsenic treatment, pump stations, storage tanks, water campus land, and water lines greater than or equal to 16 inches that form the distribution system grid.

#### Well

Existing well production capacity is summarized in Figure W5. Total capacity of individual wells is shown in gallons per minute (gpm) and millions of gallons per day (mgd). The City's design criteria indicate the capacity of a system of wells should be measured in terms of firm capacity to account for the eventuality that a well may be out of service. Existing firm capacity is 15.57 mgd in the central service area and 3.59 mgd in the Tartesso West service area.



# Figure W5: Well Capacity

Existing Well Capacity					
Well	GPM	MGD	MGD (Firm)		
Central					
Well 12	310	0.45	0.33		
Well 13	150	0.22	0.16		
Well 14	245	0.35	0.26		
Buckeye Airport Well 1	120	0.17	0.13		
Buckeye Airport Well 2	420	0.60	0.45		
Riata Well 2	380	0.55	0.41		
Evergreen Well 2*	0	0.00	0.00		
Sonoran Vista NE Well	525	0.76	0.57		
Sonoran Vista SW Well	400	0.58	0.43		
Bales Well*	0	0.00	0.00		
4th and Baseline Well 1*	0	0.00	0.00		
4th and Baseline Well 2*	0	0.00	0.00		
Church*	0	0.00	0.00		
Sundance Well 1	645	0.93	0.70		
Sundance Well 2	760	1.09	0.82		
Sundance Well 3	540	0.78	0.58		
Sundance Well 4	970	1.40	1.05		
Sundance Well 7	510	0.73	0.55		
Sundance Well 8	850	1.22	0.92		
Sundance Well 9	470	0.68	0.51		
North Airport Rd Well 1	2,600	3.74	2.81		
North Airport Rd Well 2	3,000	4.32	3.24		
B.W. 1	180	0.26	0.19		
B.W. 2	500	0.72	0.54		
B.W. 3	175	0.25	0.19		
Bulfer	40	0.06	0.04		
Sonoran Ridge	125	0.18	0.14		
Farallon Well 2	500	0.72	0.54		
Subtotal, Central	14,415	20.76	15.57		
	Tartesso West	:			
Well 1	400	0.58	0.43		
Well 2	1,200	1.73	1.30		
Well 3	1,300	1.87	1.40		
Well S.V. 1	240	0.35	0.26		
Well S.V. 2	180	0.26	0.19		
Subtotal, Tartesso West	3,320	4.78	3.59		
Total	17,735	25.54	19.15		

Source: Buckeye Water Resources Department

\*Inactive



### **Pump Station**

Shown below, Figure W6 includes existing pump station capacity. Total capacity of individual pump stations is shown in gallons per minute (gpm) and millions of gallons per day (mgd). The City's design criteria indicate the capacity of individual pump stations should be measured in terms of firm capacity to account for the eventuality that a pump within a pump station may be out of service. Existing firm capacity is 49.46 mgd in the central service area and 13.20 mgd in the Tartesso West service area.

# Figure W6: Pump Station Capacity

Existing Pump Station Capacity						
Pump Station GPM MGD (Firm						
Central						
Hopeville	3,500	5.04				
Sonoran Vista*	0	0.00				
Lower Buckeye*	0	0.00				
Buckeye North	500	0.72				
West Park	3,000	4.32				
Rancho Vista	1,850	2.66				
Bales	1,800	2.59				
4th & Central*	0	0.00				
North Airport Rd	6,000	8.64				
Sundance Zone 3	6,000	8.64				
Sundance Zone 2	3,000	4.32				
Historic Buckeye	2,400	3.46				
JMWC	5,000	7.20				
Bulfer	300	0.43				
Sonoran Ridge	1,000	1.44				
Subtotal, Central	34,350	49.46				
Tartesso West						
Tartesso Water Campus	9,165	13.20				
Subtotal, Tartesso West	9,165	13.20				
Total	43,515	62.66				

Source: Buckeye Water Resources Department

\*Inactive



## Storage

Figure W7 includes existing storage capacity. Total capacity of individual storage tanks is shown in millions of gallons (MG). Existing capacity is 15.82 mg in the central service area and 2.13 mg in the Tartesso West service area.

# Figure W7: Storage Capacity

Existing Storage Capacity				
Storage	MG			
Central				
Hopeville #1	0.10			
Hopeville #2	0.10			
Sonoran Vista WTP*	0.00			
Bales 1	0.60			
Bales 2	0.50			
Lower Buckeye*	0.00			
Buckeye North	0.20			
Westpark 1	0.50			
Westpark 2	0.20			
Rancho Vista	0.80			
4th & Central*	0.00			
4th & Baseline 1*	0.00			
4th & Baseline 2*	0.00			
Historic Buckeye 1	0.75			
Historic Buckeye 2	0.70			
Sundance 1	2.60			
Sundance 2	1.50			
North Airport Rd 1	1.05			
North Airport Rd 2	1.05			
JMWC	4.00			
Bulfer	0.90			
Sonoran Ridge	0.27			
Subtotal, Central	15.82			
Tartesso West				
Tartessto Water Campus	2.00			
Sun Valley Water Campus	0.13			
Subtotal, Tartesso West	2.13			
Total	17.95			

Source: Buckeye Water Resources Department \*Inactive



### System Components Summary

Shown below, Figure W8 includes a summary of water system components by service area.

### Figure W8: System Components

Existing Quantity						
System Component	Unit	Central	Tartesso West	Total		
Well	each	23.00	5.00	28.00		
Arsenic Treatment	mgd	5.00	1.50	6.50		
Pump Station	mgd	49.46	13.20	62.66		
Storage Tank	mg	15.82	2.13	17.95		
Water Campus Land	acres	61.32	3.20	64.52		
Water Line, ≥16"	lin. ft.	266,512	38,154	304,666		

Source: Buckeye Water Resources Department

# Level of Service

The central service area provides the most developed water system, while the Tartesso West service area has a smaller system. Figure W9 shows existing quantities for water system components in each service area and a comparison of system component quantities per mgd of well firm capacity.

### Figure W9: Existing Level of Service

		Existing Quantity		Quantity per Well mgd	
System Component	Unit	Central	Tartesso West	Central	Tartesso West
Well (Firm)	mgd	15.57	3.59	1.00	1.00
Arsenic Treatment	mgd	5.00	1.50	0.32	0.42
Pump Station	mgd	49.46	13.20	3.18	3.68
Storage Tank	mg	15.82	2.13	1.02	0.59
Water Campus Land	acres	61.32	3.20	3.94	0.89
Water Line, ≥16"	lin. ft.	266,512	38,154	17,119	10,641



## **Cost Factors**

Buckeye's Water Resources Department provided unit costs for water system components based on recent and planned construction costs.

#### Figure W10: Cost Factors

System Component	Unit	Unit Cost
Well	each	\$5,000,000
Arsenic Treatment	mgd	\$6,000,000
Pump Station	mgd	\$7,906,977
Storage Tank	mg	\$1,360,000
Water Campus Land	acres	\$60,000
Water Line, ≥16"	lin. ft.	\$568

Source: Buckeye Water Resources Department

### **System Value**

This section includes the system value for each service area based on existing water system components shown in Figure W8 and unit costs shown in Figure W10.

#### **Central Service Area**

Existing water facilities in the central service area are summarized below, and unit costs for system components are based on recent and planned construction costs provided by Water Resources Department staff. The existing water system value in the central service area equals \$712,732,370.

#### Figure W11: System Value

Central					
System Component	Unit	Existing	Unit Cost	System Value	
Well (Firm)	each	23.00	\$5,000,000	\$115,000,000	
Arsenic Treatment	mgd	5.00	\$6,000,000	\$30,000,000	
Pump Station	mgd	49.46	\$7,906,977	\$391,110,697	
Storage Tank	mg	15.82	\$1,360,000	\$21,515,200	
Water Campus Land	acres	61.32	\$60,000	\$3,679,200	
Water Line, ≥16"	lin.ft.	266,512	\$568	\$151,427,273	
Total				\$712,732,370	



## Tartesso West Service Area

Existing water facilities in the Tartesso West service area are summarized below, and unit costs for system components are based on recent and planned construction costs provided by Water Resources Department staff. The existing water system value in the Tartesso West service area equals \$163,120,325.

### Figure W12: System Value

Tartesso West					
System Component	Unit	Existing	Unit Cost	System Value	
Well (Firm)	each	5.00	\$5,000,000	\$25,000,000	
Arsenic Treatment	mgd	1.50	\$6,000,000	\$9,000,000	
Pump Station	mgd	13.20	\$7,906,977	\$104,353,116	
Storage Tank	mg	2.13	\$1,360,000	\$2,896,800	
Water Campus Land	acres	3.20	\$60,000	\$192,000	
Water Line, ≥16"	lin. ft.	38,154	\$568	\$21,678,409	
Total	\$163,120,325				

Source: Buckeye Water Resources Department

# **Central - Plan-Based**

Shown below, the analysis divides system value by well capacity to calculate the cost per gallon of water facilities. For pump station and water line components, the analysis multiplies well capacity by 3.0 (peak hour demand is 3.0 X average day demand) since these components are constructed to meet peak hour demand. The cost is \$22.55 per gallon in the central service area, and Buckeye will use water facilities development fees to construct growth-related water facilities in the central service area.

#### Figure W13: Cost per Gallon

Central					
System Component	System Value	Well Capacity (mgd)	Cost per Gallon		
Well	\$115,000,000	15.57	\$7.39		
Arsenic Treatment	\$30,000,000	15.57	\$1.93		
Pump Station	\$391,110,697	46.70	\$8.37		
Storage Tank	\$21,515,200	15.57	\$1.38		
Water Campus Land	\$3,679,200	15.57	\$0.24		
Water Line, ≥16"	\$151,427,273	46.70	\$3.24		
Total	\$712,732,370		\$22.55		



### **Tartesso West - Cost Recovery**

Buckeye currently collects water facilities development fees in the Tartesso West service area to reimburse the developer for costs related to an existing well and water lines. The remaining cost of these water facilities is \$2,729,341, and available well capacity is 0.48 mgd. The cost is \$5.70 per gallon in the Tartesso West service area, and Buckeye will use water facilities development fees to reimburse the developer for existing water facilities in the Tartesso West service area.

### Figure W14: Cost per Gallon

Tartesso West					
System Component	Remaining	Available	Cost		
System Component	Cost	Capacity (mgd)	per Gallon		
Water Facilities	\$2,729,341	0.48	\$5.70		
Total	\$2,729,341		\$5.70		

#### **Development Fee Report - Plan-Based**

The cost to prepare the Water Facilities IIP and related Development Fee Report equals \$39,840. Buckeye plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of future max day water demand, the cost is \$0.01 per gallon.

#### **Figure W15: Development Fee Report**

Necessary Public Service	Cost	Proportionate Share		Service Unit	5-Year Change	Cost per Service Unit
Fine	627 F00	Residential	82%	Population	45,138	\$0.50
Fire	\$27,500	Nonresidential	18%	Jobs	11,709	\$0.42
Librony	¢0,000	Residential	98%	Population	35,466	\$0.25
Library	\$9,000	Nonresidential	2%	Jobs	11,709	\$0.02
Parks and	ć10,400	Residential	98%	Population	35,466	\$0.51
Recreational	\$18,400	Nonresidential	2%	Jobs	11,709	\$0.03
Police	627 F00	Residential	83%	Population	45,138	\$0.51
Police	\$27,500	Nonresidential	17%	Vehicle Trips	47,030	\$0.10
Street	\$27,500	All Development	100%	VMT	631,502	\$0.04
Water	\$39,840	All Development	100%	Max Day Gallons	13,260,000	\$0.01
Wastewater	\$33,640	All Development	100%	Avg Day Gallons	2,260,500	\$0.01
Total	\$183,380					



### **PROJECTED DEMAND FOR SERVICES AND COSTS**

#### ARS § 9-463.05(E)(1) requires:

"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."

#### ARS § 9-463.05(E)(5) requires:

"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."

#### ARS § 9-463.05(E)(6) requires:

"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."

## **Projected Demand**

Shown below, Figure W16 includes projections of average day demand and maximum day demand over the next 10 years. Based on projections provided by Buckeye's Water Resources Department, future development generates an additional maximum day demand of 21.77 mgd over the next 10 years. This includes 20.79 mgd in the central service area and 0.98 mgd in the Tartesso West service area.

		Average Day Demand (mgd)			Max D	ay Demand	(mgd)
Ye	ear	Central	Tartesso West	Total	Central	Tartesso West	Total
Base	2024	6.95	1.55	8.50	12.51	2.79	15.30
1	2025	8.10	1.60	9.71	14.59	2.88	17.47
2	2026	9.26	1.65	10.91	16.67	2.97	19.64
3	2027	10.41	1.70	12.12	18.75	3.06	21.81
4	2028	11.57	1.75	13.32	20.83	3.15	23.98
5	2029	12.72	1.80	14.53	22.91	3.24	26.15
6	2030	13.88	1.85	15.73	24.98	3.33	28.32
7	2031	15.03	1.91	16.95	27.06	3.44	30.50
8	2032	16.19	1.97	18.16	29.14	3.55	32.69
9	2033	17.34	2.03	19.38	31.22	3.66	34.88
10	2034	18.50	2.10	20.59	33.30	3.77	37.07
10-Yr I	ncrease	11.55	0.55	12.10	20.79	0.98	21.77

#### Figure W16: Projected Demand



Shown below, Figure W17 includes projected well capacity utilization for each service area in 2034. Based on projected maximum day demand and existing firm capacity, projected well capacity deficits include 17.73 mgd in the central service area and 0.18 mgd in the Tartesso West service area.

### Figure W17: Projected Well Capacity Utilization

Projected Demand	Central	Tartesso West	Total
Average Day Demand (mgd), 2034	18.50	2.10	20.59
x Max Day Peaking Factor <sup>1</sup>	1.80	1.80	1.80
Max Day Demand (mgd), 2034	33.30	3.77	37.07
Existing Firm Capacity (mgd)	15.57	3.59	19.15
– Max Day Demand (mgd), 2034	(33.30)	(3.77)	(37.07)
Available Capacity (mgd)	(17.73)	(0.18)	(17.92)
÷ Existing Firm Capacity (mgd)	15.57	3.59	19.15
Percent Available Capacity	(113.90%)	(5.10%)	(93.50%)

Source: Buckeye Water Resources Department

1. Buckeye Water Engineering Design Standards, 2020



# Water Facilities Costs

The figure shown below includes planned water facilities capital expenditures during the next 10 years.

#### **Figure W18: Water Facilities Costs**

Description	Project Type	Fiscal Year	Cost
Tartesso Well / Transmission Line Reimbursement	Dev Agreement	2024-2034	\$2,729,341
Development Fee Report	Study Cost	2024-2029	\$1,657
Subtotal, White Tanks			\$2,730,998
Water Campus 5	Development	2027-2029	\$45,000,000
Water Campus 6	Development	2029-2031	\$45,000,000
Jackie Meck Service Area Well 8	CIP	2024-2025	\$5,500,000
Well 13	CIP	2024	\$800,000
Farallon Water Campus	CIP	2024-2025	\$52,875,000
Sundance Water Campus Arsenic Expansion	CIP	2024	\$1,830,000
Well Transmission Main to Jackie Meck Water Campus	CIP	2024	\$5,900,000
Brine Management - APS PVGS infrastructure	CIP	2024-2031	\$16,000,000
Historic Booster Station Expansion	CIP	2024	\$400,000
Jackie Meck Water Campus Expansion	CIP	2025-2031	\$11,050,000
Water Resources Operations Center (Water Share)	CIP	2024-2027	\$12,300,000
North Airport Water Campus 7-acre site expansion	CIP	2025	\$420,000
North Airport Water Campus - AS Expansion	Development	2026	\$2,700,000
North Airport Well 3	Development	2026	\$3,800,000
Farallon WSA Well 2	CIP	2026-2027	\$5,000,000
Farallon WSA Well 4	CIP	2029-2030	\$5,000,000
Farallon Water Campus Expansion	CIP	2033-2034	\$26,000,000
Grandview Water Campus	Development	2026-2028	\$45,000,000
Grandview Well 1	Development	2026-2027	\$5,000,000
Grandview Well 2	CIP	2031-2032	\$3,800,000
Water Lines	CIP	2024-2034	\$70,000,000
Development Fee Report	Study Cost	2024-2029	\$38,183
Subtotal, Central	\$363,413,183		
Total			\$366,144,181

Source: Buckeye Water Resources Department

# WATER FACILITIES DEVELOPMENT FEES

# **Revenue Credit/Offset**

A revenue credit/offset is not necessary for water facilities development fees. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).



### **Central Service Area**

Figure W19 includes infrastructure components and cost factors for water facilities development fees in the central service area. The cost per service unit is \$22.56 per gallon.

Water facilities fees for residential development are assessed according to maximum day gallons per housing unit. The fee of \$14,709 for a low/medium density unit is calculated using a cost per service unit of \$22.56 per gallon multiplied by a demand unit of 652 maximum day gallons per housing unit.

Water facilities fees are assessed to nonresidential development according to meter size and type. The base 1.0-inch meter is equivalent to a low/medium density unit, and a capacity ratio is used to convert the base meter fee proportionately for larger meters. The capacity ratios are calculated based on data published in Buckeye's Water Engineering Design Standards. The 1.5-inch disc meter fee of \$25,006 is calculated using a cost per service unit of \$22.56 per gallon, multiplied by 652 maximum day gallons, multiplied by a capacity ratio of 1.7. For meters larger than 1.5 inches, the fee is calculated using a cost per service unit of \$22.56 per gallon multiplied by maximum day gallons from (1) City of Buckeye Engineering Standards, (2) a submitted water study, or (3) other estimated water demand.

Fee Component	Cost per Gallon
Well	\$7.39
Arsenic Treatment	\$1.93
Pump Station	\$8.37
Storage Tank	\$1.38
Water Campus Land	\$0.24
Water Line, ≥16"	\$3.24
Development Fee Report	\$0.01
Total	\$22.56

#### Figure W19: Water Facilities Development Fees

Residential Fees per Unit - Central				
Residential Land Use	Max Day Gallons <sup>1</sup>	Proposed Fees	Current Fees	Difference
Low/Med Density (<8 DU/Acre)	652	\$14,709	\$7,675	\$7,034
High Density (≥8 DU/Acre)	509	\$11,483	n/a	n/a
Age Restricted (≤8 DU/Acre)	407	\$9,182	\$4,799	\$4,383

Nonresidential Fees per Meter - Central					
Meter Size	Meter Type	Capacity Ratio <sup>1</sup>	Proposed Fees <sup>2</sup>	Current Fees	Difference
1.0-inch	Disc	1.0	\$14,709	\$7,675	\$7,034
1.5-inch	Disc	1.7	\$25,006	\$13,048	\$11,958
1.5-inch	Turbine	2.9	\$42,656	\$22,258	\$20,398

Current fees represent Central Buckeye fees.

1. Buckeye Water Engineering Design Standards, Section 3-1.202

2. Meters larger than 1.50 inches calculated using \$22.56 per gallon multiplied by max day gallons from (1) City of Buckeye Engineering Standards, (2) a submitted water study, or (3) other estimated water demand.



# **Tartesso Service Area**

Figure W20 includes infrastructure components and cost factors for water facilities development fees in the Tartesso West service area. The cost per service unit is \$5.71 per gallon.

Water facilities fees for residential development are assessed according to maximum day gallons per housing unit. The fee of \$3,723 for a low/medium density unit is calculated using a cost per service unit of \$5.71 per gallon multiplied by a demand unit of 652 maximum day gallons per housing unit.

Water facilities fees are assessed to nonresidential development according to meter size and type. The base 1.0-inch meter is equivalent to a low/medium density unit, and a capacity ratio is used to convert the base meter fee proportionately for larger meters. The capacity ratios are calculated based on data published in Buckeye's Water Engineering Design Standards. The 1.5-inch disc meter fee of \$6,329 is calculated using a cost per service unit of \$5.71 per gallon, multiplied by 652 maximum day gallons, multiplied by a capacity ratio of 1.7. For meters larger than 1.5 inches, the fee is calculated using a cost per service unit of \$5.71 per gallon gallons from (1) City of Buckeye Engineering Standards, (2) a submitted water study, or (3) other estimated water demand.

Fee Component	Cost per Gallon
Water Facilities Reimbursement	\$5.70
Development Fee Report	\$0.01
Total	\$5.71

Figure W20: Water Facilities	Development Fees
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Residential Fees per Unit - Tartesso West					
Residential Land Use	Max Day	Proposed	Current	Difference	
	Gallons <sup>1</sup>	Fees	Fees	Difference	
Low/Med Density (<8 DU/Acre)	652	\$3,723	\$3,717	\$6	
High Density (≥8 DU/Acre)	509	\$2,906	n/a	n/a	
Age Restricted (≤8 DU/Acre)	407	\$2,324	\$2,324	\$0	

Fees per Meter - Tartesso West						
Meter SizeMeter TypeCapacityProposedCurrentRatio1Fees2FeesDifference						
1.0-inch	Disc	1.0	\$3,723	\$3,717	\$6	
1.5-inch	Disc	1.7	\$6,329	\$6,319	\$10	
1.5-inch	Turbine	2.9	\$10,796	\$10,780	\$16	

Current fees represent Tartesso West fees.

1. Buckeye Water Engineering Design Standards, Section 3-1.202

2. Meters larger than 1.50 inches calculated using \$5.71 per gallon multiplied by max day gallons from (1) City of Buckeye Engineering Standards, (2) a submitted water study, or (3) other estimated water demand.



# WATER FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains revenue forecasts required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)). Projected fee revenue shown in Figure W21 is based on projected maximum day water demand in Figure W16 and the updated water facilities development fees. If development occurs faster than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs slower than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Projected development fee revenue over the next 10 years equals \$469,022,400 in the central service area and \$2,729,341 in the Tartesso West service area – Buckeye will end collection of water facilities fees in the Tartesso West service area at the time of full reimbursement. Due to existing development agreements, projected development fee revenue may be offset by development fee credits.

Fee Component	Central	Tartesso West
Water Facilities	\$363,375,000	\$2,729,341
Development Fee Report	\$38,183	\$1,657
Total	\$363,413,183	\$2,730,998

Figure W21: Water Facilities	<b>Development Fees Revenue</b>
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		Central \$22.56 per gallon	Tartesso West \$5.71 per gallon
Yea	ar	MGD	MGD
Base	2024	12.51	2.79
Year 1	2025	14.59	2.88
Year 2	2026	16.67	2.97
Year 3	2027	18.75	3.06
Year 4	2028	20.83	3.15
Year 5	2029	22.91	3.24
Year 6	2030	24.98	3.33
Year 7	2031	27.06	3.44
Year 8	2032	29.14	3.55
Year 9	2033	31.22	3.66
Year 10	2034	33.30	3.77
10-Year I	ncrease	20.79	0.98
Projected	Revenue	\$469,022,400	\$2,730,998

Projected Fee Revenue	\$471,753,398
Total Expenditures	\$366,144,181



# WASTEWATER FACILITIES IIP

ARS § 9-463.05 (T)(7)(b) defines the eligible facilities and assets for the Wastewater Facilities IIP:

"Wastewater facilities, including collection, interception, transportation, treatment and disposal of wastewater, and any appurtenances for those facilities."

The Wastewater Facilities IIP includes components for water reclamation facilities (WRF), lift stations, WRF land, collection lines, reclaimed lines, recharge basins, and the cost of preparing the Wastewater Facilities IIP and related Development Fee Report. The plan-based methodology is used for the central and Sundance service areas and the cost recovery methodology is used for the Tartesso West service area.

# **PROPORTIONATE SHARE**

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Wastewater Facilities IIP and development fees will allocate the cost of necessary public services between both residential and nonresidential development using average day flow factors.

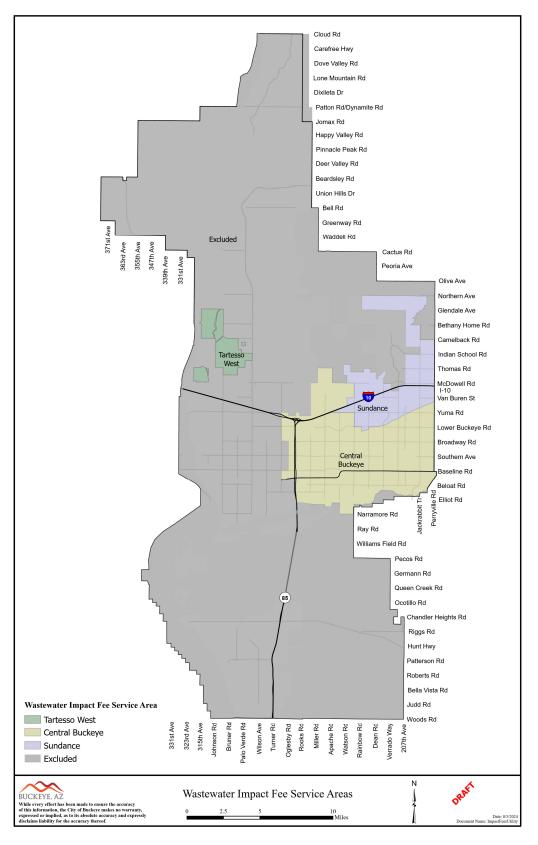
# **SERVICE AREA**

Buckeye's existing wastewater facilities consist of three separate systems with limited potential for interconnection. As shown in Figure WW1, there are three services areas for the Wastewater Facilities IIP.

The wastewater service areas are acceptable for these facilities as they are defined as the incorporated area or Buckeye utility service area. Buckeye is not the only wastewater provider within the city limits, and the proposed wastewater service areas do not include areas served by EPCOR.



#### Figure WW1: Wastewater Facilities Service Area





### **RATIO OF SERVICE UNIT TO DEVELOPMENT UNIT**

#### ARS § 9-463.05(E)(4) requires:

"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."

According to Buckeye's Gravity Sewer Design Standards, average day flow from residential development equals 80 gallons per person. As shown below in Figure WW2, average day flow from residential development includes a range from 160 gallons per day for active adult units to 256 gallons per day for low and medium density units.

#### Figure WW2: Wastewater Flow Factors

Residential Land Use	Dwelling Units per Acre	Persons per Dwelling Unit	Average Day Flow/Person	Average Day Gallons
Low and Medium Density	less than 8	3.20	80	256
High Density (includes apartments)	8 or more	2.50	80	200
Active Adult	max 8	2.00	80	160

Source: Buckeye Gravity Sewer Design Standards, Section 4-1.202

Figure WW3 includes the flow factors for residential and nonresidential land uses. For residential development, the table displays average day gallons per housing unit. For nonresidential development, the table displays average day gallons per meter by size. For meters larger than 1.5 inches, average day flow is calculated from (1) City of Buckeye Engineering Standards, (2) a submitted water study, or (3) other estimated wastewater flow.

#### Figure WW3: Ratio of Service Unit to Development Unit

Residential Flow per Housing Unit			
Residential Land Use	Average Day Gallons		
Low/Med Density (<8 DU/Acre)	256		
High Density (≥8 DU/Acre)	200		
Age Restricted (≤8 DU/Acre)	160		

Nonresidential Flow per Meter			
Motor Sizo	Capacity	Average Day	
Meter Size	Ratio <sup>1</sup>	Gallons	
1.0-inch	1.0	256	
1.5-inch	2.0	512	

1. Buckeye Gravity Sewer Design Standards, Section 4-1.202



# ANALYSIS OF CAPACITY, USAGE, AND COSTS OF EXISTING PUBLIC SERVICES

ARS § 9-463.05(E)(2) requires:

"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."

#### **Existing Flow**

According to Water Resources Department estimates, 2024 average day flow equals 9.20 million gallons per day (mgd). Average day flow is 2.25 mgd in the central service area, 1.90 mgd in the Sundance service area, and 0.63 mgd in the Tartesso service area.

Figure	WW4:	Existing	Flow
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Existing Flow	Central	Sundance	Tartesso West	Total
Existing Capacity (mgd)	4.50	3.50	1.20	9.20
– Average Day Flow (mgd), 2024	(2.25)	(1.90)	(0.63)	(4.77)
Available Capacity (mgd)	2.25	1.61	0.57	4.43
÷ Existing Capacity (mgd)	4.50	3.50	1.20	9.20
Percent Available Capacity	50.00%	45.90%	47.60%	48.10%

Source: Buckeye Water Resources Department

#### **System Components**

Level of service (LOS) generally refers to the ratio of capacity to demand. One of the principles of development fee analysis is that future development should not be required to pay for a higher LOS than existing development currently receives. Consequently, it is important to determine the existing LOS.

For wastewater facilities, water reclamation facility (WRF) treatment capacity is generally used as reflective of the capacity of the entire wastewater system. However, some components of the system may have more capacity or less capacity than needed for full utilization of treatment facilities. The existing wastewater system consists of WRFs, lift stations, WRF land, collection lines greater than or equal to 15 inches that form the collection system grid, reclaimed lines, and recharge basins. Figure WW5 includes a summary of wastewater system components by service area.

#### **Figure WW5: System Components**

Existing Quantity					
System Component	Unit	Central	Sundance	Tartesso West	Total
WRFs, < 5 mgd	mgd	4.5	3.5	1.2	9.2
Lift Stations	mgd	1.5	2.8	0.0	4.3
WRF Land	acres	52.0	5.4	44.0	101.4
Collection Lines, ≥15"	lin. ft.	105,219.0	22,619.8	35,769.0	163,607.8
Reclaimed Lines	lin. ft.	1,216.0	0.0	0.0	1,216.0
<b>Recharge Basins</b>	acres	0.0	0.0	2.0	2.0



# Level of Service

The central and Sundance service areas provide the most developed wastewater systems, while the Tartesso West service area has a smaller system. Figure WW6 shows existing quantities for wastewater system components in each service area and a comparison of system component quantities per mgd of WRF capacity.

# Figure WW6: Existing Level of Service

		Existing Quantity			Quantity per WRF mgd			
System Component	Unit	Central	Sundance	Tartesso West	Central	Sundance	Tartesso West	
WRFs, < 5 mgd	mgd	4.5	3.5	1.2	1.0	1.0	1.0	
Lift Stations	mgd	1.5	2.8	0.0	0.3	0.8	0.0	
WRF Land	acres	52.0	5.4	44.0	11.6	1.5	36.7	
Collection Lines, ≥15"	lin. ft.	105,219.0	22,619.8	35,769.0	23,382.0	6,462.8	29,807.5	
Reclaimed Lines	lin. ft.	1,216.0	0.0	0.0	270.2	0.0	0.0	
<b>Recharge Basins</b>	acres	0.0	0.0	2.0	0.0	0.0	1.7	

Source: Buckeye Water Resources Department

# **Cost Factors**

Buckeye's Water Resources Department provided unit costs for wastewater system components based on recent and planned construction costs.

### Figure WW7: Cost Factors

System Component	Unit	Unit Cost
WRFs, < 5 mgd	mgd	\$25,000,000
Lift Stations	mgd	\$1,500,000
WRF Land	acres	\$60,000
Collection Lines, ≥15"	lin. ft.	\$760
Reclaimed Lines	lin. ft.	\$760
<b>Recharge Basins</b>	acres	\$60,000



# **System Value**

This section includes the system value for each service area based on existing wastewater system components shown in Figure WW6 and unit costs shown in Figure WW7.

### **Central Service Area**

Existing wastewater facilities in the central service area are summarized below, and unit costs for system components are based on recent and planned construction costs provided by Water Resources Department staff. The existing wastewater system value in the central service area equals \$198,760,600.

#### Figure WW8: System Value

Central					
System Component	Unit	Existing	Unit Cost	System Value	
WRFs, < 5 mgd	mgd	4.5	\$25,000,000	\$112,500,000	
Lift Stations	mgd	1.5	\$1,500,000	\$2,250,000	
WRF Land	acres	52.0	\$60,000	\$3,120,000	
Collection Lines, ≥15"	lin. ft.	105,219.0	\$760	\$79,966,440	
Reclaimed Lines	lin. ft.	1,216.0	\$760	\$924,160	
<b>Recharge Basins</b>	acres	0.0	\$60,000	\$0	
Total				\$198,760,600	

Source: Buckeye Water Resources Department

#### Sundance Service Area

Existing wastewater facilities in the Sundance service area are summarized below, and unit costs for system components are based on recent and planned construction costs provided by Water Resources Department staff. The existing system value in the Sundance service area equals \$109,212,010.

# Figure WW9: System Value

Sundance						
System Component	Unit	Existing	Unit Cost	System Value		
WRFs, < 5 mgd	mgd	3.5	\$25,000,000	\$87,500,000		
Lift Stations	mgd	2.8	\$1,500,000	\$4,200,000		
WRF Land	acres	5.4	\$60,000	\$321,000		
Collection Lines, ≥15"	lin. ft.	22,619.8	\$760	\$17,191,010		
Reclaimed Lines	lin. ft.	0.0	\$760	\$0		
Recharge Basins	acres	0.0	\$60,000	\$0		
Total	\$109,212,010					



# Tartesso West Service Area

Existing wastewater facilities in the Tartesso West service area are summarized below, and unit costs for system components are based on recent and planned construction costs provided by Water Resources Department staff. The existing system value in the Tartesso West service area equals \$59,944,440.

## Figure WW10: System Value

Tartesso West						
System Component	Unit	Existing	Unit Cost	System Value		
WRFs, < 5 mgd	mgd	1.2	\$25,000,000	\$30,000,000		
Lift Stations	mgd	0.0	\$1,500,000	\$0		
WRF Land	acres	44.0	\$60,000	\$2,640,000		
Collection Lines, ≥15"	lin. ft.	35,769.0	\$760	\$27,184,440		
Reclaimed Lines	lin. ft.	0.0	\$760	\$0		
<b>Recharge Basins</b>	acres	2.0	\$60,000	\$120,000		
Total				\$59,944,440		

Source: Buckeye Water Resources Department

# **Central – Plan-Based**

Shown below, the analysis divides system value by WRF capacity to calculate the cost per gallon of wastewater facilities. The cost is \$44.17 per gallon in the central service area, and Buckeye will use wastewater facilities development fees to construct growth-related water facilities in the central service area.

#### Figure WW11: Cost per Gallon

Central						
System Component	System Value	WRF Capacity	Cost			
System component	System value	(mgd)	per Gallon			
WRFs, < 5 mgd	\$112,500,000	4.50	\$25.00			
Lift Stations	\$2,250,000	4.50	\$0.50			
WRF Land	\$3,120,000	4.50	\$0.69			
Collection Lines, ≥15"	\$79,966,440	4.50	\$17.77			
Reclaimed Lines	\$924,160	4.50	\$0.21			
Recharge Basins	\$0	4.50	\$0.00			
Total	\$198,760,600		\$44.17			



### Sundance – Plan-Based

Shown below, the analysis divides system value by WRF capacity to calculate the cost per gallon of wastewater facilities. The cost is \$31.20 per gallon in the Sundance service area, and Buckeye will use wastewater facilities development fees to construct growth-related water facilities in the Sundance service area.

### Figure WW12: Cost per Gallon

Sundance					
System Component	System Value	WRF Capacity (mgd)	Cost per Gallon		
WRFs, < 5 mgd	\$87,500,000	3.50	\$25.00		
Lift Stations	\$4,200,000	3.50	\$1.20		
WRF Land	\$321,000	3.50	\$0.09		
Collection Lines, ≥15"	\$17,191,010	3.50	\$4.91		
Reclaimed Lines	\$0	3.50	\$0.00		
Recharge Basins	\$0	3.50	\$0.00		
Total	\$109,212,010		\$31.20		

# **Tartesso West -Cost Recovery**

Buckeye currently collects wastewater facilities development fees in the Tartesso West service area to reimburse the developer for costs related to the existing wastewater facilities. The remaining cost of these wastewater facilities is \$5,668,690, and available WRF capacity is 0.19 mgd. The cost is \$29.96 per gallon in the Tartesso West service area, and Buckeye will use wastewater facilities development fees to reimburse the developer for existing wastewater facilities in the Tartesso West service area.

# Figure WW13: Cost per Gallon

Tartesso West						
System Component	Remaining Available		Cost			
System Component	Cost	Capacity (mgd)	per Gallon			
Wastewater Facilities	\$5,668,690	0.19	\$29.96			
Total	\$5,668,690		\$29.96			



# **Development Fee Report - Plan-Based**

The cost to prepare the Wastewater Facilities IIP and related Development Fee Report equals \$33,640. Buckeye plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of future average day wastewater flow, the cost is \$0.01 per gallon.

Necessary Public Service	Cost	Proportionate Share		Service Unit	5-Year Change	Cost per Service Unit
Fire	627 F00	Residential	82%	Population	45,138	\$0.50
Fire	\$27,500	Nonresidential	18%	Jobs	11,709	\$0.42
Librory	¢0,000	Residential	98%	Population	35,466	\$0.25
Library	\$9,000	Nonresidential	2%	Jobs	11,709	\$0.02
Parks and	ć10,400	Residential	98%	Population	35,466	\$0.51
Recreational	\$18,400	Nonresidential	2%	Jobs	11,709	\$0.03
Police	607 F00	Residential	83%	Population	45,138	\$0.51
Police	\$27,500	Nonresidential	17%	Vehicle Trips	47,030	\$0.10
Street	\$27,500	All Development	100%	VMT	631,502	\$0.04
Water	\$39,840	All Development	100%	Max Day Gallons	13,260,000	\$0.01
Wastewater	\$33,640	All Development	100%	Avg Day Gallons	2,260,500	\$0.01
Total	\$183,380					

Figure WW14: Development Fee Report

