



Grand Canyon National Park Airport

Drainage Master Plan and Water Use Study

Planning Advisory Committee Meeting #2

January 31, 2019



AGENDA

- Introductions
- Project Overview
- Summary of Findings – Draft Data Collection and Existing Conditions Report
- Improvement Alternatives
- Next Steps



INTRODUCTIONS



PROJECT TEAM

- Matthew Smith (ADOT, Airport Manager)
- Lee McCleary (ADOT, Past Airport Manager)
- Bob Haneline (Dibble, Project Manager)
- Charlie McDermott (Dibble, Sr. Airport Planner)
- Nanette Pageau (Kaneen Communications, Public Outreach)



PAC AGENCY MEMBERS

Arizona Department of Transportation
Arizona Game & Fish
Arizona State Land Department
Coconino County
Federal Aviation Administration
Grand Canyon Airlines
Grand Canyon National Park
Grand Canyon National Park Airport
Havasupai Tribe
KT Consulting, LLC
Hydro Resources
Maverick Airlines
National Park Service
Papillon Grand Canyon Helicopters
Sierra Club
Sierra Club, Grand Canyon Chapter
Town of Tusayan
USDA Forest Service – Kaibab National Forest



PROJECT OVERVIEW & GOALS



- **Drainage Master Plan**
 - Develop an FAA-compliant Drainage Master Plan
- **Water Use Study**
 - Estimate Future Water Demands (matching 2017 Airport Master Plan)
 - Evaluate Alternatives for Providing Increased Potable Water Source(s)



PROJECT PHASES

- Data Collection and Existing Conditions Analysis
- Alternatives Analysis and Drainage Master Plan, Water Use Recommendations

LEGEND

- - - Airport Property Line
- 10' Ground Contours
- Runway Protection Zone (RPZ)
- Intermediate Term Program
- Long Term Program
- Taxiway Designation
- 35' Building Restriction Line (BRL)
- General Aviation Development Potential
- Non-Aviation Development Potential
- To Remain Vacant for Underground Utilities
- Private Development/Beyond Planning Period

INTERMEDIATE TERM (Years 6-10)

- 1 Construct Blast Pads (Both Runway Ends)
- 2 Replace Airfield Generator
- 3 Rehabilitate Existing Terminal Roadways and Parking Lots
- 4 Environmental Assessment - Terminal Building Replacement - *Not Pictured*
- 5 Equipment Purchase - ARFF Truck - *Not Pictured*
- 6 Equipment Purchase - Deicing Equipment to Service Larger Aircraft - *Not Pictured*
- 7 Upgrade Perimeter Access Road on East and West Sides of Airfield
- 8 Construct Helipad Between ARFF Facility and Terminal Apron
- 9 Construct Dedicated Airport Maintenance Facility
- 10 Design New Replacement Terminal Building and Associated Infrastructure - *Not Pictured*
- 11 Replace VASI-4 with PAPI-4 on Runway 21
- 12 Construct New Replacement Terminal Building
- 13 Construct Associated Vehicle Access/Parking to Serve Replacement Terminal Building
- 14 Relocate Airport Housing for Non-Aviation Development Potential*
- 15 General Airfield Pavement Maintenance - *Not Pictured*

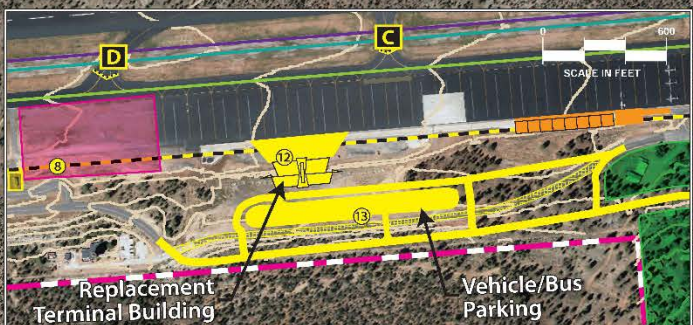
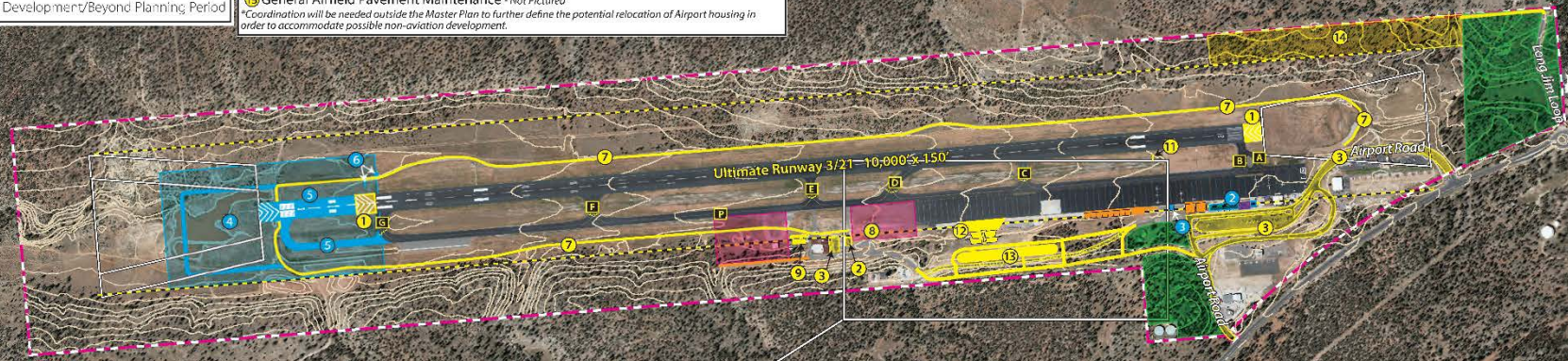
*Coordination will be needed outside the Master Plan to further define the potential relocation of Airport housing in order to accommodate possible non-aviation development.

LONG TERM (Years 11-20)

- 1 Environmental Assessment - Runway 3-21 Extension - *Not Pictured*
- 2 Redevelop Existing Terminal Area for Aviation Use (Site Preparation)
- 3 Implement Self-Service Fuel Facility/Fuel Farm
- 4 Site Preparation for Runway 3-21 Extension (Clearing, Grading, Relocated Perimeter Access Road)
- 5 Extend Runway 3-21 1,001' Southwest and Associated Parallel Taxiway P
- 6 Relocate Navigational Aids (Glide Slope Antenna, PAPI-4, and REILs)
- 7 General Airfield Pavement Maintenance - *Not Pictured*

KEY

- PAPI - Precision Approach Path Indicator
- VASI - Visual Approach Slope Indicator
- REIL - Runway End Identification Light
- ARFF - Aircraft Rescue and Firefighting



NEW AIRPORT MASTER PLAN



*Grand Canyon National Park Airport
Drainage Master Plan and Water Use Study
Data Collection and Existing Conditions Analysis Report*

ADOT Project No.: ADOT18-00007491
Dibble Engineering Project No.: 1017095

July 30, 2018

Prepared For:



**Dibble
Engineering**

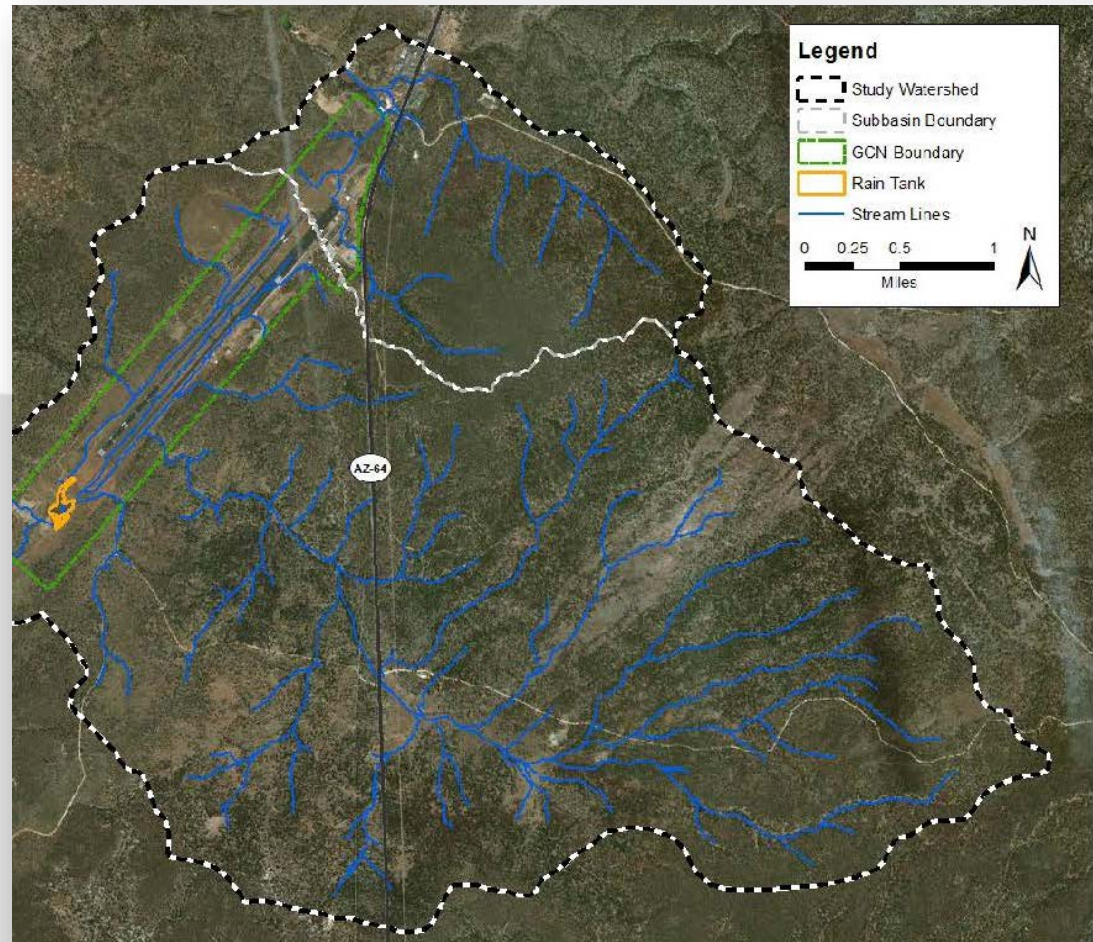
7878 North 16th Street
Suite 300
Phoenix, Arizona 85020
P: 602.957.1155
F: 602.957.2838
www.dibblecorp.com

DATA COLLECTION AND EXISTING CONDITIONS ANALYSIS REPORT



WATERSHED

- 16 Square Mile Area
- Mostly Forest Cover
- 2 Subbasins



2 - Stream Lines Based on Topography



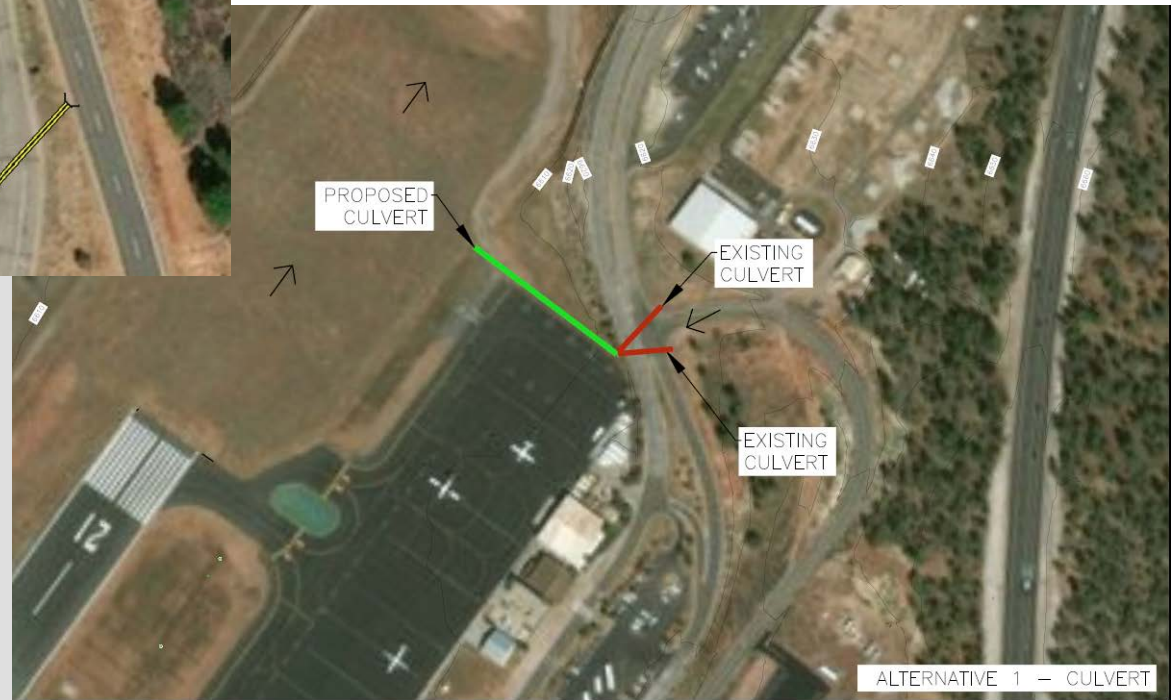
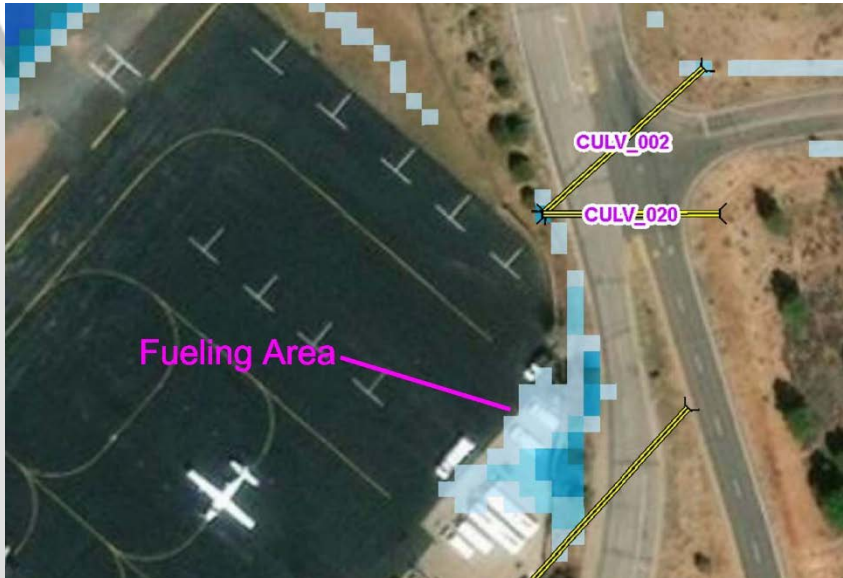
PROJECT ALTERNATIVES

- North Area Drainage (2)
- Infield Culvert Locations (3)
- Taxiway 'P' Pavement Weeping (3)
- Rain Tank relocation (2)
- Stormwater Harvesting (3)



NORTH AREA DRAINAGE

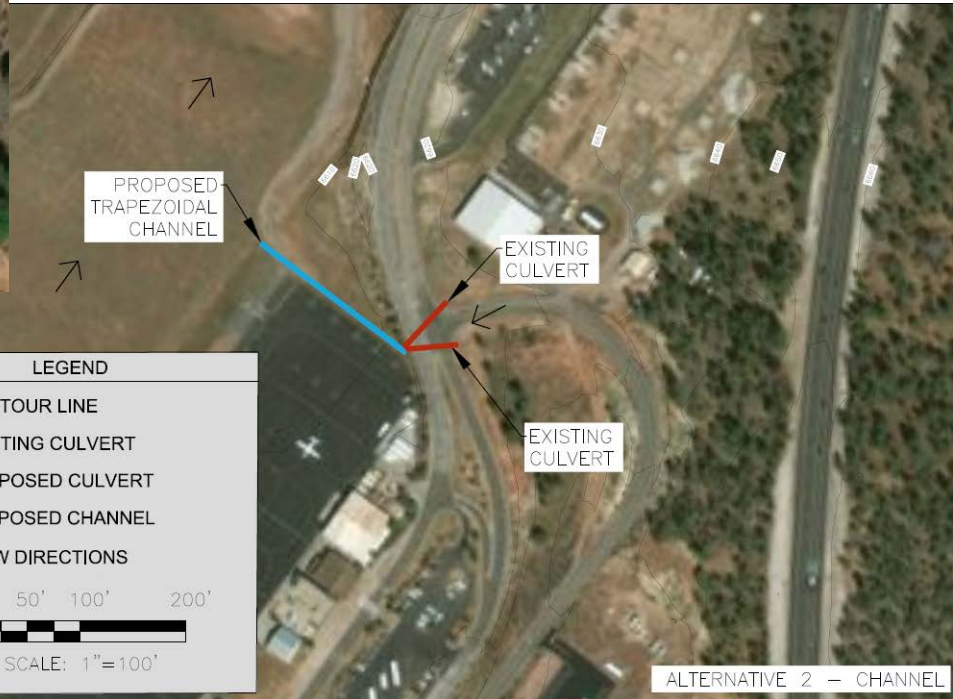
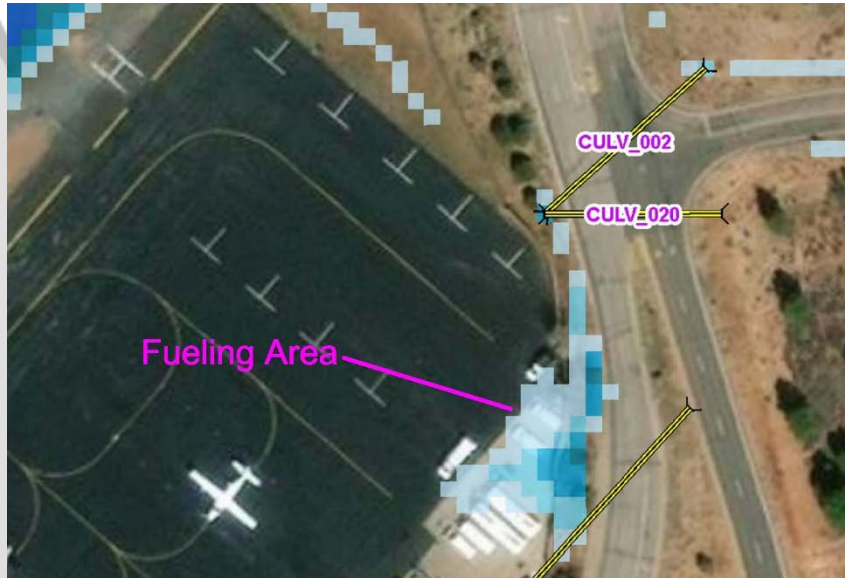
ALT. 1 – INFIELD AREA NEW CULVERT





NORTH AREA DRAINAGE

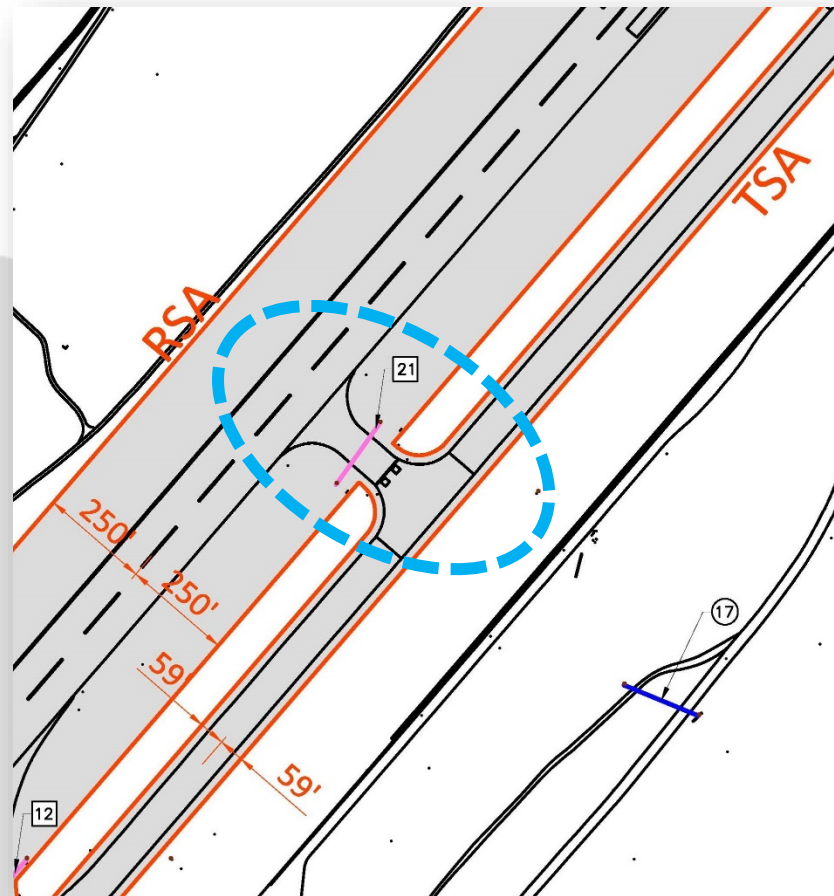
ALT. 2 – INFIELD AREA NEW CHANNEL





INFIELD CULVERT LOCATIONS

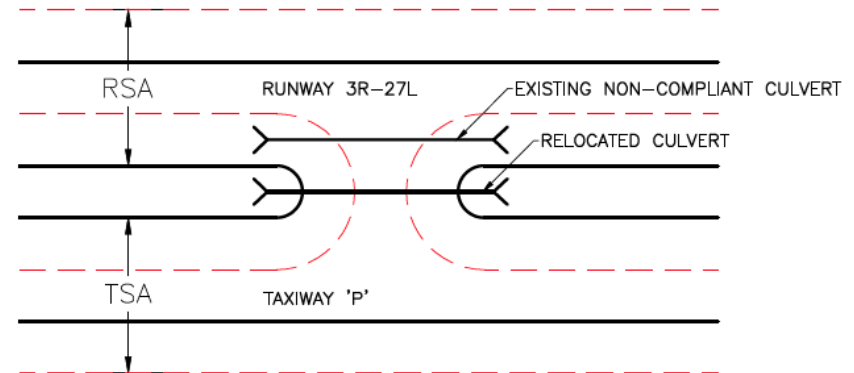
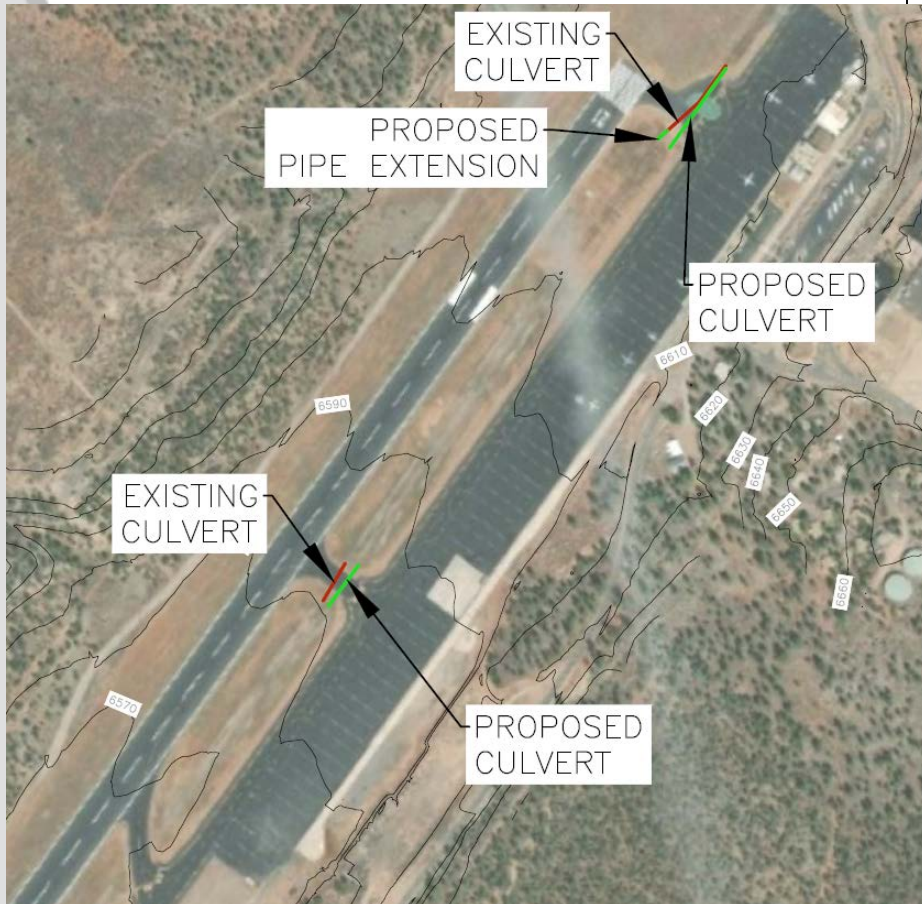
- Six Culverts Located in Runway Safety Area



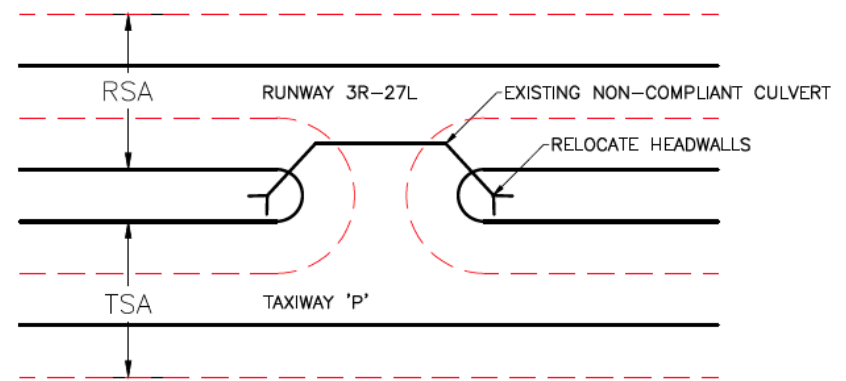


INFIELD CULVERT LOCATIONS

ALTS 1, 2 AND 3



ALTERNATIVES 1 AND 2 SCHEMATIC



ALTERNATIVE 3 SCHEMATIC



TAXIWAY 'P' PAVEMENT WEEPING

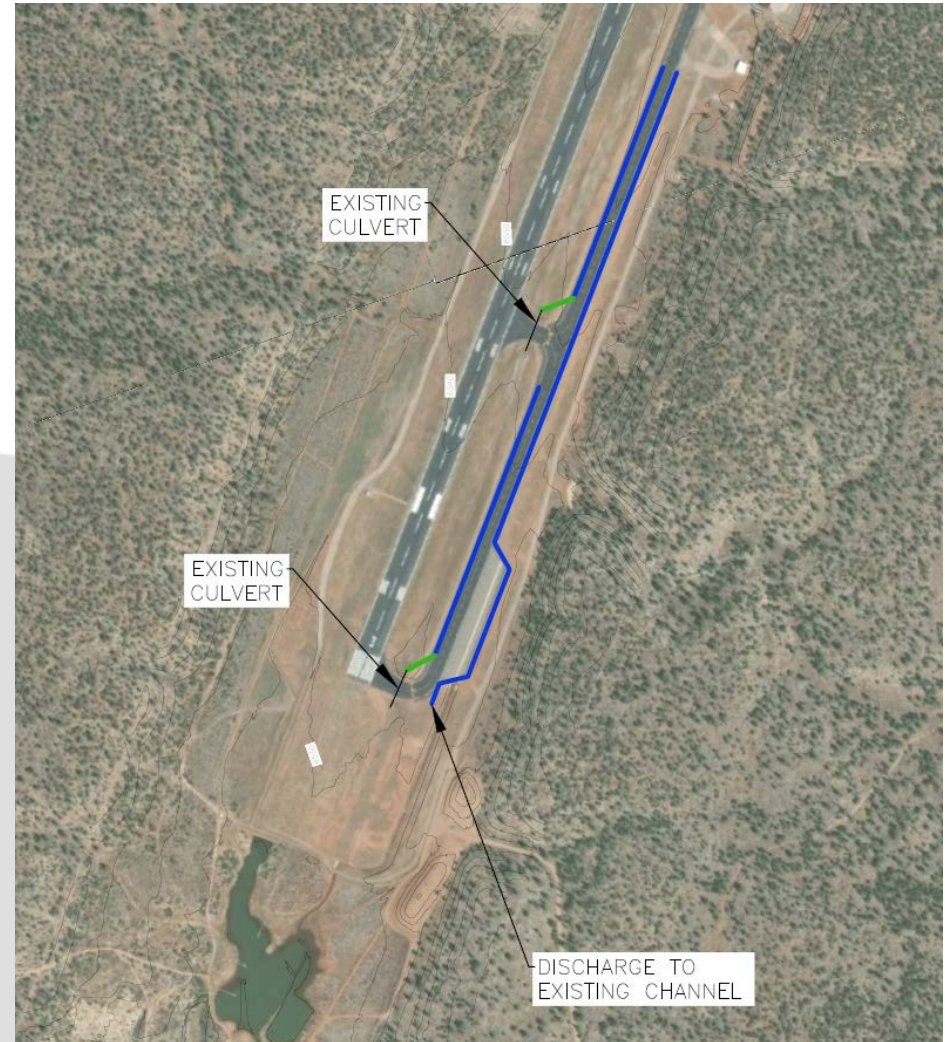
- Likely due to shallow seasonal groundwater





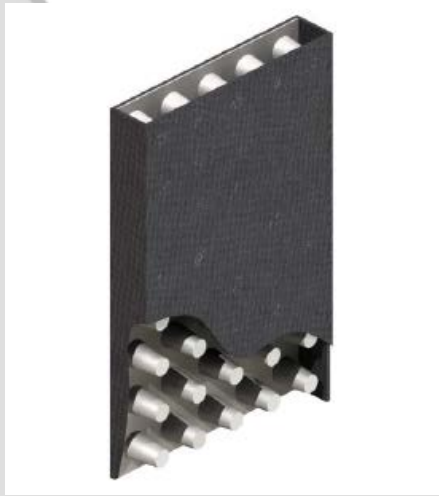
TAXIWAY 'P' PAVEMENT WEeping

- Install 9,100 feet of Underdrain Systems at Pavement Edge.

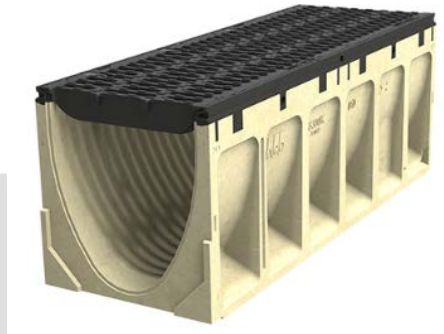




TAXIWAY 'P' PAVEMENT WEeping ALTERNATIVES 1, 2 AND 3



Alternative 1
Geocomposite
Strip Drains



Alternative 2
Trench Drains



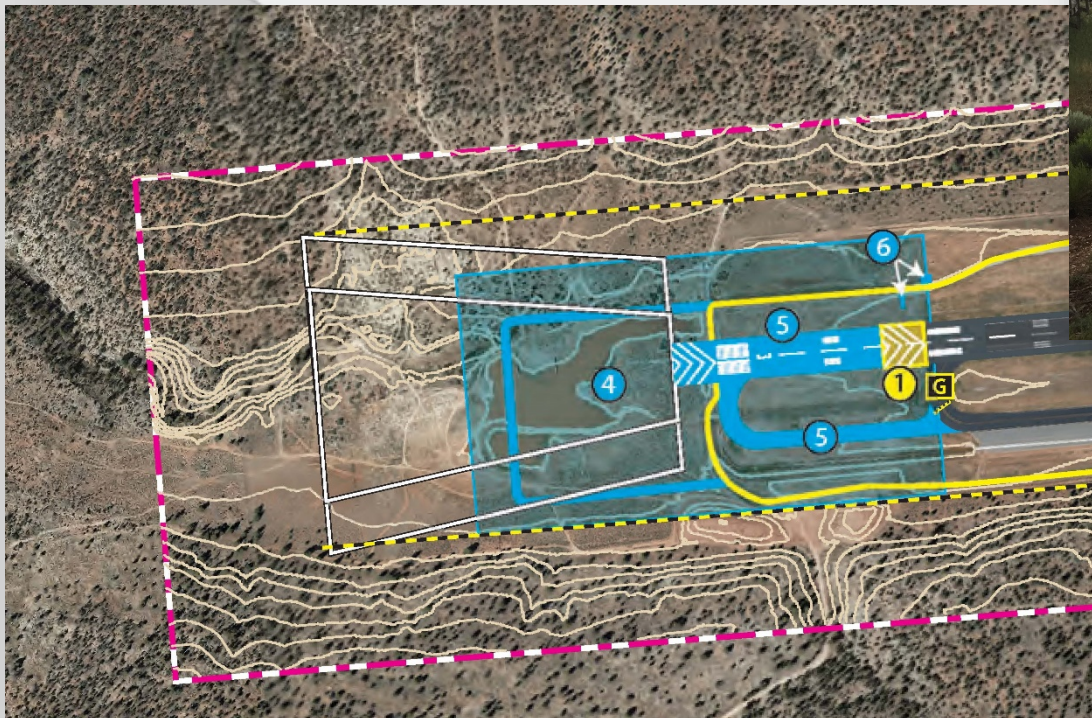
Alternative 2
Perforated
Storm Drains



RAIN TANK RELOCATION



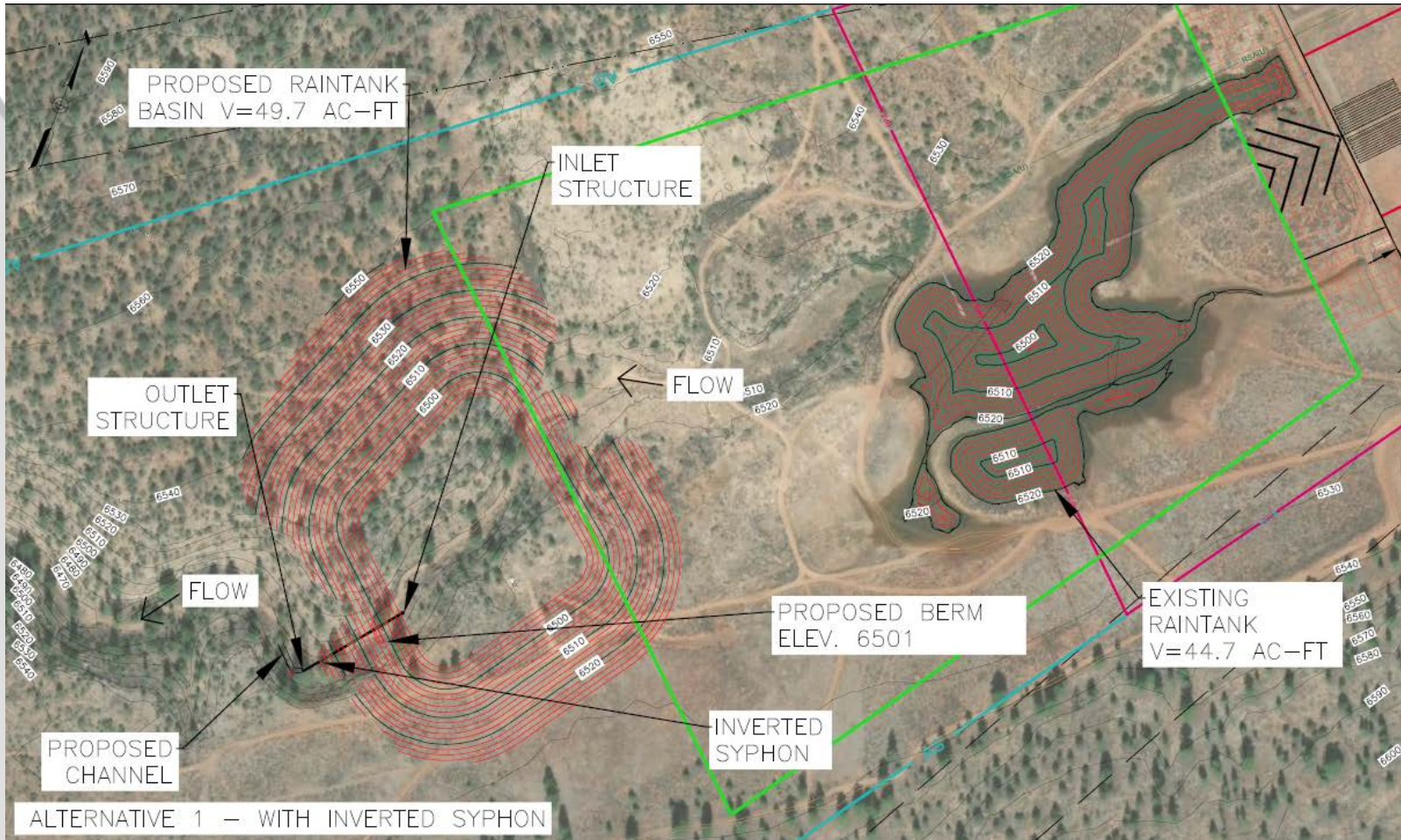
- Runway Extension
- Wildlife Attractant
- National Wetland Inventory





RAIN TANK RELOCATION

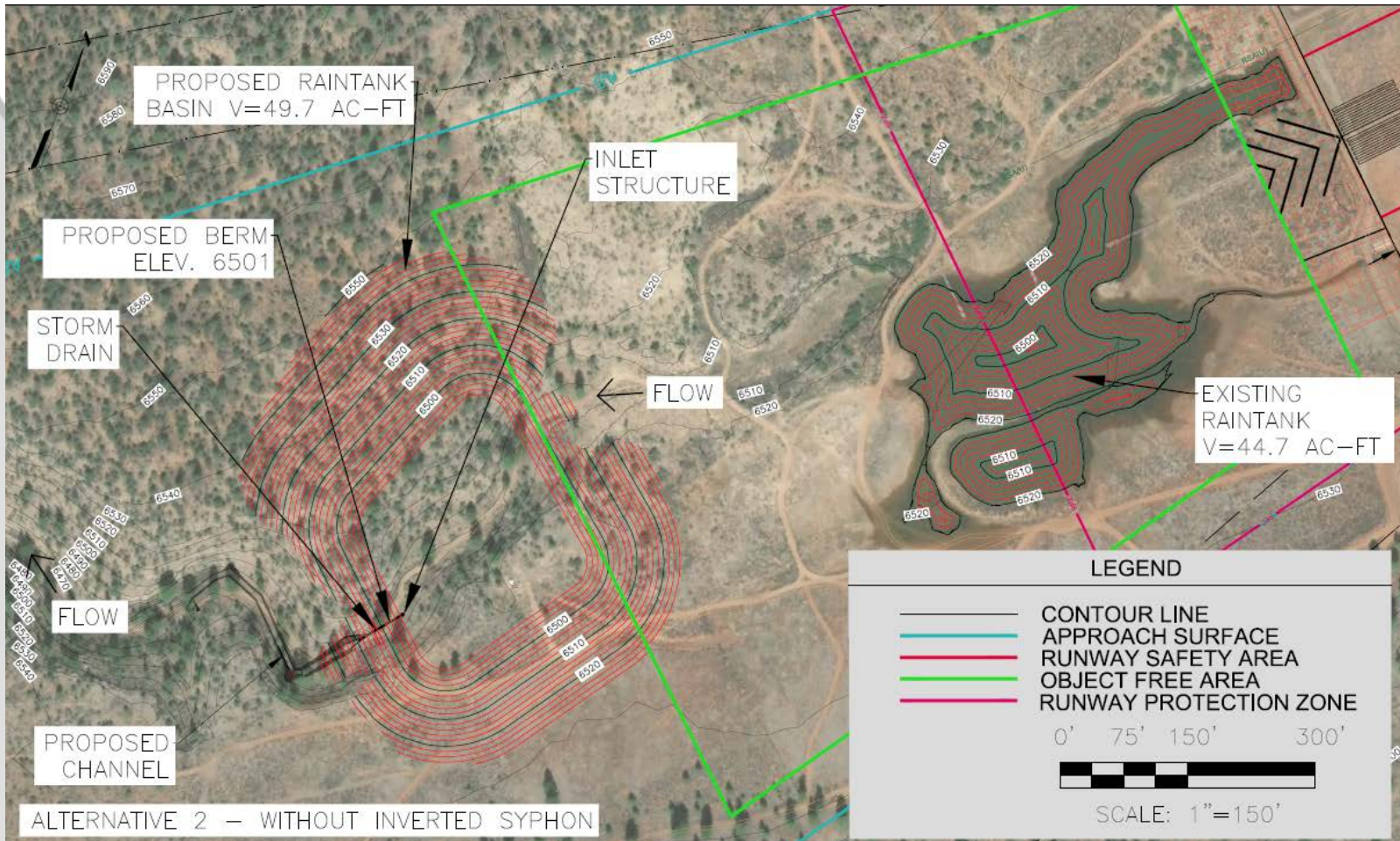
ALT. 1 – RELOCATION WITH INVERTED SIPHON





RAIN TANK RELOCATION

ALT. 2 – RELOCATION WITHOUT INVERTED SIPHON





CURRENT WATER USAGE

- Estimated Annual Usage (2008-217) = **1.5 million gallons per year**



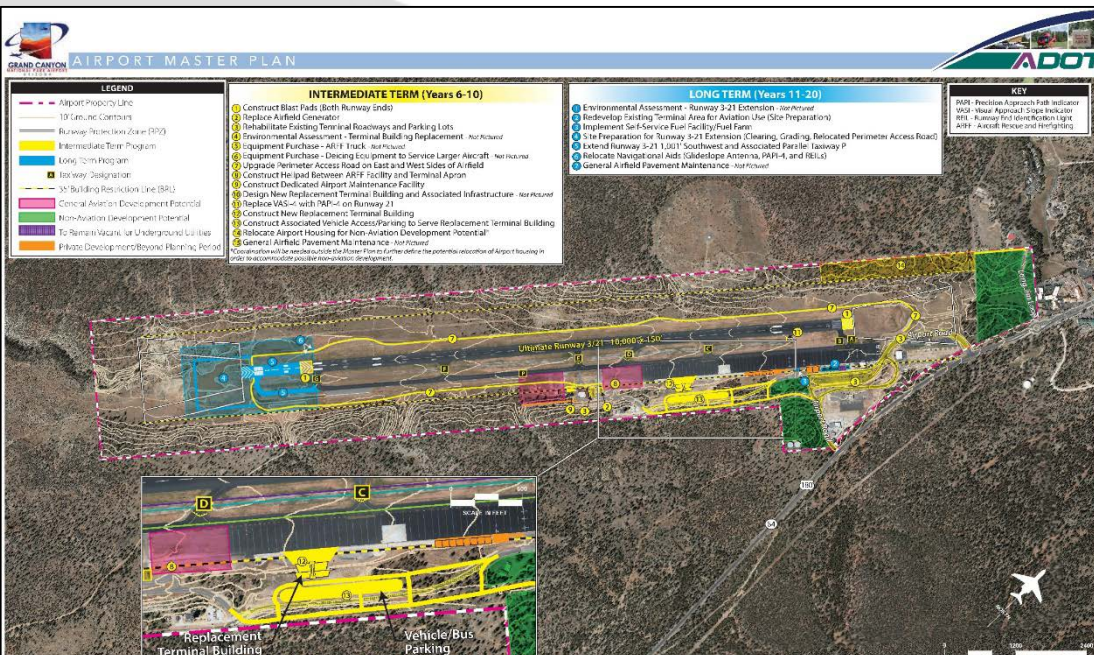
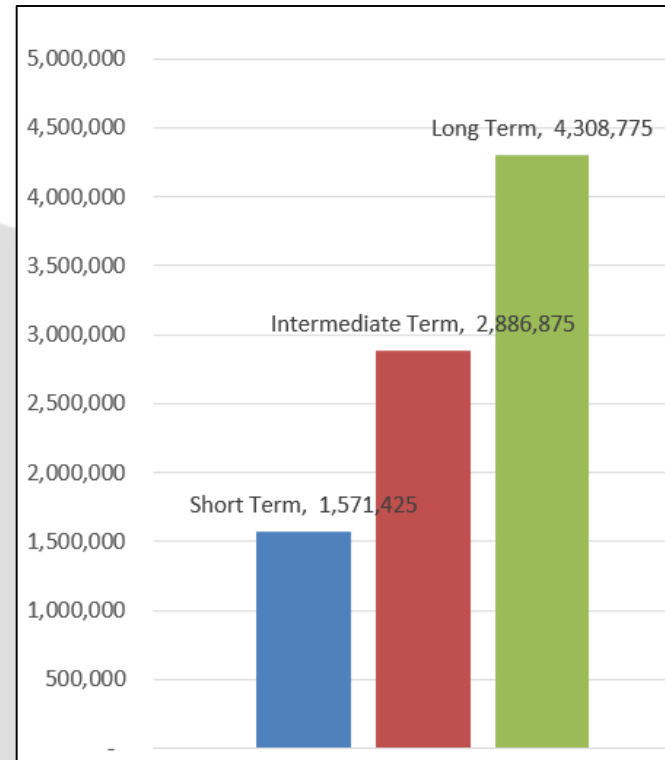


FUTURE WATER USAGE

Based on Airport Master Plan

- Short Term (2018-2022)
- Intermediate Term (2022-2027)
- Long Term (2028-2037)

1.57M Gallons per Year
 2.89M Gallons per Year
 4.31M Gallons per Year

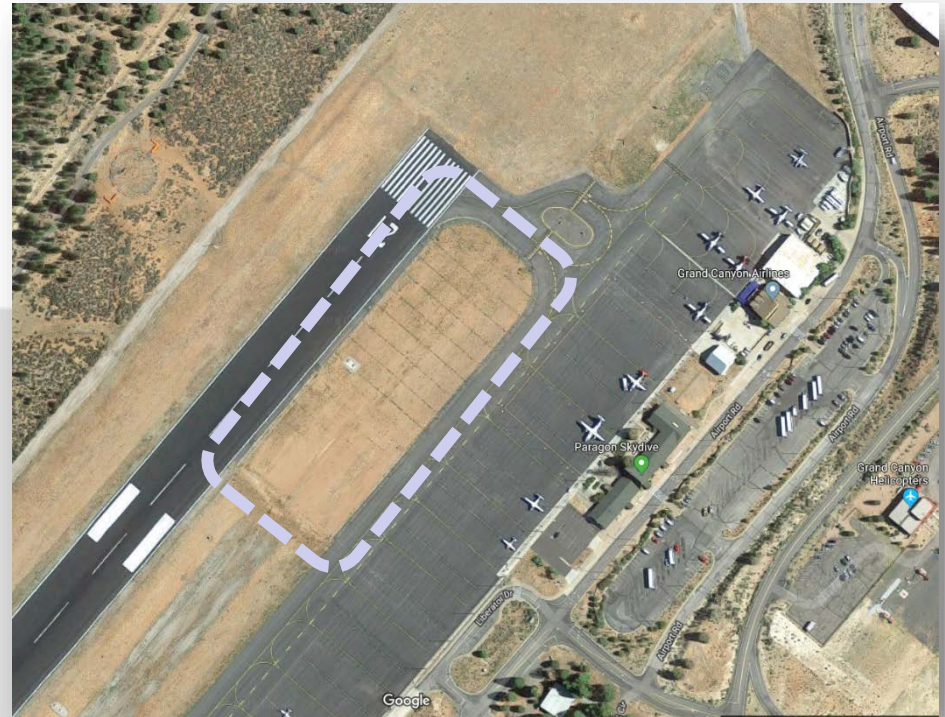




FORMER & CURRENT WATER SUPPLY



- Formerly Collected from Infield Catchment Area
- **Now from Hydro Resources**
- Reclaimed Water Used by One Tenant





WATER TREATMENT SYSTEM



- Designed to Treat Surface Water
- **Re-Use is Feasible**

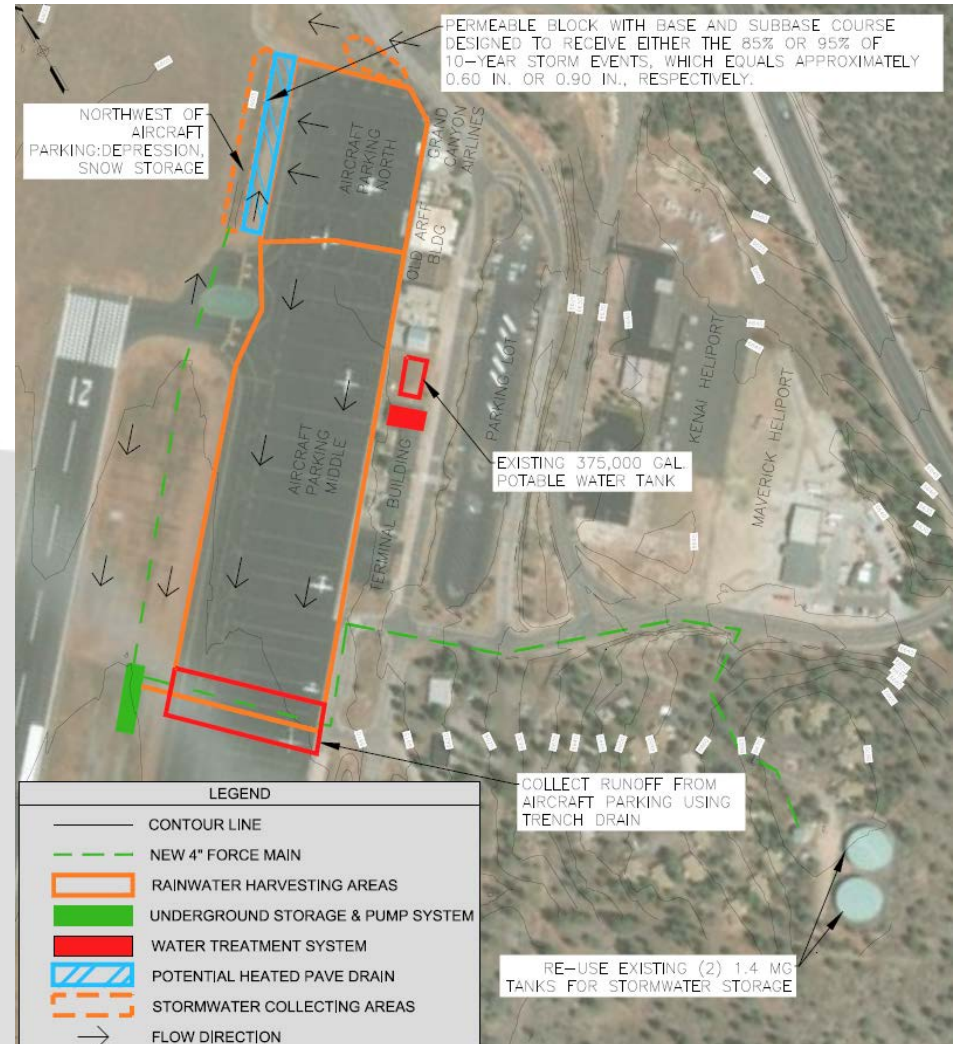




STORMWATER HARVESTING

ALT. 1 – INFIELD STORAGE AREA

- Collect Stormwater from 25 acres
- Pump from Underground Structure in Infield

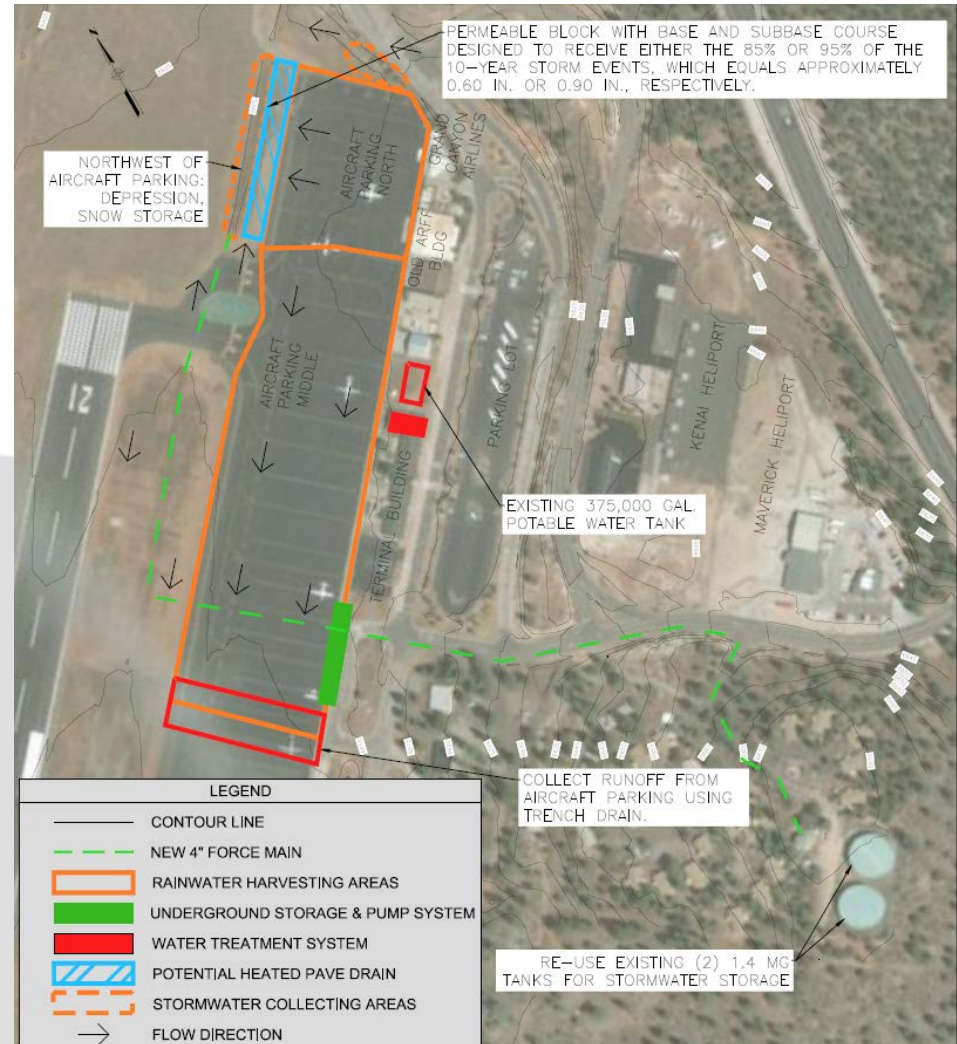




STORMWATER HARVESTING

ALT. 2 – APRON STORAGE AREA

- Collect Stormwater from 25 acres
- Pump from Underground Structure in Apron

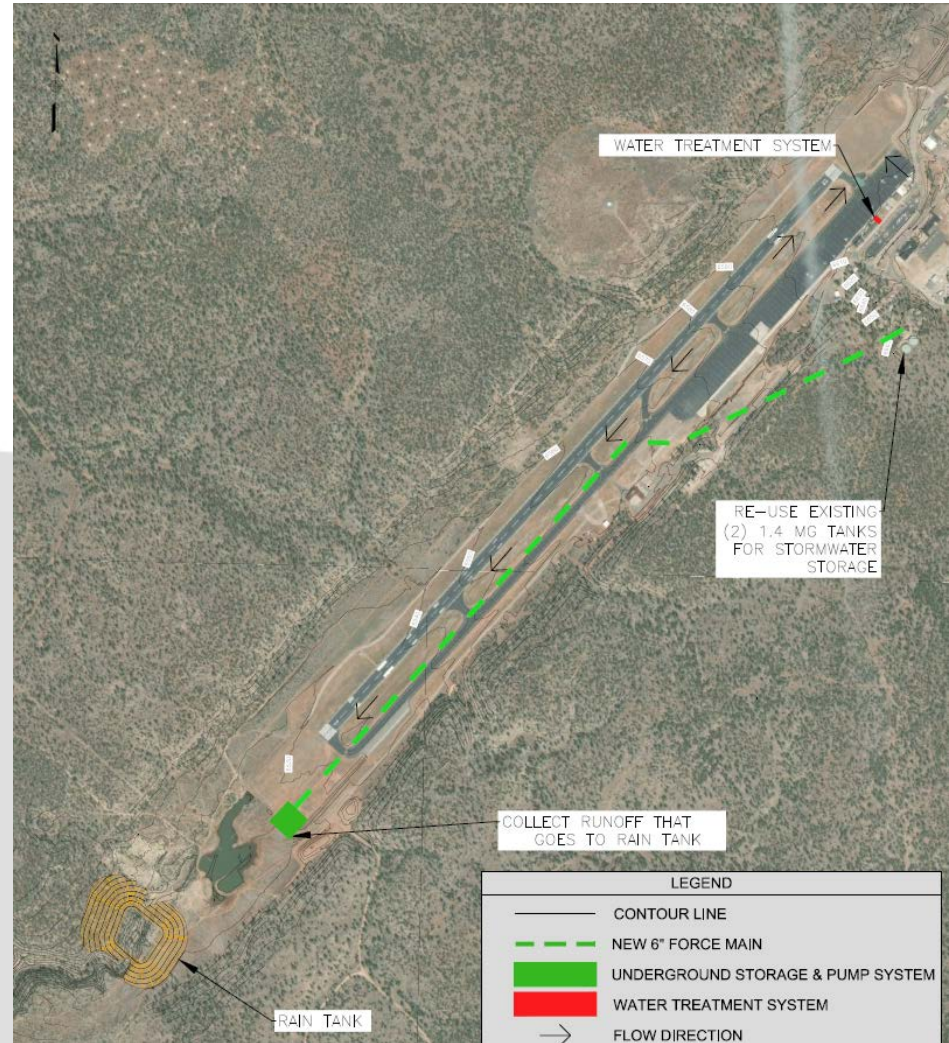




STORMWATER HARVESTING

ALT. 3 – COLLECT AT RAIN TANK

- Collect Stormwater at Rain Tank Basin
- Pump 11,000 feet

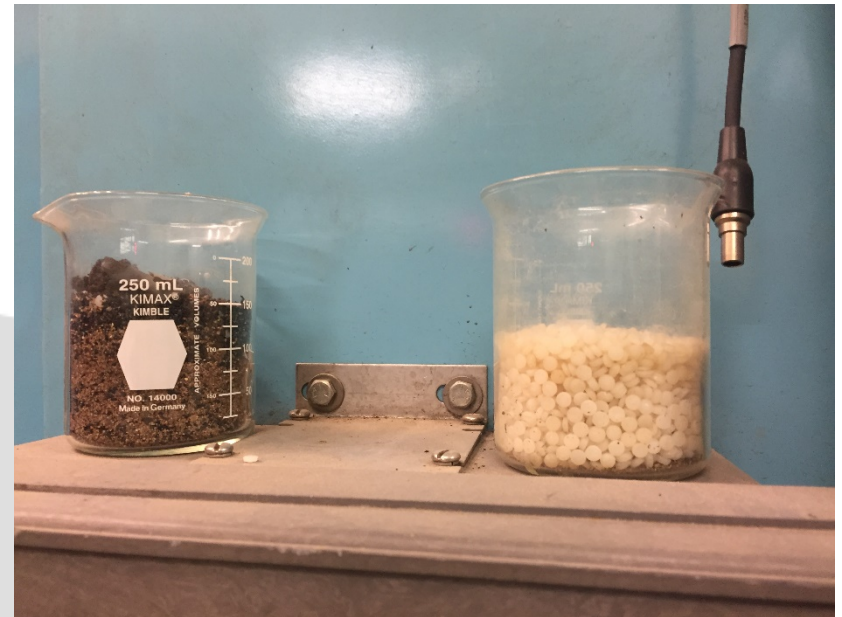




WATER TREATMENT SYSTEM



- Replacement of Anthracite Filter Media
- Replacement of Sand Filter Media
- Other minor repairs





WATER STORAGE

- Re-use of All Tanks
- 1.4 M Gallon Tanks Re-purposed to Stormwater Storage
- Rehabilitation of Pre-Sedimentation Tank





COMMENTS?



NEXT STEPS

