Outline

- System Overview
  - 3 slides #4-6

- Santa Fe Water Past
  - 5 slides #8-12

- Santa Fe Water Present
  - 5 slides #14-20

- San Juan Chama Return Flow Project
  - 12 slides #22-32

- Long Range Planning
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- Santa Fe Water Resources Indicator
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- Water Bank
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Outline to System Overview Transition Slide

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The System

- 4 Potable Sources
  - SF River
  - City Wells
  - Buckman Wells
  - BDD
- BDD jointly owned
  - City
  - County
  - Las Campanas
- City diverts SJC water at BDD
- Non-potable resource
- Santa Fe River watershed
San Juan Chama (SJC) Water

- Portion of NM’s share of Colorado River water under the Upper Colorado River Compact

- Diversion from three tributaries to the San Juan, gravity flow through tunnels into Chama system.

- City of Santa Fe full allocation 5230 AF/yr
2013-2019:

45% BDD
33% Canyon Road
22% Groundwater

City of Santa Fe Sources of Water Supply
Total Production
(annual average 2013 - 2019)

<table>
<thead>
<tr>
<th>Source</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buckman Well Field</td>
<td>975</td>
</tr>
<tr>
<td>City Well Field</td>
<td>911</td>
</tr>
<tr>
<td>Buckman Direct Diversion</td>
<td>3,901</td>
</tr>
<tr>
<td>Canyon Road YWTP</td>
<td>2,807</td>
</tr>
<tr>
<td>total</td>
<td>8,594</td>
</tr>
</tbody>
</table>
System Overview to SF Water Past Transition Slide

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CoSF Water Past: A Picture Is Worth…

City of Santa Fe Annual Water Production by Source 1925 - 2021

- Santa Fe River Surface Water
- Local Groundwater
- Buckman Groundwater
- San Juan Chama Surface Water
- Potable Production

1925-1995: Exponential demand growth, 20th Century solution: increase supply

1995 to present: City ownership of utility, reduced demand through conservation. 33% decrease in demand despite 25% increase in population served.

2011 to present: Surface water dominated.
Water Conservation

City of Santa Fe Per Capita Water Use 1995-2020

Population (Thousands)

Metered Use (GPCD)
Shifting to surface water dominated production

City of Santa Fe Annual Potable Water Production Since 2011 Compared to the 1995 Historical High

Annual Water Use (Acre Feet)

Year

13180 9952 9959 9402 8582 8155 8692 8544 8961 8268 8776 8691

Well Water
Treated River Water

Annual Water Use (Acre Feet)
Groundwater Recovery (our “savings accounts”)

- Since 2010, our wells have been recovering

- We like to keep our wells in reserve as a “drought proof” backup
City of SF Water Current (average of past 8 years) Demand and Supply

- **Current Demand**
  - 2014 – 2021 Demand & Production:
    - 1,511 acre-feet per year
    - ~9,000 acre-feet per year
  - 2014 – 2021 Sustainable Availability:
    - 7,045 acre-feet per year
    - 7,500 acre-feet per year

- **Water Available**
  - ~12,000 acre-feet per year

- **Water Sources**
  - Well Water
  - River Water

Legend:
- Orange: Well Water
- Blue: River Water
SF Water Past to Water Present Transition Slide

• System Overview
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City Water Present (2021)

56% BDD
22% Canyon Road
21% Groundwater

City of Santa Fe Sources of Water Supply 2021 Total Production

Total Production Averages
8,685 ac-ft/yr
2021 City of Santa Fe Water Production and Use

- SF River 1947 AF (22% of total)
- San Juan - Chama 4883 AF (56% of total)
- Metered Use 8195 AF (94% of production)
- Buckman Wells 659 AF (8% of total)
- City Wells 1201 AF (14% of total)
Even in 2021, a dry year, 79% of City water use was from rivers.
2021 Specific Information

Total Santa Fe River Reservoir Storage

Reservoir Storage (AF)

1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug 1-Sep 1-Oct 1-Nov 1-Dec

Total San Juan Chama Project Storage

Reservoir Storage (AF)

1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug 1-Sep 1-Oct 1-Nov 1-Dec

* In Heron, El Vado, Abiquiu, and Elephant Butte (2008-2014 only).
Does not include SJC water stored by exchange in SF River reservoirs.
2021 City of Santa Fe Water Annual Report

- Key figures from the report are in this slide deck

- Full 22 page report at www.santafenm.gov/water

- Please read it and let us know how to improve it!
2022 Outlook & Plans

Combined City-County 2022 Supply Projection (10,157 AF)

Monthly Production (AF/mo)

- CRWTP 2402 AF, 24%
- BDD 6126 AF, 60%
- CWF 670 AF, 7%
- BWF 960 AF, 9%

Snow Water Equivalent in Upper Rio Grande

- Median Peak SWE
- Max
- Median (PO)
- Median ('91-'20)
- Min

Current as of 04/21/2022:
- % of Median: 70%
- Median Peak: 24%
- Days since Median Peak: 30
- Percentile: 27

For more information visit: 30-Year Hydroclimatic Normals
Financials

- 6/30/2020 Cash balance: 55.4M
- 6/30/2020 Outstanding debt: 42.5M
- Projected water revenues current FY through FY 2026 36M to 39M per year
- Projected cash expenditures including CIP current FY through FY 2026 34M to 61M per year
- ~90M in only four capital projects on the near horizon that will drawdown cash reserves and likely increase debt
  - Nichols Dam Outlet Conduit Rebuild (~19M)
  - Flocculation Sedimentation Upgrades CRWTP (~13M)
  - McClure Dam Outlet Conduit Rebuild (~19M)
  - San Juan Chama Return Flow Project (~35M)
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Long Range Water Resources Planning (City Water Future)
Threats to a resilient water future

Climate Change + Demand Uncertainty = Potential Supply Shortages

![Graph showing New Mexico Rio Grande Tributary Flows](image1)

![Graph showing Santa Fe Basin Study Update Population Projections](image2)

![Graph showing Projected Santa Fe Utility Shortages](image3)
Most recent planning efforts

2015 Santa Fe Basin Study and 2019 Santa Fe Basin Study Update

- Growing demand & less reliable supply will lead to shortages if we do nothing
- Best way to avoid these shortages is more efficient use of effluent
Adaptation Strategies to Avoid Shortages

Adaptation strategies considered in the 2015 Santa Fe Basin Study:

1. Water Conservation
   » CoSF Water believes in a water conservation ethic and budgets about $1.6 million per year in support of conservation.

2. Direct /Indirect Reclaimed Water Reuse
   » We are moving towards the SJC Return Flow Project.

3. Aquifer Storage and Recovery
   » Staff is evaluating concepts for ASR of Santa Fe River Water in or near the river channel.
   » Staff is evaluating concepts for potential infiltration of effluent or raw river water for recovery with Buckman Wellfield Wells 11-13.

4. Additional Surface Water Rights
   » Large developers are required to bring water rights to offset added demands due to development
   » CoSF Water purchases water rights when available at a reasonable price
26

2013 – 2019
Flows to WWTP
San Juan Chama Return Flow Project

Returning water originating from the BDD to the Rio Grande was contemplated in the original BDD design. This idea was identified in the 2017 Reuse Feasibility Study as the preferred alternative for using effluent to increase City of Santa Fe Water supply.
Project Location
San Juan Chama Return Flow Project

Full consumption of SJC water

- Goal: Achieve full consumption of San Juan Chama (SJC) water by getting credit for returning unconsumed SJC water to the Rio Grande.

Current: all diversions at BDD from upstream reservoir releases

With project: same diversions at BDD with less release from upstream reservoirs. River "made whole" with effluent return.
Use of Effluent, with Buckman return (annual averages 2013 - 2019)
SJC Return Flow Project Status

• OSE Return Flow Credit Application
  • Submitted November 2021. Publicly notice should occur by month end.

• NEPA Process
  • Held two successful public scoping meetings in early November of 2021
  • Based on information gathered CoSFW is refining our proposal for NEPA analysis
  • Moving forward with this information towards target of NEPA document in fall 2022

• Lower Santa Fe River Planning Process
  • Being led by Santa Fe County

• Project Design
  • Currently evaluating four responses to RFP for engineering design
Near term plan: San Juan Chama Return Flow Project

- **Current Demand**
  - 2014 – 2021 Demand & Production: 1,511 acre-feet per year
  - 2014 – 2021 Sustainable Availability: 7,045 acre-feet per year

- **Water Available**
  - 2014 – 2021 Sustainable Availability: 4,500 acre-feet per year
  - Near future with return flow: 15,500 acre-feet per year

Legend:
- **Orange**: Well Water
- **Blue**: River Water
• **System Overview**
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Long Term Planning

Current Demand

Water Available

Future supply reduction (uncertain)

Future demand growth (uncertain)

Well Water

River Water

Acre-Feet per Year

2014 – 2021 Demand & Production

2014 – 2021 Sustainable Availability

Near future with return flow

Distant future with return flow and climate change

Demand

Water Available

Future demand growth (uncertain)
Long Range Water Resources Planning (City Water Future)
Local Water Planning with County: Water 2100

- '20: Planning Process
- '21: Supply and Demand Projections
- '22: Shortages
- '23: Adaptation Strategies
- '24: Develop 40 & 80 Year Plans

Ongoing Studies

Public Feedback
Do we have water to support growth?

• 6:40s video linked from www.santafenm.gov/water

• Condensed version of much of what has been shown here
• System Overview
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Santa Fe Water Resources Indicator
A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform seasonal conservation policy

- Q: When do we ask for or require more conservation from Santa Fe Water Utility customers?

**UTILITY PERSPECTIVE:**
- In the past 25 years potable water demand has decreased by 33% even as population served has increased by 25%
- Groundwater levels are rising
- We currently use about 75% of estimated renewable supply

**COMMUNITY PERSPECTIVE:**
- We are in a megadrought
- Most customers are very aware of the drought
- Growth is evident

**GOAL:**
Transparent and predictable conservation policy that incorporates Utility and Community perspectives
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform seasonal conservation policy

- Provide a transparent, quantitative, and predictable trigger to guide seasonal conservation policy
- Actual policy response to indicator will be developed by engagement with City’s WCC and County’s WPAC and direct public outreach.
- The indicator is not for short term infrastructure related disruption or long term water resources planning

“"It hasn’t rained in months, and all I read about in the newspaper is drought. Why aren’t you asking for or even mandating more conservation?”

- Tina Bitworried

A hypothetical Santa Fe Water Utility customer

<table>
<thead>
<tr>
<th>Time Scale</th>
<th>Technical Tools Used by Santa Fe Water Utilities</th>
<th>Conservation Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeks to Months</td>
<td>Worst case scenarios evaluated with hydraulic (pipe network) model</td>
<td>Short term drastic reduction</td>
</tr>
<tr>
<td>1 Year</td>
<td><strong>Santa Fe Water Resources Indicator</strong></td>
<td>Seasonal policy</td>
</tr>
<tr>
<td>Decades</td>
<td>STEWaRDS long range water resources planning model</td>
<td>Long range conservation policy</td>
</tr>
</tbody>
</table>
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform *seasonal* conservation policy

- **40% of weight to groundwater pumping**
  - Groundwater (water from wells) is our “drought-proof” savings account.
  - We can only indirectly estimate total availability, but we can see if water levels in the wells are going up or down through time.
  - Over time we don’t want to be pumping more than is being recharged. Water levels should be stable or rising if this is the case.
  - City wellfield is “unconfined” and water levels change slowly through time.
  - Much of Buckman wellfield is “confined” water under pressure between clay layers and water pressure changes more quickly through time.

- **30% of weight to surface water availability**
  - Surface water (river water) in reservoirs is our checkings account.
  - It is renewable and we know with very high accuracy how much is available.
  - When we use it up we have to go to the savings account (wells).

- **30% of weight to regional drought conditions**
  - As summarized by the drought value assigned to Santa Fe County in the U.S. Drought Monitor.
  - The public is more aware of regional drought than Utility water availability.
  - Regional drought will impact water use, especially outside.
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform seasonal conservation policy

• Groundwater Sub-indicator (40% of overall Supply Indicator)
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform *seasonal* conservation policy

- Surface Water Sub-indicator (30% of overall Supply Indicator)
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform seasonal conservation policy

• Regional Drought Sub-indicator (30% of overall Supply Indicator)
  • Based on weekly Santa Fe County drought score in the U.S. Drought Monitor (USDA-NOAA product)
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform *seasonal* conservation policy

- Regional Drought Sub-indicator (30% of overall Supply Indicator)
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform *seasonal* conservation policy.

Policy response to different indicator values will be developed by engagement with City’s WCC and County’s WPAC and direct public outreach.

Preliminary thinking is 5 different zones of conservation efforts.
Santa Fe Water Resources Indicator

A quantitative tool to summarize water availability to the City and County Water Utility systems in order to inform seasonal conservation policy.

Santa Fe Water Resources Indicator

Megadrought in the West Is Worst in More Than 1,200 Years

Nearly half of the drought can be attributed to human-caused climate change, a new study finds.

“a 22-year period between 2000-2021 that’s unmatched over the past 12 centuries”


MY VIEW CAROL ROMERO-WIRTH

Building water resiliency amid megadrought

Recent headlines call out the dangerous megadrought facing communities across the West. While concern is warranted, here’s the good news: Santa Fe is better off now than it was 20 years ago. Building on the proactive water decisions made by city leaders before us, we are continuing to make smart investments in our water future.
Water Supply Indicator to Water Bank Transition Slide

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City Code 25-10 – City Water Bank

• Became effective January 1, 2010

• “The purpose of the City Water Bank Ordinance is to establish a city water bank consisting of various accounts holding water rights, water credits and water conservation credits” which can be dedicated “to a specific development water budget”.

• In practice, three types of rights/credits can be used to offset added demand

  1. **Pre-1907 Middle Rio Grande water rights**: must be transferred to Buckman Wellfield (which is water rights limited)

  2. **Toilet retrofit credits**: Estimated savings associated with pre-2010 conservation used to offset development from 2010 forward.

  3. **Conservation credits**: Estimated savings associated with conservation from 2010 forward used to offset development from 2010 forward
The Water Bank
Tracking development and conservation since 2010

City Code 25-10 – City Water Bank

• In practice, three types of rights/credits can be used to offset added demand

  1. **Pre-1907 Middle Rio Grande water rights:** must be transferred to Buckman Wellfield (which is water rights limited)

  2. **Toilet retrofit credits:** Estimated savings associated with pre-2010 conservation used to offset development from 2010 forward.

  3. **Conservation credits:** Estimated savings associated with conservation from 2010 forward used to offset development from 2010 forward

Can be bought and sold by City and developers.

Used by developers to meet requirements associated with large developments.

Development using these would result in City production above 2010 levels*.

City accounting of room for development created by conservation from 2010 forward.

City implicitly sells these (or water rights) to small developments who pay for offsets instead of bringing water rights or credits.

Can be used by City to offset demands associated with added affordable housing.

Development using these would not result in increased City production above 2010 levels*.

*All other things being equal, and everything perfectly understood and quantified.
Imagine it’s January 1st 2010

City of Santa Fe Water Water Bank Accounting

Toilet retrofit credit program 2003 - 2009
Imagine it’s January 1st 2010 & you can predict development through 2020

City of Santa Fe Water Water Bank Accounting

784 AF/yr of new development demand added in 12 years

536 AF/yr new demand including affordable housing

248 AF/yr new demand from small developments

Water Volume (acre-feet)

Year


Water Volume (acre-feet)

Small Development

Large Development & Affordable Housing

City of SF Potable Water Production

536 AF/yr new demand including affordable housing

248 AF/yr new demand from small developments

784 AF/yr of new development demand added in 12 years
Production of 10,500 AF in 2021 would be expected/accepted

City of Santa Fe Water Water Bank Accounting

Water Volume (acre-feet)

Year


536 AF/yr new demand including affordable housing
248 AF/yr new demand from small developments
Actual Production in 2021: 8685 (~1800 AF less than expected)

City of Santa Fe Water Water Bank Accounting

Estimated 1800 AF/yr total demand reduction

12 Years of Water Banking

- 536 AF/yr new demand including affordable housing offset with toilet retrofit credits (51 AF/yr) & water rights (485 AF/yr).
- 248 AF/yr new demand from small developments
- ~1800 AF/yr total demand reduction (resulting from some combination of conservation programs, demand shift to County Utility during annexation, water budget uncertainty, meter & SCADA improvements, and other factors)
Pre-1907 Water Rights Moved to Buckman Wellfield

Water Rights in Water Bank at Calendar Year End

- City-owned, designated to specific developments
- City-owned, designated to affordable housing
- City-owned, undesignated
- Owned by others, undesignated

<table>
<thead>
<tr>
<th>Calendar Year End</th>
<th>Acre Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>1237</td>
</tr>
<tr>
<td>2020</td>
<td>1248</td>
</tr>
<tr>
<td>2021</td>
<td>1268</td>
</tr>
</tbody>
</table>
Questions?