



**“The mission of the City of Safford is to make Safford
a great place to live, work, and visit”**

**JOINT MEETING OF GRAHAM COUNTY BOARD OF SUPERVISORS
TOWN OF THATCHER, TOWN OF PIMA, and CITY OF SAFFORD
MEETING MINUTES
Wednesday, September 23, 2015 @ 6:30 PM
General Services Building, 921 Thatcher Blvd., Safford, Arizona**

PRESENT: Horatio Skeete, Wyn “Chris” Gibbs, Mary Bingham, Kenneth Malloque, Gene Seale, Arnold A. Lopez, James D. Howes, Richard Ortega, Georgia Luster, Terry Cooper, Drew John, Jim Palmer, Danny Smith, Kenneth Larson, Bob Rivera, Joy Martin, Ryan Rapier, Aaron Allen, Russell Woods, Don Carter, Sam Napier, Randy Petty, Rusty Sherman, Emily Muteb, Cathy Gray, Kirk Gray, Sean Wenham, Jeff McCormick, Bill Brandau, Phillip Tutor, John Howard, Jenny Howard, Ken Showers, Gene Fowler, Christopher Fullerton, Kelly Mott Lacrozy, Wayne Felles, Bob Bigando, Gale Hedges, Dustin Welker, David Morse, Leanne McElroy, Cliff Davis, Leslie Norton, Eric Buckley, Alma Flores, Joe Brugman, Jay Curtis, Tracey O’Donnal, Jeff Gott, Darcy Gott and Curtis Allen.

1. **Call to Order:** Jim Palmer, Chairman, Board of Supervisors, called the meeting to order at 6:312:21 p.m. He welcomed the public, Councils’ and Board of Supervisors for attending.
2. **Pledge of Allegiance:** Jim Palmer, Chairman, Board of Supervisors, led the Pledge of Allegiance to the Flag.
3. **Opening Prayer:** Dr. Phillip Tutor offered the opening prayer.
4. Jenny Howard provided a brief presentation of where the City of Safford is with its current water production (PowerPoint Presentation attached).
 - Water Well/Water Mains Legend
 - Storage – capacity
 - Water Sources – gpm
 - 2014/2015 Monthly Production (Million Gallons)
 - Well Depths
 - Average Well Depths

- Annual Production – 2010 –August 2015.

Jenny Howard introduced Mr. Bob Bigando of Freeport McMoRan. Mr. Bigando stated Freeport became involved in an excess of three years. They were aware that the water yield of Bonita Creek Water system was dropping, and at that time, Freeport partnered with the City of Safford to learn how the system operates and then to help develop some solutions that would assist the City to manage the yields in the system a little better. Develop alternatives to allow the city to realize more water out of the system with the understanding that there is a lot more water in the Bonita Creek Aquifer than the City could tap into. Different approaches were taken, but believe with the combination of technical apparatuses in place, they can now get a picture of what is actually going on inside the system that will help the City of Safford adjust their way to operate the system in order to take advantage of the fluctuations in the flow. At that time, Clear Creek Associates came on board to assist. Clear Creek is one of the most important Hydrological Consultants that Freeport has. Mr. Wayne Feller is the Project engineer manager on Bonita Creek Project.

At this time, Mr. Wayne Feller of Clear Creek Associates provided a presentation on the Bonita Creek Collector System Subsurface Evaluation Project Overview. (PowerPoint Presentation attached).

5. Mr. Dustin Welker provided a brief background on discussions of the water situation in the Valley. A committee was compiled throughout Graham County to develop a water efficiency ordinance for the County. Members of the committee are Bill Brandau, University of Arizona, Joe Goodman, Graham County, Dustin Welker, City of Safford, Heath Brown, Town of Thatcher, Jeff McCormick, Town of Pima, Jay Curtis, Curtis Landscape and Eric Buckley, University of Arizona. The goal, as a committee is to educate the community regarding the need and benefit of conservative water consumption and implement changes in water use habits and policies together resulting in a reduced water consumption rate which preserves water for future generations. He introduced Mr. William K. "Bill" Brandau, Graham County Extension Director, and Chairman of the Committee. Mr. Brandau provided a presentation on a proposed Graham County Water Efficiency Ordinance. He provided a brief background and relationship of his involvement with Bonita Creek and stated that this community is blessed with the foresight of those people who developed the Bonita Creek system in the 1930's. If you were in that meeting at that time, folks would be saying – "Are you crazy?" "We are talking about changing behavior in people," which is a challenge. (PowerPoint Presentation attached).

Mayor Gibbs stated "where do we go from here?" How to conserve and get people to change their behavior? Future needs are being addressed. What do we want our Valley

to look like in fifty years? Should we schedule a time to get back together to discuss and work out the details?

Chairman, Jim Palmer, suggested contacting your representatives to ask questions. He believes each entity should continue with work sessions to develop an ordinance individually and then collectively.

A comment was made regarding why each entity should go back and develop their own ordinance? What was the point of a committee and the development of a draft ordinance?

A comment was made that a unified ordinance is needed for all governmental entities. An individual ordinance will not work. The proposed ordinance addresses new construction.

Mr. Skeete thanked the committee for compiling the draft ordinance. The representation from the different jurisdictions is truly reflected in this draft ordinance. He believes the jurisdictions go to the next stage and develop a course of action.

6. Adjourn: The meeting was adjourned at 8:34:50 p.m.

APPROVED:

Wyn "Chris" Gibbs, Mayor
City of Safford

ATTEST:

Georgia Luster, MMC, City Clerk

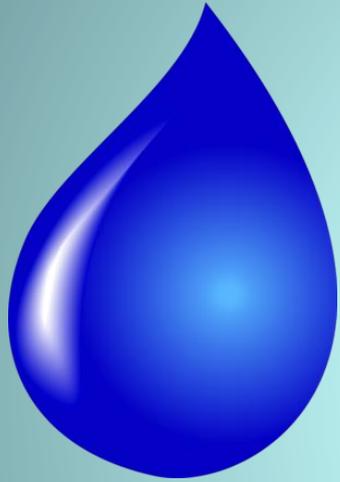
STATE OF ARIZONA)
) ss
County of Graham)

CERTIFICATION

I hereby certify that the foregoing minutes are a true and correct copy of the Joint Meeting Minutes of the Safford City Council, Town of Thatcher Council, Town of Pima Council, and Graham County Board of Supervisors, Graham County, Arizona held Wednesday, September 23, 2015, and approved at a Regular Council Meeting on Monday, October 26, 2015. I further certify the meeting was duly called, held and that a quorum was present.

October 26, 2015 _____
Date:

Georgia Luster, MMC, City Clerk

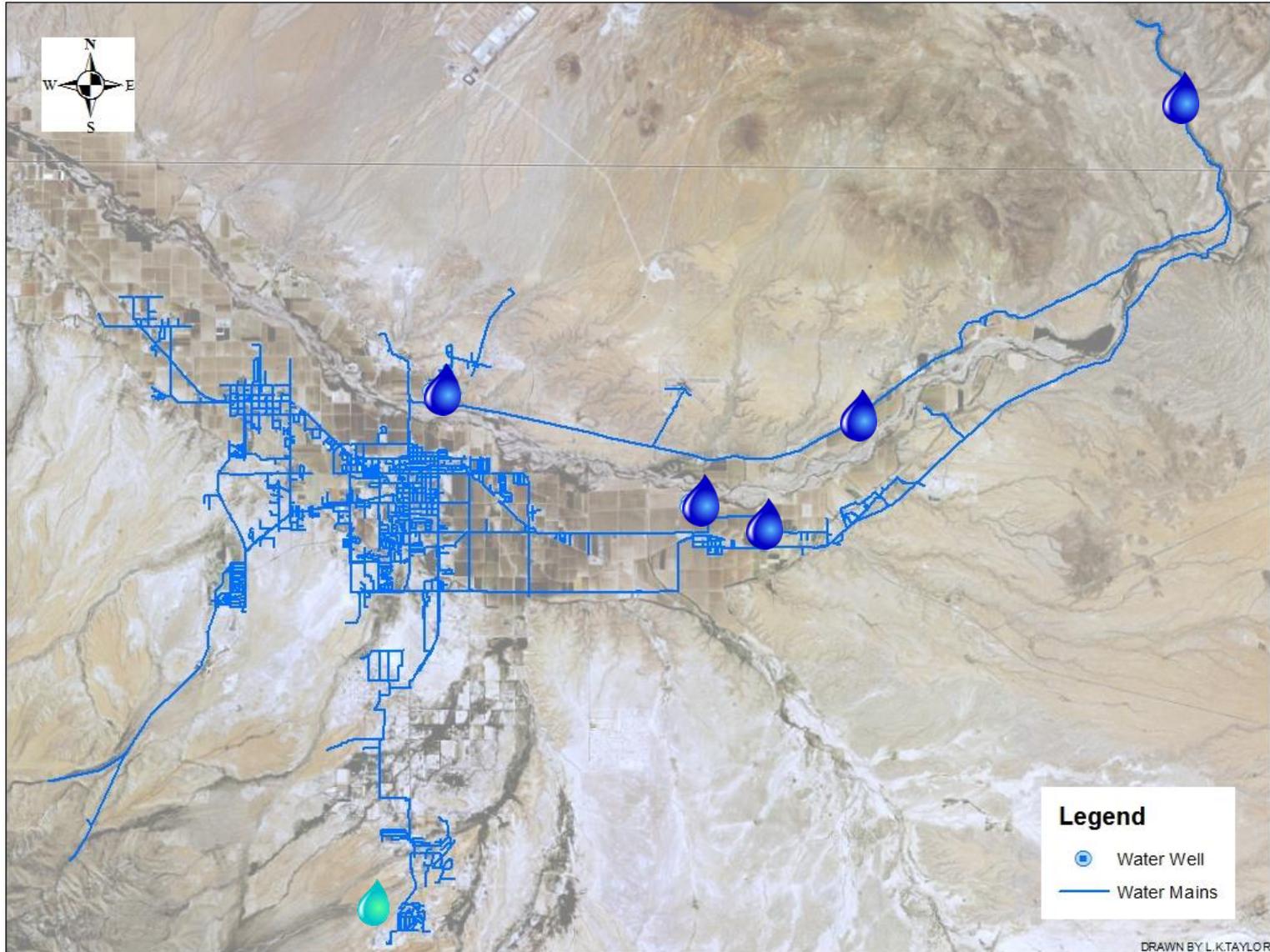


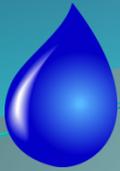
City of Safford

Current Water Production



Safford Water System





Storage – Capacity (gallons)

TMT – 10,000,000

1 MGT – 1,000,000

1.5 MGT – 1,500,000

Rocky Lake Tank – 250,000

Hillcrest Tank – 2,000,000

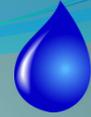
Discovery Park Tank – 3,000,000

Lebanon Tank – 2,000,000

TOTAL STORAGE – ~20M gallons



Water Sources - gpm



Morris I – 450

Morris II – 350

Morris III – 350

Kempton A – 200

Kempton B – 300

Kempton C – 300

Carrasco – 900

Smith Well – 600 **

Clonts Well – 350

Alder Well – 600

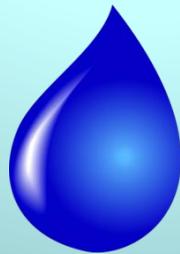
Well #15 - 600

Bonita Creek 1,500 gpm (produces $\geq 80\%$ of our water)



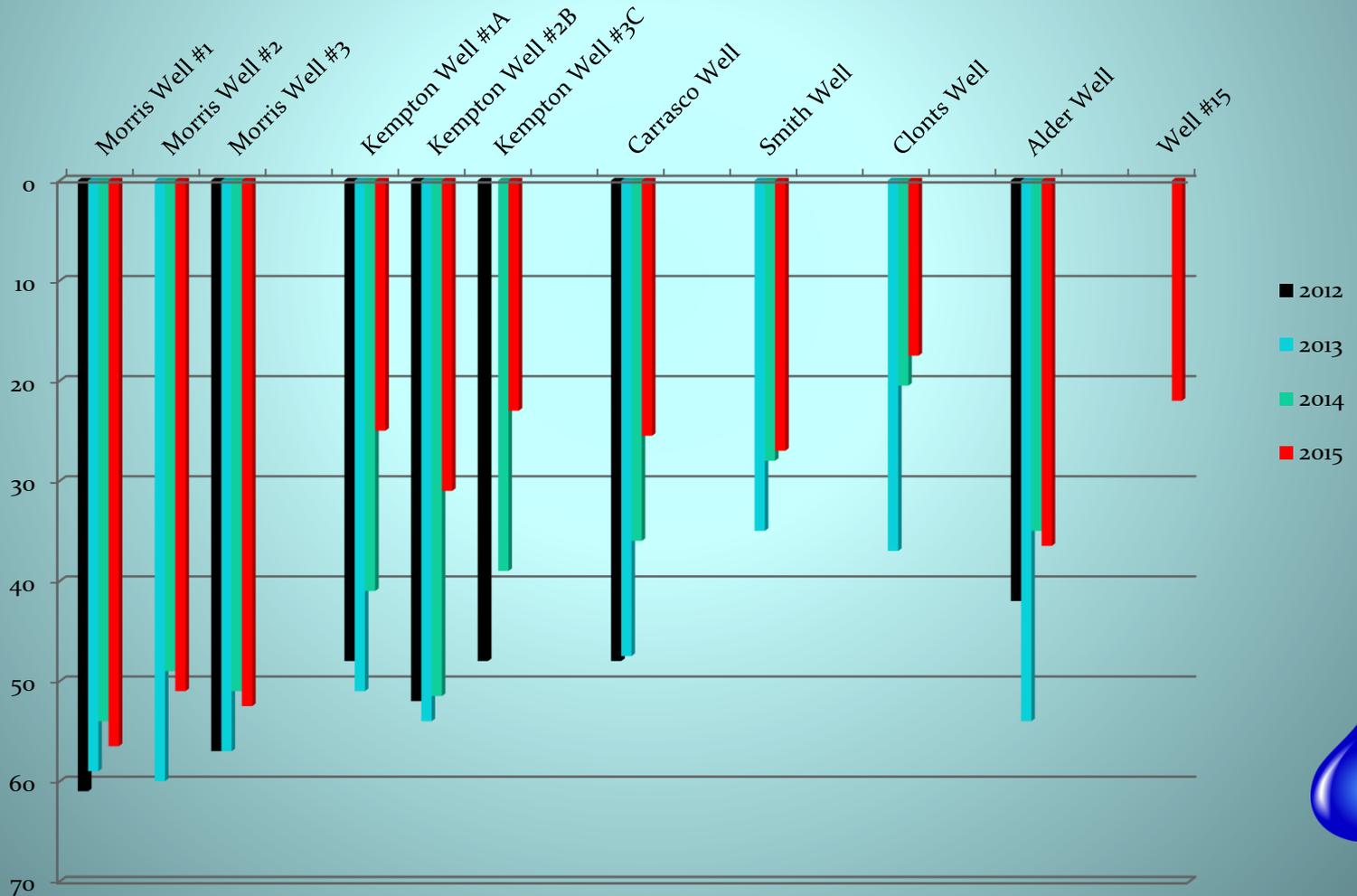
2014/2015 Monthly Production (Million Gallons)

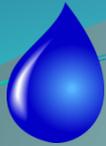
2014 Production	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG
Bonita	74.90	71.34	70.31	68.88	69.37	65.81	65.35	72.12
Wells	10.85	8.36	17.01	30.61	44.55	57.02	38.06	33.91
Total	85.75	79.70	87.32	99.49	113.92	122.83	103.41	106.03
2015 Production	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG
Bonita	73.14	69.28	44.15	85.68	87.23	80.72	81.95	78.53
Wells	2.02	0.00	36.91	18.02	26.31	37.90	29.65	25.06
Total	75.16	69.28	81.06	103.70	113.54	118.62	111.60	103.59



Well Depths

	Morris Well #1	Morris Well #2	Morris Well #3	Kempton Well A	Kempton Well B	Kempton Well C	Carrasco Well	Smith Well	Clonts Well	Alder Well	Well #15
PUMP DEPTH	75'	74'	80'	63.5'	80'	65'	75'	65'	72.5'	65'	212'
WATER TABLE	55	49.5	51	25.5	32	24	25.5	25	15.5	34	22





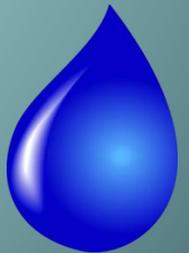
AVERAGE WELL DEPTHS

Average Well Surface Depths	2010	2011	2012	2013	2014	2015 (to date)
Alder	25.94	37.75	40.88	33.4	31.21	27.79
Carrasco	23.94	30.75	37.5	37.7	29.91	22.93
Kempton A	22.29	29	39.55	44.43	33.58	23.43
Kempton B	28.42	41	39.92	46.67	39.19	30.07
Kempton C	22	29	37.55	39.4	33.5	22.50
Morris I	46.08	57	56.68	56.08	49.33	47.14
Morris II	40.81	45.25	50.5	48.5	43.9	42.29
Morris III	40.8	45.25	54.3	52.5	46.1	42.57
Clonts	16.33	17	22.63	24	17.25	13.57
Smith	20	23	37	30.83	25.17	22.57

ANNUAL PRODUCTION

● 2010-Aug 2015

Year	2010	2011	2012	2013	2014	2015 (Todate)	2015 (Est.)
Production Gallons	1,368,428,000	1,457,358,500	1,336,080,414	1,159,523,300	1,141,801,500	776,660,000	1,164,990,000
Average Population Served	20,628	20,778	20,766	24,444	20,919	20,897	
# of Connections	6,876	6,926	6,922	7,148	6,973	6,970	



Bonita Creek Water Collection System

***Piezometer Well Installations
and Flow Testing***

September 23, 2015



**VALUE AT
OUR CORE**



Location

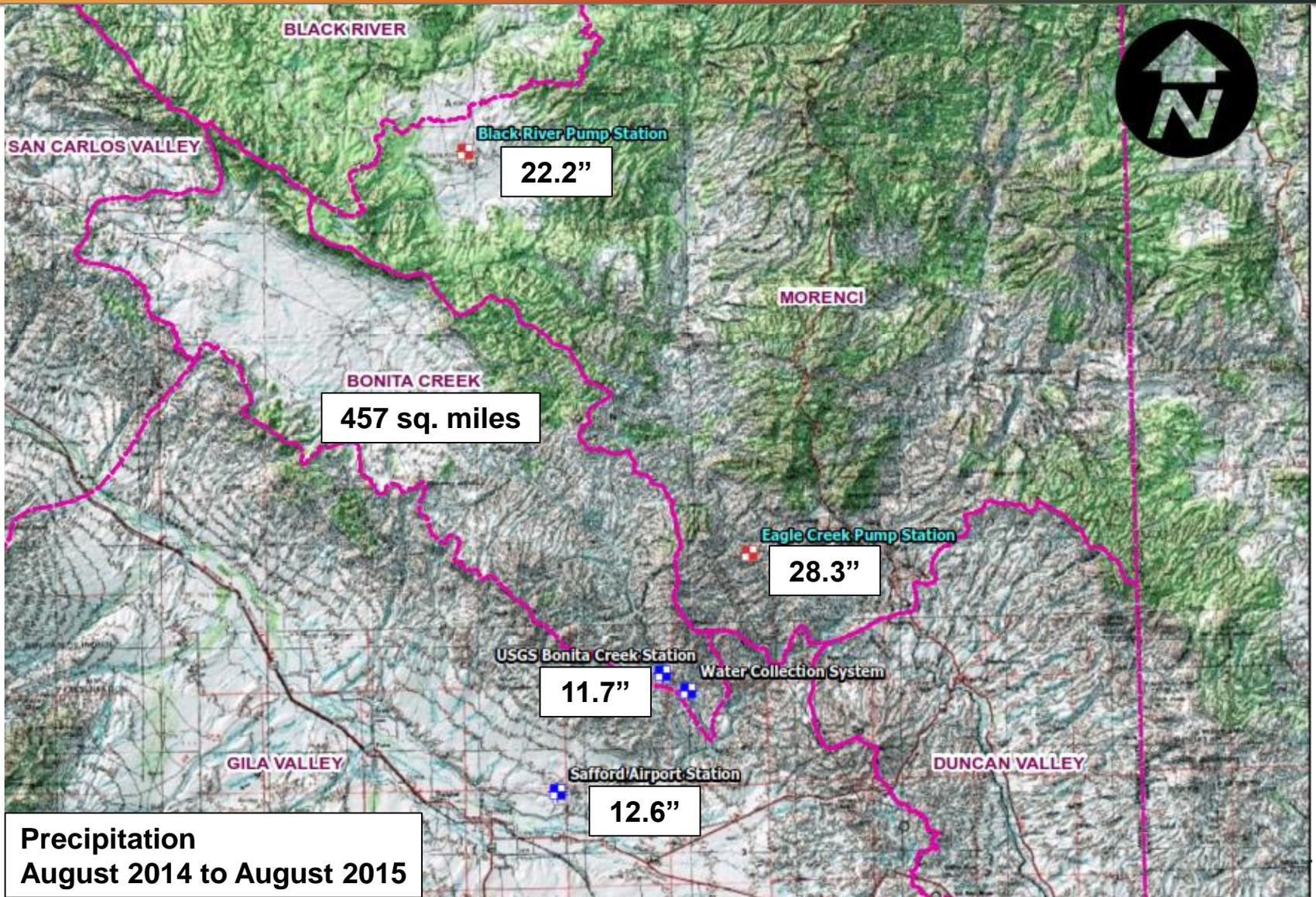
VALUE AT OUR CORE





Basins and Precipitation

VALUE AT OUR CORE



Presentation Contents

- Early Development of the Water Collection System
- Current Construction and Flows
- Piezometer Well Installations
- Flow Testing and Groundwater Level Monitoring

Initial Construction in Late 1930s

- Developed in late 1930s as secondary source
- Infiltration gallery installed in the “Meadows”
- Depth of about 15 feet below stream bed
- Approximately 21 miles of pipe from gallery to Safford
- Delivered about 700 gpm under gravity flow

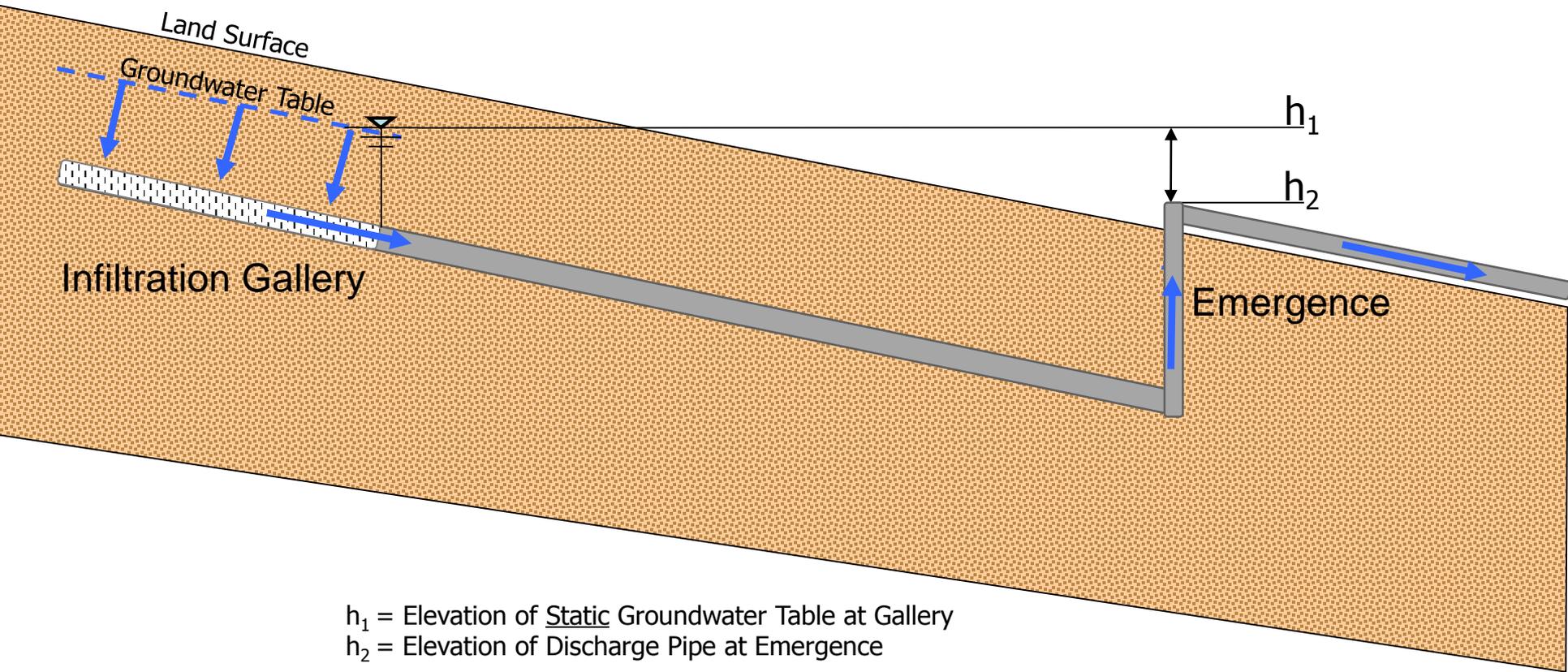


The U.S. Piper
December 1939



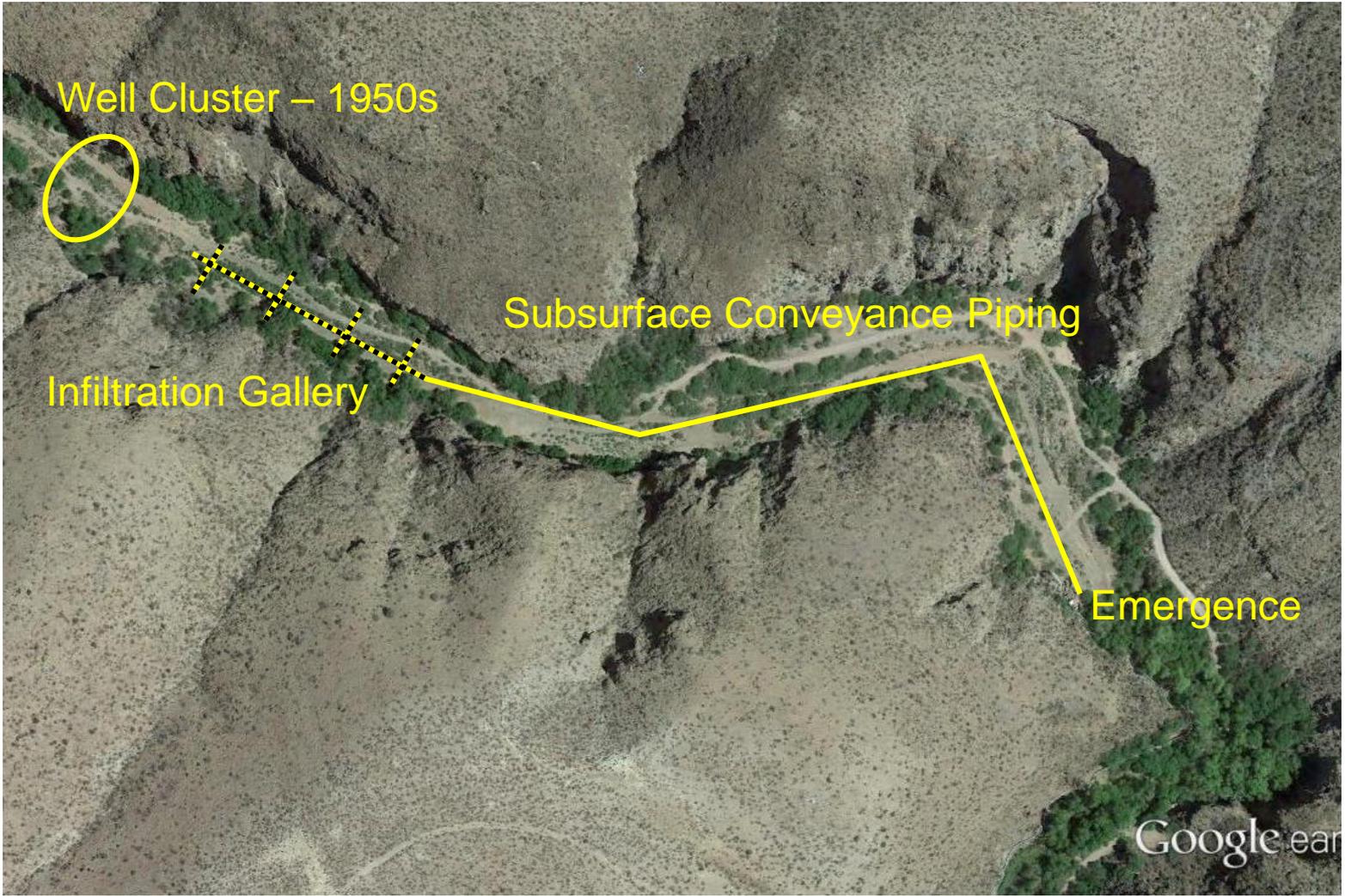
Gravity Flow Operation

- Gravity flow possible when $h_1 > h_2$



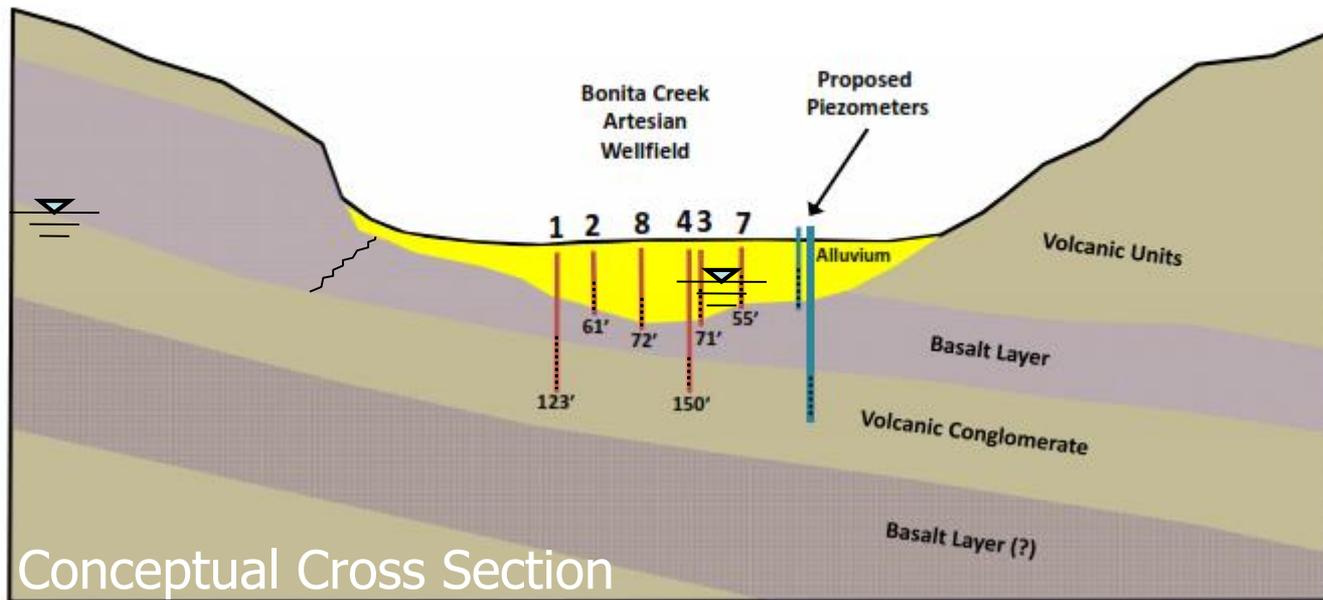
h_1 = Elevation of Static Groundwater Table at Gallery
 h_2 = Elevation of Discharge Pipe at Emergence

Initial Construction - 1939



Addition of Well Cluster in 1950s

- 4 Shallow Wells
- 2 Deep Artesian Wells
- Reportedly increased flow from 700 gpm to 2,200 gpm



Post-Flooding Reconstruction 1994

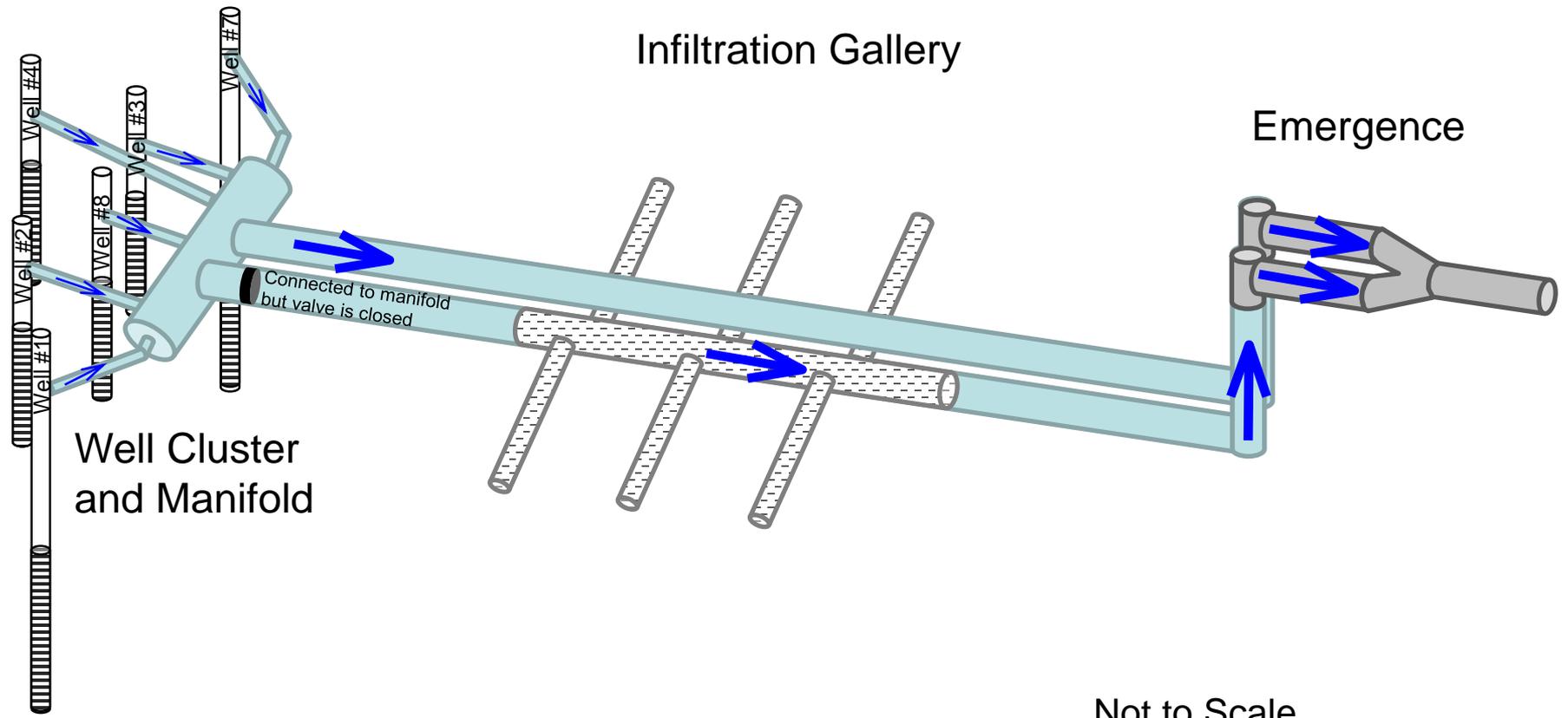
- Wells tied into 36-inch diameter manifold
- Separate infiltration gallery and well cluster lines
- 20 feet deep (5 feet deeper than initial construction)
- Surface transmission pipe attached to canyon wall
- Flows restored to approximately 2,200 gpm





Reconstruction 1994

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Not to Scale

PHASE TWO BONITA CREEK WATER FACILITIES IMPROVEMENTS FOR THE CITY OF SAFFORD

"AS-BUILT PLANS"

"AS-BUILT" CERTIFICATION:

I HEREBY CERTIFY, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE WATER SYSTEM, AS SHOWN HERE ON, HAS BEEN CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE PLANS, AND SPECIFICATIONS EXCEPT AS DELINEATED ON THESE "AS-BUILT" PLANS. PREPARED UNDER MY DIRECTION, BASED ON FIELD OBSERVATIONS, AND DATA PROVIDED BY THE CITY OF SAFFORD.

W. Greg Lohman
 ARIZONA REGISTRATION #222902  *3/21/25*
 DATE

NOTE:
 THESE "AS-BUILT" PLANS ARE AN INTEGRAL PART OF THE ORIGINAL CONSTRUCTION PLANS AND SHOW ONLY THE HORIZONTAL AND VERTICAL LOCATION OF THE CONSTRUCTED WATER SYSTEM.

DATE: MARCH 1995.
 JOB No.: 93-ASLR
 DRAWN BY: J. K. P.
 REVISIONS

PROJECT: PHASE TWO BONITA CREEK WATER FACILITIES IMPROVEMENTS FOR THE CITY OF SAFFORD

ENGINEERS INC
 609 5TH AVENUE SAFFORD, AZ 85084-1004
 908-488-1004

TITLE
 COVER



SHEET
AB COVER



- Declines in system flow reported around 2000 and 2010
- ~1,550 gpm in January 2014
- Preliminary siphon flow testing 2013/2014
- Groundwater levels at system unknown
- Increased flows sustainable with siphon?

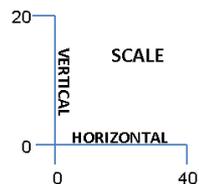
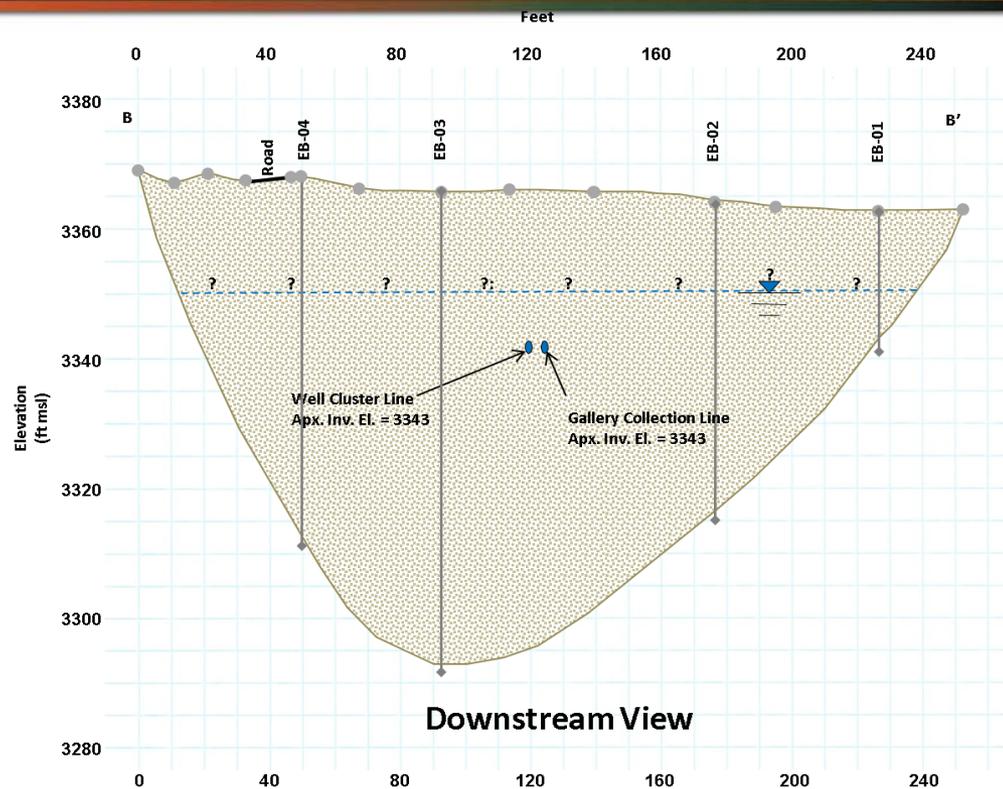
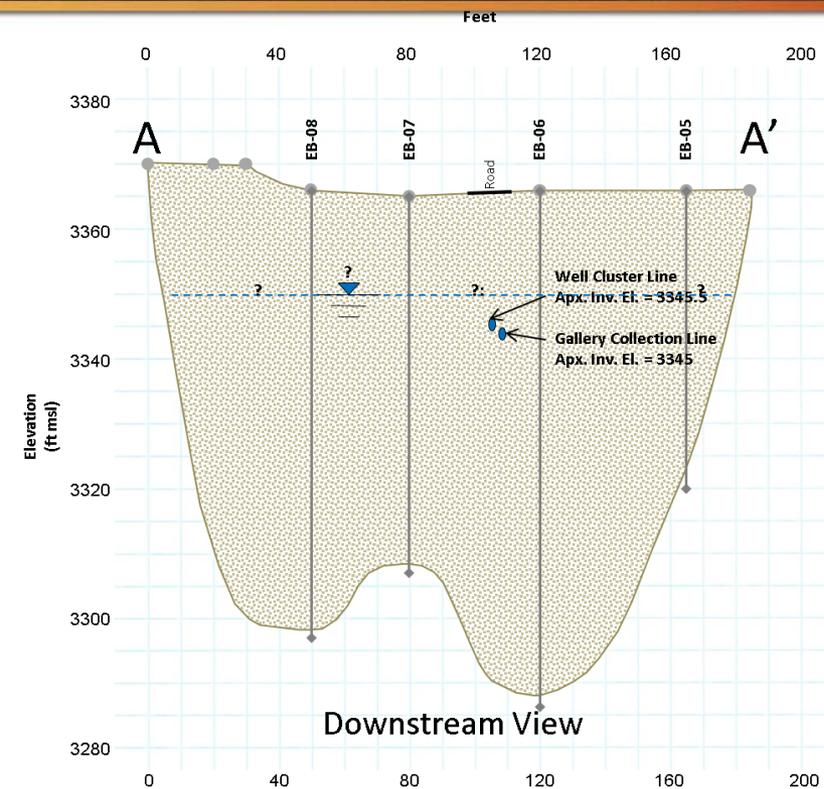
Piezometer Well Installations and Exploratory Borings

VALUE AT OUR CORE



Exploratory Borings

VALUE AT OUR CORE



EXPLANATION

- Unconsolidated alluvium – Exploratory borings tagged basalt at total depth.
- EB-04 Exploratory Borings
- Approximate Depth to Water

Notes:
Elevations of water collection lines are provided by Sheet AB-6 of *Bonita Creek Water Facilities Improvements for the City of Safford* prepared by Engineers, Inc., dated March 2, 1995.

Borings EB-01 through EB-08 were drilled during June 2014.

Apx. Inv. El. is the top of pipe elevation.

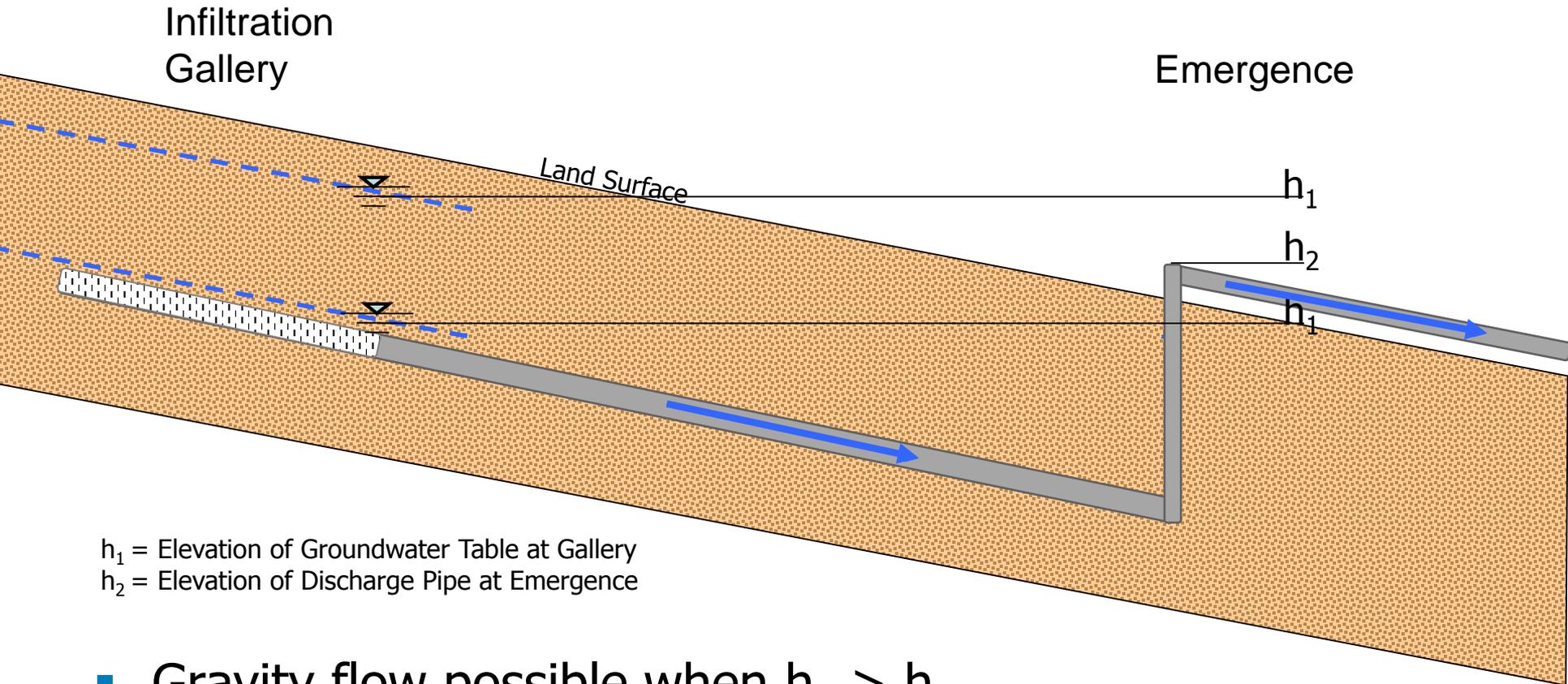
See Figure 2 for location of cross sections.

Figure 3
Alluvial Cross Sections
Bonita Creek Water Collection System



Siphon Flow Operation

VALUE AT OUR CORE



h_1 = Elevation of Groundwater Table at Gallery
 h_2 = Elevation of Discharge Pipe at Emergence

- Gravity flow possible when $h_1 > h_2$
- Siphon flow possible when $h_1 < h_2$

Flow Testing – March 2015

1. Identify individual flow contribution from wells and gallery
2. Identify static water level conditions under no flow
3. Siphon testing to evaluate sustainability of additional flow

Ongoing

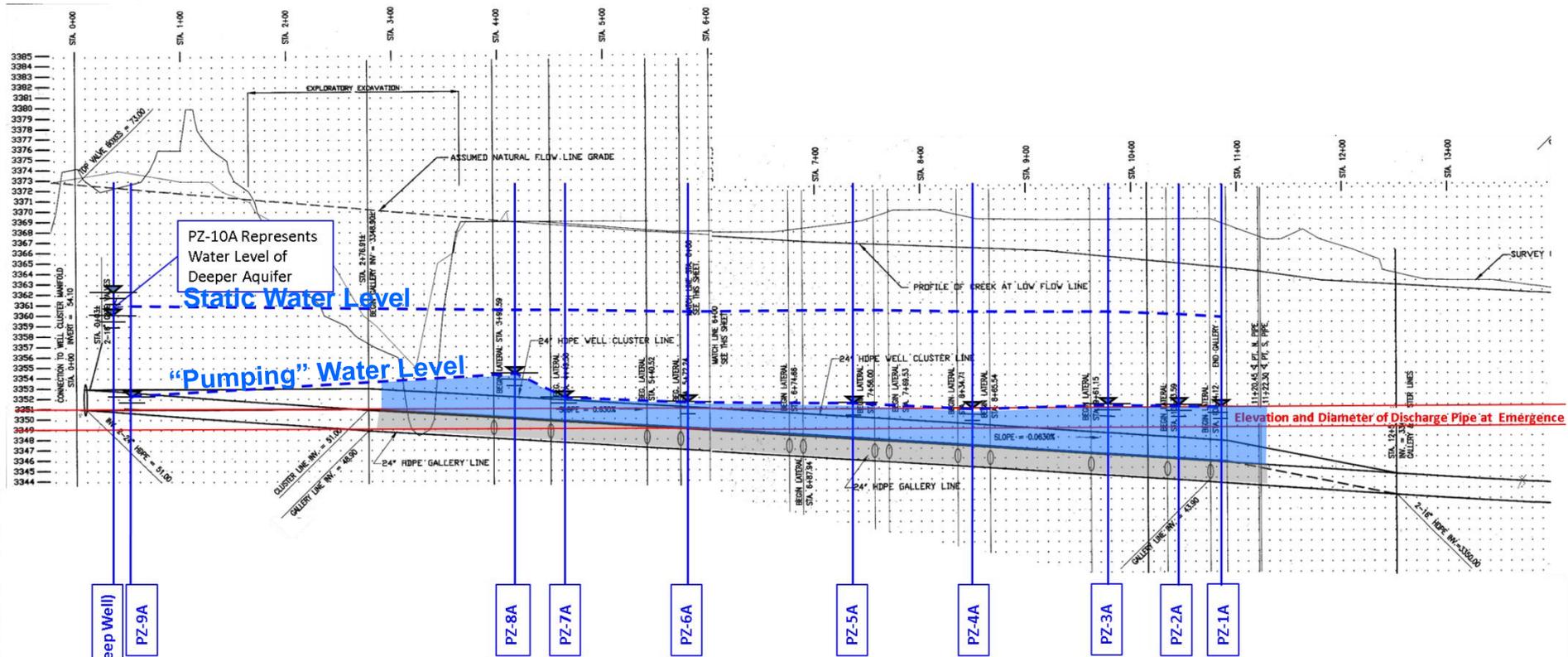
Results - Individual Contributions

- Prior to testing – 1,650 gpm total
- Infiltration gallery only - 1,300 gpm
- Well cluster only – 1,100 gpm
- ~55% gallery / 45% well cluster



Results - Static Water Level

VALUE AT OUR CORE



EXPLANATION

-  Groundwater Elevation on June 16, 2014
-  Approximate Groundwater Elevation
-  Perforated Pipe
-  Location of lateral
-  Piezometer Well (Well dimensions are not represented on this figure).



Reference: Phase Two Bonita Creek Water Facilities Improvements for the City of Safford "As-Built Plans", Sheet AB-6 by Engineers Inc., dated March 21, 1995

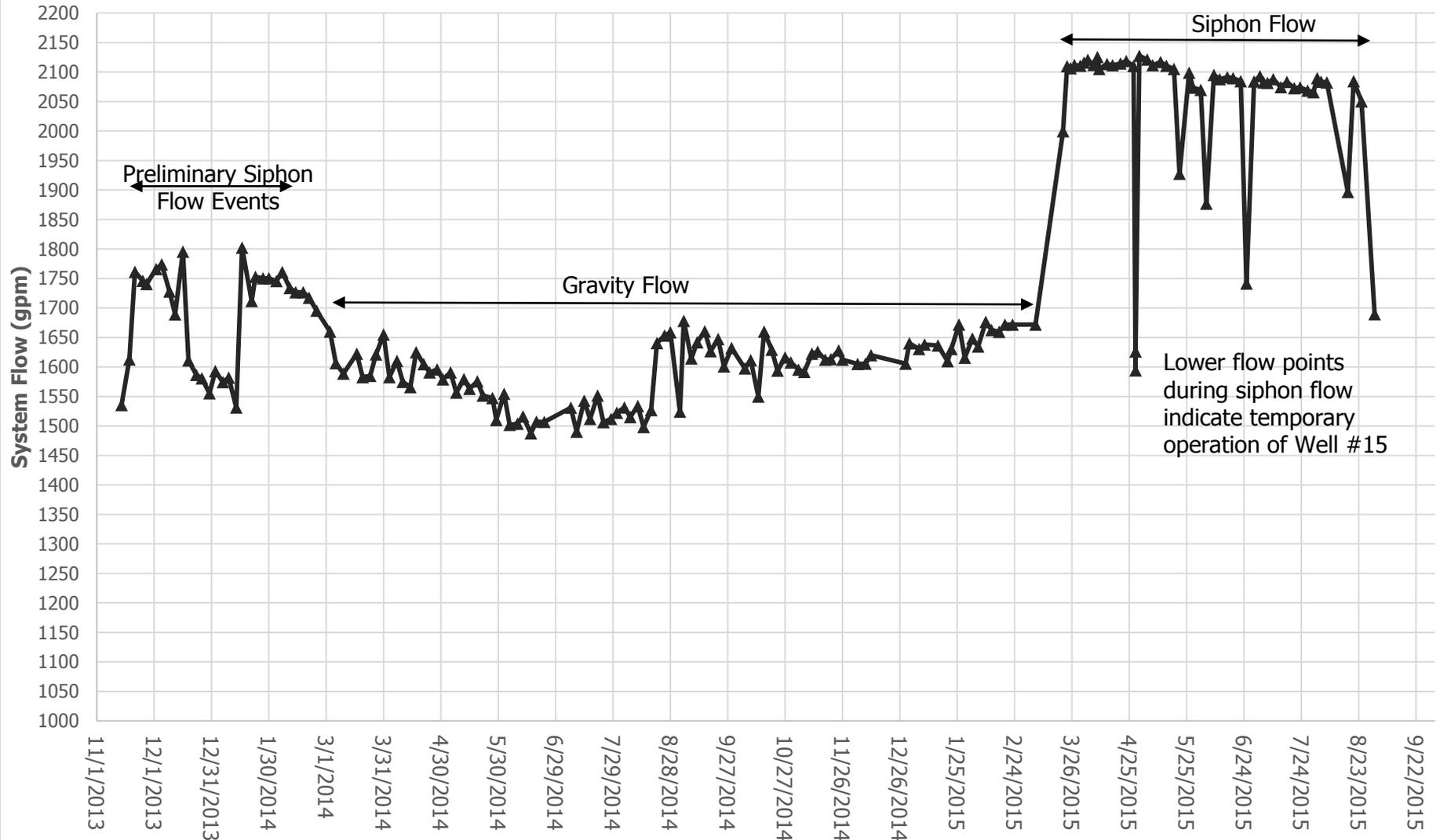
Siphon Testing Flow Rate

- Assume an average “Specific Capacity” of 180 gpm/ft drawdown or 1,650 gpm / 9 feet drawdown under static conditions
- Assumed 2.5 feet of additional drawdown available between “pumping” water level and infiltration gallery
- 180 gpm/ft drawdown equates to 450 gpm (2.5x180) additional flow.
- Established 2,100 gpm as siphon test flow rate



Flow Rate Trend

VALUE AT OUR CORE



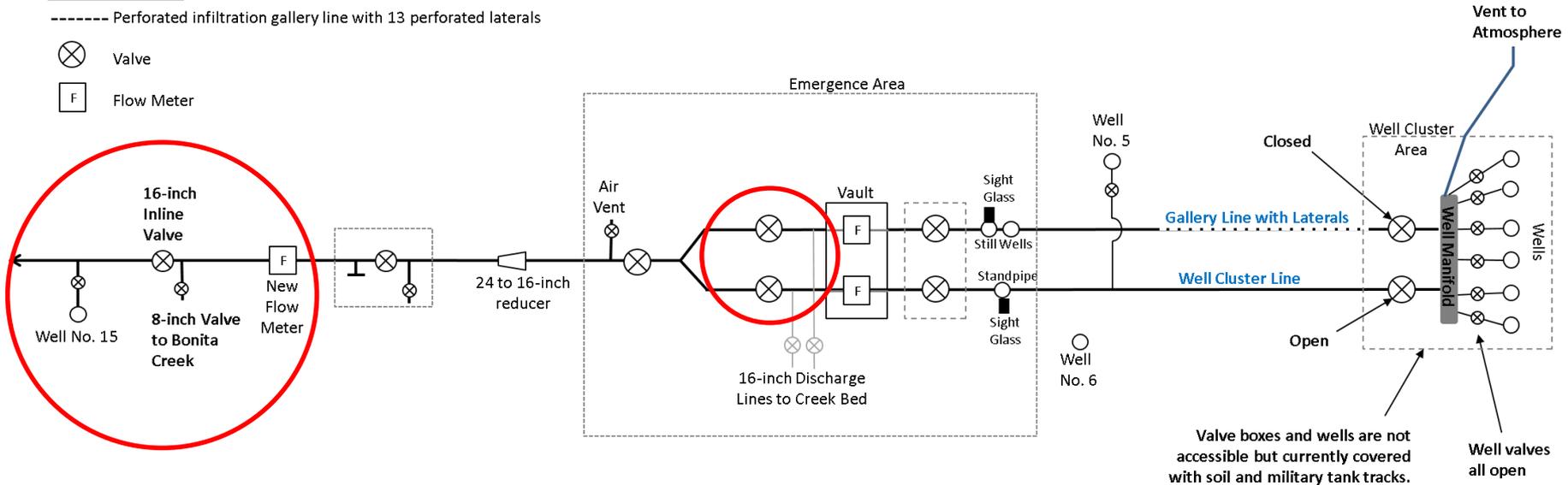
Flow Control Diagram

EXPLANATION

----- Perforated infiltration gallery line with 13 perforated laterals

⊗ Valve

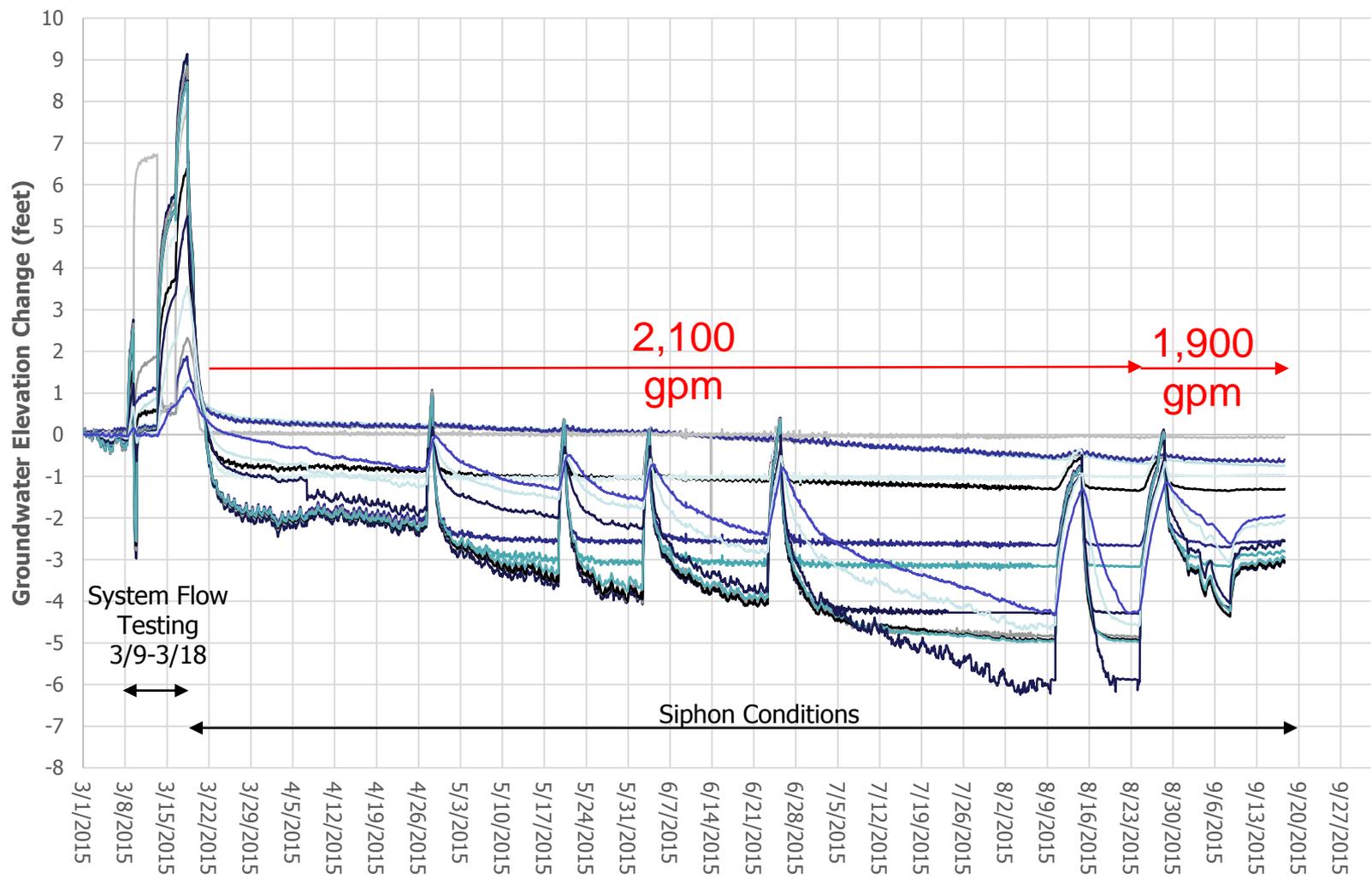
⊠ Flow Meter





Changes in Groundwater Table

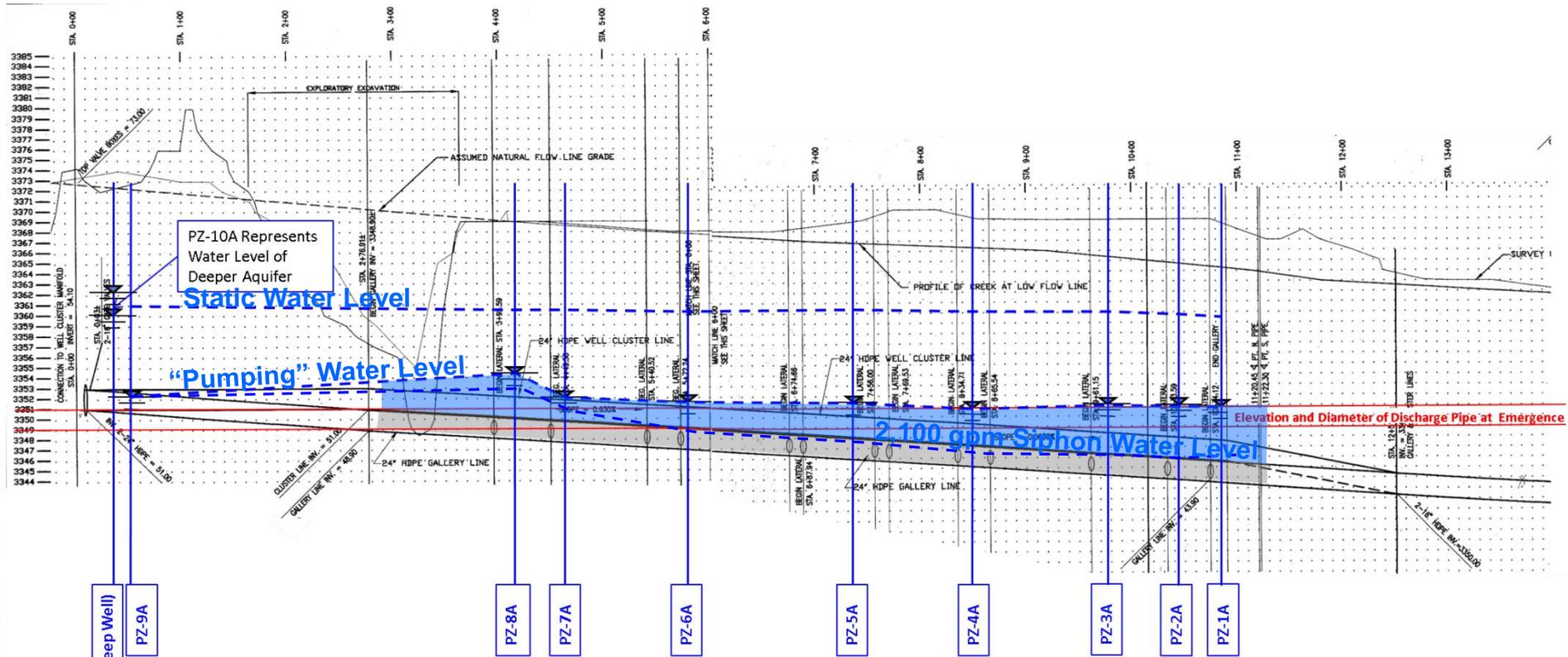
Water Level Change from 3/1/15 – All Wells





Water Levels

VALUE AT OUR CORE



PZ-10A Represents Water Level of Deeper Aquifer

Static Water Level

"Pumping" Water Level

2,100 gpm Siphon Water Level

Elevation and Diameter of Discharge Pipe at Emergence

EXPLANATION

-  Groundwater Elevation on June 16, 2014
-  Approximate Groundwater Elevation
-  Perforated Pipe
-  Location of lateral
-  PZ-10A
Piezometer Well (Well dimensions are not represented on this figure).



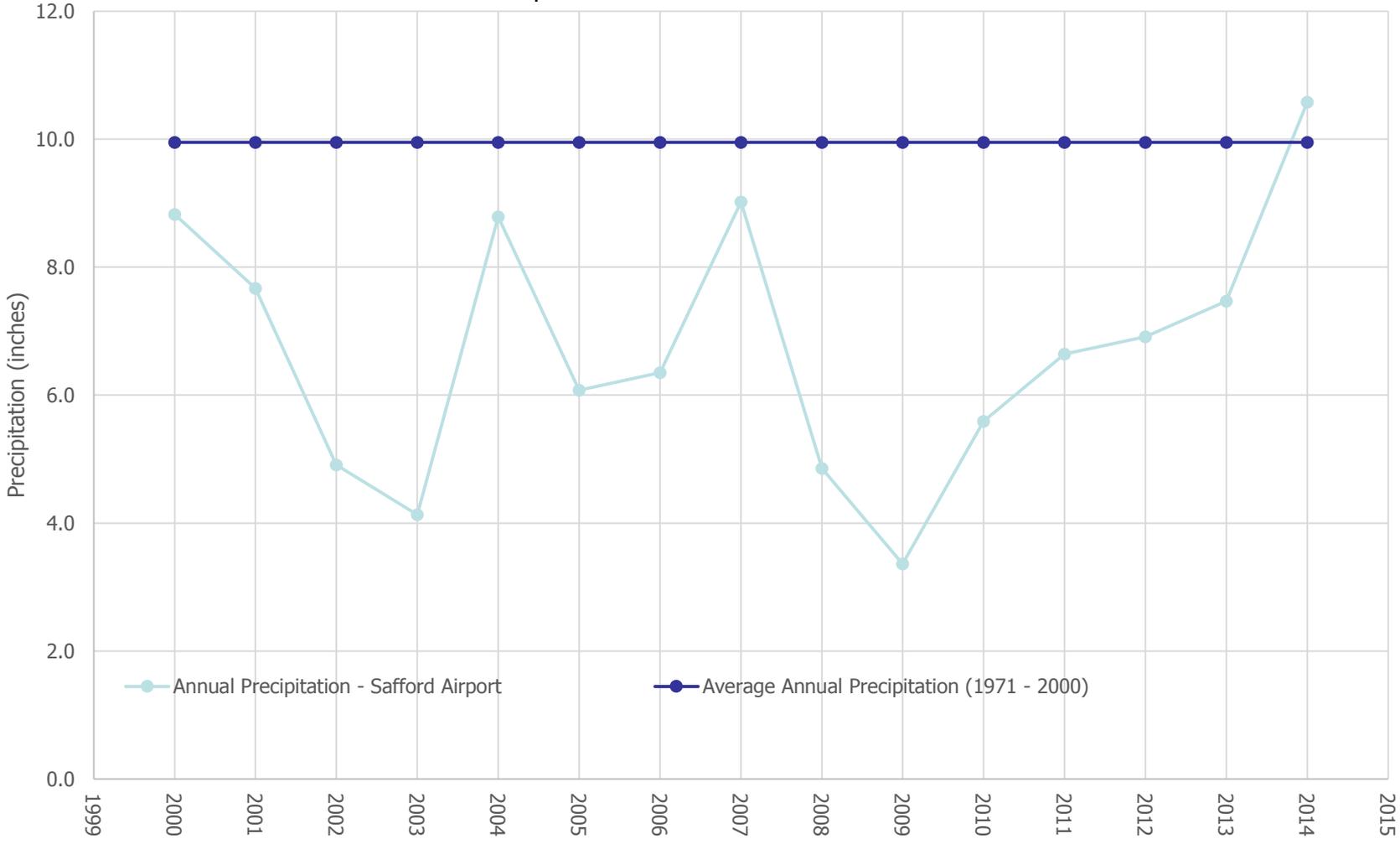
Reference: Phase Two Bonita Creek Water Facilities Improvements for the City of Safford "As-Built Plans", Sheet AB-6 by Engineers Inc., dated March 21, 1995



Precipitation and Streamflow

Safford Precipitation

Source: National Oceanic and Atmospheric Administration

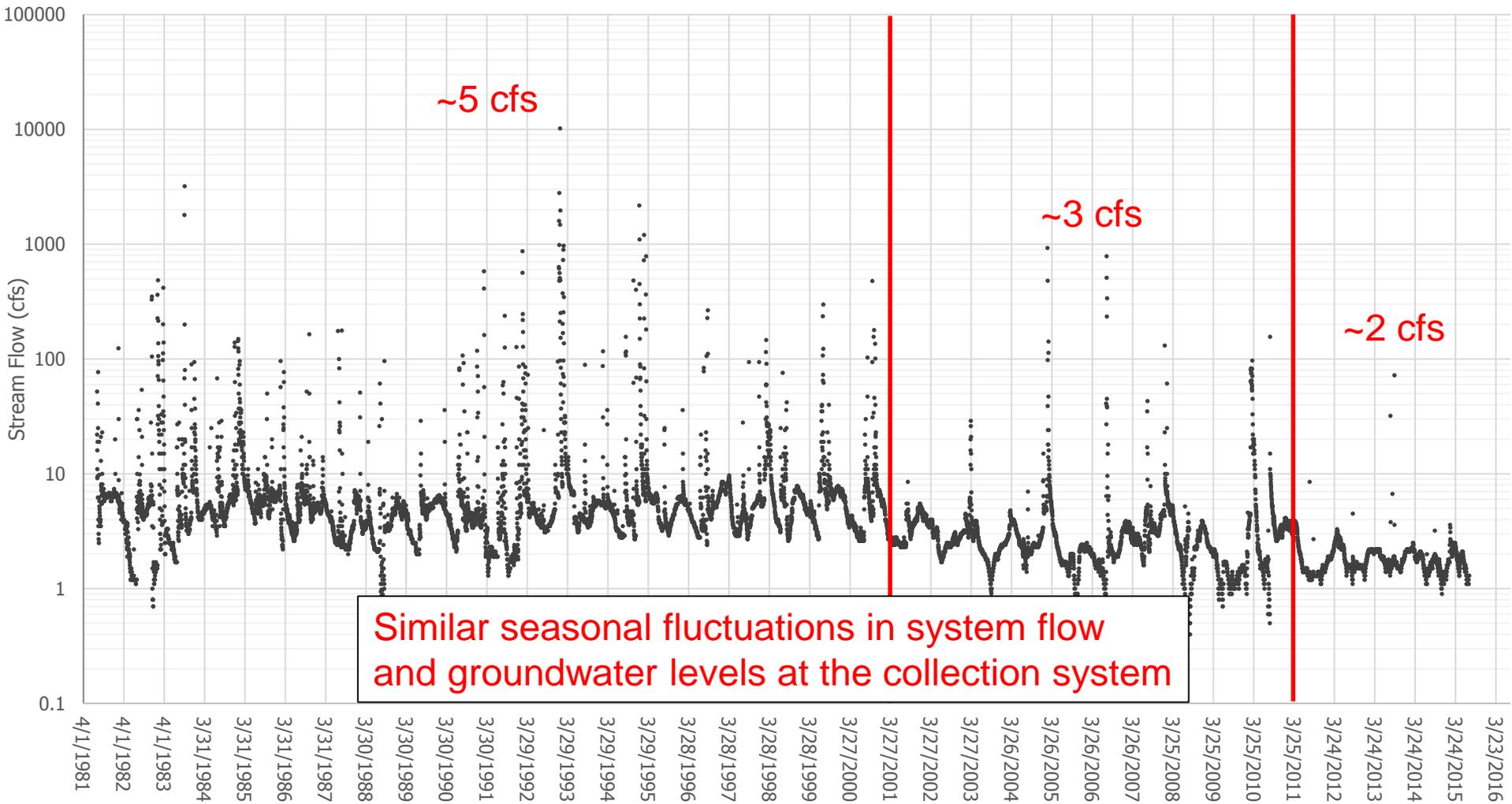




Bonita Creek Historical Flow

VALUE AT OUR CORE

Daily Stream Flow at USGS Bonita Creek Gaging Station





Near Term Recommendations

- Continue to record flow rate and evacuate entrained air as necessary to maintain siphon flow.
- Continue to monitor water levels via transducers.
- Continue tracking precipitation and stream flow for long term response monitoring.
- Sight glasses
- Install/Replace pressure gages

Long Term Recommendations

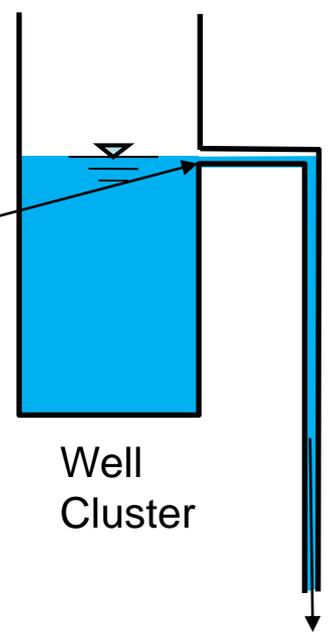
- Consider uncovering the valve access boxes at well cluster and manifold area for adjustments in the future.
- To reduce air entrainment and possibly maintain higher siphon yield, consider directing well cluster flow into gallery pipe at manifold.



Questions?

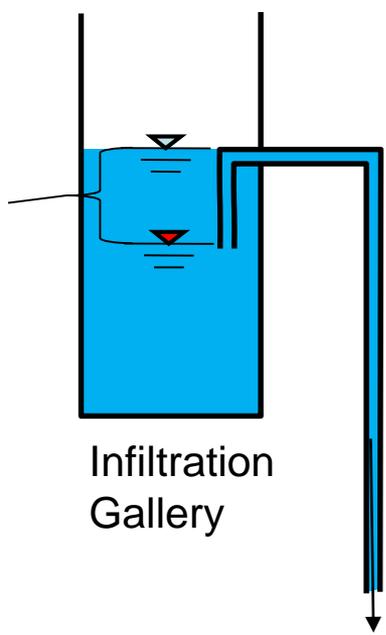
SIPHON DIAGRAM

No additional water available for extraction under siphon conditions

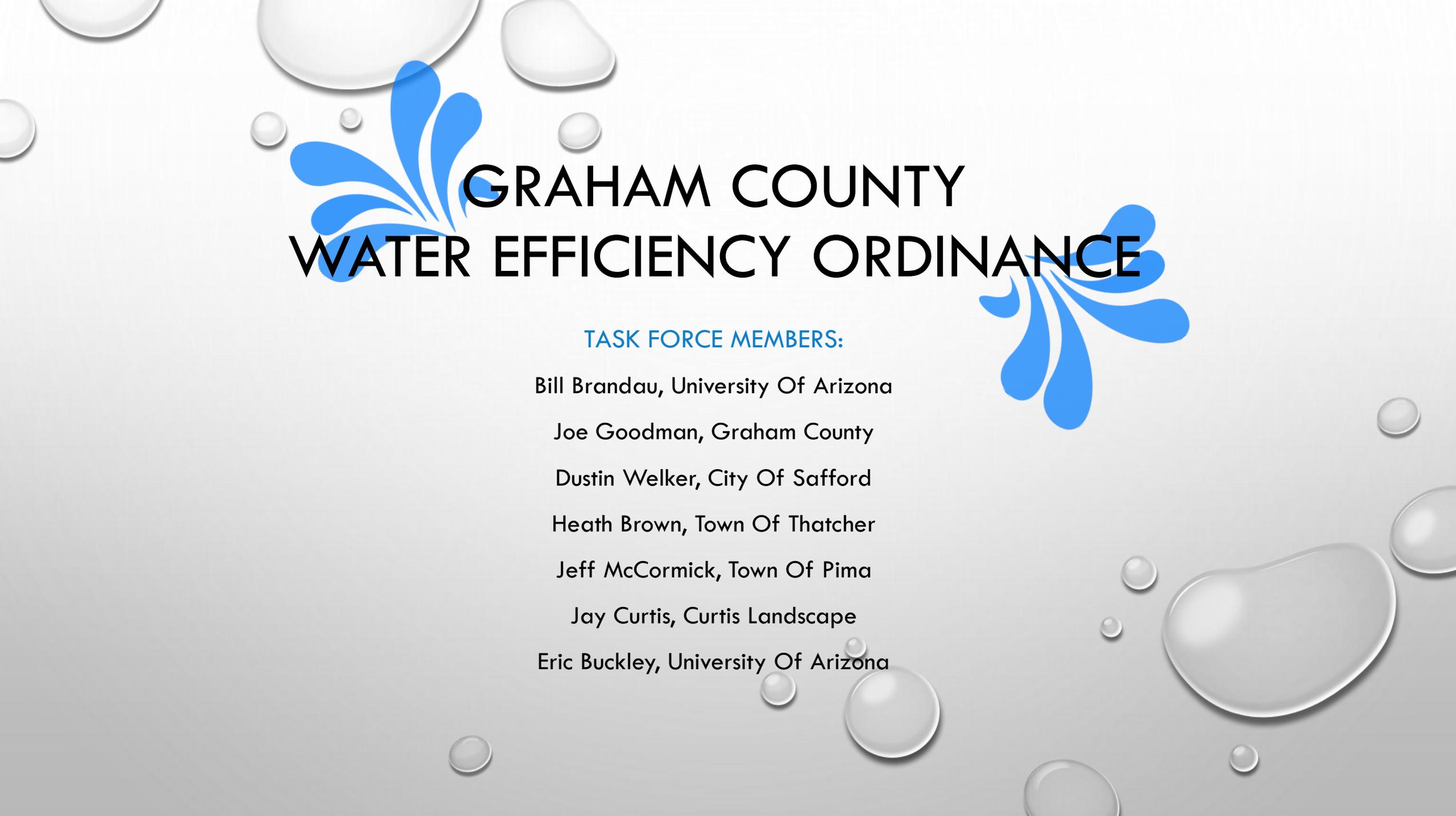


Well Cluster

Additional water available for extraction under siphon conditions



Infiltration Gallery



GRAHAM COUNTY WATER EFFICIENCY ORDINANCE

TASK FORCE MEMBERS:

Bill Brandau, University Of Arizona

Joe Goodman, Graham County

Dustin Welker, City Of Safford

Heath Brown, Town Of Thatcher

Jeff McCormick, Town Of Pima

Jay Curtis, Curtis Landscape

Eric Buckley, University Of Arizona

OUR GOAL

Educate the community regarding the need and benefit of conservative water consumption and implement changes in water use habits and policies together resulting in a reduced water consumption rate which preserves water for future generations.



**GOAL
AHEAD**

Gila River Watershed

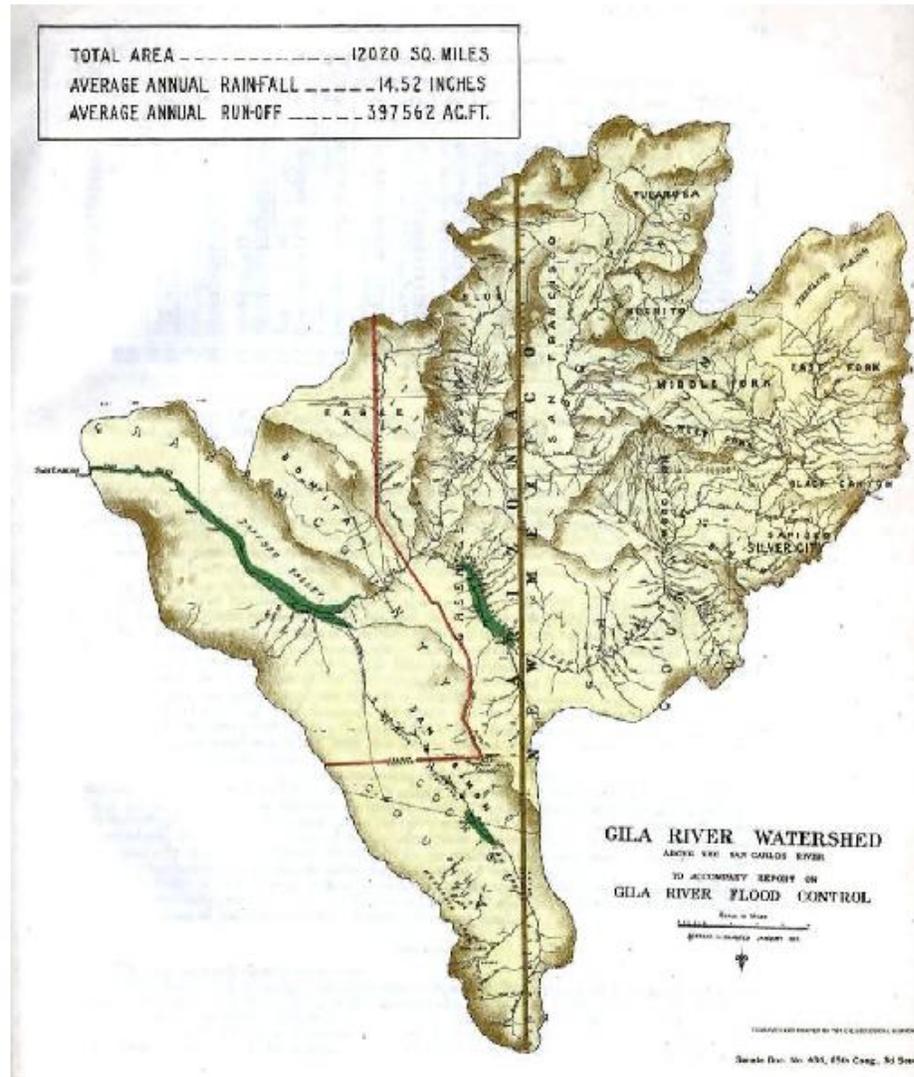
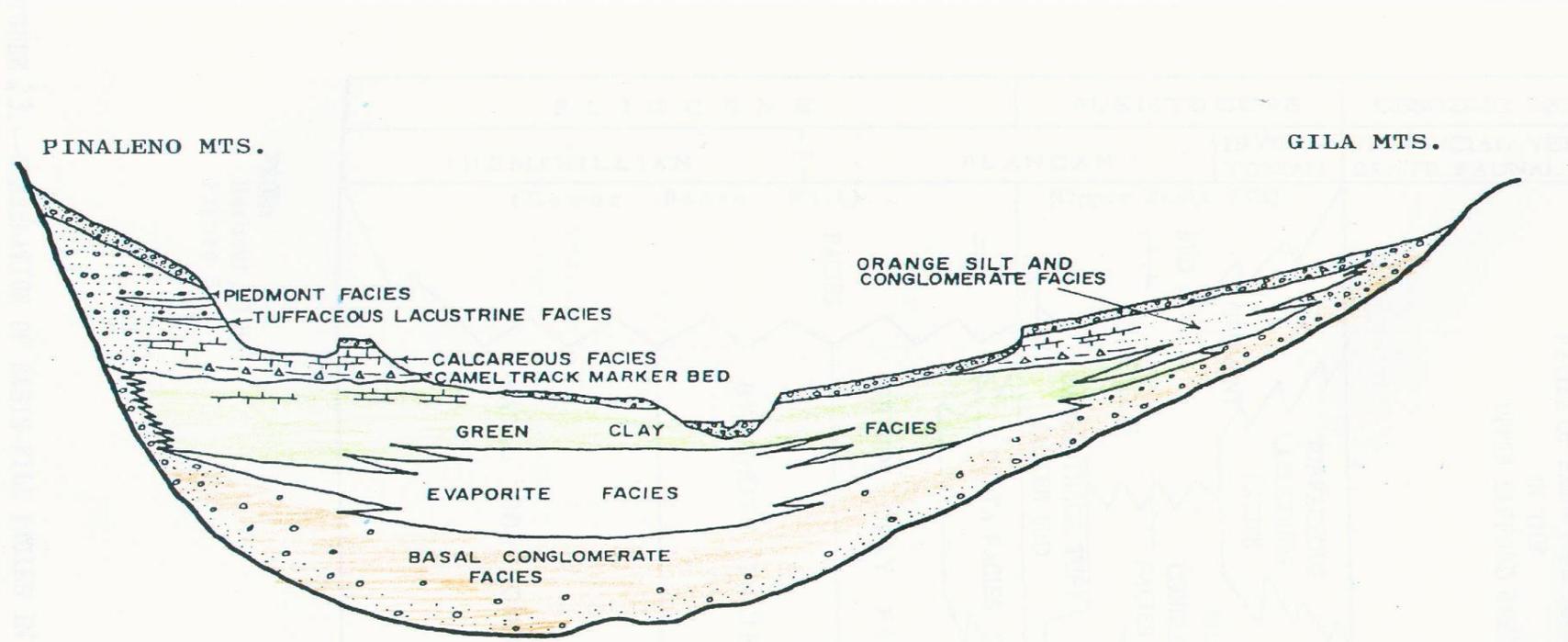
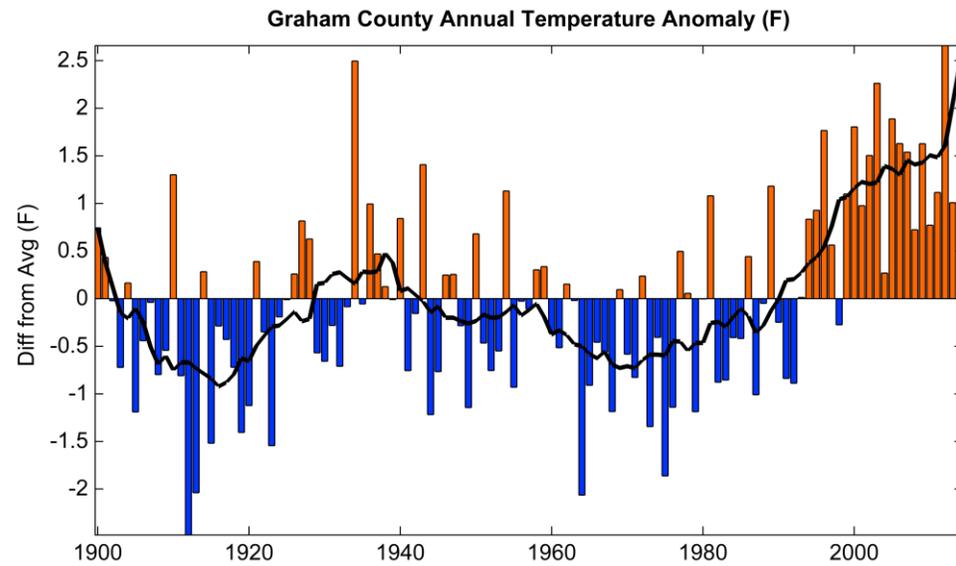
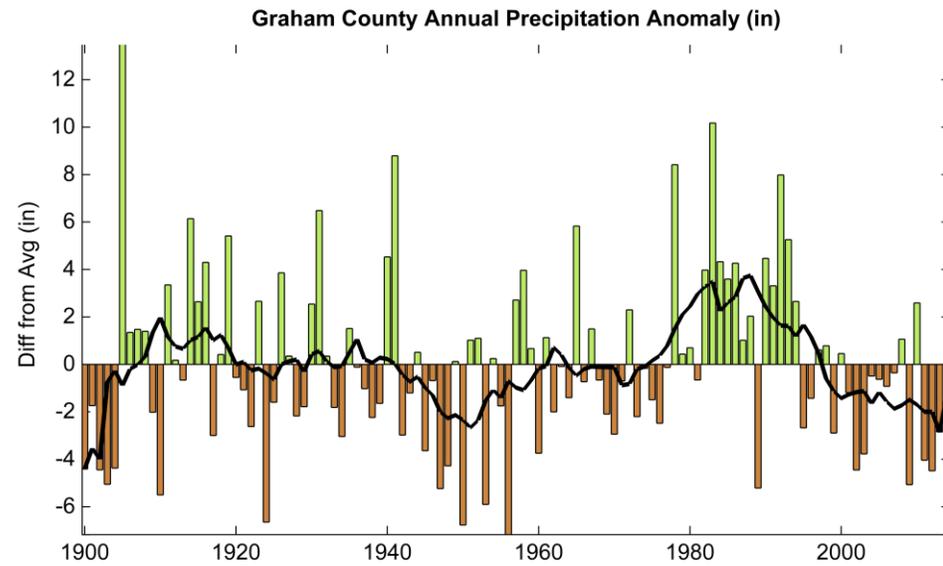


DIAGRAM OF ALLUVIAL AQUIFER



FROM:
Harbour, 1966
Figure 3

FIGURE 2.2.--GENERALIZED RELATIONSHIPS OF THE BASIN-FILL FACIES IN A CROSS-SECTION IN THE VICINITY OF THATCHER, ARIZONA



WATER EDUCATION



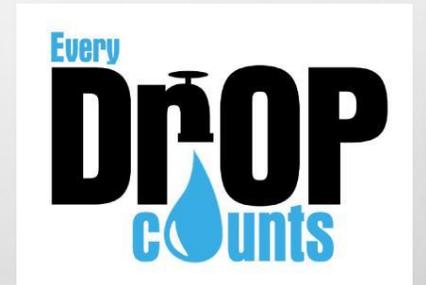
3 FOLD RECOMMENDATION

- EDUCATION
- AUGMENTATION
- CONSERVATION



EDUCATION

- Provide a regional water advisory board managing an overarching water management plan for Graham County
- Create a website that displays actively monitored hydrologic conditions
- Continue to provide a water education program for classrooms
- Provide water education at events in Graham County throughout the year
- Provide literature for water conservation available through numerous sources
- Provide water use analysis to property owners
- Provide an irrigation schedule for different times of the year
- Establish and provide target water budgets for households and the community



AUGMENTATION

- Connect Safford and the Graham County Cooperative water systems and create a joint emergency plan
- Continue developing the Safford reclaimed water system
- Create additional Storage throughout the valley
- Continue exploring new water sources



CONSERVATION

- Create an incentive rebate program with the following elements:
 - Gray water
 - Water harvesting
 - Smart water controllers
 - Drip irrigation systems
 - Turf replacement
 - Urinals
 - Washing machines
 - Toilets
 - Faucets
- An example of an incentive rebate program below is from Albuquerque:
http://www.Abcwua.Org/water_saving_rebates.aspx
- Graham County, Safford, Thatcher and Pima adopt a uniform Water Efficiency Ordinance to promote water conservation for new development.



“GRAHAM COUNTY WATER EFFICIENCY STANDARDS” PURPOSE OF THE ORDINANCE

- The purpose of this section is to establish minimum standards for water consumption with the intent to conserve limited water resources within Graham County.
- 

DEFINITIONS

- “Active Recreational Areas” means any public area designated and primarily used for athletic fields, playgrounds, golf courses, and other like uses.
- "Common Area" means areas in a development designated for common use, but not including active recreational areas in developments.
- “Landscapable Area” means the area of a lot less the footprint of the primary structure.
- “Landscape Plan” means a commercial or residential site plan designating proposed locations of components and types of plants and irrigation systems including gray water and water harvesting systems.
- “Lot” means a legally created parcel of land occupied or intended for occupancy by one (1) or more main buildings together with accessory buildings.
- “Public Facilities” means governmental owned and operated properties, including utility, recreational, and educational facilities.
- "Turf" means a surface layer of earth containing annual or perennial grasses.

DEFINITIONS

- "Water-Intensive Landscaped Area" means an area of land consisting primarily of turf, plants and trees not listed in the Graham County Low Water Use Plant List or any approved modifications to the list. Included is the total surface area of all water features (i.e. swimming pools of any size, fountains, ponds, water courses, waterfalls, and other artificial water structures) filled or refilled with water from any source.
- "Efficient Irrigation System" means a permanent system that delivers water in sufficient supply to meet the turf, plants, and trees water consumption requirements, directly to the plant material without causing loss of water due to surface runoff, excessive infiltration, or excessive evaporation.
- "Gray water" means wastewater that originates from residential clothes washers, bathtubs, showers, and sinks not including the kitchen, and does not include wastewater from toilets.
- "Water Harvesting" means the process of intercepting storm water from a surface such as a roof, hard surface, land surface, and putting it to beneficial use.

GENERAL REQUIREMENTS

- A landscape plan shall be required for the establishment of any new landscaping on any lot within the city/town/county.
- All turf, plants and trees shall be watered by an efficient irrigation system.
- No turf areas may be less than eight (8) feet in length or width.
- Plants and trees listed on the **Graham County Low Water Use Plant List** may be used without limitation. Turf, plants and trees not listed in the Graham County Low Water Use Plant List are considered water-intensive landscaped areas and are limited as described in the following sections.

What is it?



NEW SINGLE FAMILY AND MULTI-FAMILY DEVELOPMENT COMMON AREAS

- The amount of **water-intensive landscaping** in common areas of new single family and multi-family developments shall not exceed 15% of the total landscapable area. If reclaimed water is used on such common areas, the area may be increased to 25%.



NEW SINGLE FAMILY LOTS

- The amount of water-intensive landscaping shall not exceed the following:
- 20% - Lots under 10,000 sq. ft.
- 15% - Lots 10,000 sq. ft. to 20,000 sq. ft.
- 10% - Lots 20,000 sq. ft. and over

COMMERCIAL/INDUSTRIAL LOTS

- The amount of water-intensive landscaping shall not exceed 15% of the landscapable area.
- 



PUBLIC FACILITIES

- The amount of water-intensive landscaping shall not exceed 15% of the landscapable area. Active recreational areas are exempt from this limitation.

RIGHT OF WAYS

- Turf, plants and trees not listed in the Graham County Low Water Use Plant List shall be prohibited in all rights-of-way, whether or not reclaimed water is used to irrigate.





NEW INSTALLATION OF INDOOR FIXTURES

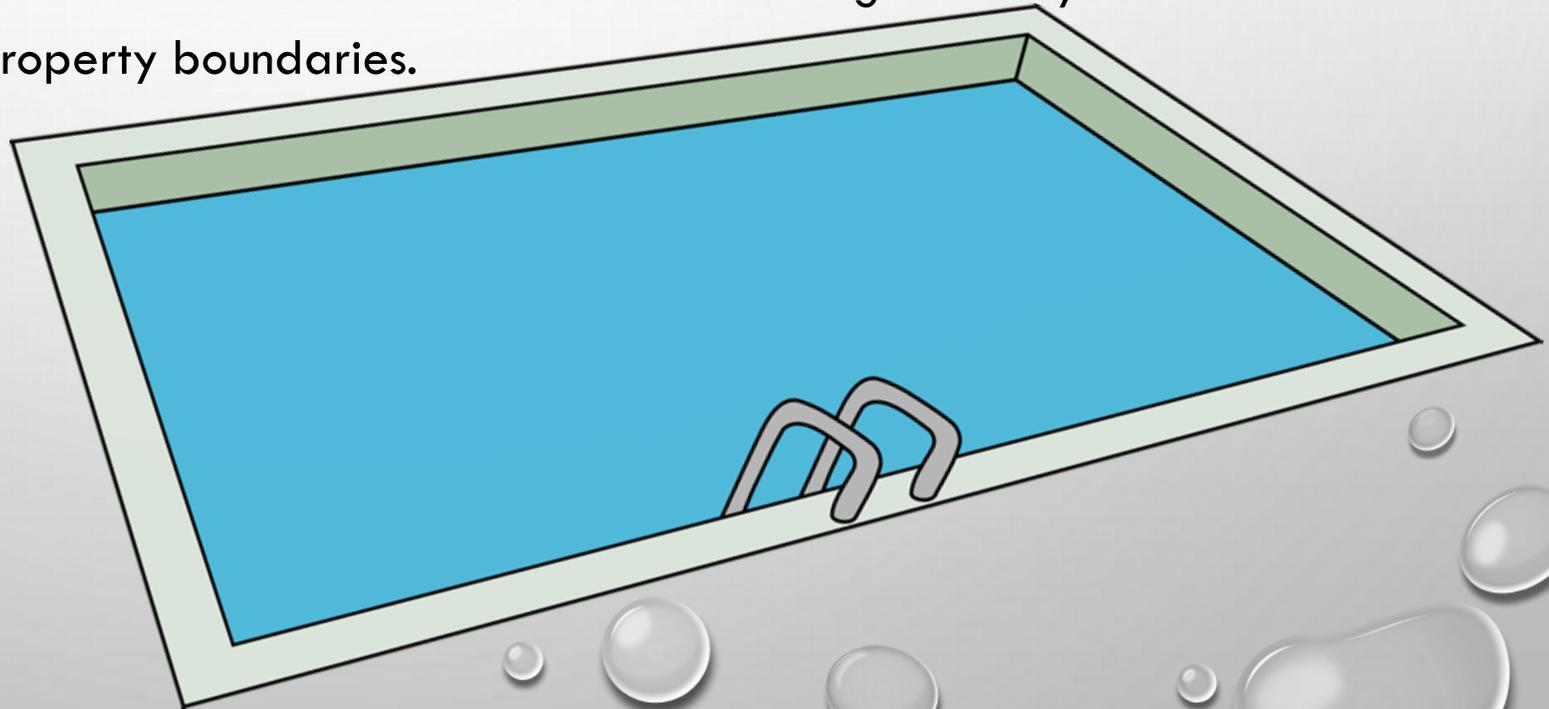
New installation of plumbing fixtures must meet the following minimums for high water efficiency ratings:

Toilet:	1.6 gallons per flush (gpf)
Urinal for Commercial:	Waterless
Showerheads:	2.5 gallons per minute (gpm)
Faucets:	2.2 gpm for residential 0.5 gpm for commercial or public with automatic shutoff



SWIMMING POOLS

- Swimming pools shall be equipped with pool covers and shall be in place any time the pool is not in use. Pool covers must be customized to minimize evaporation and must cover the shape of the pool entirely and be made of a durable material.
- If pools require backwashing, water shall not be drained onto streets or right of ways and shall be utilized and retained within the property boundaries.





GRAY WATER

Gray water systems are encouraged. Gray water originating from the residence shall be used and contained within the property boundary for household gardening, composting, lawn watering, or landscape irrigation. Human contact with gray water and soil irrigated by gray water should be avoided. Gray water requirements are as follows:

1. Surface application of gray water is not used for irrigation of food plants that have an edible portion that comes in direct contact with gray water.
2. The gray water shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions from home photo labs or similar hobbyist or home occupational activities.
3. The gray water system shall be constructed so that if blockage, plugging, overflow, or backup of the system occurs, gray water can be directed into the sewage collection system. The gray water system may include a means of filtration to reduce plugging and extend system lifetime.
4. Any gray water storage tank is covered to restrict access and to eliminate habitat for mosquitoes or other nuisances. Untreated gray water should be stored as short a time as possible—in any case, less than 24 hours.
5. The gray water system must be located outside of a floodway.
6. Gray water piping systems shall be clearly marked for identification.
7. Gray water applied by surface irrigation shall not contain water used to wash diapers or similarly soiled or infectious garments unless the gray water is disinfected before irrigation.
8. Surface irrigation by gray water is only by flood or drip irrigation. Spray irrigation is not allowed. Containment within horticultural basins or swales is encouraged for flood irrigation.

WATER HARVESTING

Water harvesting is encouraged. Water retained from water harvesting shall be used and contained within the property boundary for irrigation and other watering purposes with the following requirements:

1. Maintained as required to keep the system functioning as designed.
2. Maintained to prevent the accumulation of unwholesome, stagnant or offensive water.
3. Maintained to prevent the attraction or breeding of mosquitoes or other undesirable pests.
4. Used for nothing other than its intended purpose as a rainwater harvesting system.



DISCUSSION

GRAHAM COUNTY WATER EFFICIENCY STANDARDS

PURPOSE

The purpose of this section is to establish minimum standards for water consumption with the intent to conserve limited water resources within Graham County.

DEFINITIONS

“Active Recreational Areas” means any public area designated and primarily used for athletic fields, playgrounds, golf courses, and other like uses.

"Common Area" means areas in a development designated for common use, but not including active recreational areas in developments.

“Efficient Irrigation System” means a permanent system that delivers water in sufficient supply to meet the turf, plants, and trees water consumption requirements, directly to the plant material without causing loss of water due to surface runoff, excessive infiltration, or excessive evaporation.

“Gray water” means wastewater that originates from residential clothes washers, bathtubs, showers, and sinks not including the kitchen, and does not include wastewater from toilets.

“Landscapable Area” means the area of a lot less the footprint of the primary structure.

“Landscape Plan” means a commercial or residential site plan designating proposed locations of components and types of plants and irrigation systems including gray water and water harvesting systems.

“Lot” means a legally created parcel of land occupied or intended for occupancy by one (1) or more main buildings together with accessory buildings.

“Public Facilities” means governmental owned and operated properties, including utility, recreational, and educational facilities.

"Turf" means a surface layer of earth containing annual or perennial grasses.

"Water-Intensive Landscaped Area" means an area of land consisting primarily of turf, and plants and trees not listed in the [Graham County Low Water Use Plant List](#) or any approved modifications to the list. Included is the total surface area of all water features (i.e. swimming pools of any size, fountains, ponds, water courses, waterfalls, and other artificial water structures) filled or refilled with water from any source.

“Water Harvesting” means the process of intercepting storm water from a surface such as a roof, hard surface, land surface, and putting it to beneficial use.

GENERAL REQUIREMENTS

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Plants and trees listed on the [Graham County Low Water Use Plant List](#) may be used without limitation. Turf, plants and trees not listed in the [Graham County Low Water Use Plant List](#) are considered water-intensive landscaped areas and are limited as described in the following sections.

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The amount of water-intensive landscaped areas in common areas of new single family and multi-family developments shall not exceed 15% of the total landscapable area. If reclaimed water is used on such common areas, the area may be increased to 25%.

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|------------------------|------------------------------|
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