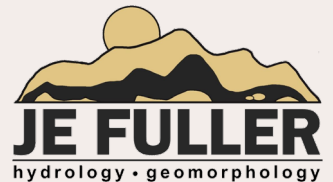




Buckeye Creek Flood Mitigation Design Concept

July 18, 2023



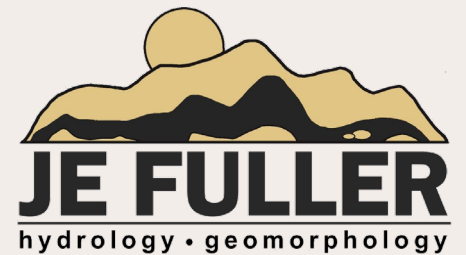
Buckeye Creek Flood Mitigation Design Concept



Project Funding



Technical Team



Agenda

Project Goals

Topographic Mapping

Project Hydrology

Existing Conditions Hydraulic Modeling

Flood Mitigation Location Decision Process

Concept Mitigation Design

Proposed Conditions

Questions

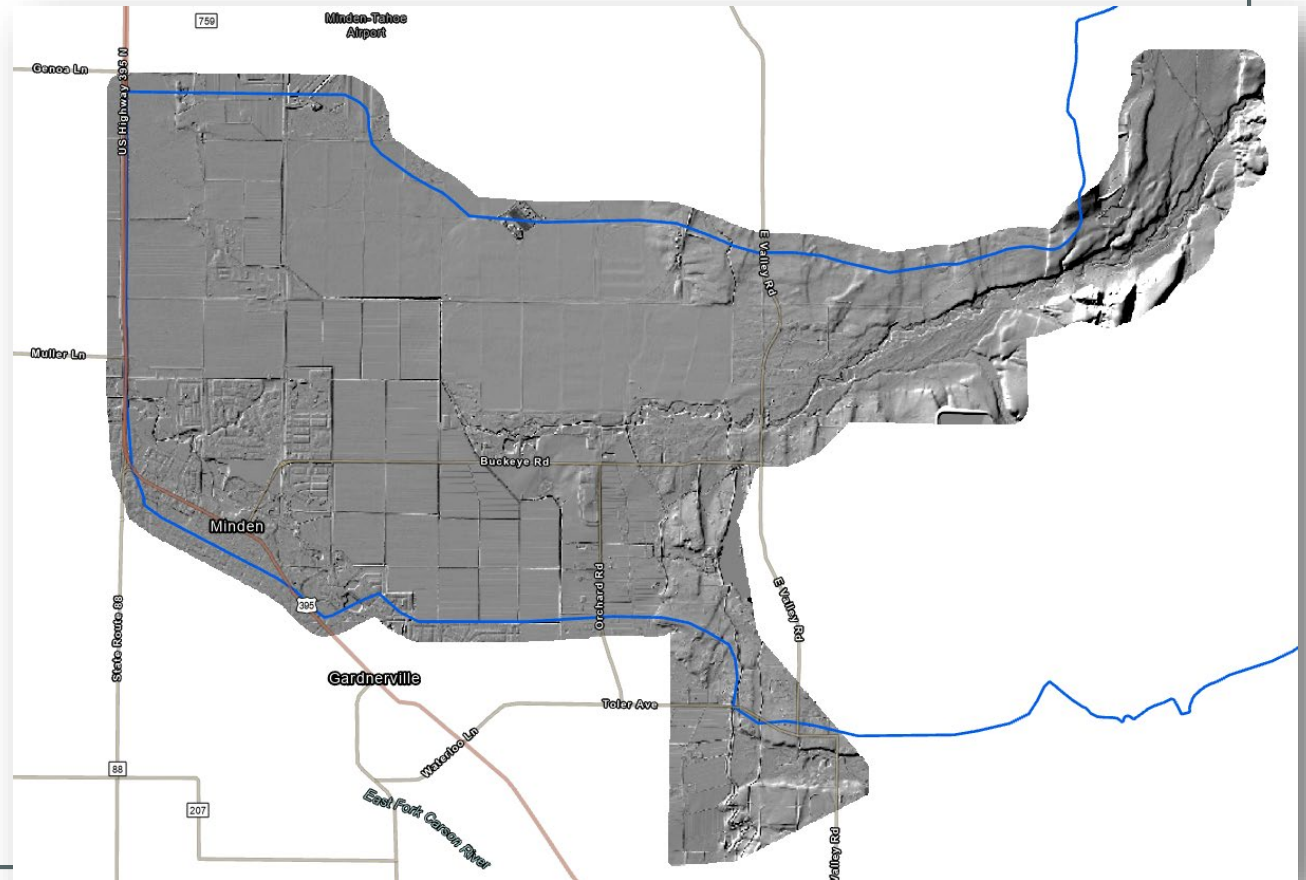
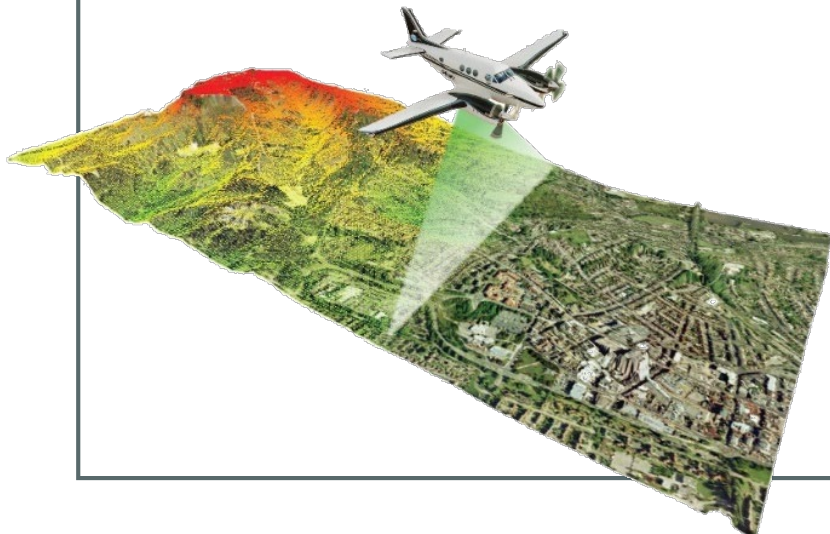


Project Goals

1. Evaluate the potential locations provided by Douglas County for flood control basins.
2. Assess the viability of the basin(s) that would reduce the downstream Buckeye Creek 100-year flow from 3,940 cfs (100-year regulatory discharge) to approximately 400 cfs.
3. If basin(s) are viable, develop 15% concept design plans for the basin(s).
4. Ensure that the post-project outflow discharge is compatible with the on-going proposed Muller Parkway improvement design plans.
5. Evaluate the existing network of drainage ditches and canals downstream of Orbit Way and their capacity for the proposed outflow discharge.
6. Where capacity is inadequate, develop a conceptual channel design that would sufficiently convey the reduced outflow discharge.

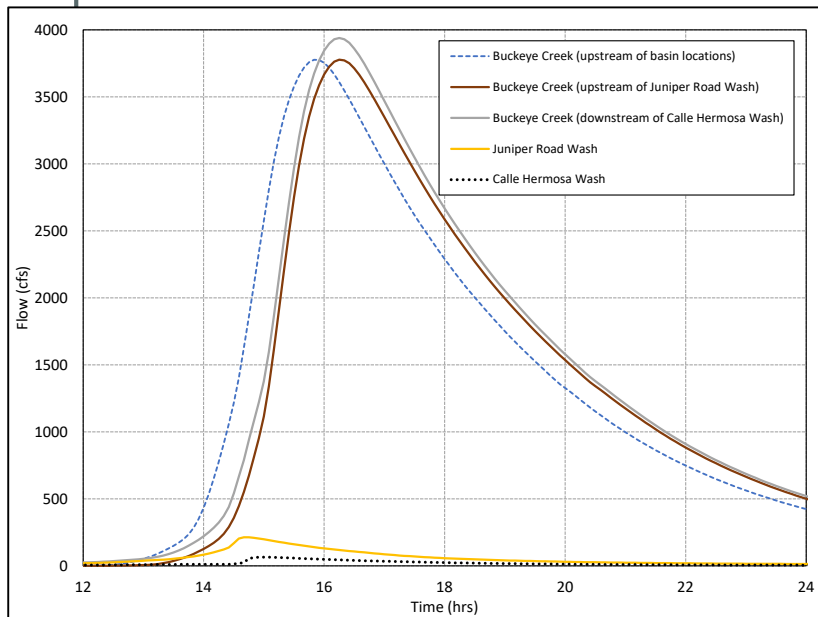
Topographic Mapping

- LiDAR Mapping
- Existing Culverts and Bridges



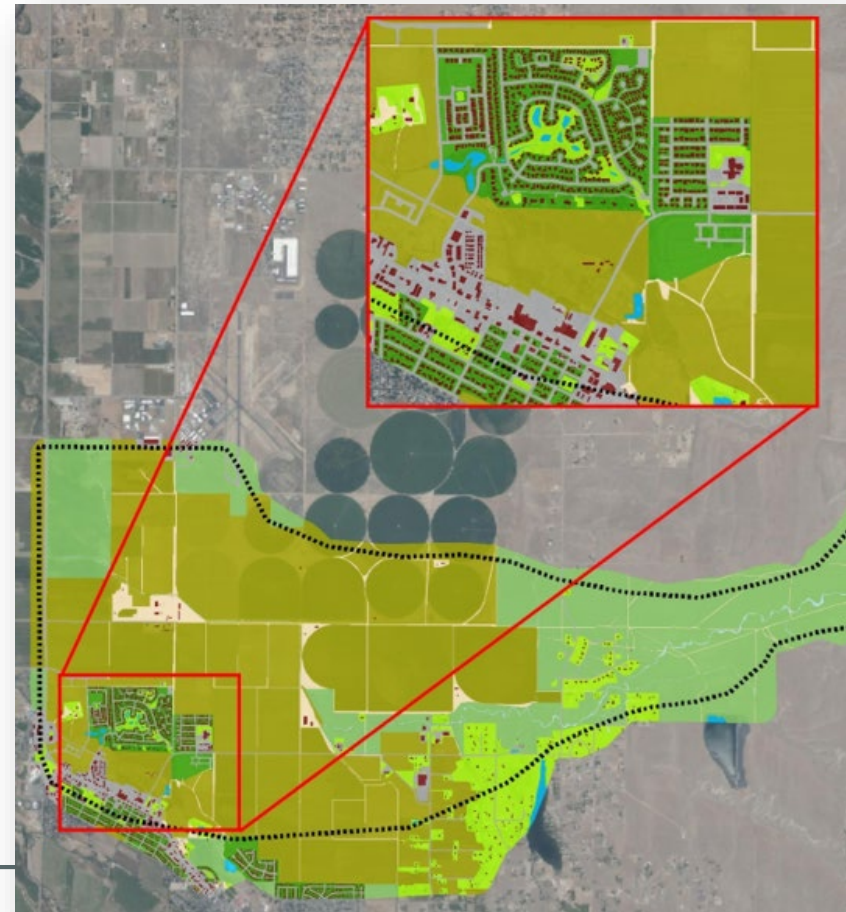
Project Hydrology

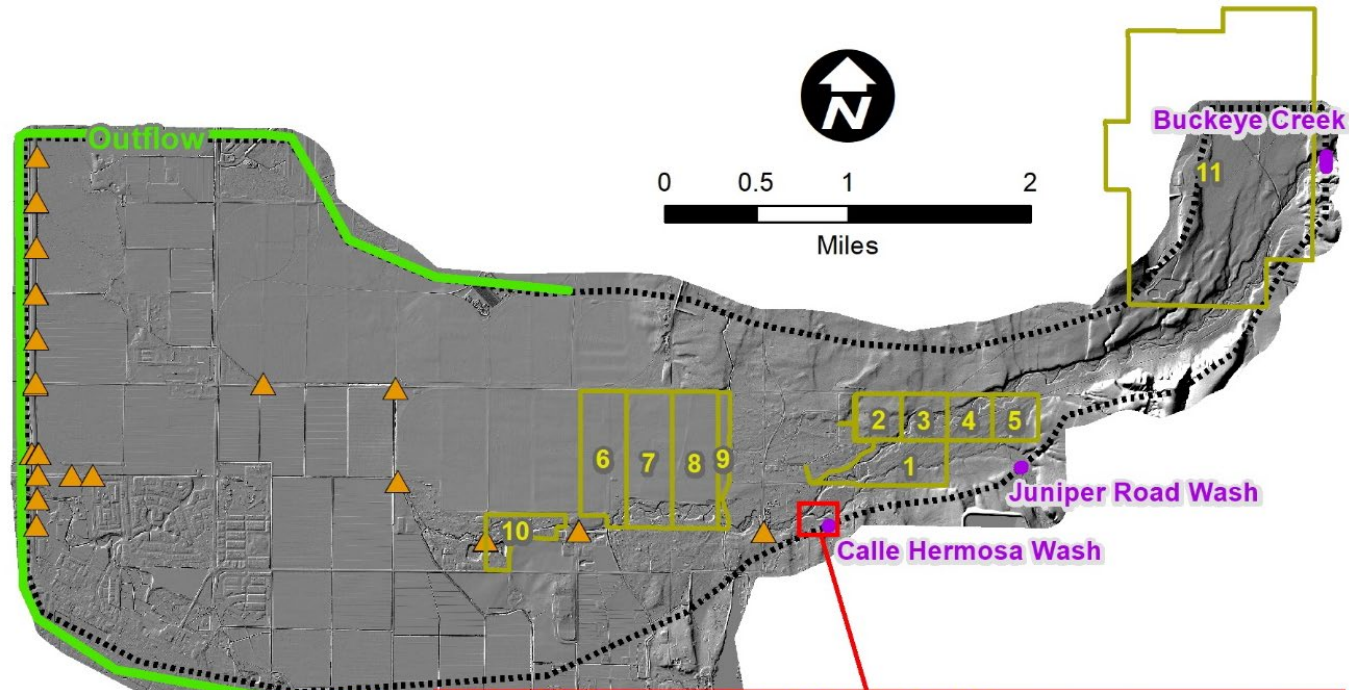
- FEMA Effective Hydrology (2012)
- 100-Year Storm
- Buckeye Creek + Tributaries



Existing Cond. Hydraulic Modeling

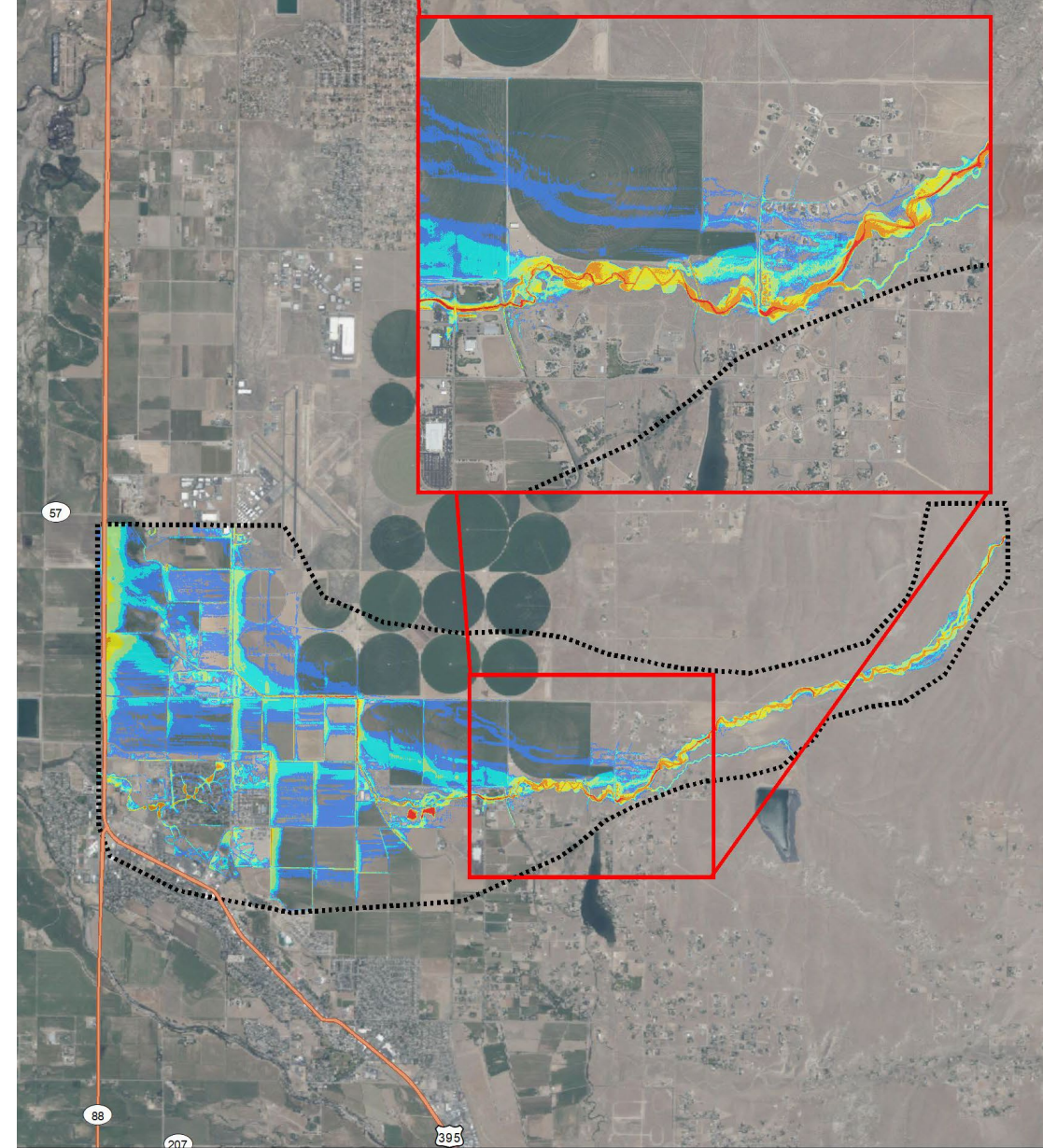
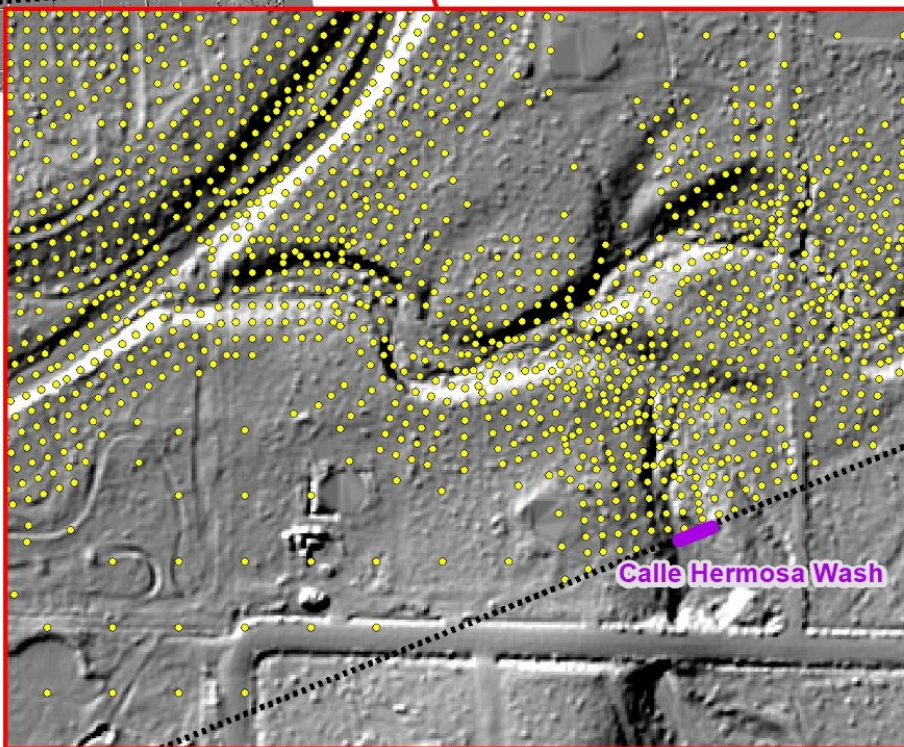
- Surface Feature Classification
- Latest technology (HEC-RAS 2D)
- Define existing flooding limits
- Flow Depths + Discharge + Velocities





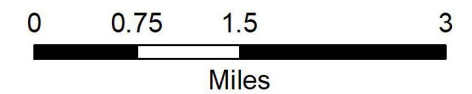
Legend

- Computation Points
 - ▲ Modeled Culverts
 - ⋯ Model Domain
 - ▭ Parcel Locations
- Boundary Conditions**
- Inflow
 - Outflow



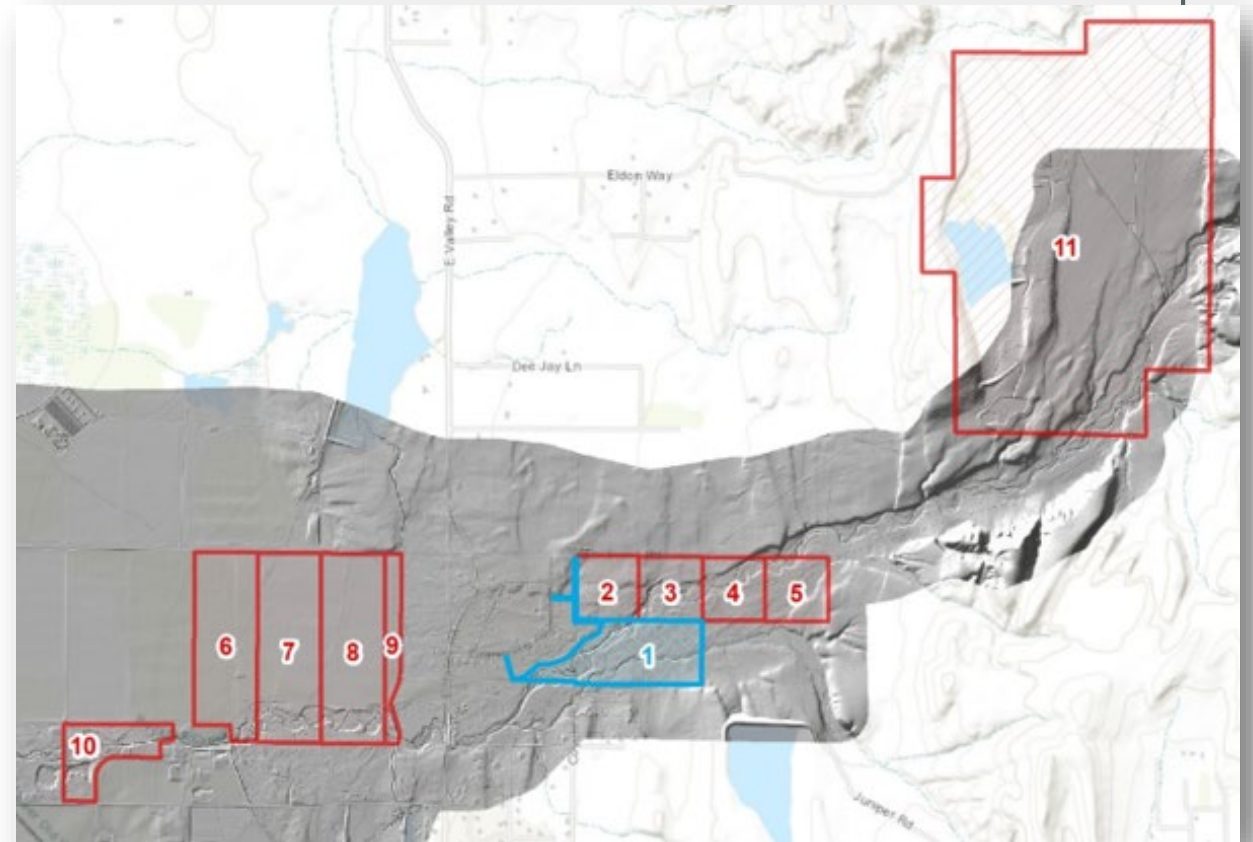
100-year, 24-hour Maximum Flow Depth (feet)

- | | | |
|---------------|--------------|----------------|
| □ < 0.15 | ■ 2.0 - 2.99 | ⋯ Model Domain |
| ■ 0.15 - 0.49 | ■ 3.0 - 5.99 | |
| ■ 0.50 - 0.99 | ■ ≥ 6.0 | |
| ■ 1.0 - 1.99 | | |



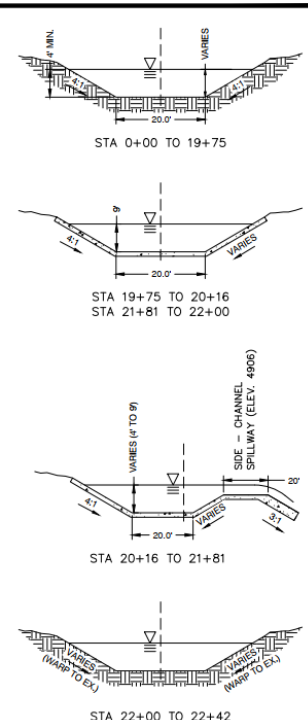
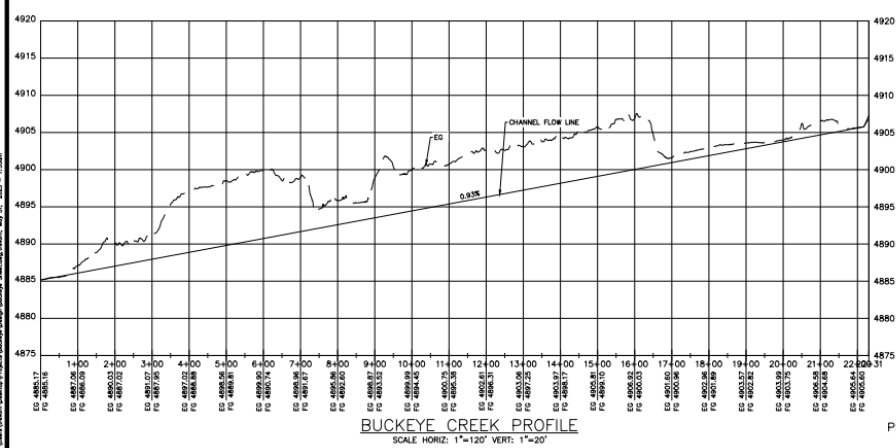
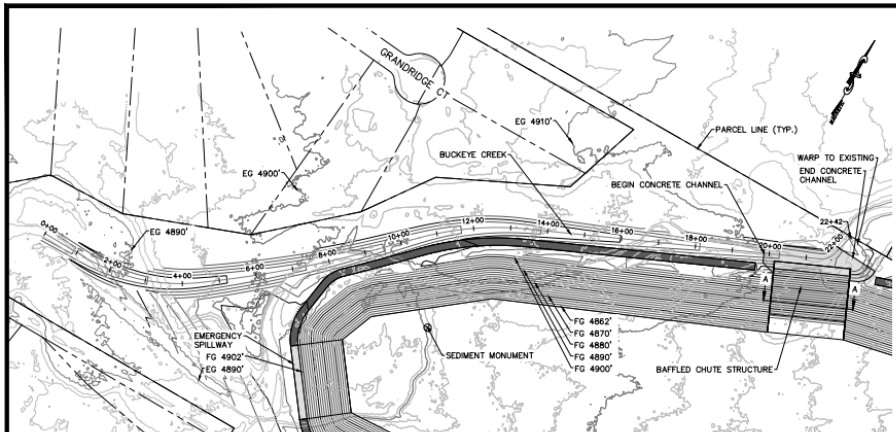
Flood Mitigation Location Decision Process

- Douglas County selected a series of parcels to investigate
- Assessed the viability of each parcel
- Combination of multiple parcels
- Parcel priority #1 was ultimately selected for the concept mitigation design



Concept Mitigation Design

- GOAL: reduce 100-year flow from 3,940 cfs to 400 cfs.
- Challenges
 - No jurisdictional dam
 - Basin entirely below grade
 - Large runoff volume
 - Account for sediment
- Final basin design elements
 - Basin excavation volume = 3,740,000 cubic yards
 - Channel excavation volume = 78,000 cubic yards
 - 100-year outflow discharge = 781 cfs

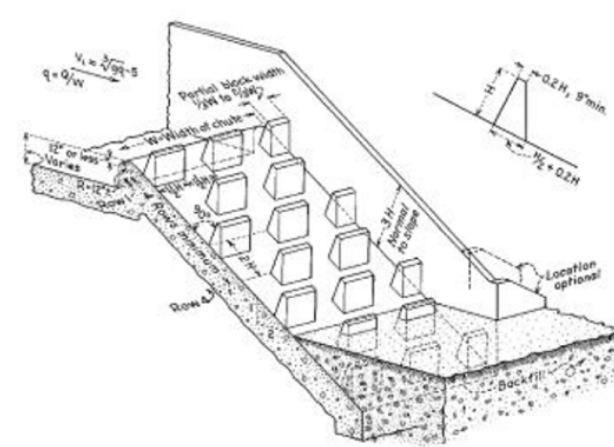


TYPICAL SECTIONS
BUCKEYE CREEK



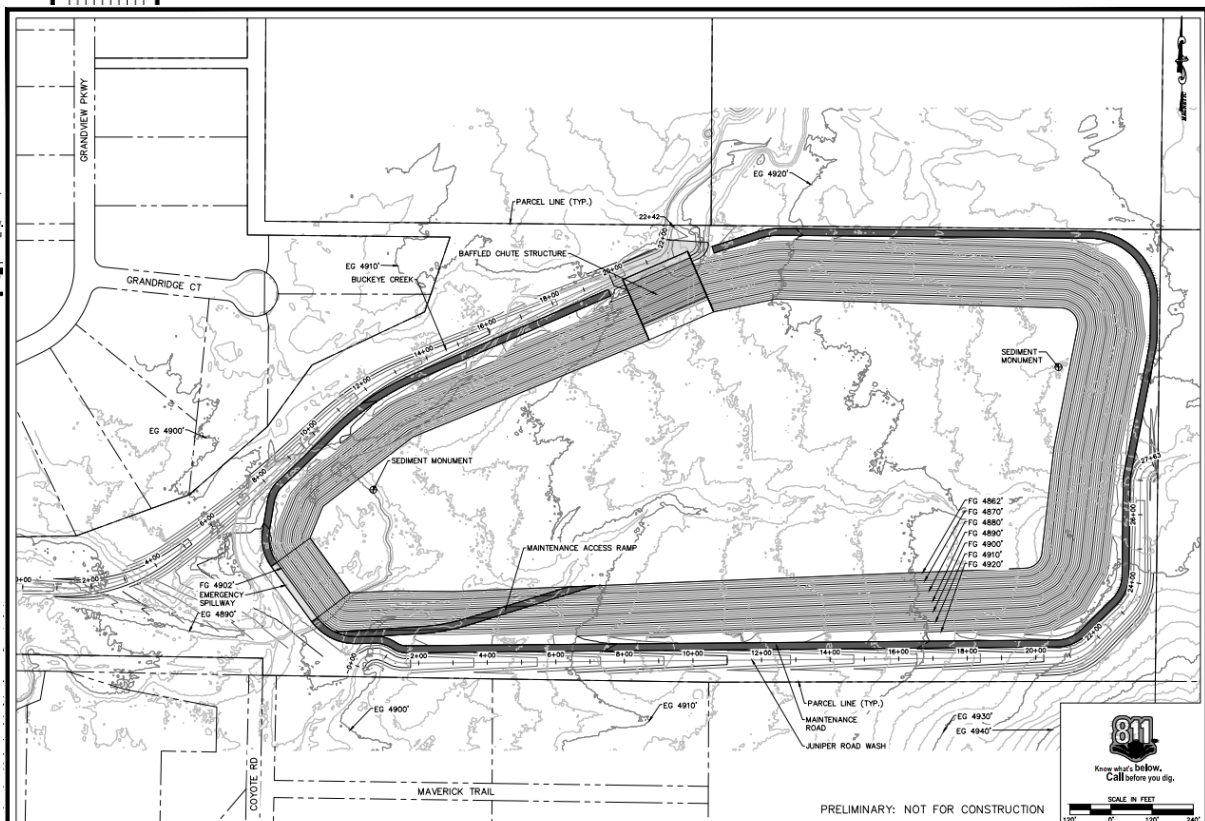
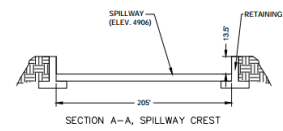
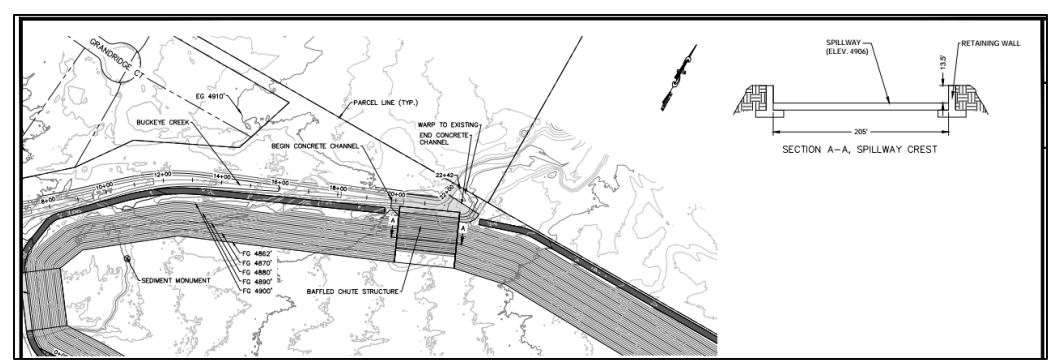
SCALE IN FEET
120' 0' 120'

PRELIMINARY: NOT FOR CONSTRUCTION



CA Group, Inc.
8830 TECHNOLOGY WAY, SUITE C
RENO, NV 89521
PHONE: 775-363-2540

REGIONAL TRANSPORTATION COMMISSION OF WASHOE COUNTY
BUCKEYE CREEK RETENTION BASIN
BUCKEYE CREEK CHANNEL / PROFILE
DOUGLAS COUNTY NEVADA



CA Group, Inc.
8830 TECHNOLOGY WAY, SUITE C
RENO, NV 89521
PHONE: 775-363-2540

REGIONAL TRANSPORTATION COMMISSION OF WASHOE COUNTY
BUCKEYE CREEK RETENTION BASIN
PLAN VIEW
DOUGLAS COUNTY NEVADA

NO.	DATE	BY

811
Know what's below.
Call before you dig.

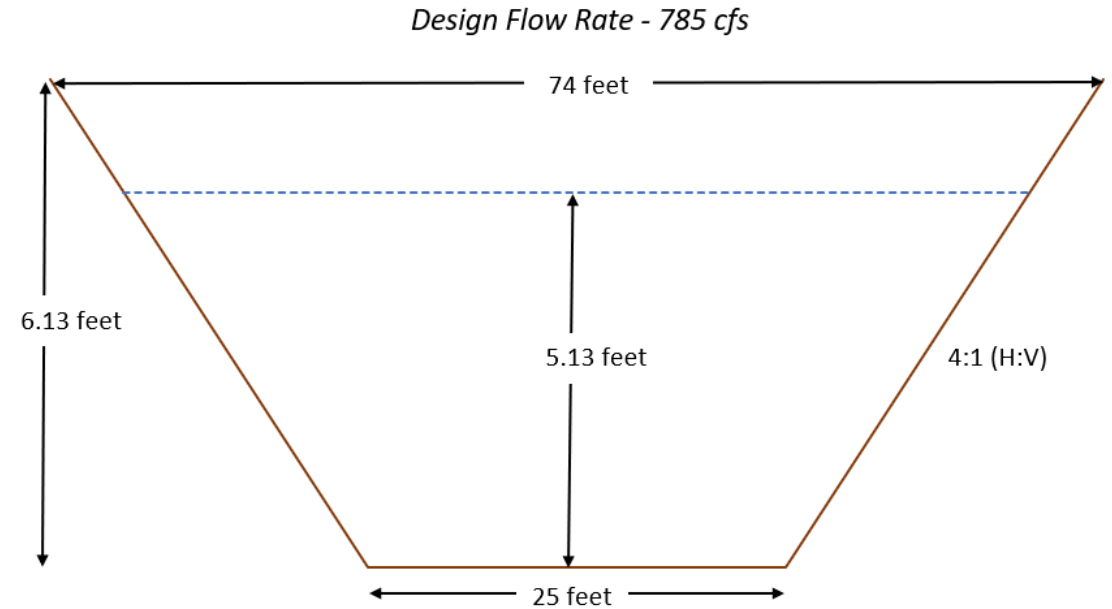
SCALE IN FEET
120' 0' 120' 240'

PRELIMINARY: NOT FOR CONSTRUCTION

SCALE: AS SHOWN
DESIGN: JTF
DRAWN: JTF
CHECKED: JTF
APPROVED: CA
DATE: MAY 2023
SHEET P1
OF 3

Proposed Conditions

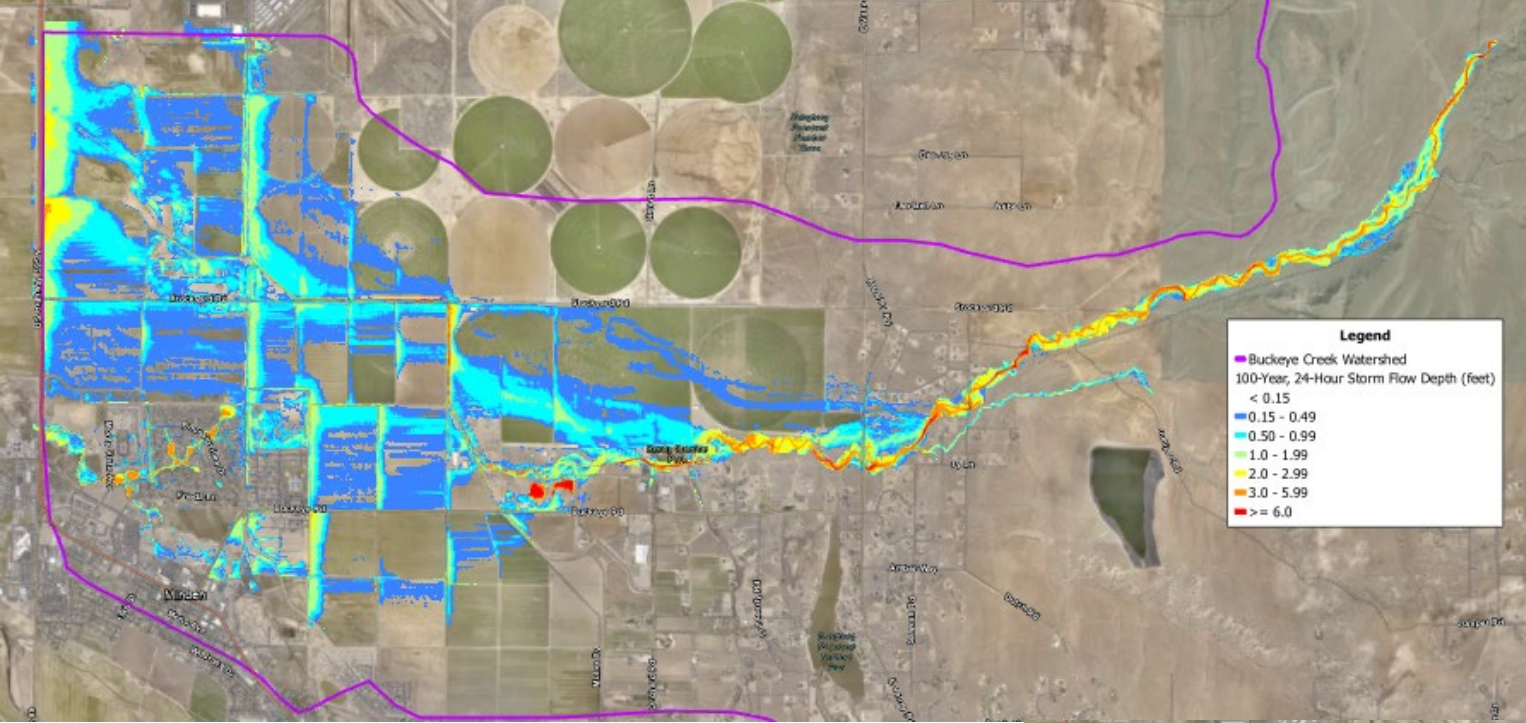
- Impact of flow reduction
 - 2,700 acres benefit from lower water surface elevation
 - 80% reduction in peak discharge downstream of basin
- Downstream Channel and Culvert Assessment



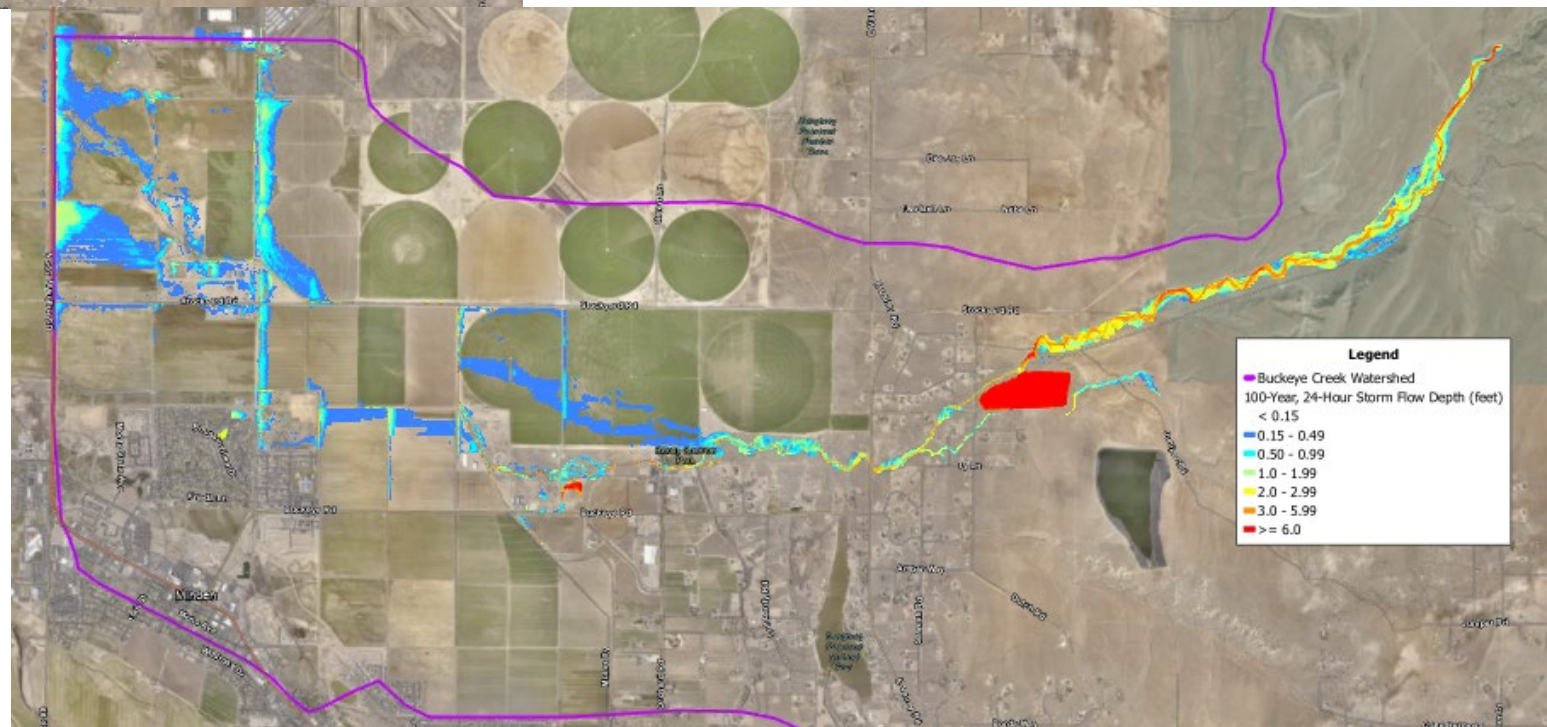
East Valley Road = OK

Heybourne Road = 3 x 10ft x 5ft Box Culverts

Existing Condition

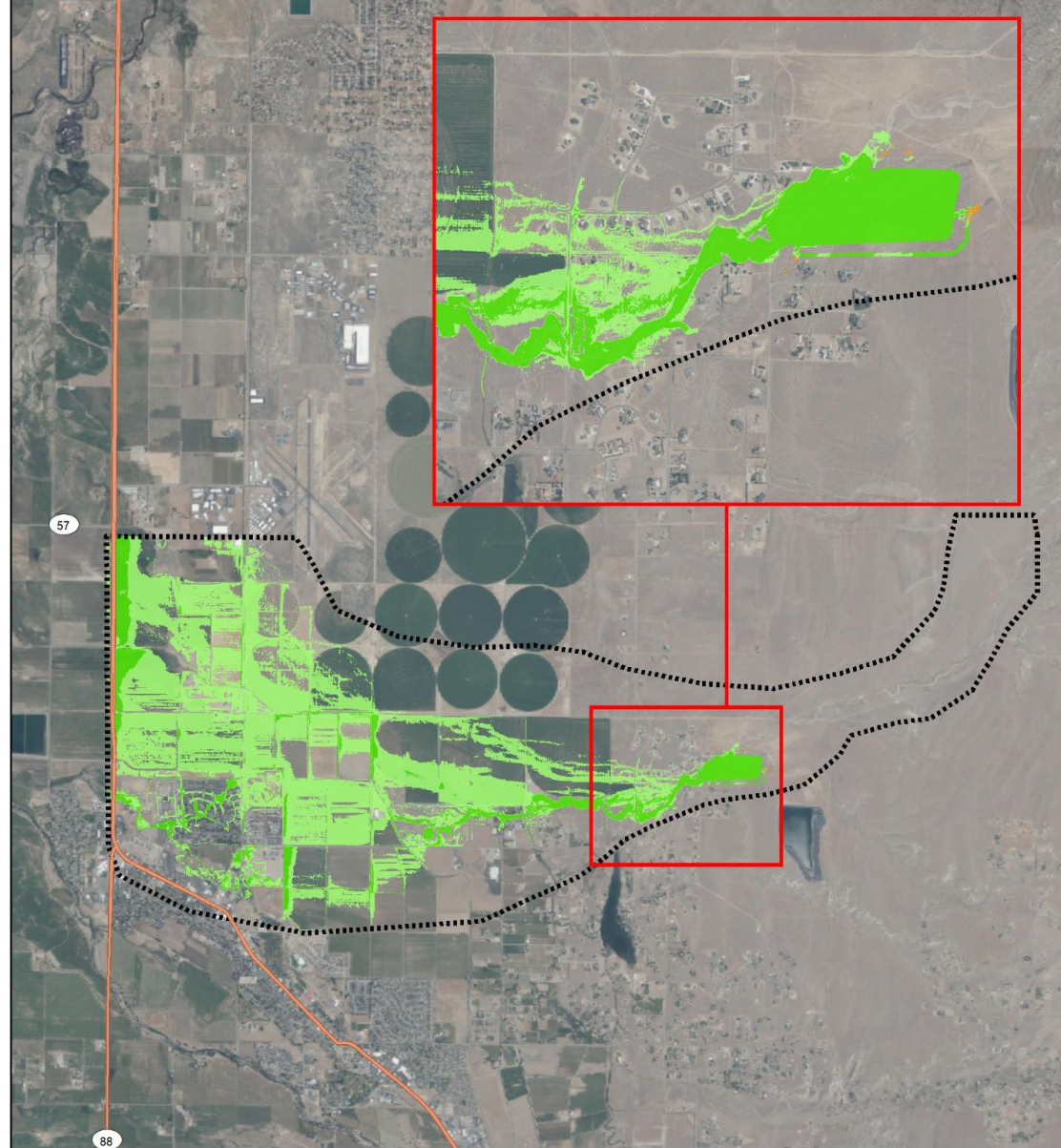


Proposed Condition

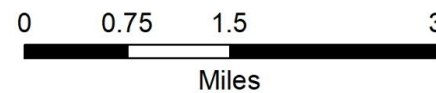
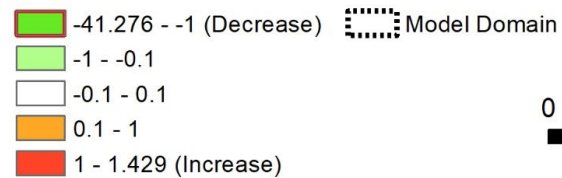


Proposed Condition

Water Surface Elevation Reduction



100-year, 24-hour Water Surface Change (feet)







Concept Mitigation Design

20-Year Lifecycle Cost Assessment

Item	Cost (\$)
Construction Costs	43,000,000
20-Year O&M*	1,062,000
Salvage Value	0
Total Cost	44,062,000

* Net Present Value

O&M Cost Assessment

	Recurrence (years)	Man/equipment Hours	unit	Cost/unit	Total	Avg/year
Channel maintenance – vegetation and debris removal	5	80	hours	\$150	\$12,000	\$2,400
Retention basin slope maintenance – seeding, reshaping	5	40	hours	\$150	\$6,000	\$1,200
Sediment Removal	1	12910	cubic yards	\$7	\$90,370	\$90,370
Maintenance Road resurfacing	5	40	hours	\$150	\$6,000	\$1,200
Fencing repairs	5	20	hours	\$70	\$1,400	\$280
Total						\$95,450

Maintenance hours include equipment and operator

Sediment removal assumes 8 acre feet of sediment annually

All unit costs are estimated from local contractor bid summaries and bid proposals



Questions?