

Extend the Living River
Reduce Flood Risk
Improve Acequia Flows
Preserve Wildlife Habitat

NEIL WILLIAMS, PE
FEBRUARY 6, 2024

My Background

NM PE # 8309

1995 Co-Chair City River Task Force & River Corridor Master Plan,

1995 City Wastewater Task Force

1997 Board Member SF Watershed Association

2000 Stream / Aquifer Interaction Study

2000-2006 Adopt the River Sponsor

2000 - 2012 Nichols, St Francis & Ricardo stream gages,

2000 La Bajada stream stage gage

2002 Acequia Surveys of San Juan Basin for ISC

2000 – 2006 Paired Basin Monitoring Study

2007 Alire to Frenchy's Channel Restoration Design

2008 Fish Habitat Study Nichols to Two Mile Pond

2011 Aztec Springs Hydrologic Analysis,

2011 Restoration Channel Design and Flood Analysis

2011 Bathymetric Surveys Nichols & McClure Reservoirs

2012 Greenways Conceptual Designs Siler to WWTP

2012 Bishop's Diversion Boulder Drop

2013 Arroyo Chamiso Channel Protection

2013 Restoration Channel Stream Monitoring

2022 Brother's Lane Rain Garden

2009 – present Parciente of Acequias de Llano San Juan, Taos Co.

At sale in 1994 PNM and City Agreed to Share the Cost of:

Sources:

- OSE Dam Safety Bureau files
- City/PMN Purchase Agreement
- Dam Breach 404 Permit Plans
- Dr. Richard Heggen, PE, PHD

1. A bridge bridge at Cerro Gordo Rd to replace the dangerously undersized culvert.
2. Close the Bypass ditch to river flows.
3. Restore all river flows, including floods, to the natural channel via the beaver pond wetlands and Two Mile Pond
4. Remove the concrete flood weir.
5. Restore the Acequia Cerro Gordo to it's historic pre-Two Mile Dam location on the N side of the river.

What Happened ?

WADING DISCHARGE MEASUREMENTS

Gage Below
Nichols Reservoir



Stream Gaging

Paige Grant
Downloading
Data
at Gage Below
Nichols Reservoir



Stream Gage

Restoration Channel
flowing toward
Old Stone Dam
2012



Stream Gage

Above St.
Francis Dr



Stream Gage

Ricardo Road
August 24, 2000

890 cfs



Stream Gage

2005 USFS
La Bajada Abandoned
Uranium Mine



PAIRED BASIN STUDY
2001 - 2006

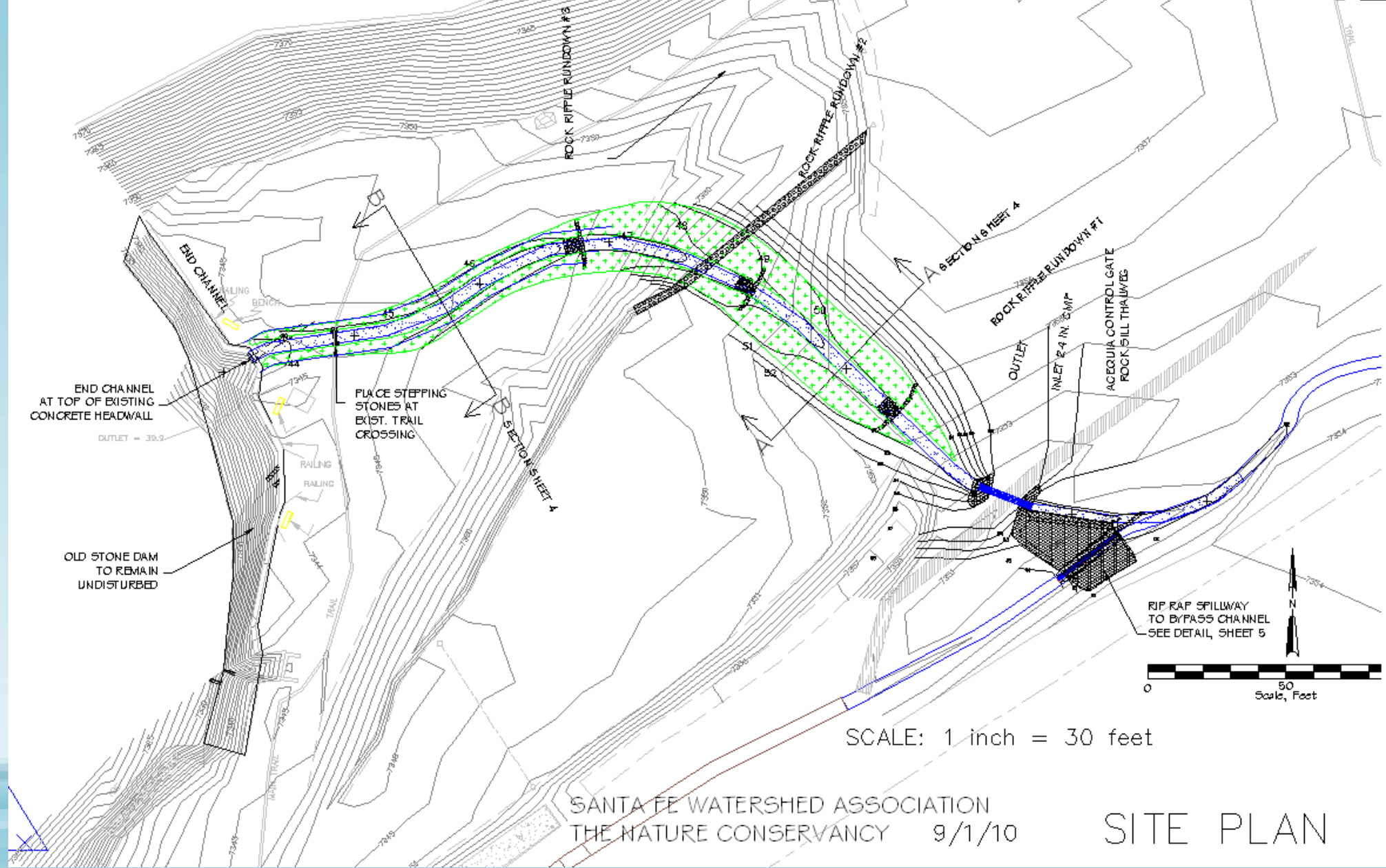
CREEK RESPONSES TO THINNING AND
BURNING

FLOWS
TURBIDITY
TEMPERATURE
CONDUCTIVITY
RAINFALL



Restoration Channel Design 2010

Approved
by:
CITY
OSE
NMED
ACOE



SANTA FE WATERSHED ASSOCIATION
THE NATURE CONSERVANCY 9/1/10

SITE PLAN

2012 RESTORATION CHANNEL CONSTRUCTION



Bob Findling,
The Nature
Conservancy



Steve Carson,
Rangeland
Hands





**Dr. Jerry Jacobi,
River Commission**

RESTORATION CHANNEL

April 17, 2012

**FIRST LIVING RIVER FLOWS
OVER OLD STONE DAM**

RESTORATION CHANNEL

JUNE 2012

LIVING RIVER FLOWS



RESTORATION CHANNEL

July 2012

LIVING RIVER FLOWS
OVER STONE DAM

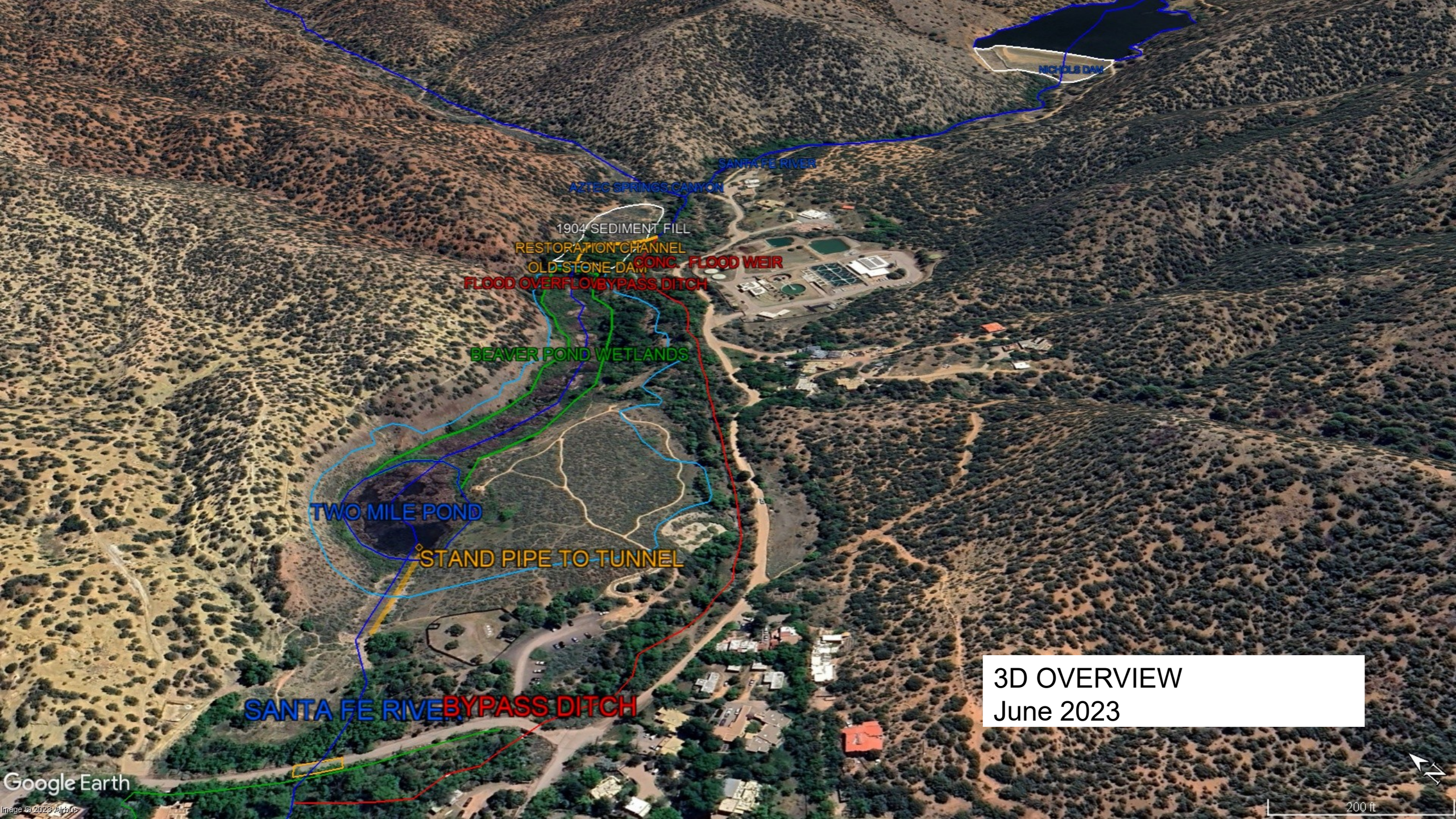


RESTORATION CHANNEL

July 2012

LIVING RIVER FLOWS
OVER STONE DAM





NICHOLS DAM

SANTA FE RIVER

AZTEC SPRINGS CANYON

1904 SEDIMENT FILL

RESTORATION CHANNEL

OLD STONE DAM

CONG. FLOOD WEIR

FLOOD OVERFLOW BYPASS DITCH

BEAVER POND WETLANDS

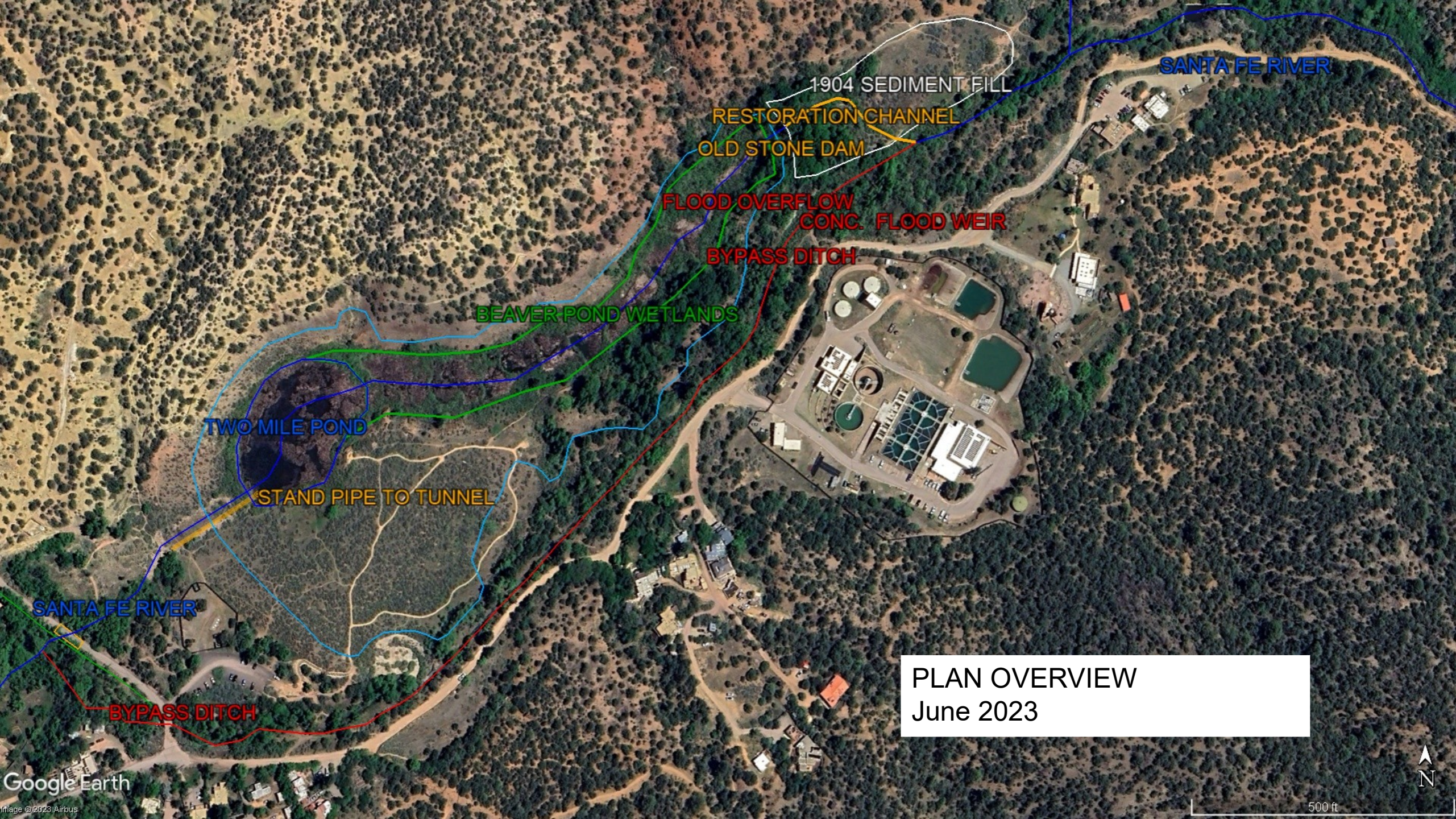
TWO MILE POND

STAND PIPE TO TUNNEL

SANTA FE RIVER BYPASS DITCH

3D OVERVIEW
June 2023





SANTA FE RIVER

1904 SEDIMENT FILL

RESTORATION CHANNEL

OLD STONE DAM

FLOOD OVERFLOW
CONC. FLOOD WEIR

BYPASS DITCH

BEAVER POND WETLANDS

TWO MILE POND

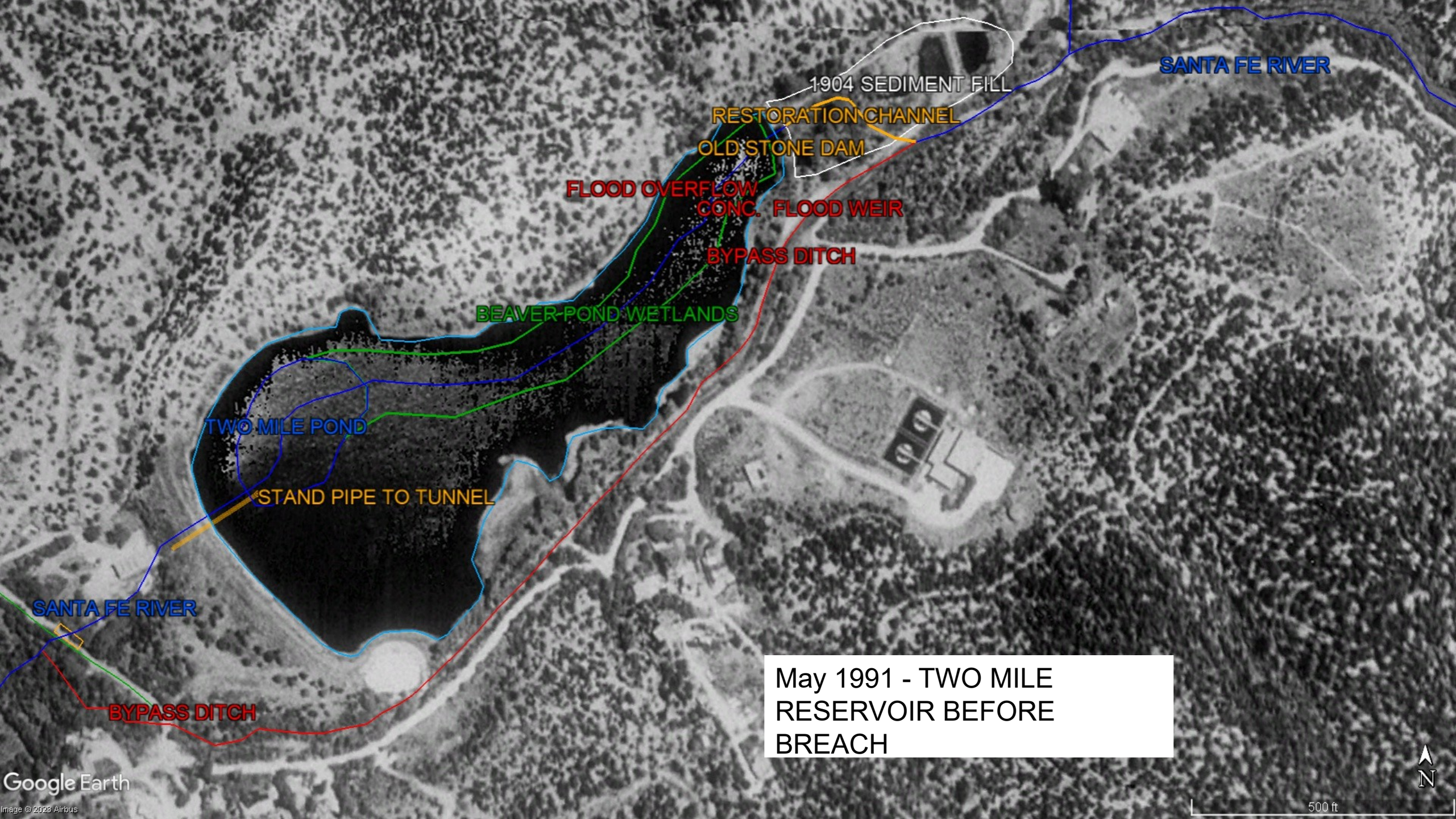
STAND PIPE TO TUNNEL

SANTA FE RIVER

BYPASS DITCH

PLAN OVERVIEW

June 2023



SANTA FE RIVER

1904 SEDIMENT FILL

RESTORATION CHANNEL

OLD STONE DAM

FLOOD OVERFLOW
CONC. FLOOD WEIR

BYPASS DITCH

BEAVER-POND WETLANDS

TWO MILE POND

STAND PIPE TO TUNNEL

SANTA FE RIVER

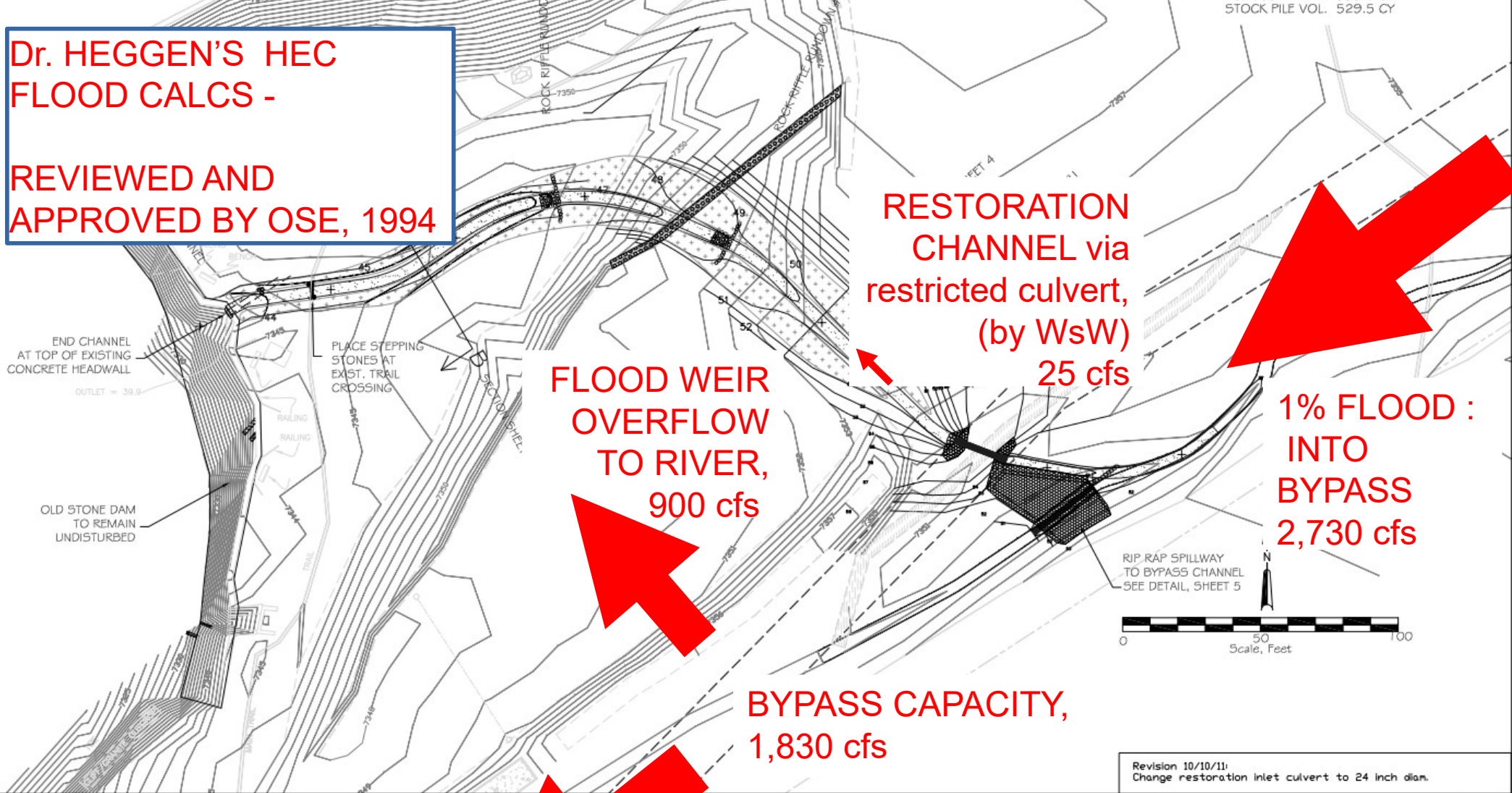
BYPASS DITCH

May 1991 - TWO MILE
RESERVOIR BEFORE
BREACH



Dr. HEGGEN'S HEC
FLOOD CALCS -

REVIEWED AND
APPROVED BY OSE, 1994



 **WATERSHED WEST**

ENGINEERING - HYDROLOGY - RESTORATION

1288 Lejano Lane, Santa Fe, NM 87501
Tel: 505.982.5180 FAX: 505.982.9208
Website: www.watershedwest.com

 **LEGEND ENGINEERING, LLC**

10000 Sandstone Avenue, NE Albuquerque, NM 87107
Tel: 505-344-3315 FAX: 505-344-0698
Website: www.riverrestoration.com

Revision 10/10/11:
Change restoration inlet culvert to 24 inch dian.

SANTA FE RIVER RESTORATION
AT OLD STONE DAM, SANTA FE, NM

RESTORATION PLAN

Scale: 1 INCH = 16 FT 10/10/11

Sheet
2
of
6

Bypass Ditch Cleaning in 1972

Photo source OSE
Dam Safety Bureau



An Efficient Channel for Acequia Delivery

Narrow,
Clear of
vegetation



The Bypass Channel Today



Tree growth clogs the Bypass and will cause major flood water to spill over the concrete weir here.





SANTA FE RIVER

AZTEC SPRINGS CANYON

1904 SEDIMENT FILL

RESTORATION CHANNEL

OLD STONE DAM

CONC. FLOOD WEIR

BYPASS DITCH

FLOOD OVERFLOW

BYPASS FLOOD OVERFLOW



FLOOD ZONES - Nichols to Cerro Gordo Rd

Santa Fe County
GIS Flood Zone
Mapping 2023

Note: TM Reservoir
area still shows 30
years after breach.



THE BYPASS DITCH LEAKS

Bypass seepage ranged from -0.5 cfs at base flow up to -1.75 cfs during acequia deliveries

Average Measured Loss - 0.304 cfs

THE NATURAL CHANNEL GAINS

Natural channel below Two Mile pond flowed from +0.3 to +0.5cfs from infiltration without any river input

Average Measured Gain+ 0.320 cfs

JSAI

All loss occurs in Bypass Channel

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Table 6. Water budget for the Santa Fe River from below Nichols Reservoir to below Two Mile Pond, July 23, 2018 to March 16, 2019

component	station	average flow (cfs)
inflow	below Nichols river station	0.527
midpoint	Stilling Well A bypass station	0.458
outflow	Stilling Well B bypass station	0.154
outflow	TNC Restoration Channel return below Two Mile Pond	0.320
net loss		0.053

**John Shomaker Assoc. Inc.,
June 30, 2019 Monitoring
Results, – Table 6 , p26**

POND SIZING: IF POND IS EXCAVATED TO A UNIFORM 6 FEET DEEP

1.6 ACRE MAX WATER SURFACE

6 FEET DEEP, 3:1 SIDE SLOPES

8.5 ACRE FEET TOTAL VOLUME

ACEQUIA RELEASES :

ACEQUIA DELIVERY = APPROX. 3.5 ACRE FEET/ WEEK
(99 AF/Y, 28 WK SEASON)

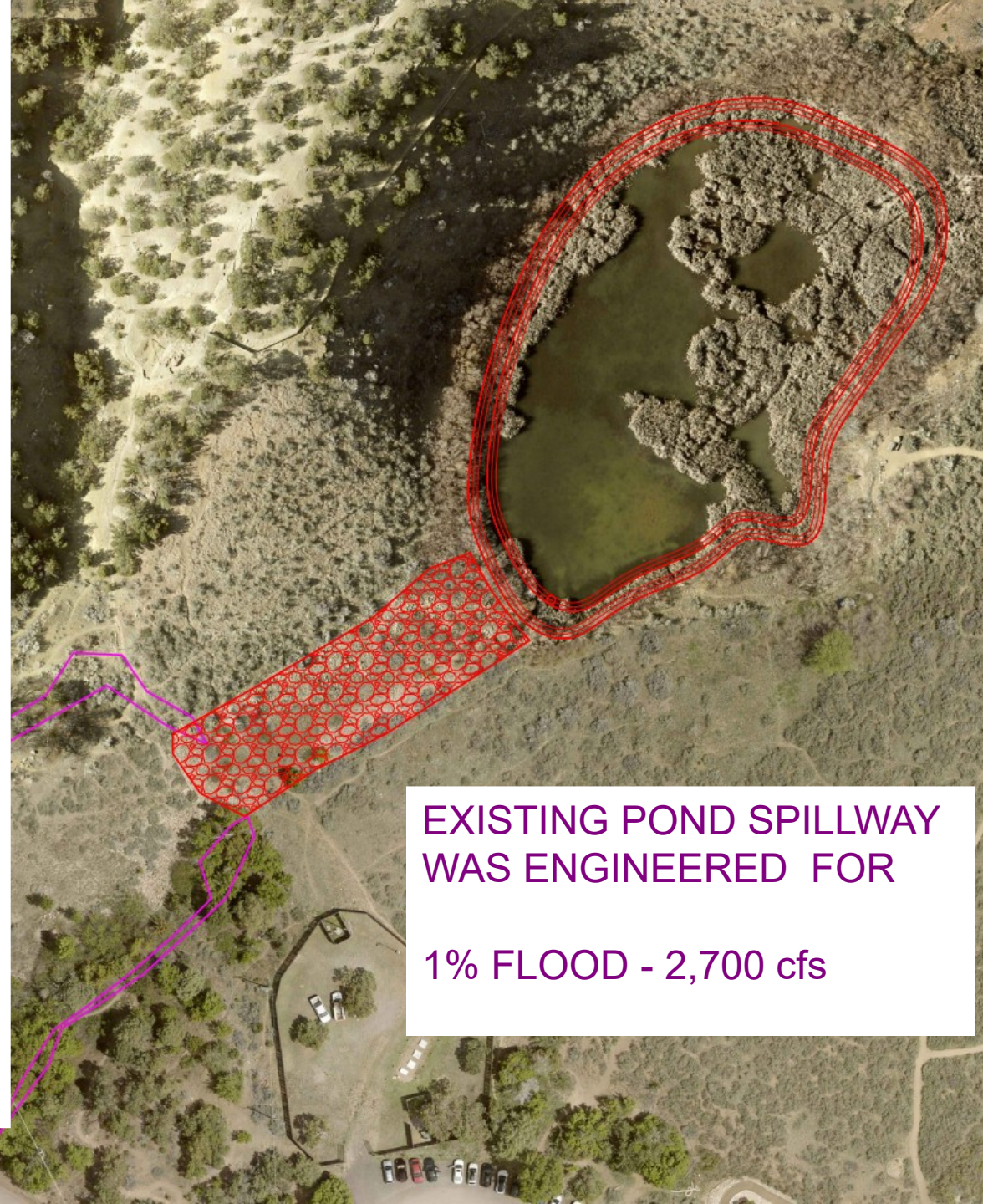
DRAWDOWN ON ACEQUIA RELEASE DAYS - APPROX. 2.5 FT

POND INFLOWS :

NICHOLS ACEQUIA TRANSFERS = APPROX. 3.5 ACRE FEET/ WEEK

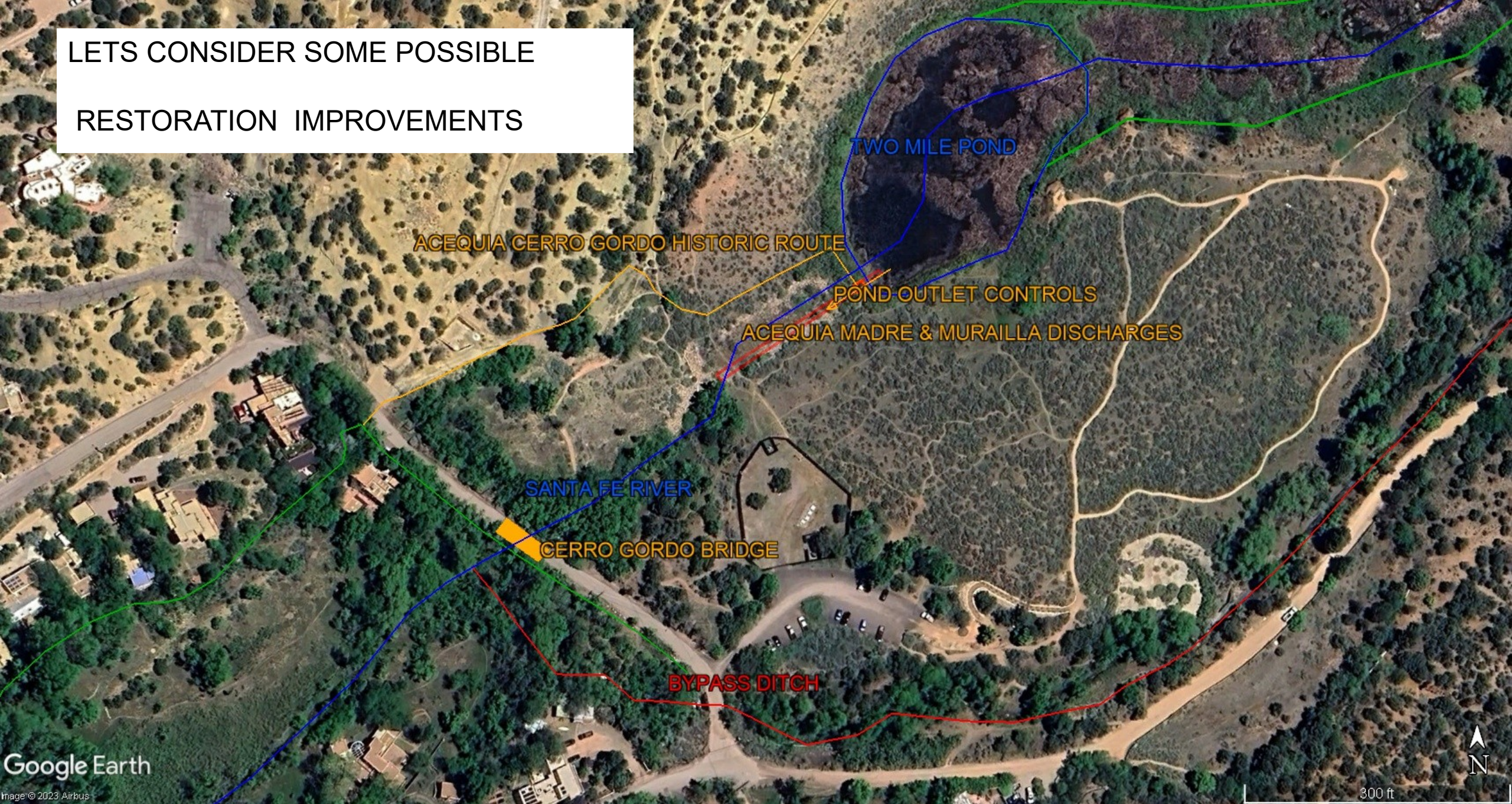
NATURAL INFLOW = APPROX. 4.2 ACRE FEET / WEEK (0.3 CFS)

LIVING RIVER INFLOW = VARIES



EXISTING POND SPILLWAY
WAS ENGINEERED FOR
1% FLOOD - 2,700 cfs

LETS CONSIDER SOME POSSIBLE
RESTORATION IMPROVEMENTS



TWO MILE POND

ACEQUIA CERRO GORDO HISTORIC ROUTE

POND-OUTLET CONTROLS

ACEQUIA MADRE & MURAILLA DISCHARGES

SANTA FE RIVER

CERRO GORDO BRIDGE

BYPASS DITCH



The Bypass Channel Creates Problems

- *It had* an engineering purpose 113 years ago, but now it's a **Public Works Liability**
- The Bypass is now overgrown and clogged with trees.
- A major storm will cause the spillway to dump uncontrolled flood water upstream of Cerro Gordo Rd
- When the flood spillway overflows (as designed) it will likely flood and destroy Cerro Gordo Road and damage properties through downtown Santa Fe
- PNM and the City did not completed the bridge and other flood work recommended in their 1994 purchase agreement
- No one is responsible for Bypass maintenance - and most of it is now TNC land.
- The Bypass loses water continuously. Retiring it will save drinking water.

We need to Retire the Bypass:

- Splitting flows through two parallel half mile long channels wastes water by seepage.
- Using the Bypass means **less water** for acequias, living river flows and our municipal drinking water supply.
- The Bypass increases flood risk for the community
- Continuing to use the Bypass divides the community, without benefit to anyone.
- It's a headache for the Water Division, the Acequias, and the Public
- We're very interested in our water history - but no one loves the Bypass.
- ***Santa Fe loves its natural river !***

Solutions are on City Property

- BUILD A BRIDGE ON CERRO GORDO RD
- RETIRE THE BYPASS & ROUTE FLOWS TO THE NATURAL CHANNEL
- IMPROVE & PERMIT TWO MILE POND WITH OUTLET CONTROLS FOR ACEQUIA RELEASES
- REMOVE THE STANDPIPE & PLUG THE TUNNEL. LET THE POND OVERFLOW VIA ITS EXISTING SPILLWAY
- RESTORE ACEQUIA CERRO GORDO TO ITS HISTORIC ACCESS ROUTE ON NORTH SIDE OF RIVER
- RESTORE THE AREA BETWEEN THE POND AND CERRO GORDO RD FOR RIPARIAN VALUES AND WATER HISTORY PARK FEATURES

