

FINAL:
Adopted Draft
March 16, 2021
HOOPER WATER IMPROVEMENT DISTRICT



CAPITAL FACILITIES PLAN
AND
IMPACT FEE FACILITIES PLAN

MANAGER

SCOTT CHRISTIANSEN

A handwritten signature in black ink, appearing to read "Scott Christiansen", written over a horizontal line.

March 16, 2021

SIGNATURE

DATE

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I. Executive Summary

The Hooper Water Improvement District (HWID, District) has retained Gardner Engineering to create a Capital Facilities Plan (CFP) for the District. This CFP will lay out the anticipated projects to be undertaken by the District through buildout. Projects include the construction, purchase or replacement of the District's water rights, sources of water, storage tanks and pipelines: collectively, the District's *capital facilities*.

Buildout is the theoretical point at which all land within the District is as densely populated with culinary water users as zoning will allow. It is recognized that not all lands will be developed as densely as allowed by zoning, and some zoning may be changed to allow higher densities. The variability of development density and location is accounted for by a regular review and update of the District's CFP.

Some of the projects identified in this Plan will be necessitated by new connections. The growth-related projects should appropriately be paid for by the new connections that necessitate the project. Utah Code provides a mechanism for the District to collect from new connections their proportionate share of the costs related to providing the capital facilities needed within the District. The mechanism is collection of an impact fee. The amount of the impact fee is established through creation of an Impact Fee Facilities Plan (IFFP), which is a subset of this CFP that identifies the capital projects necessitated by new connections. The resulting IFFP will then be analyzed by others to establish an appropriate impact fee in a separate document called an Impact Fee Analysis (IFA).

This CFP considers a built-out condition within the District but establishes a tentative capital improvement plan for the next 10 years (the planning horizon).

This Plan researches and documents the answers to several questions:

1. What Facilities does the HWID have? **Refer to Table 12 on page 13.**
 - a. "Facilities" include:
 - i. Distribution (pipelines)
 - ii. water rights
 - iii. source delivery (wells)
 - iv. storage tanks
2. What commitments has the HWID already made for the use of those Facilities? **Refer to Table 13 on page 13.**
 - a. "Commitments" include:
 - i. The commitment to provide a certain level of service to all active connections within its defined boundaries.
 - ii. The commitment to provide that same level of service to all platted lots, for which an impact fee has been paid, which lots do not yet have an active connection.
3. What excess capacity does the HWID have in its Facilities to serve additional connections? **Refer to Table 14 on page 14.**
4. How will the needs of additional connections be met? **Refer to Table 18 on page 18.**
5. How much will it cost to meet the identified needs? **Refer to Table 19 on page 20.**

The following table collates the answers to each of these questions and briefly summarizes the anticipated projects needed within the current planning horizon, 2021-2030.

TABLE 1 HWID 2021-2030 IFFP PROJECT PLANNING SUMMARY

Project Description	Estimated Total Project Cost	Estimated Impact Fee-Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
Source	\$5,255,000	\$5,255,000	\$0
Storage	\$3,930,000	\$2,570,000	\$1,360,000
Distribution	\$13,169,400	\$10,073,578	\$3,095,822
2021-2030 Estimated Project Costs	\$22,354,400	\$17,898,578	\$4,455,822

Please refer to Table 19, beginning on page 20 for a complete list of projects within the planning horizon. Exhibit A.9 in Appendix A is a complete description of identified projects through buildout.

A. CERTIFICATION OF COMPLIANCE WITH UTAH STATE CODE (11-36A-306(1)):

To the extent the following items are addressed in the IFFP dated February 25, 2021, Gardner Engineering certifies that the following impact fee facilities plan:

1. INCLUDES ONLY THE COSTS OF PUBLIC FACILITIES THAT ARE:
 - a. allowed under the Impact Fees Act; and
 - b. actually incurred; or
 - c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. DOES NOT INCLUDE:
 - a. costs of operation and maintenance of public facilities;
 - b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
 - c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. COMPLIES IN EACH AND EVERY RELEVANT RESPECT WITH THE IMPACT FEES ACT.



Dan White, P.E.

II. Introduction

This Capital Facilities Plan and Impact Fee Facilities Plan (Jointly, "Plan") is a document that considers the Level of Service (LOS) that the Hooper Water Improvement District (HWID, District) can provide to its customers. The LOS will be calculated in the categories of Distribution, Water Rights, Source Delivery, equalization Storage, and fire suppression Storage capacities.

The District has retained a separate consultant to utilize the results of this Plan to determine an appropriate fee (an "Impact Fee") to assess new connections to help pay for needed improvements. The process to establish an impact fee is governed by state law.

The Impact Fee Act requires that an impact fee be imposed only when based on an Impact Fee Facilities Plan (IFFP, Plan). An IFFP must document the following¹:

- A. Identify the existing level of service (LOS) for each public facility.
- B. Establish a proposed level of service (LOS) for each public facility.
- C. Identify any excess capacity to accommodate future growth at the proposed level of service
- D. Identify demands placed upon existing public facilities by new development activity at the proposed level of service.
- E. Identify the means by which the political subdivision or private entity will meet those growth demands identified in D, above, through
 1. "Selling" the excess capacity in C, or
 2. The acquisition of new capacity, which acquisition would be financed through grants, bonds, interfund loans, impact fees and anticipated or accepted dedication of system improvements.

¹ Utah Code 11-36a-302(1)

II. Demographics

A. EXISTING CONNECTIONS

"Existing Connections" in this document are defined as all connections for which the impact fee has been paid.

TABLE 2 EXISTING CONNECTIONS, 12/31/2020

CONNECTION TYPE	CONNECTION COUNT	FLOW CAPACITY PER STANDARD (GPM)	ERCs PER METER	ERCs
Residential Total (subtotals below)	5,856			6,179
5/8x3/4 AWWA C715 Type I	5,798	20	1.0	5,798
3/4-inch AWWA C715 Type I	0	30	1.5	0
1-inch AWWA C715 Type I	21	50	2.5	53
1.5-inch AWWA C715 Type I	2	100	5.0	10
2-inch AWWA C715 Type I	31	160	8.0	248
3-inch AWWA C715 Type I	4	350	17.5	70
4-inch AWWA C715 Type I	0	600	30.0	0
6-inch AWWA C715 Type I	0	1,350	67.5	0
8-inch AWWA C715 Type I	0	1,600	80.0	0
Non-Residential	95			159
Total Existing Connections	5,951			6,338

For reference, the total number of connections and ERCs on the HWID system for the last decade is shown below.

TABLE 3 TOTAL CONNECTIONS, 2010-2020¹

YEAR	TOTAL CONNECTIONS	% GROWTH	ERCs
2020	5,951	6.59%	6,338
2019	5,583	2.35%	5,674
2018	5,455	-1.21%	5,846
2017	5,522	4.17%	6,315
2016	5,301	2.83%	6,600
2015	5,155	-3.25%	5,253
2014	5,328	2.17%	5,421
2013	5,215	-3.32%	5,352
2012	5,394	7.00%	5,474
2011	5,041		5,140
Growth 2011-2020	910	18.05%	

¹ Data reported by HWID and recorded by the Utah Division of Water Rights.

https://www.waterrights.utah.gov/asp_apps/viewEditPWS/pwsView.asp?SYSTEM_ID=1067, accessed 2020-12-21.

B. WATER USE

HWID annually reports to the Utah Division of Water Rights (DWRi) the production of water from its wells, purchased water from its wholesale connection to Weber Basin Water Conservancy District's (WBWCD's) culinary system, and water metered out to its customers. State-wide, 2020 is the first year that such data for each public water system is being used to establish a system-specific standard to plan for future water use and capacity needs. Production data from January 1, 2016 – December 31, 2018 was analyzed by the Division of Drinking Water (DDW) to establish a minimum sizing standard for each ERC in the District. The District then adopted a resolution in 2020 officially setting a minimum sizing standard.

In preparation for compiling this Plan, Gardner Engineering analyzed connection, use and production data from January 1, 2019 through December 31, 2020 to verify the appropriateness of the established Standard. The maximum data from 2019 and 2020 indicated that the established sizing standard is appropriate.

A synopsis of the information referred to in the preceding paragraphs is summarized in Table 4.

TABLE 4 MINIMUM SIZING STANDARD VERIFIED APPROPRIATE

CRITERIA	STATE-DETERMINED MINIMUM SIZING STANDARD	2019-2020 DATA VERIFICATION	DISTRICT-ADOPTED MINIMUM SIZING STANDARD USED IN THIS PLAN
Peak Day Demand (GAL/day per ERC)	731	548	800 GPD = 0.56 GPM
Annual Demand (AF per ERC)	125,717	84,729	130,340 GAL/YR = 0.40 AF/YR
Equalization Storage (GAL per ERC)	345	232	400
Fire Suppression Storage (set by Fire Authorities, GAL)	540,000	540,000	540,000

C. PROJECTED FUTURE CONNECTIONS

Based on the General Plans of each of the political entities to which HWID provides culinary water service, and assuming that all between the current HWID boundary and the flood plain, within the south and north limits of the existing District boundaries, where it appears logical, will annex into HWID, it is anticipated that HWID may serve up to 25,629 ERCs at buildout. Of the potential total number of ERCs, 21,877 would likely be within the current (as of July 16, 2019) Boundary, and 3,752 would likely be on the properties of potential annexation. A map of Projected Land Use at Buildout is included as Map B1 in Appendix B and is summarized in the following tables.

TABLE 5 PROJECTED ERCs AT BUILDOUT WITHIN THE HWID BOUNDARY (AS DEFINED ON JULY 16, 2019)

POLITICAL ENTITY	DENSITY ALLOWED BY ZONING (ERCs/AC)						TOTAL	DEVELOPMENT EFFICIENCY	NUMBER OF ERCs
	1	2	3	4	6	15			
Davis County* (AC)	140	246	0	0	0	0	386	84%	531
West Point (AC)	266	2,134	288	70	53	0	2,811		5,037
Hooper (AC)	1,606	2,662	739	154	0	0	5,161		8,201
Roy (AC)	0	53	132	19	0	0	204		486
West Haven (AC)	1,207	139	2	105	114	432	1,999		7,623
TOTAL (AC)	3,219	5,234	1,161	348	167	432	10,561		21,877
Development Efficiency	84%								
Number of ERCs	2,704	8,793	2,926	1,169	842	5,443	21,877		

TABLE 6 PROJECTED ERCs AT BUILDOUT WITHIN REASONABLY ANNEXABLE LAND

POLITICAL ENTITY	DENSITY ALLOWED BY ZONING (ERCs/AC)						TOTAL	DEVELOPMENT EFFICIENCY	NUMBER OF ERCs
	1	2	3	4	6	15			
DAVIS COUNTY* (AC)	10	1,405	0	0	0	0	1,415	84%	2,369
WEST POINT (AC)	52	274	0	0	0	0	326		504
HOOPER (AC)	435	306	0	0	0	0	741		879
WEST HAVEN (AC)	0	0	0	0	0	0	0		0
ROY (AC)	0	0	0	0	0	0	0		0
TOTAL (AC)	497	1,985	0	0	0	0	2,482		3,752
DEVELOPMENT EFFICIENCY	84%								
NUMBER OF ERCs	417	3,335	0	0	0	0	3,752		

* It is assumed that all land in the HWID boundary that is currently in unincorporated Davis County will, before being developed, be annexed into West Point City at the allowable density shown. If not annexed into West Point, the Davis County Zoning Ordinance currently allows only 1 residence per 10 acres or 1 residence per 5 acres (shown as 1 ERC/AC and 2 ERC/AC, respectively, if annexed into West Point).

III. Impact Fee Facilities Plan

A. IDENTIFY THE EXISTING LEVEL OF SERVICE (E-LOS)¹

To identify the Existing Level of Service (E-LOS) provided to those served by the HWID, we must first inventory existing facilities to determine how the capacity in those facilities is being utilized.

1. INVENTORY OF EXISTING FACILITIES

a. Distribution

The HWID distribution system consists of 152 miles of pipe, from 2" diameter to 20" diameter.

TABLE 7 MAIN LINE PIPE INVENTORY

Pipe Diameter (In)	Length (ft)
2"	8,820
3"	227
4"	66,451
6"*	194,817
8"	319,342
10"	20,980
12"	137,342
14"	434
16"	4,619
18"	42,955
20"	8,304
Total	804,291
*Fire hydrant laterals are included in this table	

b. Water Rights

HWID holds its own water rights with the State of Utah and holds contracts with the Weber Basin Water Conservancy District (WBWCD). The District's rights are for groundwater diversion from 3 existing and up to 4 potential future wells.

The WBWCD contracts are for the delivery of water through a wholesale connection. The contracts are either 1) "take or pay", wherein the District has purchased a block of water and pays for that block of water, whether it is used or not, or 2) "impact fee contracts" wherein the District has entered into an agreement to collect impact fees on behalf of the WBWCD and pass those fees on. The fees thus collected and forwarded, entitle the District to the use of a relatively small, per-user, amount of water and a relatively small usage and operation and maintenance fee is collected by WBWCD per gallon consumed.

The District's water rights are summarized below.

¹ Reference: Utah State Code 11-36a-302(1)(a)(i)

TABLE 8 HWID WATER RIGHTS

WATER RIGHT NUMBER / AGREEMENT DATE	QTY	POINT OF DIVERSION	NATURE OF USE	NOTES
35-4250 35-4803 35-4950 (a36297)	6,516.0 AF	Existing Wells (#1, #2, #3) Future Wells (Vineyard, Shop, 5700 S, 6000 S)	Municipal	4150 AF w/1977 or earlier priority; 2,366 AF w/ 2005 priority
WBWCD contract ca. 1990	5.0 AF	WBWCD wholesale connection vault near 4000 S Well	Domestic	Take or Pay Contract
WBWCD contract ca. 2007	96.3 AF	WBWCD wholesale connection vault near 4000 S Well	Domestic	"Impact fee contract" Purchase small blocks as new connections are made.
Total	6,617.3 AF			

c. Source Delivery

HWID currently has three ground water wells and one wholesale connection with a treated capacity of 4,819 GPM and total capacity of 6,319 GPM as shown in Table 9.

TABLE 9 HWID EXISTING SOURCE CAPACITY

POINT OF DIVERSION	FLOW RATE (GPM)	NOTES
Well 1	2,350	Equipped with chlorinator and backup power
4000 South Well	2,350	Equipped with iron/manganese filters, chlorinator, and backup power
Well 3	1,500	Safe, but needs oxidation and filtration for aesthetics, and backup power
WBWCD Connection, peak flow rate for current number of AF (Refer to table 7):	119	Set flow control at meter vault to no more than 1.24 GPM per contracted AF (1 AF taken at a constant flow rate, year-round, is 0.62 GPM. WBWCD allows a flow rate of up to 2x the average without charging peaking fees, so limit flow through the wholesale connection to avoid peaking charges).
Subtotal: Treated water	4,819	
Total: Treated and Untreated	6,319	

For reference, HWID's SCADA data from each of its sources in 2020 indicated a realized peak demand day demand of 2,400 GPM and the District-adopted sizing standard shown in Table 4 on page 7, indicates a peak day demand of (6,338 ERCs * 0.56 GPM/ERC)

3,557 GPM. Both the realized and the standard-anticipated demands are less than the available treated source water. HWID has sufficient source capacity to satisfy current demands with ample excess capacity.

d. Storage

HWID currently has four storage tanks as shown in the following table.

TABLE 10 EXISTING STORAGE FACILITIES

Tank ID	Volume	Notes
ST001 - South 2 MG Tank	2,000,000 GAL	Steel
ST002 - North 2 MG Tank	2,000,000 GAL	Steel
ST003 - 4000 South Tank	750,000 GAL	Steel
ST004 - Well #1, 120,000-GAL Tank	120,000 GAL	Concrete
Total	4,870,000 GAL	

2. E-LOS PROVIDED TO HWID CUSTOMERS

a. Distribution

HWID has established a standard that all newly-constructed main lines in the District be a minimum of 8-inches in diameter. Much of the District's distribution system was constructed before the current 8-inch-minimum standard was set. The District also has a policy to replace aging lines that have exceeded their useful life with minimum 8-inch diameter lines.

The government body that regulates operation of public water systems such as HWID, the Utah Division of Drinking Water (DDW), has established requirements for operating pressures that must be maintained within public water systems that are calculated to protect drinking water quality and provide adequate flow at adequate pressures for fire suppression and household use. The flow and pressure requirements are given in Table 11.

TABLE 11 PUBLIC WATER SYSTEM FLOW AND PRESSURE REQUIREMENTS

DEMAND SCENARIO	SYSTEM-SPECIFIC FLOW ¹	MINIMUM REQUIRED PRESSURE IN DISTRIBUTION SYSTEM	COMMENTS
Peak Day	0.56 GPM/ERC	40 PSI	
Peak Instantaneous	1.30 GPM/ERC	30 PSI	
Fire Flow Superimposed on Peak Day	FF + 0.56 GPM/ERC	20 PSI	FF = 1,000 GPM residential; 3,000 GPM schools ²

Required pressures and flows are available throughout most of the District. Existing distribution facilities can provide the required flows at the required pressures. Where improvements to the existing distribution system are needed to meet the standards listed in Table 11, those improvements have been identified on Map B3 in Appendix B with a dashed line type.

b. Non-Distribution Facilities

The E-LOS provided by HWID in the other capacity criteria are easily presented in tabular format and are thus shown in the following table.

¹ See also Table 4 on page 7.

The [AWWA manual, M31](#) (pg. 18), was consulted for generally accepted peaking factors. The District-adopted peak day demand (800 GAL) is 2.3 times the average day demand (130,340 GAL/year / 365 days = 357 GAL), which falls within the guidelines given in M31 that "maximum daily demand may vary from 1.5 to three times the average daily rate". M31 suggests that peak instantaneous demands range from 2 to 8 times the average day demand. Based on the range given in M31, it is assumed that peak instantaneous demand is 5 times the average day demand: $5 \times 375 \text{ GPD/ERC} = 1,875 \text{ GPD/ERC}$, which is 1.30 GPM/ERC.

² Refer to International Fire Code, Table B105.1(1) for residential flow to residences less than 3,600 square feet without automatic fire sprinklers (the North Davis Fire District sent a copy of the referenced table to HWID in response to a request for what the required fire flow and storage is in the Davis County portion of HWID) and an email dated 2 April 2020 from Weber Fire District regarding the District's firefighting storage capacity. Both documents are included as Exhibit A.2.1 and A.2.2 in Appendix A. The 3,000 GPM flow can be a combined flow rate pulled from up to three fire hydrants surrounding the given structure.

TABLE 12 EXISTING LEVELS OF SERVICE

Capacity Criteria	Current Capacity	Current Number of ERCs	LOS per ERC
Water Rights	6,617.3 AF	6,338	1.04 AF/YR
Source Delivery (Treated)	4,819 GPM		0.76 GPM
Total Storage	4,870,000 GAL		NA
Fire Suppression Storage	540,000 GAL		NA
Equalization Storage	4,330,000 GAL		683 GAL

B. ESTABLISH A PROPOSED LEVEL OF SERVICE (P-LOS)¹

Pursuant to UCA 19-4-114, effective May 12, 2020, HWID has established a P-LOS for each of its facilities².

1. DISTRIBUTION:

The District proposes that all new pipelines be constructed to provide pressures as required by the DDW³ and shown on Map B3 in Appendix B.

2. NON-DISTRIBUTION FACILITIES

The P-LOS to meet the demands determined in Table 4 on page 7 are summarized in Table 13, below.

TABLE 13 PROPOSED LEVELS OF SERVICE

Criteria	District-Adopted minimum sizing standard used in this Plan
Annual Demand (per ERC)	0.40 AF/YR
Peak Day Demand (per ERC)	0.56 GPM
Equalization Storage (per ERC)	400 GPM
Fire Suppression Storage	540,000 GAL

C. IDENTIFY ANY EXCESS CAPACITY TO ACCOMMODATE FUTURE GROWTH AT THE PROPOSED LEVEL OF SERVICE⁴

Excess capacity is herein calculated as the difference between the total demand for the current number of residential connections of each type at the E-LOS and the P-LOS.

1. DISTRIBUTION:

It is estimated that 10" and larger pipelines have excess capacity in them and that they are at approximately 1/4 capacity, which is sufficient to adequately service the District through buildout.

¹ Reference: Utah State Code 11-36a-302(1)(a)(ii)

² The referenced code section requires the establishment of system-specific sizing standards based on 3 years of daily source supply data. Daily source supply data from 2016-2018 was analyzed by DDW to establish a system-specific minimum sizing requirement. HWID then adopted its own sizing standard, which provides an additional safety factor. The District-adopted sizing standard is shown in Table 4.

³ UAC R309-105-9(2).

⁴ Reference: Utah State Code 11-36a-302(1)(a)(iii)

2. NON-DISTRIBUTION FACILITIES

Excess facility capacity for use by additional connections is shown in Table 14, below.

TABLE 14 CAPACITY DEMANDS AT E-LOS AND P-LOS

Capacity criteria	Total Capacity Provided	Current Number of ERCs	Capacity Demand per ERC at P-LOS	Total Capacity Demand for Current ERCs at P-LOS	Excess Capacity For Use by Add'l ERCs
Water Rights	6,617.30 AF/YR	6,338	0.40 AF/YR	2,535.20 AF/YR	4,082.10 AF/YR
Source Delivery (Treated)	4,819 GPM		0.56 GPM	3,549 GPM	1,270 GPM
Equalization Storage	4,330,000 GAL		400 GAL	2,535,200 GAL	1,794,800 GAL
Fire Suppression Storage	540,000 GAL		NA	540,000 GAL	NA
Total Storage	4,870,000 GPM		NA	3,075,200 GAL	NA

D. IDENTIFY DEMANDS PLACED UPON EXISTING PUBLIC FACILITIES BY NEW DEVELOPMENT ACTIVITY AT THE PROPOSED LEVEL OF SERVICE¹.

The District adopted an Annexation Policy on July 16, 2019 stating that:

"No area is to be annexed in the District unless the annexation is accompanied by the delivery to the District of sufficient water rights and water sources...for the District to provide culinary water service to the area to be annexed."²

Thus, facility demands in the categories of water rights and source delivery will be projected for areas that were inside the HWID boundary on July 16, 2019 (hereafter referred to as "District 1") and separately for areas that were outside the HWID boundary on July 16, 2019 (hereafter referred to as "District 2").

1. BUILDOUT SCENARIO

Referring to Table 5 and Table 6 on page 8, it is estimated that the maximum theoretical number of ERCs served by HWID is 25,629 (21,877 in District 1 and 3,752 in District 2) if all property is annexed and zoned as shown on Map B1 in Appendix B. There are 6,338 ERCs served by the District currently, as indicated in Table 2 on page 6. Thus, it is estimated that there may be up to 19,291 additional ERCs served by the District before buildout conditions are realized.

a. Distribution:

It is estimated that the 10" and larger pipelines have excess capacity in them, that they are at approximately 1/4 capacity and will be sufficient through buildout.

¹ Reference: Utah State Code 11-36a-302(1)(a)(iv)

² Hooper Water Improvement District, Resolution 19-07-01; attached as Exhibit A.8 in Appendix A.

b. Non-Distribution Facilities

Table 15, below, is given for reference only, to give an estimate of the magnitude of potential facility capacity demand at buildout.

TABLE 15 POTENTIAL FACILITY CAPACITY DEMANDS AT BUILDOUT AT P-LOS

Capacity Criteria	Total Capacity Demand for Current ERCs at P-LOS	Potential Add'l ERCs	Capacity Demand per ERC at P-LOS	Potential Add'l Demand	Potential Total Demand
WATER RIGHTS					
District 1	2,535.20 AF/YR	15,539	0.40 AF/YR	6,216 AF/YR	8,751 AF/YR
District 2	0.00 AF/YR	3,752		1,501 AF/YR	1,501 AF/YR
TOTAL	2,535.20 AF/YR	19,291		7,717 AF/YR	10,252 AF/YR
Source Delivery (Treated)					
District 1	3,549 GPM	15,539	0.56 GPM	8,702 GPM	12,251 GPM
District 2	0 GPM	3,752		2,101 GPM	2,101 GPM
TOTAL	3,549 GPM	19,291		10,803 GPM	14,352 GPM
Storage					
Equalization	2,535,200 GAL	19,291	400 GAL	7,716,400 GAL	10,251,600 GAL
Fire Suppression	540,000 GAL	NA	NA	0 GAL	540,000 GAL
TOTAL	3,075,200 GAL	19,291	NA	7,716,400 GAL	10,791,600 GAL

2. PLANNING HORIZON

The remainder of this document should regularly be compared against actual development and demand needs and adjusted accordingly.

It is assumed that growth within District 1 will occur at an average rate of 7% per year through 2025, 5% per year during 2026 through 2030, 3% per year during 2031 through 2039 and 2.2% through buildout.

There are 17 lots that have been annexed into District 2, awaiting completion of this current IFFP and associated Impact Fee Analysis before active connection to the HWID distribution system. Anecdotally, there are several other parcels of ground that will annex into District 2 relatively soon. Therefore, it is assumed that growth within District 2 will occur at an average rate of 100% per year in 2022 and 2023, 50% per year during 2024 and 2025, 25% in years 2026 through 2030, 10% per year during 2031 through 2039 and 6.3% through buildout.

Refer to Exhibits A.4 through A.7 for graphic representations of growth and the associated facility demands in Districts 1 and 2 within HWID during the planning horizon for this IFFP (2021-2030).

TABLE 16 PROJECTED GROWTH DURING PLANNING HORIZON (2021-2030)

Year	District 1: % Growth	District 1: Cumulative ERCs	District 2: % Growth	District 2: Cumulative ERCs
2020		6,338		0
2021	7%	6,782	0%	17
2022	7%	7,257	100%	34
2023	7%	7,765	100%	68
2024	7%	8,309	50%	102
2025	7%	8,891	50%	153
2026	5%	9,336	25%	191
2027	5%	9,803	25%	239
2028	5%	10,293	25%	299
2029	5%	10,808	25%	374
2030	5%	11,348	25%	468
10-Year Change	79%	5,010	Undefined	468

a. Distribution:

It is estimated that the 10" and larger pipelines have excess capacity in them, that they are at approximately 1/4 capacity and will be sufficient through the planning horizon.

b. Non-Distribution Facilities

Table 17, below, summarizes the anticipated total demand for the non-distribution facilities in the District at the end of the current planning horizon.

TABLE 17 PROJECTED FACILITY CAPACITY DEMANDS IN PLANNING HORIZON (2021-2030)

Capacity Criteria	Total Capacity Demand for Current ERCs at P-LOS	Projected Add'l ERCs	Capacity Demand per ERC at P-LOS	Projected Add'l Demand
Water Rights				
District 1	2,535.20 AF/YR	5,010	0.40 AF/YR	2,004 AF/YR
District 2	0.00 AF/YR	468		187 AF/YR
Source Delivery (Treated)				
District 1	3,549 GPM	5,010	0.56 GPM	2,806 GPM
District 2	0 GPM	468		262 GPM
Storage				
Equalization	2,535,200 GAL	5,478	400 GAL	2,191,200 GAL
Fire Suppression	540,000 GAL	NA	NA	0 GAL
Total	3,075,200 GAL	5,478	NA	2,191,200 GAL

E. IDENTIFY THE MEANS BY WHICH THE POLITICAL SUBDIVISION OR PRIVATE ENTITY WILL MEET THOSE GROWTH DEMANDS¹

The identified additional capacity demands may be met by a combination of “selling” the excess capacity identified in Table 14 on page 14 or by the acquisition of new capacity. Acquisition of new capacity would be through either purchase of existing facilities currently owned by a different entity or construction of new facilities.

1. BUILDOUT SCENARIO

a. Distribution:

Some of the existing pipelines need to be upsized or new lines installed to provide the flows and pressures identified in Table 11 on page 12 to existing users. The improvements needed at present are identified on Map B3 in Appendix B with a dashed line type. The cost of improvements needed at present must not be paid for by new connections and *are not* eligible for payment through the collection of impact fees.

In addition to the improvements needed at present, new 10” and larger pipes² have been identified that will maintain required flows and pressures as growth occurs within the system³. The costs associated with installing larger-diameter pipes necessitated by growth *are* eligible for payment through the collection of impact fees.

¹ Reference: Utah State Code 11-36a-302(1)(a)(v)

² The District’s policy is that all main lines will be a minimum 8” diameter and that developers will be responsible to install 8” pipes. Thus, only 10” and larger pipes are included as impact-fee-eligible projects.

³ The identified improvements are calculated to make flows available throughout the District. Each development will be assessed to determine if project-specific pipeline improvements larger than 8” will be needed to access the capacity made available through the impact-fee-eligible pipelines.

Pipeline projects anticipated for construction are shown on Map B3 in Appendix B. Those pipeline projects recommended for construction in the current Planning Horizon are detailed on Table 19 on page 20. Each identified project through buildout is described given a present-day cost estimate in Appendix A.9.

b. Non-Distribution Facilities

The need for additional non-distribution facilities in the planning horizon is identified below.

TABLE 18 ADDITIONAL FACILITIES NEEDED TO MEET DEMANDS IN PLANNING HORIZON (2021-2030)

Capacity Criteria	Projected Add'l Demand During Planning Horizon ¹	Excess Capacity For Use by Add'l Connections ²	Excess Capacity at end of Planning Horizon	Add'l Capacity Needed in Planning Horizon
Water Rights				
District 1	2,004.00 AF/YR	4,082.10 AF/YR	2,078.10 AF/YR	NA
District 2	187.00 AF/YR	0	-187.00 AF/YR	187 AF/YR
Source Delivery (Treated)				
District 1	2,806 GPM	1,270 GPM	-1,536.00 GPM	1,536 GPM
District 2	262 GPM	0	-262.00 GPM	262 GPM
Storage				
Equalization	2,191,200 GAL	1,794,800	-396,400 GAL	396,400 GAL
Fire Suppression	0 GAL	NA	NA	0 GAL
Total	2,191,200 GAL	1,794,800	-396,400 GAL	396,400 GAL

Water Rights and Source Delivery, District 2

District 2 is required to bring their own water rights and source delivery capacity. The District has entered into an agreement with WBWCD for the purchase of both rights and source that District 2 landowners may utilize to satisfy that requirement. The District's agreement with WBWCD allows the HWID to collect impact fees (currently \$3,878 per 0.40 AF) from developers³ and forward those impact fees to WBWCD in exchange for the right to divert water from the District's wholesale connection near the 4000 South tank on a pay-for-use basis.

Water Rights and Source Delivery, District 1

Only the water rights and source delivery demands of District 1 need further consideration. As shown in the table above, it is projected that no additional water rights and an additional 1,658 GPM of treated source delivery capacity will be needed by the end of the planning horizon.

¹ From Table 14 on page 14.

² From Table 14 on page 14.

³ District 2 developers and eventually, District 1 developers after the current pool of District 1 water rights is fully utilized.

HWID's Well #3 has been maintained on standby status for the last 20 years due to low-aesthetic quality water...water quality that is very similar to the raw water produced at Well #2. Well #2 is successfully treated and it is expected that Well #3 could be similarly treated and put into active service to meet the projected District 1 source delivery demands.

As shown on Exhibit A.6 in Appendix A, it is projected that an additional source of treated water will be needed in the year 2025. It is proposed that the Well #3 treatment project be initiated in 2023 with an anticipated in-service date of 2025. The project will consist of a treatment pilot study, well cleaning and maintenance, the construction of a ground-level storage tank for disinfection contact time, yard piping and construction of a new well house, to include a chlorine generator, filter vessels, booster pumps and a backup power generator. Refer to Table 19 on page 20 for cost estimates.

Storage

The demand for storage facility capacity for both District 1 and District 2 is considered as a combined need that HWID will plan for. As shown in Table 18 on the previous page, it is projected that 484,000 gallons of additional storage will be needed before the end of the planning horizon. It is proposed that the ground-level storage tank associated with Well #3 be sized large enough to provide adequate disinfection contact time, as well as meet system storage demands. An initial, conceptual review of the Well #3 property indicates that a 1 MG tank could be constructed on site. Refer to Table 19 beginning on page 20 for project cost estimates. Unit cost estimates are developed and shown on Exhibit A.1 in Appendix A.

TABLE 19 HWID 10-YEAR IMPROVEMENT PLAN - 2021-2030 DRAFT

2021 IFFP Project Number	Estimated Project Year	2014 IFFP Project Number for reference	Project Description	Quantity	Estimated Unit Cost	Estimated Project Cost	Impact Fee Eligible Project Cost	Estimated Fee-Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
24	2022		Property Acquisition for New Well: Cold Springs	1 EA	\$500,000	\$500,000	100%	\$500,000	\$0
56	2025		Property Acquisition for New Well: 7100 W	1 EA	\$500,000	\$500,000	100%	\$500,000	\$0
20	2023-2025	32	New wellhouse at Well #3 w backup power, booster pumps and treatment	1,500 GPM	\$2,837	\$4,255,000	100%	\$4,255,000	\$0
Subtotal: Source						\$5,255,000		\$5,255,000	\$0
M1	2022	M1	Tank Maintenance, 4000 S: full blast, recoat, safety	1 EA	\$720,000	\$720,000	0%	\$0	\$720,000
M2	2023	M2	Tank Maintenance, North 2MG tank: full blast, recoat, safety	1 EA	\$610,000	\$610,000	0%	\$0	\$610,000
M3	2023		Tank Maintenance, South 2MG tank: clean and inspect, not IF eligible, plan in annual budget	1 EA	\$20,000	\$20,000	0%	\$0	\$20,000
M4	2023		Tank Maintenance, Well #1 tank: clean and inspect, not IF eligible, plan in annual budget	1 EA	\$10,000	\$10,000	0%	\$0	\$10,000
21	2024	32.1	Ground Level Tank at Well #3	1,000,000 GAL	\$2.57	\$2,570,000	100%	\$2,570,000	\$0
Subtotal: Storage						\$3,930,000		\$2,570,000	\$1,360,000
53	2021	64	10 In. Pipe, 5100 S, 6700 W to 7100 W	2,650 LF	\$239	\$633,350	100%	\$633,350	\$0
54	2021	65	10 In. Pipe, 7100 W, 5100 S to ~5400 S, back out 8 In. cost needed at present	2,000 LF	\$239	\$478,000	37%	\$176,860	\$301,140
63	2021	68	10 In. Pipe, 5100 S, 7100 W to 7300 W	1,300 LF	\$239	\$310,700	100%	\$310,700	\$0
64	2021	68	10 In. Pipe, 5100 S, 7300 W to 7500 W, backout cost of 8 in. needed at present	1,450 LF	\$239	\$346,550	37%	\$128,224	\$218,326
M7	2021		12 in. and 8 In. Pipe, 4700 W, 4550 S to 4150 S, part of West Haven Road Project	1,300 LF	\$181	\$235,300	0%	\$0	\$235,300

2021 IFPP Project Number	Estimated Project Year	2014 IFPP Project Number for reference	Project Description	Quantity	Estimated Unit Cost	Estimated Project Cost	Impact Fee Eligible	Estimated Impact Fee- Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
15	2022		Abandon 6 in. pipe: 5500 W, 4200 S to 4000 S and west to tie-over to 12", w/ Hooper City Road Project	1,850 LF	\$15	\$27,750	0%	\$0	\$27,750
39	2022	25	12 in. Pipe, 5500 W, 4600 S to 4200 S	2,750 LF	\$251	\$690,250	100%	\$690,250	\$0
35	2022	33	12 in. Pipe, 4500 W, 1300 N to 1800 N	2,750 LF	\$251	\$690,250	100%	\$690,250	\$0
40	2022	25a	12 in. Pipe, 4200 S, 5900 W to 5500 W	2,750 LF	\$251	\$690,250	100%	\$690,250	\$0
28	2022		12 in. Pipe, 4290 W, 920 S to 700 S	1,200 LF	\$251	\$301,200	100%	\$301,200	\$0
55	2022		10 in. Pipe, 7100 W, 5500 S to 5900 S, backout cost of 8" needed at present	2,750 LF	\$239	\$657,250	37%	\$243,183	\$414,067
43	2023	44	8 in. Pipe, 5800 S, 5900 W to 6300 W and 6000 W, 5700 S to 5800 S	3,350 LF	\$223	\$747,050	0%	\$0	\$747,050
22	2024	32.3	16 in. Pipe, Well #3 to 1800 N tie-in	300 LF	\$298	\$89,400	100%	\$89,400	\$0
19	2025		12 in. Pipe, 1800 N, Well #3 east to 12"	500 LF	\$251	\$125,500	100%	\$125,500	\$0
33	2026	34	12 in. Pipe, 4500 W, 1300 N to 800 N	2,650 LF	\$251	\$665,150	100%	\$665,150	\$0
32	2027	36	12 in. Pipe, 4500 W, 300 N to 800 N	2,600 LF	\$251	\$652,600	100%	\$652,600	\$0
47	2026	49	10 in. Pipe, 5000 W, 1800 N to ~1200 N	3,200 LF	\$239	\$764,800	100%	\$764,800	\$0
48	2026	50	10 in. Pipe, 5000 W, ~1100 N to 800 N	1,850 LF	\$239	\$442,150	100%	\$442,150	\$0
49	2027	52	12 in. Pipe, 5000 W, 800 N to 300 N	2,650 LF	\$251	\$665,150	100%	\$665,150	\$0
9	2028	9	8 in. Pipe, 5600 S, 3500 W to 3450 W to replace existing 2"	450 LF	\$223	\$100,350	0%	\$0	\$100,350
60	2028	66	10 in. Pipe, 7100 W, 5900 S (Weber Co.) to 2425 N (Davis Co), backout cost of 8" needed at present	2,700 LF	\$239	\$645,300	37%	\$238,761	\$406,539
61	2028		10 in. Pipe, 2425 N, 6500 W to 6000 W	2,700 LF	\$239	\$645,300		\$0	\$645,300
44	2029	56	10 in. Pipe, 5500 W, 5900 S (Weber Co.) to 2425 N (Davis Co)	2,700 LF	\$239	\$645,300	100%	\$645,300	\$0
45	2029	58	10 in. Pipe, 5500 W, 2425 N to 1925 N	2,750 LF	\$239	\$657,250	100%	\$657,250	\$0

2021 IFFP Project Number	Estimated Project Year	2014 IFFP Project Number for reference	Project Description	Quantity	Estimated Unit Cost	Estimated Project Cost	Impact Fee Eligible	Estimated Impact Fee-Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
34	2030	48	12 In. Pipe, 1300 N. 5000 W to 4500 W	2,700 LF	\$251	\$677,700	100%	\$677,700	\$0
46	2030	59	10 In. Pipe, 1925 N. 5000 W to 5500 W, back out 8 In. cost needed at present	2,450 LF	\$239	\$585,550	100%	\$585,550	\$0
Subtotal: Distribution						\$13,169,400		\$10,073,578	\$3,095,822
2021-2030 Estimated Project Costs						\$22,354,400		\$17,898,578	\$4,455,822

-----End of IFFP-----

Appendix A

EXHIBITS

- A.1 Construction Cost Estimates
- A.2 Weber Fire District Flow and Duration Requirements
- A.3 International Fire Code Table B105.1(1)
- A.4 Estimated Growth
- A.5 Estimated Water Rights Demand
- A.6 Estimated Source Delivery Demand
- A.7 Estimated Storage Demand
- A.8 Annexation Policy July 16, 2019
- A.9 Project Planning List Through Buildout

Hooper Water Improvement District
Culinary Water Capital Facilities and Impact Fee Facilities Plan 2021

Construction Cost Estimates

Description	Quantity	Quantity per foot of pipe	unit price	unit	Total Cost per foot of pipe
8" C-900 PVC DR18	1	1	\$12	lf	\$12
8" Gate Valves	2 per 500 ft	0.004	\$1,725	ea	\$7
Fire Hydrant Assembly	1 per 500 ft	0.002	\$6,015	ea	\$12
Connections	1 per 500 ft	0.002	\$3,574	ea	\$7
Pipe Bedding sand		0.708	\$15	ton	\$10
Granular fill		0.788	\$16	ton	\$12
Asphalt Patch		0.400	\$147	ton	\$59
Mill and fill		0.081	\$147	ton	\$12
Crossings and Loops	1 per 750 ft	0.001	\$4,989	ea	\$7
Test and Chlorinate	1 per project (1200 ft)	0.001	\$1,250	ea	\$1
Signage and Flagging	1 per project (1200 ft)	0.001	\$27,592	ea	\$23
Service Connections	1 per 200 ft	0.005	\$1,900	ea	\$10
Construction Subtotal					\$171
Contingency 20% of construction subtotal					\$34
Engineering and Construction Management 10% of construction subtotal					\$17
Cost of pipe items, \$/ft = sum of red text:	\$78				\$223
Half of other costs, \$/ft = (sum of blue items)*0.5:	\$73				

Description	Quantity	Quantity per foot of pipe	unit price	unit	Total Cost per foot of pipe
10" C-900 PVC	1	1	\$17	lf	\$17
10" Gate Valves	2 per 500 ft	0.004	\$2,713	ea	\$11
Fire Hydrant Assembly	1 per 500 ft	0.002	\$6,249	ea	\$12
Connections	1 per 500 ft	0.002	\$4,074	ea	\$8
Pipe Bedding sand		0.751	\$15	ton	\$11
Granular fill		0.788	\$16	ton	\$12
Asphalt Patch		0.400	\$147	ton	\$59
Mill and fill		0.081	\$147	ton	\$12
Crossings and Loops	1 per 750 ft	0.001	\$4,989	ea	\$7
Test and Chlorinate	1 per project (1200 ft)	0.000833	\$1,500	ea	\$1
Signage and Flagging	1 per project (1200 ft)	0.000833	\$27,592	ea	\$23
Service Connections	1 per 200 ft	0.005	\$2,000	ea	\$10
Construction Subtotal					\$184
Contingency 20% of construction subtotal					\$37
Engineering and Construction Management 10% of construction subtotal					\$18
When 8-inch is needed at present, subtract 8-inch pipe cost, \$78 and one half of other project costs, \$73.					\$239
Resulting IFFP cost for 10" line when 8" line is needed at present, as % of 10" total cost and in \$:				37%	\$89

Description	Quantity	Quantity per foot of pipe	unit price	unit	Total Cost per foot of pipe
12" C-900 PVC	1	1	\$24	lf	\$24
12" Butterfly Valves	2 per 500 ft	0.004	\$2,710	ea	\$11
Fire Hydrant Assembly	1 per 500 ft	0.002	\$6,060	ea	\$12
Connections	1 per 500 ft	0.002	\$4,574	ea	\$9
Pipe Bedding sand		0.791	\$15	ton	\$12
Granular fill		0.788	\$16	ton	\$12
Asphalt Patch		0.400	\$147	ton	\$59
Mill and fill		0.081	\$147	ton	\$12
Crossings and Loops	1 per 750 ft	0.001	\$4,989	ea	\$7
Test and Chlorinate	1 per project (1200 ft)	0.000833	\$1,750	ea	\$1
Signage and Flagging	1 per project (1200 ft)	0.000833	\$27,592	ea	\$23
Service Connections	1 per 200 ft	0.005	\$2,100	ea	\$11
Construction Subtotal					\$193
Contingency 20% of construction subtotal					\$39
Engineering and Construction Management 10% of construction subtotal					\$19
When 8-inch is needed at present, subtract 8-inch pipe cost, \$78 and one half of other project costs, \$73.					\$251
Resulting IFFP cost for 10" line when 8" line is needed at present, as % of 10" total cost and in \$:				40%	\$101

Hooper Water Improvement District
Culinary Water Capital Facilities and Impact Fee Facilities Plan 2021

Construction Cost Estimates

Description	Quantity	Quantity per foot of pipe	unit price	unit	Total Cost per foot of pipe
14" C-900 PVC	1	1	\$31	lf	\$31
14" Butterfly Valves	2 per 500 ft	0.004	\$4,550	ea	\$18
Fire Hydrant Assembly	1 per 500 ft	0.002	\$6,913	ea	\$14
Connections	1 per 500 ft	0.002	\$4,874	ea	\$10
Pipe Bedding sand		0.791	\$15	ton	\$12
Granular fill		0.788	\$16	ton	\$12
Asphalt Patch		0.400	\$147	ton	\$59
Mill and fill		0.081	\$147	ton	\$12
Crossings and Loops	1 per 750 ft	0.001	\$4,989	ea	\$7
Test and Chlorinate	1 per project (1200 ft)	0.000833	\$2,000	ea	\$2
Signage and Flagging	1 per project (1200 ft)	0.000833	\$27,592	ea	\$23
Service Connections	1 per 200 ft	0.005	\$2,200	ea	\$11
Construction Subtotal					\$210
Contingency 20% of construction subtotal					\$42
Engineering and Construction Management 10% of construction subtotal					\$21
					\$273

Description	Quantity	Quantity per foot of pipe	unit price	unit	Total Cost per foot of pipe
16" C-900 PVC	1	1	\$44	lf	\$44
16" Butterfly Valves	2 per 500 ft	0.004	\$5,343	ea	\$21
Fire Hydrant Assembly	1 per 500 ft	0.002	\$7,392	ea	\$15
Connections	1 per 500 ft	0.002	\$5,174	ea	\$10
Pipe Bedding sand		0.862	\$15	ton	\$13
Granular fill		0.788	\$16	ton	\$12
Asphalt Patch		0.400	\$147	ton	\$59
Mill and fill		0.081	\$147	ton	\$12
Crossings and Loops	1 per 750 ft	0.001	\$4,989	ea	\$7
Test and Chlorinate	1 per project (1200 ft)	0.000833	\$2,250	ea	\$2
Signage and Flagging	1 per project (1200 ft)	0.000833	\$27,592	ea	\$23
Service Connections	1 per 200 ft	0.005	\$2,300	ea	\$12
Construction Subtotal					\$229
Contingency 20% of construction subtotal					\$46
Engineering and Construction Management 10% of construction subtotal					\$23
					\$298

Description (UTA trail corridor)	Quantity	Quantity per foot of pipe	unit price	unit	Total Cost per foot of pipe
20" DIPS DR21 PE 4710	1	1	\$108	lf	\$108
20" Butterfly Valves with adapters	2 per 500 ft	0.004	\$11,250	ea	\$45
Connections	1 per 500 ft	0.002	\$15,000	ea	\$30
Pipe Bedding sand		1.563	\$15	ton	\$23
Granular fill		1.800	\$16	ton	\$28
UTA Fees	1 per project (1300 ft)	0.001	\$15,000	ea	\$12
Crossings and Loops	1 per 750 ft	0.001	\$12,000	ea	\$16
Test and Chlorinate	1 per project (1300 ft)	0.001	\$5,000	ea	\$4
Construction Subtotal					\$265
Contingency 20% of construction subtotal					\$53
Engineering and Construction Management 10% of construction subtotal					\$27
					\$345

Hooper Water Improvement District
Culinary Water Capital Facilities and Impact Fee Facilities Plan 2021

Construction Cost Estimates

Source Capacity

Well: Based on TWWWID 900 S well construction costs, ca 2016 for 600' x 18" finished casing	\$750,000
PER and DWSPP and engineering for well and well house	\$130,000
Well total:	\$880,000
PER and DWSPP and engineering for well and well house	\$130,000
Booster: Based on Well #1 booster station ca 2017; pumps, HVAC, Electrical, Meter vault, 50% building	\$375,000
Treatment: Based on Well #2 filter project, including pilot study and engineering, backup generator, CL2 generator	\$3,000,000

Storage Capacity

Tank - Well #1 ca 2017	0.11 MG	\$3.81
Tank - TWWWID ca 2015	3.00 MG	\$1.57
Tank - Pole Patch ca 2014	0.11 MG	\$1.69
Tank - Cobble Creek ca 2009	0.01 MG	\$4.35
Tank - Liberty Pipeline ca 2006	0.50 MG	\$1.35
Tank - West Point ca 2005	1.00 MG	\$0.63
Tank Average Cost Estimate with 15% increase for contingency		\$2.57



2023 W. 1300 N.
Farr West, UT 84404
(801) 782-3580
Fax (801) 782-3582

Board of Trustees

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April 2, 2020

To: Hooper Water Improvement District

RE: Fire Flow Requirements

After surveying the area served by Hooper Water Improvement District, I believe our highest demand building for fire flow would require 3000 GPM for 3 hours or a total fire flow of 540,000 gallons.

Sincerely,

David Reed
Deputy Chief/Fire Marshal
Weber Fire District

Chief, Paul Sullivan - Deputy Chief, Britt Clark - Fire Marshal, David Reed

APPENDIX B FIRE-FLOW REQUIREMENTS FOR BUILDINGS

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0-3,600	Section 903.3.1.3 of the International Fire Code or Section P2904 of the International Residential Code	500	1/2
3,601 and greater	Section 903.3.1.3 of the International Fire Code or Section P2904 of the International Residential Code	1/2 value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m.

GE note: Use this for a standard flow rate and duration for residences

APPENDIX B FIRE-FLOW REQUIREMENTS FOR BUILDINGS

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701- 30,200	12,701- 17,000	8,201-10,900	5,901-7,900	3,601- 4,800	1,750	
30,201- 38,700	17,001- 21,800			4,801- 6,200	2,000	
38,701- 48,300	21,801- 24,200	12,901- 17,400	9,801-12,600	6,201- 7,700	2,250	
48,301- 59,000	24,201- 33,200	17,401- 21,300		7,701- 9,400	2,500	
59,001- 70,900	33,201- 39,700	21,301- 25,500	15,401- 18,400	9,401- 11,300	2,750	3
70,901- 83,700	39,701- 47,100	25,501- 30,100	18,401- 21,800	11,301- 13,400	3,000	
83,701- 97,700	47,101- 54,900	30,101- 35,200	21,801- 25,900	13,401- 15,600	3,250	
97,701- 112,700	54,901- 63,400	35,201- 40,600	25,901- 29,300	15,601- 18,000	3,500	
112,701- 128,700	63,401- 72,400	40,601- 46,400	29,301- 33,500	18,001- 20,600	3,750	
128,701- 145,900	72,401- 82,100	46,401- 52,500	33,501- 37,900	20,601- 23,300	4,000	4
145,901- 164,200	82,101- 92,400	52,501- 59,100	37,901- 42,700	23,301- 26,300	4,250	
164,201- 183,400	92,401- 103,100	59,101- 66,000	42,701- 47,700	26,301- 29,300	4,500	
183,401- 203,700	103,101- 114,600	66,001- 73,300	47,701- 53,000	29,301- 32,600	4,750	
203,701- 225,200	114,601- 126,700	73,301- 81,100	53,001- 58,600	32,601- 36,000	5,000	
225,201- 247,700	126,701- 139,400	81,101- 89,200	58,601- 65,400	36,001- 39,600	5,250	
247,701- 271,200	139,401- 152,600	89,201- 97,700	65,401- 70,600	39,601- 43,400	5,500	
271,201- 295,900	152,601- 166,500	97,701- 106,500	70,601- 77,000	43,401- 47,400	5,750	
295,901- Greater	166,501- Greater	106,501- 115,800	77,001- 83,700	47,401- 51,500	6,000	
—	—	115,801- 125,500	83,701- 90,600	51,501- 55,700	6,250	
—	—	125,501- 135,500	90,601- 97,900	55,701- 60,200	6,500	
—	—	135,501- 145,800	97,901- 106,800	60,201- 64,800	6,750	
—	—	145,801- 156,700	106,801- 113,200	64,801- 69,600	7,000	
—	—	156,701- 167,900	113,201- 121,300	69,601- 74,600	7,250	
—	—	167,901- 179,400	121,301- 129,600	74,601- 79,800	7,500	

Weber Fire District
requires 3,000
GPM for 3 hours
= 540,000 gallons

North Davis Fire
District requires
50% of 4,250
GPM for 4 hours
= 510,000 gallons

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—	—	179,401- 191,400	129,601- 138,300	79,801- 85,100	7,750
—	—	191,401- Greater	138,301- Greater	85,101- Greater	8,000

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

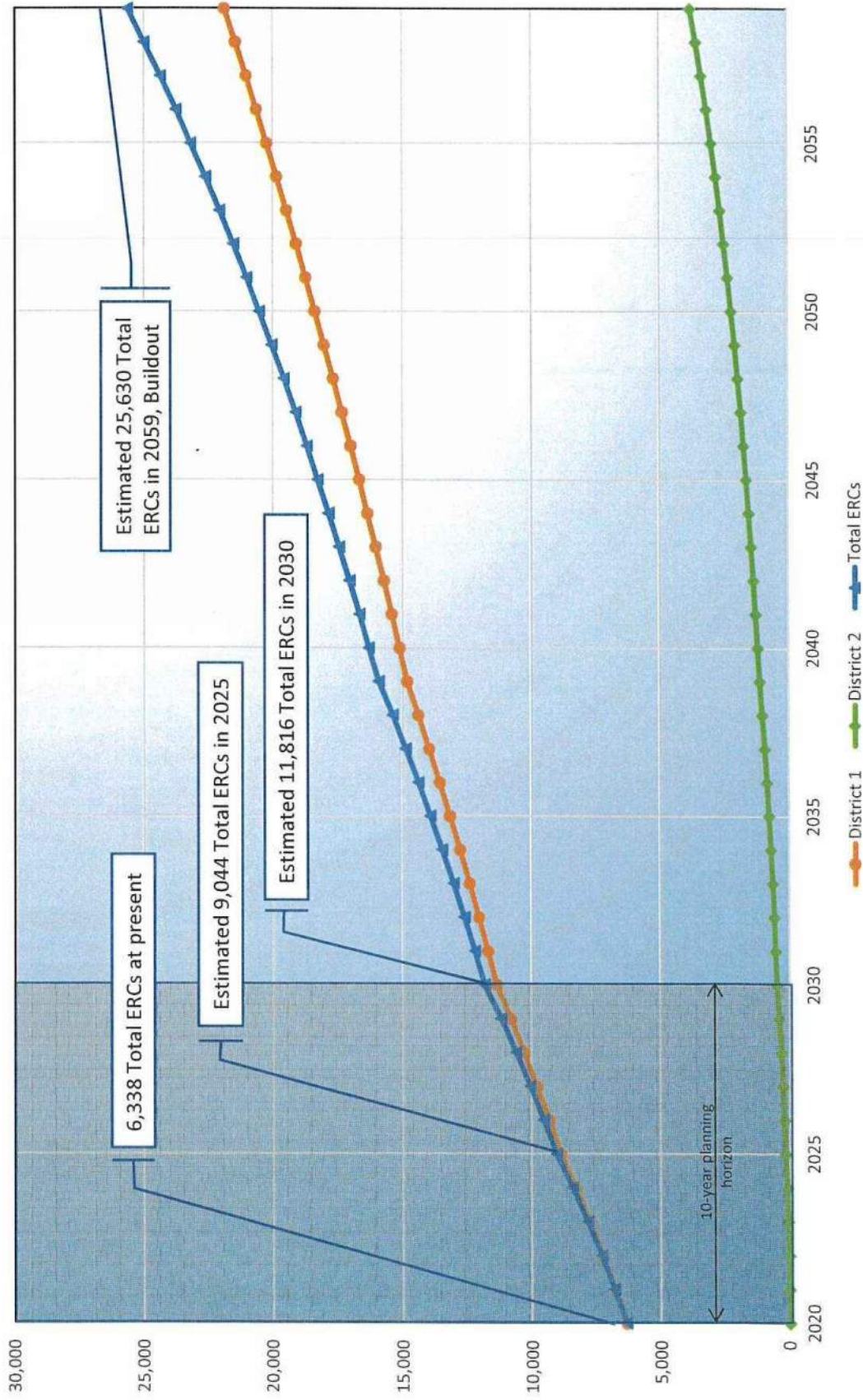
- a. Types of construction are based on the *International Building Code*.
- b. Measured at 20 psi residual pressure.

Hooper Water Improvement District

2021 Capital Facilities Plan and Impact Fee Facilities Plan

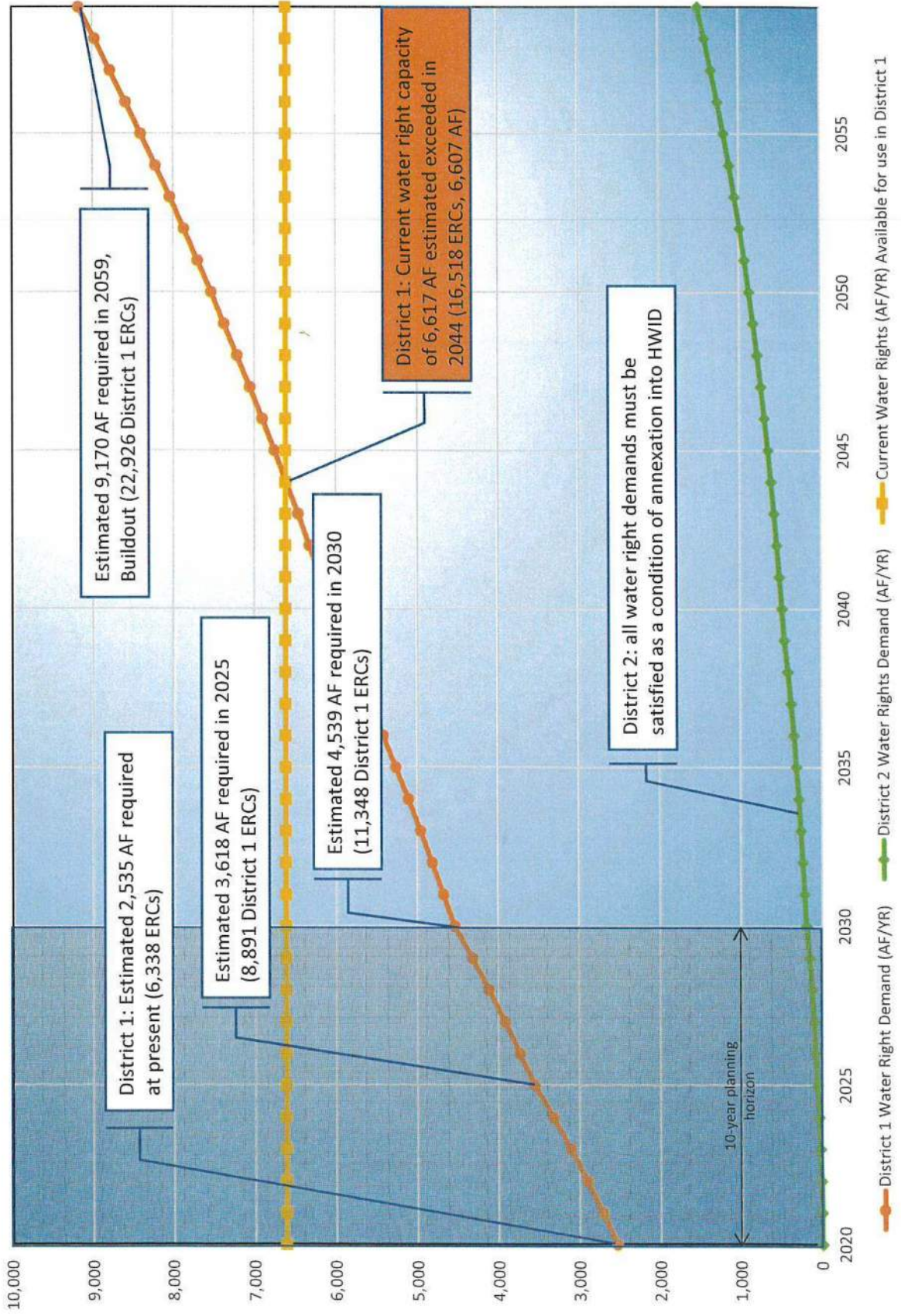
Estimated Growth

District 1: 7% / year through 2025; 5% / year 2026 thru 2030; 3% per year thereafter
 District 2: 100% in 2021 and 2022; 50% / year in 2024 and 2025; 25% / year in 2026 through 2030; 10% / year in 2032 through 2039 and 6.3 % / year thereafter



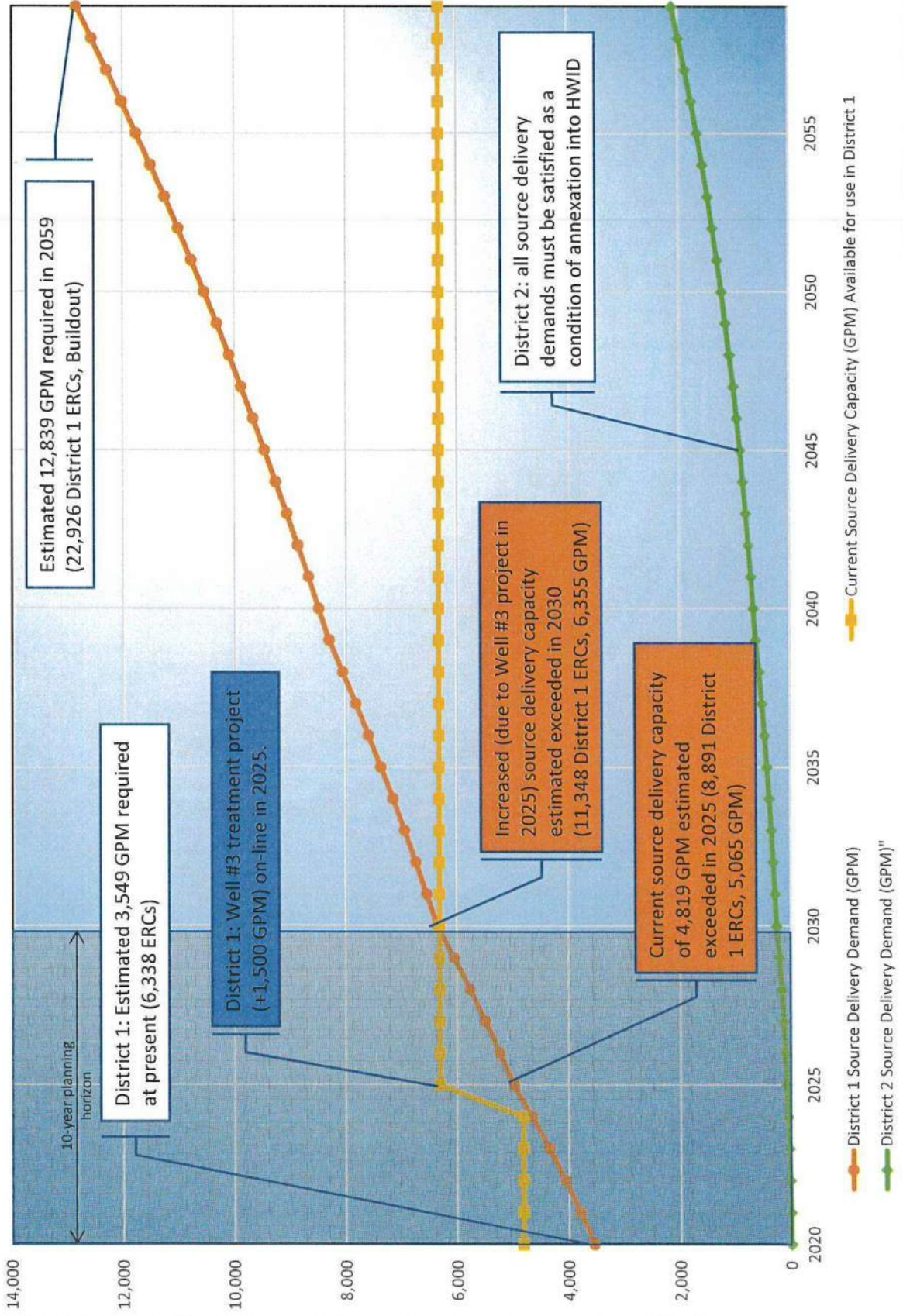
Hooper Water Improvement District 2021 Capital Facilities Plan and Impact Fee Facilities Plan

Estimated Water Rights Demand



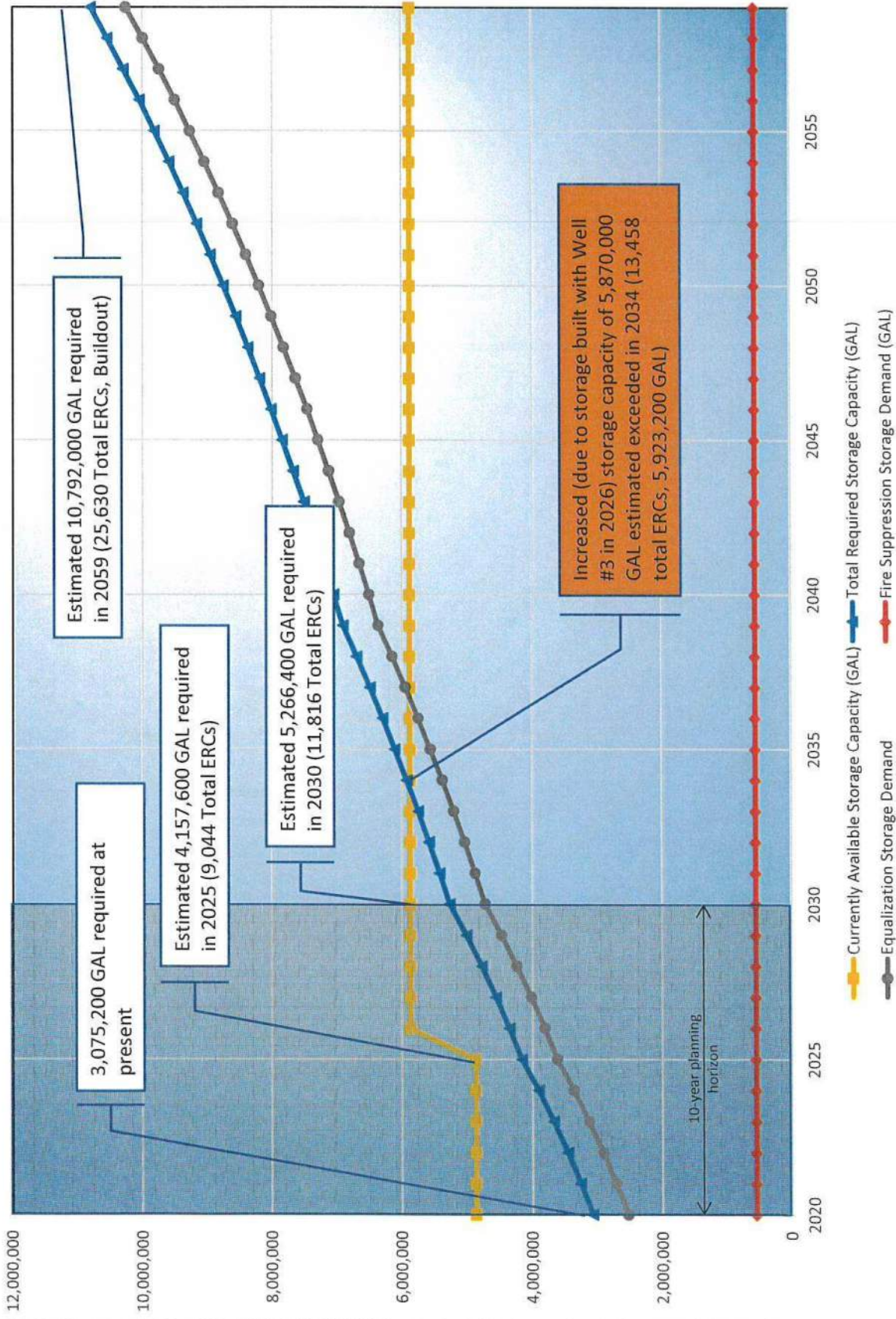
Hooper Water Improvement District 2021 Capital Facilities Plan and Impact Fee Facilities Plan

Estimated Source Delivery Demand



Hooper Water Improvement District 2021 Capital Facilities Plan and Impact Fee Facilities Plan

Estimated Storage Demand



HOOPER WATER IMPROVEMENT DISTRICT

RESOLUTION 19-07-01

ADOPTING
ANNEXATION POLICY

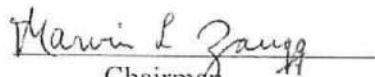
WHEREAS, the Hooper Water Improvement District (the "District") has concluded that the District does not currently have adequate water rights and/or water sources to serve, at build out, more than the service area lying within the District's current boundary; and

WHEREAS, the District therefore desires to adopt the Annexation Policy attached hereto as Exhibit "A", to set forth reasonable annexation requirements that will enable the District to serve new areas that are not currently part of the District while protecting the legitimate interests of owners of real property or residents already within the District;

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the Hooper Water Improvement District, as follows:

1. That the District adopt the Annexation Policy attached as Exhibit "A."
2. That any prior Policies relating to the same subject or other enactment of the District in conflict with the above paragraph be and hereby is repealed.
3. That this Resolution shall take effect immediately upon its passage, with the new Annexation Policy stated in paragraph 1 to be effective immediately.

Approved and adopted by the Board of Trustees of the Hooper Water Improvement District this 16th day of July, 2019.


Chairman

ATTEST:


Clerk

Exhibit "A"
Copy of Annexation Policy

**HOOPER WATER IMPROVEMENT DISTRICT
ANNEXATION POLICY**

PURPOSE: The Board of Trustees, (the "Board") of the Hooper Water Improvement District (the "District") having concluded that the District does not currently have adequate water rights and/or water sources to serve, at build out, more than the service area lying within the District's current boundary, the purpose of this Annexation Policy (the "Policy") is to protect the owners of real property or residents already within the local district by requiring new areas annexing into the District, as a condition of annexation approval, to enter into a Development Agreement pursuant to which the developer will provide to the District water rights and/or water sources as deemed necessary by the District to serve the area being annexed.

GOAL: The goal is to set forth reasonable annexation requirements that will enable the District to serve new areas that are not currently part of the District while protecting the legitimate interests of owners of real property or residents already within the District.

1. **FINDINGS:**

- 1.1 Culinary Water Service: The District provides culinary water service to customers within its boundary, which boundary may be referred to as the District's "service area".
- 1.2 Sufficiency of Water Supplies: Having examined the water rights and water sources of the District, the Board has found and determined that the District's water rights and water sources are not sufficient to serve areas not currently included in the District because those water rights and water sources will be required to serve the current District service area at or before ultimate build-out.
- 1.3 Equitable Considerations: It would be inequitable to the owners of real property or residents already within the District for the Board to annex additional areas into the District unless the owners of those areas deliver to the District sufficient water rights and water sources for the District to serve the area being annexed.

2. **POLICY:**

- 2.1 Delivery of Water: No area is to be annexed into the District unless the annexation is accompanied by the delivery to the District of sufficient water rights and water sources, in the District's judgment, for the District to provide culinary water service to the area to be annexed. Delivery of such water rights and/or water sources by the landowner, developer or other interested person will be in addition to the payment of the District's ordinary and customary impact fees and other established fees and charges.
- 2.2 Development Agreements: The requirements for an area to be annexed into the District will be as set forth in a Development Agreement executed by the District and the landowner or other interested person deemed competent and reliable by the District. The Development Agreement will contain such terms and conditions as may be negotiated by the District and the other contracting party or parties.

and conditions as may be negotiated by the District and the other contracting party or parties.

- 2.3 No Moratorium: While the District is not declaring a moratorium on new annexations, no new annexations will be approved by the Board unless the annexation complies with the requirements of this Policy. Nothing in this Policy binds, or shall be deemed to bind, the Board to approve any particular annexation.

This Policy was adopted and approved by the Board of Trustees of the Hooper Water Improvement District on the 16th day of July, 2019.


Chairman

ATTEST:


Clerk

Hooper Water Improvement District
Culinary Water Capital Facilities and Impact Fee Facilities Plan 2021

2021 Project Number	Estimated Project Year	2014 Project Number	Project Description	Quantity	Estimated Unit Cost	Estimated Project Cost	% Impact Fee Eligible	Estimated Impact Fee-Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
24	2022		Property Acquisition for New Well: Cold Springs	1 EA	\$500,000	\$500,000	100%	\$500,000	\$0
56	2025		Property Acquisition for New Well: 7100 W	1 EA	\$500,000	\$500,000	100%	\$500,000	\$0
20	2023-2025	32	New wellhouse at Well #3 w backup power, booster pumps and treatment	1,500 GPM	\$2,837	\$4,255,000	100%	\$4,255,000	\$0
Subtotal: Source						\$5,255,000		\$5,255,000	\$0
M1	2022	M1	Tank Maintenance, 4000 S: full blast, recoat, safety	1 EA	\$720,000	\$720,000	0%	\$0	\$720,000
M2	2023	M2	Tank Maintenance, North 2MG tank: full blast, recoat, safety	1 EA	\$610,000	\$610,000	0%	\$0	\$610,000
M3	2023		Tank Maintenance, South 2MG tank: clean and inspect, not IF eligible, plan in annual budget	1 EA	\$20,000	\$20,000	0%	\$0	\$20,000
M4	2023		Tank Maintenance, Well #1 tank: clean and inspect, not IF eligible, plan in annual budget	1 EA	\$10,000	\$10,000	0%	\$0	\$10,000
21	2024	32.1	Ground Level Tank at Well #3	1,000,000 GAL	\$2.57	\$2,569,368	100%	\$2,569,368	\$0
Subtotal: Storage						\$3,929,368		\$2,569,368	\$1,360,000
53	2021	64	10 In. Pipe, 5100 S, 6700 W to 7100 W	2,650 LF	\$239	\$633,625	100%	\$633,625	\$0
54	2021	65	10 In. Pipe, 7100 W, 5100 S to ~5400 S, back out 8 In. cost needed at present	2,000 LF	\$239	\$478,207	37%	\$177,592	\$300,616
63	2021	68	10 In. Pipe, 5100 S, 7100 W to 7300 W	1,300 LF	\$239	\$310,835	100%	\$310,835	\$0
64	2021	68	10 In. Pipe, 5100 S, 7300 W to 7500 W, backout cost of 8 In. needed at present	1,450 LF	\$239	\$346,700	37%	\$128,754	\$217,946
M7	2021		12 in. and 8 In. Pipe, 4700 W, 4550 S to 4150 S, part of West Haven Road Project	1,300 LF	\$181	\$235,300	0%	\$0	\$235,300
15	2022		Abandon 6 In. pipe, 5500 W, 4200 S to 4000 S and west to tie-over to 12", w/ Hooper City Road Project	1,850 LF	\$15	\$27,750	0%	\$0	\$27,750
39	2022	25	12 In. Pipe, 5500 W, 4600 S to 4200 S	2,750 LF	\$251	\$689,883	100%	\$689,883	\$0
35	2022	33	12 In. Pipe, 4500 W, 1300 N to 1800 N	2,750 LF	\$251	\$689,883	100%	\$689,883	\$0
40	2022	25a	12 In. Pipe, 4200 S, 5900 W to 5500 W	2,750 LF	\$251	\$689,883	100%	\$689,883	\$0
28	2022		12 In. Pipe, 4290 W, 920 S to 700 S	1,200 LF	\$251	\$301,040	100%	\$301,040	\$0
55	2022		10 In. Pipe, 7100 W, 5500 S to 5900 S, backout cost of 8" needed at present	2,750 LF	\$239	\$657,535	37%	\$244,188	\$413,347
43	2023	44	8 In. Pipe, 5800 S, 5900 W to 6300 W and 6000 W, 5700 S to 5800 S	3,350 LF	\$223	\$746,508	0%	\$0	\$746,508
22	2024	32.3	16 In. Pipe, Well #3 to 1800 N tie-in	300 LF	\$298	\$89,383	100%	\$89,383	\$0
19	2025		12 In. Pipe, 1800 N, Well #3 east to 12"	500 LF	\$251	\$125,433	100%	\$125,433	\$0
33	2026	34	12 In. Pipe, 4500 W, 1300 N to 800 N	2,650 LF	\$251	\$664,797	100%	\$664,797	\$0
32	2027	36	12 In. Pipe, 4500 W, 300 N to 800 N	2,600 LF	\$251	\$652,253	100%	\$652,253	\$0
47	2026	49	10 In. Pipe, 5000 W, 1800 N to ~1200 N	3,200 LF	\$239	\$765,132	100%	\$765,132	\$0
48	2026	50	10 In. Pipe, 5000 W, ~1100 N to 800 N	1,850 LF	\$239	\$442,342	100%	\$442,342	\$0
49	2027	52	12 In. Pipe, 5000 W, 800 N to 300 N	2,650 LF	\$251	\$664,797	100%	\$664,797	\$0
9	2028	9	8 In. Pipe, 5800 S, 3500 W to 3450 W to replace existing 2"	450 LF	\$223	\$100,277	0%	\$0	\$100,277
60	2028	66	10 In. Pipe, 7100 W, 5900 S (Weber Co.) to 2425 N (Davis Co); backout cost of 8" needed at present	2,700 LF	\$239	\$645,580	37%	\$239,749	\$405,831
61	2028		10 In. Pipe, 2425 N, 6500 W to 6000 W	2,700 LF	\$239	\$645,580		\$0	\$645,580
44	2029	56	10 In. Pipe, 5500 W, 5900 S (Weber Co.) to 2425 N (Davis Co)	2,700 LF	\$239	\$645,580	100%	\$645,580	\$0
45	2029	58	10 In. Pipe, 5500 W, 2425 N to 1925 N	2,750 LF	\$239	\$657,535	100%	\$657,535	\$0
34	2030	48	12 In. Pipe, 1300 N, 5000 W to 4500 W	2,700 LF	\$251	\$677,340	100%	\$677,340	\$0
46	2030	59	10 In. Pipe, 1925 N, 5000 W to 5500 W, back out 8 In. cost needed at present	2,450 LF	\$239	\$585,804	100%	\$585,804	\$0
Subtotal: Distribution						\$13,168,983		\$10,075,828	\$3,093,155
2021-2030 Estimated Project Costs						\$22,353,351		\$17,900,196	\$4,453,155

Hooper Water Improvement District
Culinary Water Capital Facilities and Impact Fee Facilities Plan 2021

2021 Project Number	Estimated Project Year	2014 Project Number	Project Description	Quantity	Estimated Unit Cost	Estimated Project Cost	% Impact Fee Eligible	Estimated Impact Fee-Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
1			16 In. Pipe, Base of 4000 S tank to 12" between tanks, reconfigure piping in road	200 LF	\$298	\$59,589	100%	\$59,589	\$0
2		2	Tank at Vineyard Site	2,000,000 GAL	\$2.57	\$5,138,736	100%	\$5,138,736	\$0
3		3	New Well at Vineyard Site w backup power and treatment	1,500 GPM	\$2,587	\$3,880,000	100%	\$3,880,000	\$0
4		5	20 In. Pipe, West Park to Vineyard Site	1,700 LF	\$345	\$586,542	100%	\$586,542	\$0
5			Upsize 16" HDPE through intersection to 18" HDPE	240 LF	\$500	\$120,000	100%	\$120,000	\$0
6		7	16 In. Pipe, 3500 W, 4800 S to 5500 South	4,550 LF	\$298	\$1,355,642	100%	\$1,355,642	\$0
7			14 In. Pipe, Well #1 to 3500 W through District property	450 LF	\$273	\$122,966	100%	\$122,966	\$0
8		15	16 In. Pipe, 5500 S, Well #1 to 3500 W	650 LF	\$298	\$193,663	100%	\$193,663	\$0
10			8 In. Pipe, 4950 S, 4700 W to dead end if no future loop is made: upsize is for purpose of improving FF	1,750 LF	\$223	\$389,967	0%	\$0	\$389,967
11			New Well at 5100 S w backup power, booster pumps and treatment	1,500 GPM	\$2,837	\$4,255,000	100%	\$4,255,000	\$0
12			Ground Level Tank at 5100 S Well Site	1,000,000 GAL	\$2.57	\$2,569,368	100%	\$2,569,368	\$0
13			16 In. Pipe, 5100 S Well to 5100 S tie-in	800 LF	\$298	\$238,355	100%	\$238,355	\$0
14		20	8 In. Pipe, 5850 S from 5100 W to dead end	1,350 LF	\$223	\$300,832	0%	\$0	\$300,832
16		26	12 In. Pipe, 4600 S, 5100 W to 5500 W	2,750 LF	\$251	\$689,883	100%	\$689,883	\$0
17		30	12 In. Pipe, 5900 S, 5500 W to canal, backout cost of 8" needed at present for FF	1,375 LF	\$251	\$344,942	40%	\$138,268	\$206,673
18		30	12 In. Pipe, 5900 S, canal to 5100 W	1,375 LF	\$251	\$344,942	100%	\$344,942	\$0
23			8 In. Pipe, 200 S, 4500 W east to dead end if no future loop is made: upsize is for purpose of improving FF	1,350 LF	\$223	\$223	0%	\$0	\$223
25			New Well at Cold Springs Road site w backup power, booster pumps and treatment	1,500 GPM	\$2,837	\$4,255,000	100%	\$4,255,000	\$0
26			Ground Level Tank at Cold Springs Well	1,000,000 GAL	\$2.57	\$2,569,368	100%	\$2,569,368	\$0
27			16 In. Pipe, Cold Springs Well to Cold Springs Road tie-in	700 LF	\$298	\$208,560	100%	\$208,560	\$0
29		38	12 In. Pipe, 4500 W, 700 S to 200 S	2,600 LF	\$251	\$652,253	100%	\$652,253	\$0
30			8 In. Pipe, 200 S, 4500 W west to dead end if no future loop is made: upsize is for purpose of improving FF	650 LF	\$223	\$223	0%	\$0	\$223
31		37	12 In. Pipe, 4500 W, 200 S to 300 N	2,700 LF	\$251	\$677,340	100%	\$677,340	\$0
36		45	12 In. Pipe, 5900 S, 5900 W to 5500 W	2,700 LF	\$251	\$677,340	100%	\$677,340	\$0

Hooper Water Improvement District
Culinary Water Capital Facilities and Impact Fee Facilities Plan 2021

2021 Project Number	Estimated Project Year	2014 Project Number	Project Description	Quantity	Estimated Unit Cost	Estimated Project Cost	% Impact Fee Eligible	Estimated Impact Fee-Eligible Project Cost	Estimated Non-Impact Fee-Eligible Project Cost
37		27	12 In. Pipe, 5500 W 4800 S to 5100 S	2,700 LF	\$251	\$677,340	100%	\$677,340	\$0
38		40	12 In. Pipe, 4600 S, 5900 W to 5500 W	2,750 LF	\$251	\$689,883	100%	\$689,883	\$0
41			8 In. Pipe, 5900 W, 4000 S north to dead end	2,300 LF	\$223	\$512,528	0%	\$0	\$512,528
42		55	12 In. Pipe, 5500 S, 5900 W to 6300 W	2,700 LF	\$251	\$677,340	100%	\$677,340	\$0
50		62	12 In. Pipe, 5500 S, 6300 W to 6700 W	2,700 LF	\$251	\$677,340	100%	\$677,340	\$0
51			8 In. Pipe, 4800 S, 6300 W west to dead end if no future loop is made; upsize is for purpose of improving FF	1,360 LF	\$223	\$303,060	0%	\$0	\$303,060
52		60	8 In. Pipe, 6700 W, 4350 S to 4600 S	1,600 LF	\$223	\$356,541	0%	\$0	\$356,541
57			New Well at 7100 West site w backup power, booster pumps and treatment	1,500 GPM	\$2,837	\$4,255,000	100%	\$4,255,000	\$0
58			Ground Level Tank at 7100 W well	1,000,000 GAL	\$2.57	\$2,569,368	100%	\$2,569,368	\$0
59			16 In. Pipe, 7100 W Well to 5500 S tie-in	500 LF	\$298	\$148,972	100%	\$148,972	\$0
62		70	10 In. Pipe, 5500 S, 7100 W to 7500 W	2,750 LF	\$239	\$657,535	100%	\$657,535	\$0
65		67	8 In. Pipe, 7500 W, Bird Refuge to 5100 S	2,750 LF	\$223	\$612,805	0%	\$0	\$612,805
66		69	8 In. Pipe, 7500 W, 5100 S to 5500 S	2,750 LF	\$223	\$612,805	0%	\$0	\$612,805
67			8 In. Pipe, 7500 W, 5500 S to 5700 S	1,000 LF	\$223	\$222,838	0%	\$0	\$222,838
M5			8 in. Pipe, 4300 W, 5500 S to end of line on 6000 W, to replace spots of 4 in. line	3,750 LF	\$223	\$835,643	100%	\$835,643	\$0
M6		new	8 In. Pipe, 4700 W, South of 4800 S Intersection	350 LF	\$181	\$63,404	0%	\$0	\$63,404
M8		42	8 In. Pipe, 5800 S, 5900 W to 6250 W	2,350 LF	\$223	\$523,670	0%	\$0	\$523,670
M9		43	8 In. Pipe, 5700 S, 5900 W to 6000 W and 6100 W to 6300 W	2,050 LF	\$223	\$456,818	0%	\$0	\$456,818

Appendix B

MAPS

- B.1 Projected Land Use at Buildout
- B.2 Existing System
- B.3 Proposed Buildout System

MAP B1 - Hooper Water Density Zones

Legend

Boundary_Buildout

Hooper Water Boundary

Density Zones

Density/Acre

0

1

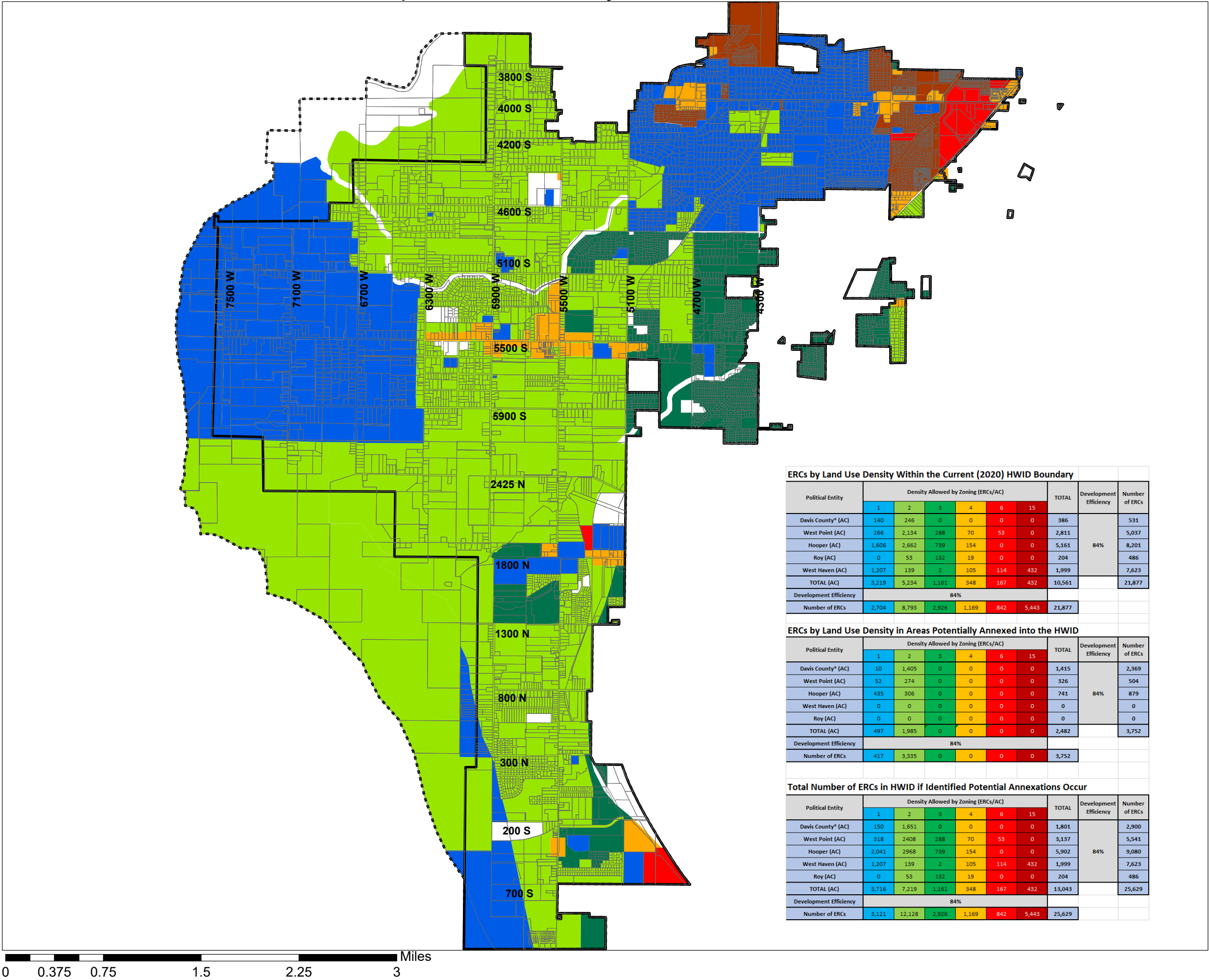
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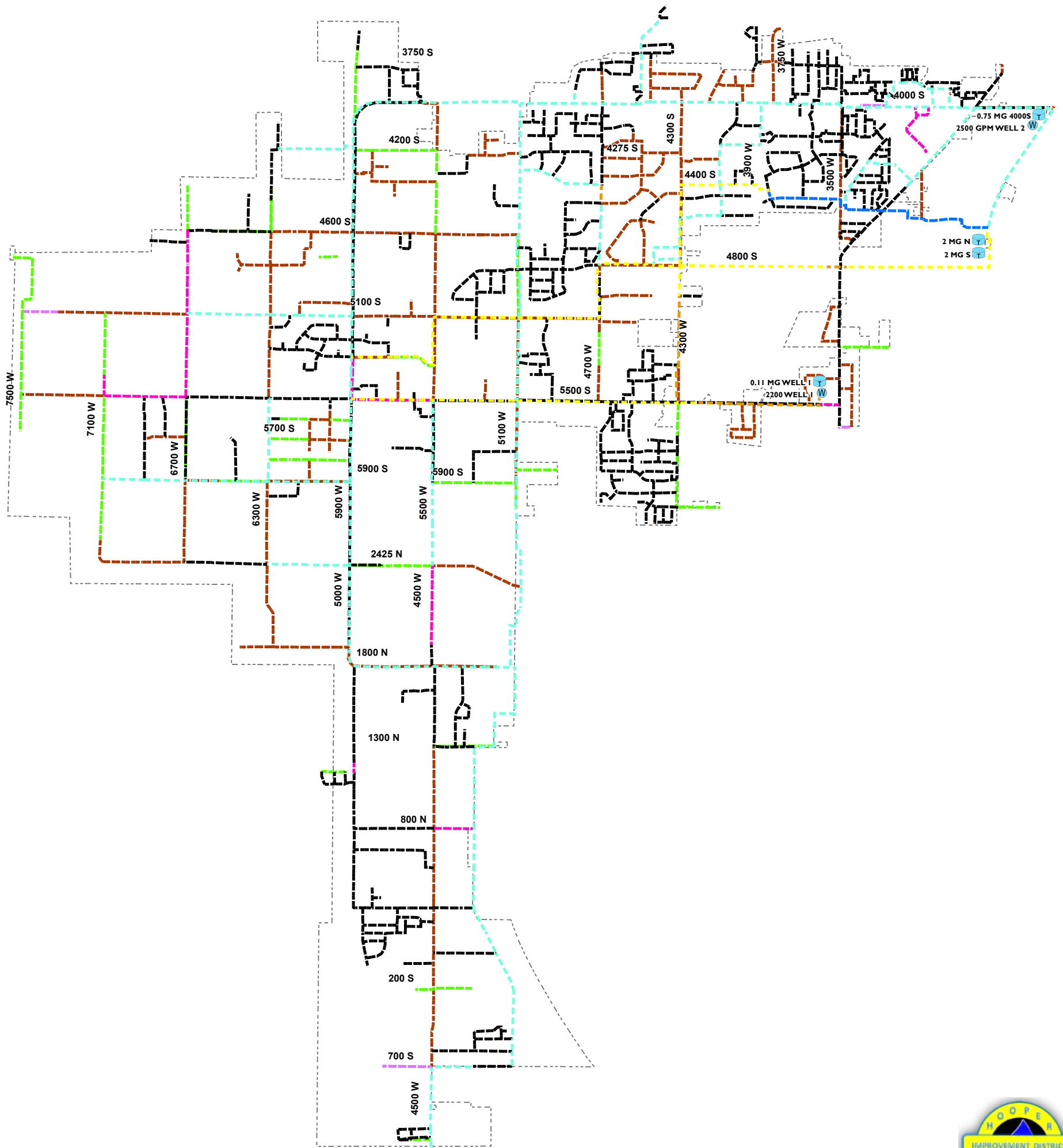
4

6

12



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MAP B2 -EXISTING SYSTEM

HOOPER WATER IMPROVEMENT DISTRICT

IFFP 2021

- EXISTING BOUNDARY 16
EXISTING SOURCES 18
EXISTING TANKS 20

EXISTING PIPES

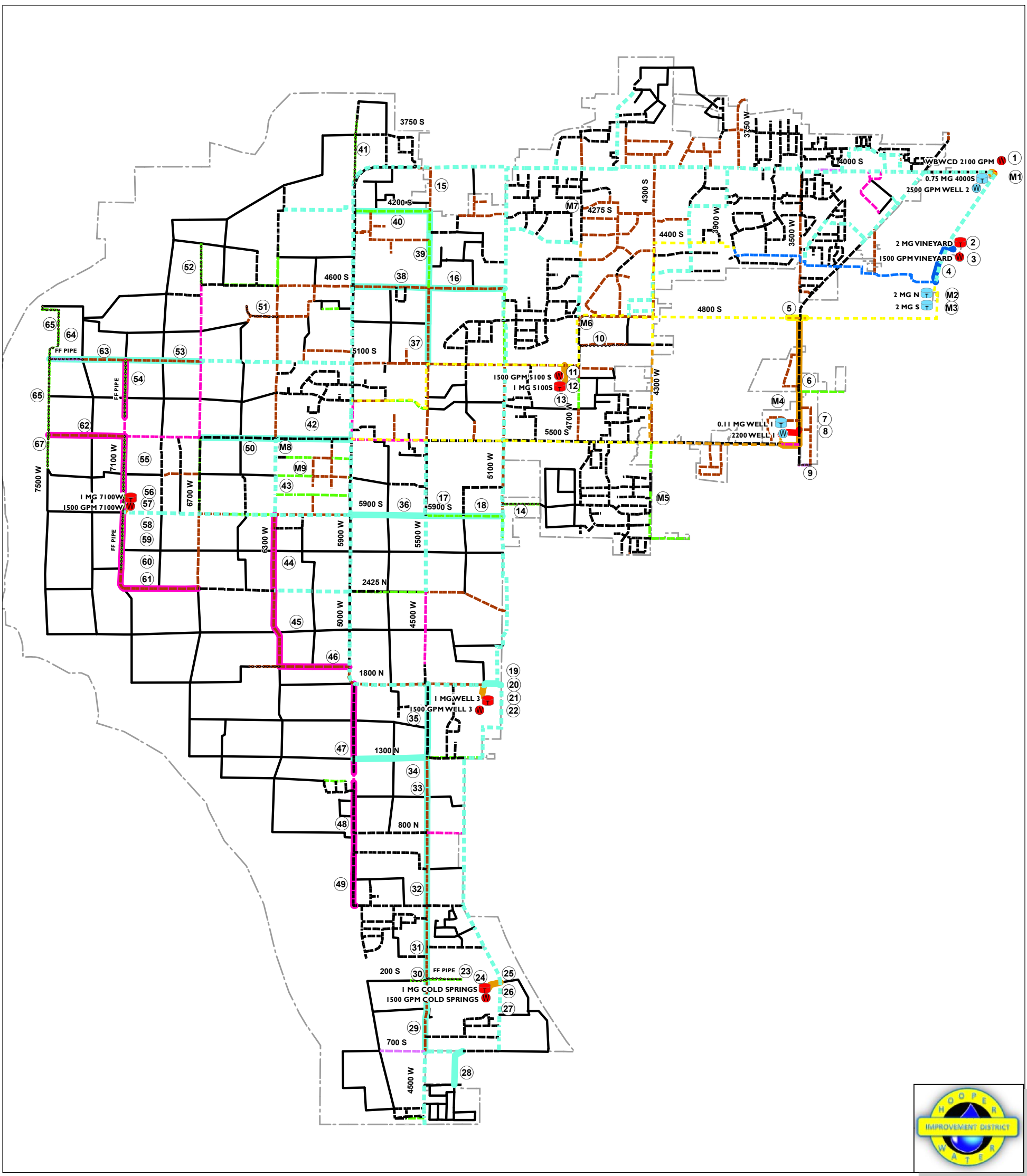
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0 800 1,600 3,200 4,800 6,400 Feet
1 inch equals 1,667 feet

DATE: 2/9/2021
PREPARED BY DAN WHITE



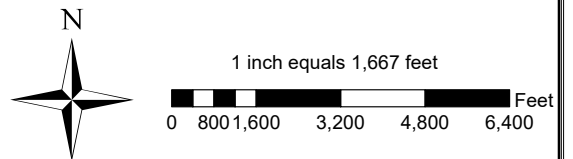


- BUILDOUT BOUNDARY**
- TANKS**
- EXISTING
 - PROPOSED
- SOURCES**
- EXISTING
 - PROPOSED
- EXISTING PIPES**
- 2
 - 3
 - 4
 - 6
 - 8
 - 10
 - 12
 - 14
 - 16
 - 18
 - 20
- IFPP PIPES**
- 10 IFPP
 - 12 IFPP
 - 14 IFPP
 - 16 IFPP
 - 18 IFPP
 - 20 IFPP
- DEV PIPES**
- 12
 - 8 DEVELOPMENT
 - PIPES EX SYSTEM FF
- NOTE: FF NEED PIPES SHOWN REPRESENT PIPING THAT IS NEEDED TO BRING EXISTING SYSTEM TO STANDARD FIRE FLOW RATES.**
- PROJECT NUMBERING**

MAP B3 - PROPOSED BUILDOUT SYSTEM

HOOPER WATER IMPROVEMENT DISTRICT

IFPP 2021



DATE: 2/9/2021
PREPARED BY: DAN WHITE
PAGE SIZE: 24X36

