



September 13, 2010

Stakeholder Workshop:

**Planning Study For Rehabilitation or
Replacement of:**

Powerline FRS

Vineyard Road FRS

Rittenhouse FRS

Bob Eichinger, P.E., CFM
Kimley Horn Project Manager

Felicia Terry, P.E., CFM
FCD Project Manager

Workshop Introduction

- Participant Introductions
- Refreshment Breaks, Lunch, Cell Phones, Restrooms
- Agenda



Topic	Desired Outcomes	Who & Time
Poster Review - Refreshments	Welcome – Staff Interaction	8:00
Introduction <ul style="list-style-type: none"> • Participants • Agenda 	Understand meeting purpose and agenda;	Felicia, Debbi; 8:30
Workshop Intro <ul style="list-style-type: none"> • Project Background • Review Project Goals • Workshop Objectives • Discuss Evaluation Criteria • Workshop Process <ul style="list-style-type: none"> ▪ Alternatives for all 3 dams ▪ Take Home Survey 	Understand project and meeting process;	Felicia; 8:40
Project Issues <ul style="list-style-type: none"> • FRS Considerations <ul style="list-style-type: none"> ▪ IDSM ▪ Modified Easement • NRCS – 3 Types of Alternatives • Identified Problems <ul style="list-style-type: none"> ▪ Toolbox 	Understand project issues;	Bob; 9:10
Break	Free	All; 9:50
Brainstorm Ideas for Alternatives <ul style="list-style-type: none"> • Creative Flow • Free of Judgment or Analysis 	Generate and list ideas;	Debbi, Afshin, All; 10:00

Agenda



Topic	Desired Outcomes	Who & Time
Lunch – Poster Session	Enjoy and discuss;	12:00
Narrow List of Ideas of Alternatives <ul style="list-style-type: none"> • Eliminate • Combine 	Ideas to be evaluated;	Debbi, Afshin, All; 12:30
Group Evaluation <ul style="list-style-type: none"> • Review and Evaluate Ideas of Alternatives • Evaluation Matrix <ul style="list-style-type: none"> ▪ Scoring of Ideas • Written Comments 	Evaluation scores;	Groups; 1:30
Break	Free	All: 2:45
Identify Alternatives from Groups <ul style="list-style-type: none"> • List Scores of Alternatives • Agree to Top 10 	10 Alternatives to move forward;	Debbi, Afshin, All; 3:00
Next Steps <ul style="list-style-type: none"> • Survey • Schedule • Action Items 	Summarize and Wrap - Up	Felicia; 3:45
Adjourn	Free	4:00

Agenda



Powerline FRS, Vineyard Road FRS, Rittenhouse FRS (PVR)

Project Background:

- Three Flood Control Dams Built by SCS (Now NRCS) from 1967 to 1969
- PVR Dams Modified with Central Filters: 1991, 1983, 1979
- District is Local Sponsor
- District Operates and Maintains Under Agreements with NRCS
- ADWR is Regulatory Agency
- Located on Arizona State Land Department (ASLD) Property within Superstition Vistas area



Powerline FRS, Vineyard Road FRS, Rittenhouse FRS (PVR)

Project Background:

- PVR Dams Total 11.6 Miles in Length
- PVR Dams Max. Heights: 21 Ft, 16.5 Ft, 24.3 Ft
- Total Flood Storage of 12,600 Acre-Feet
- Provide 100-year Flood Protection for 169 Square Miles
- Year 2000 Census Downstream Population: 157,000
- Dams Are Hydraulically Connected



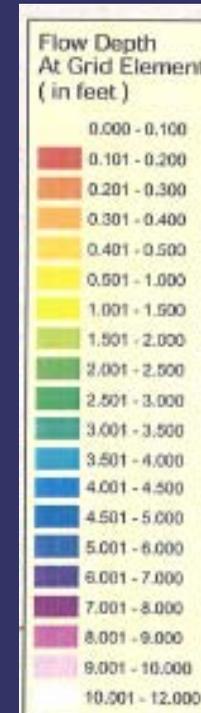
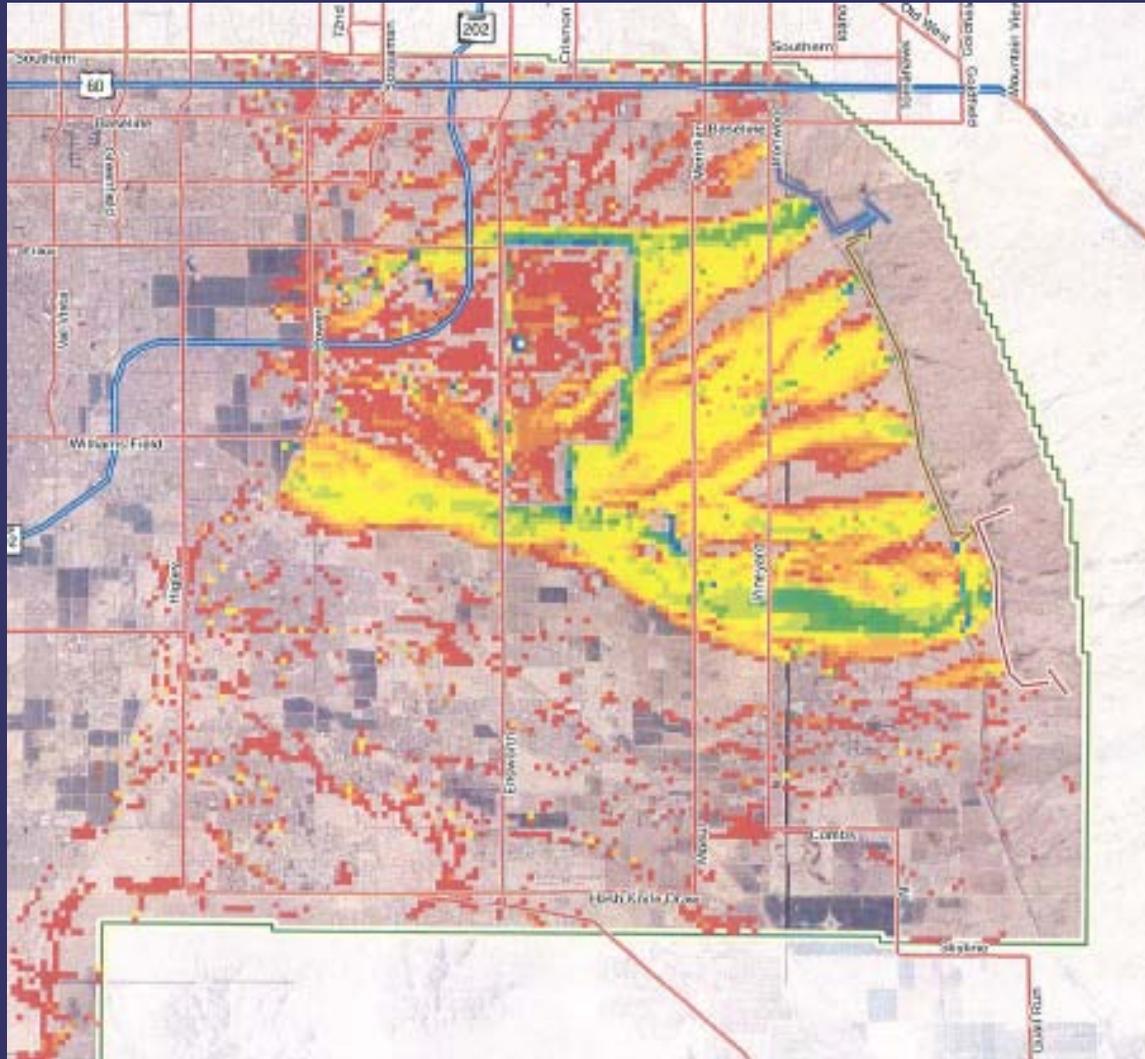
Powerline FRS, Vineyard Road FRS, Rittenhouse FRS (PVR)



October 20, 1972



Downstream Inundation Area



FCD Project Goals

- Primary: Long-Term Flood Protection
- Secondary: Minimized Project Footprint

FCD Project Objectives

- Develop and Evaluate Alternatives for Rehab or Replacement of The PVR Dams
- Select an Implementable Alternative
- Have NRCS be a Cost Share Partner
- Have Construction Completed in 10 to 15 Years



Stakeholder Goals and Objectives

- NRCS

- From a federal perspective, the following must be met:
 - Technically sound alternatives that meet the project purpose
 - At the least cost
 - Minimize or mitigate adverse environmental impacts



Stakeholder Goals and Objectives

- ADWR

- Dam Safety Program – Ensure safety to the public, fix current safety deficiencies and comply with state rules and regulations.

- ASLD

- Integrate future land uses into the project.
- Allow the project to be used as a regional amenity.



Stakeholder Goals and Objectives

- Stakeholders

- Not have additional restrictions on what ADOT can discharge into the Powerline Floodway. (ADOT)
- Coordinate plans with future transportation corridors (i.e. North South Freeway) and utility crossings (i.e. SRP 260 KV powerline). (ADOT)
- CAP – Structures are close to CAP canal; right of way concerns (Central Arizona Project)



Stakeholder Goals and Objectives

- Other Stakeholders
 - Preserve Mesquite Bosques and accommodate wildlife enhancements (i.e. water holes). (AZGFD)
 - No detrimental impact to downstream facilities. (Mesa)
 - Maximize any recreational opportunities. Reduce frequent inundation pool. (Apache Junction, Superstition Vistas)



Suggested Evaluation Criteria

- Performance
- Risk
- Environmental
- Multi-Use Opportunities
- Social
- Economics (Capital and O&M)



Workshop Objectives

- Stakeholder Input
- Formulate Feasible Alternatives for the PVR structures
- Desired Outcome: Screen those Alternatives to 10



Workshop Process

- Present FRS Issues and Concerns
- Toolbox (measures to mitigate)
- Brainstorm Alternatives
- Breakout Groups to Score Alternatives
- List Scores of Alternatives
- Identify the top scored 10 Alternatives
- Discussion and Consensus of Top 10
- Stakeholder Survey

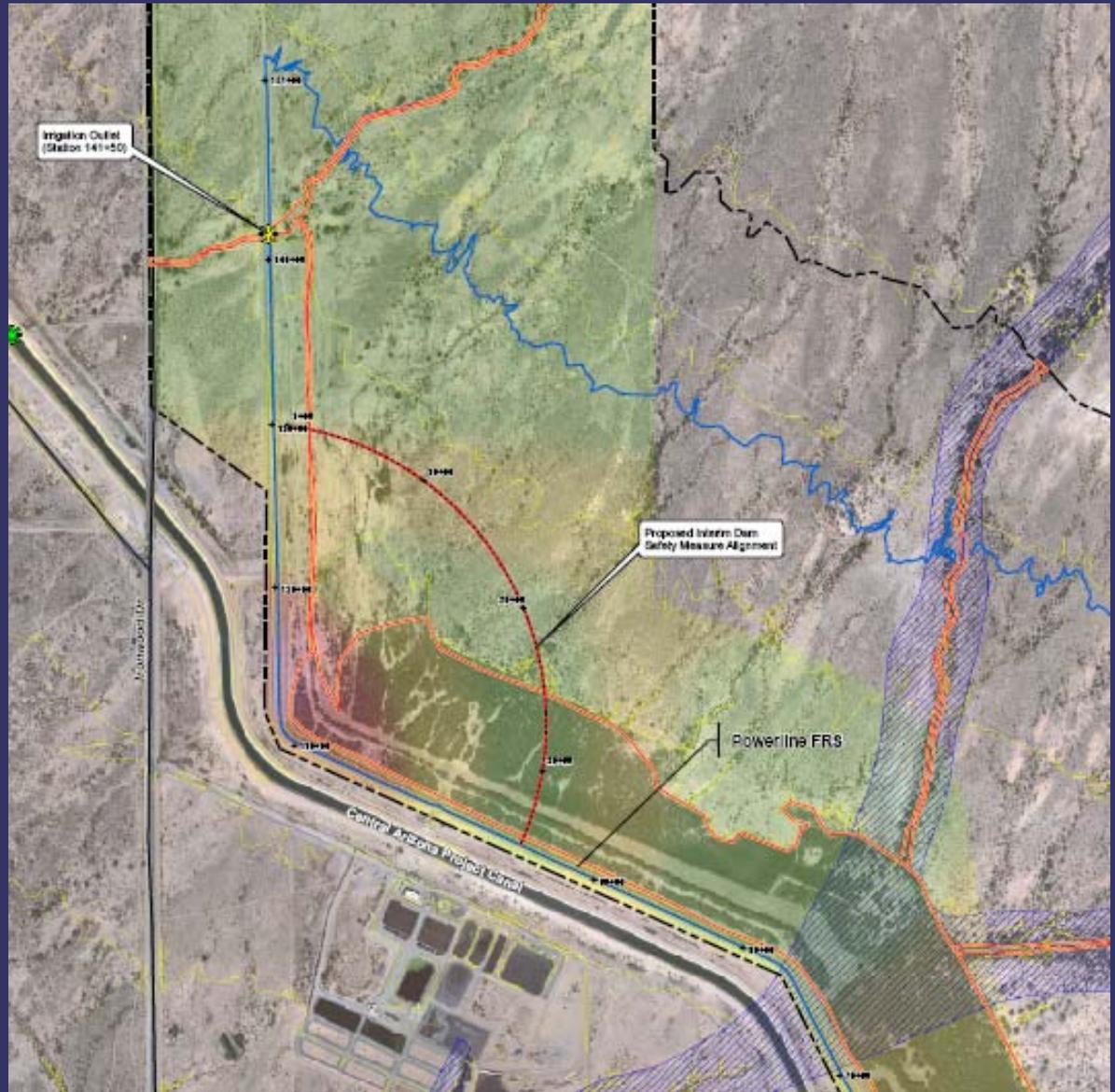


Project Issues

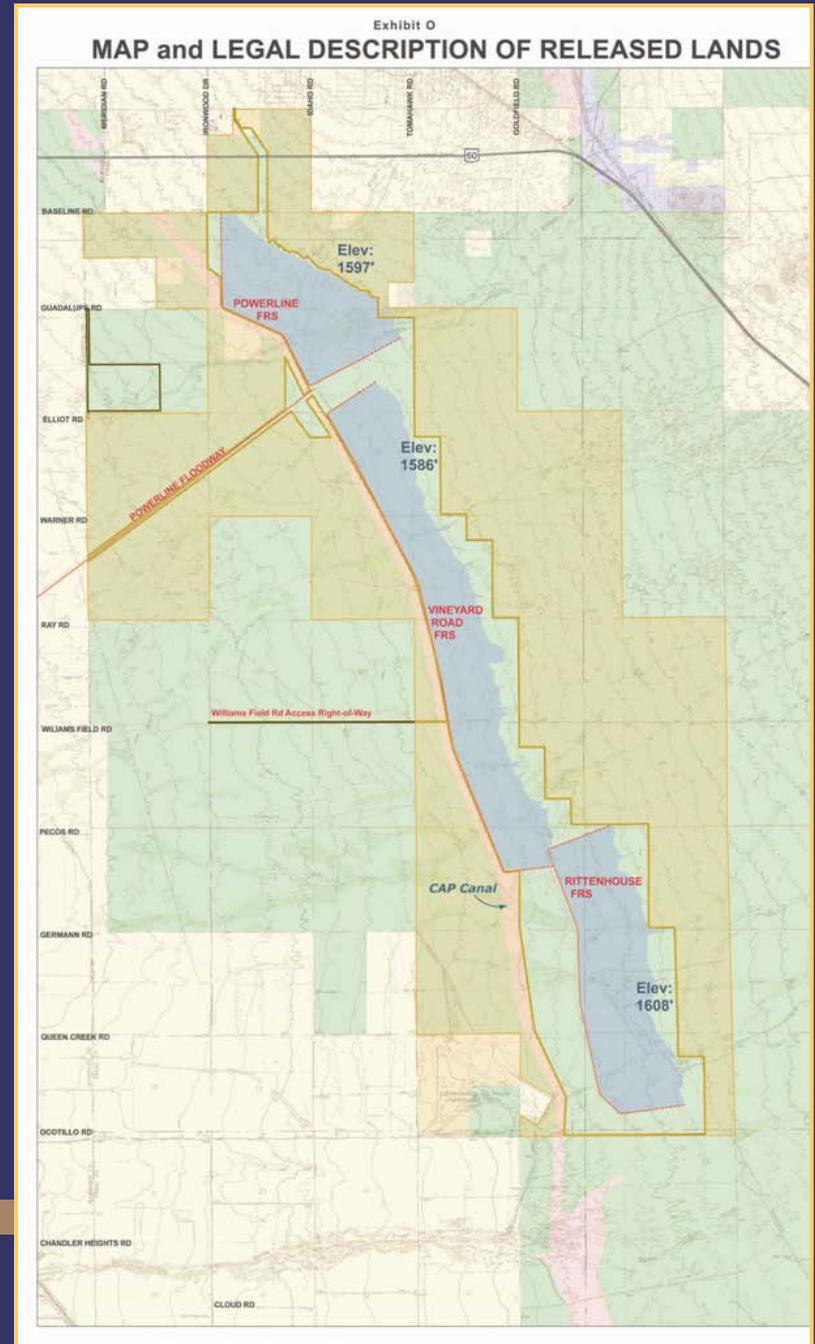
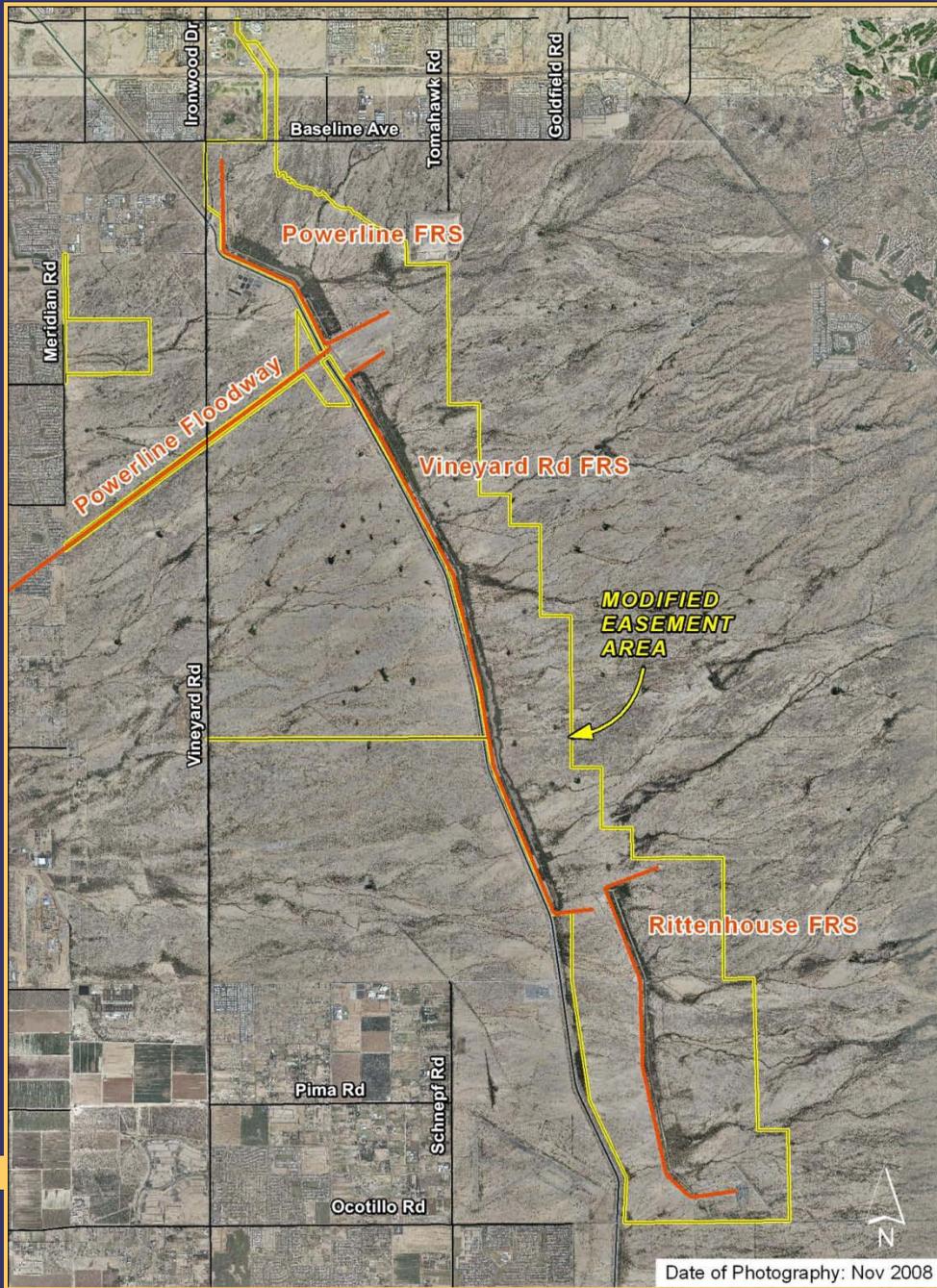
- FRS Considerations
 - Interim Dam Safety Measure – Powerline FRS
 - Modified Easement
- NRCS and Workshop Alternatives Categories
- Identified Problems
 - Mitigation Toolbox



Powerline FRS IDSM



Study Limits: Modified Easement Area



NRCS Alternatives

- Rehabilitation
- Decommissioning
- No Federal Action
- <National Economic Development NED>



Alternative Category Types

- Rehabilitation
- Replacement
- Combination Rehabilitation/Replacement
- Decommissioning



Identified Problems

- Potential for Overtopping During Large Flood Event
- Embankment Cracking
- Foundation Deficiencies
- Central Filters
- Outlet Pipe Deficiencies
- Slow Drain Time Principal Outlet
- Potential Auxiliary Spillway Erosion
- Earth Fissure: Powerline FRS
- Land Subsidence: Powerline FRS, Vineyard Road FRS (North Third of Dam)



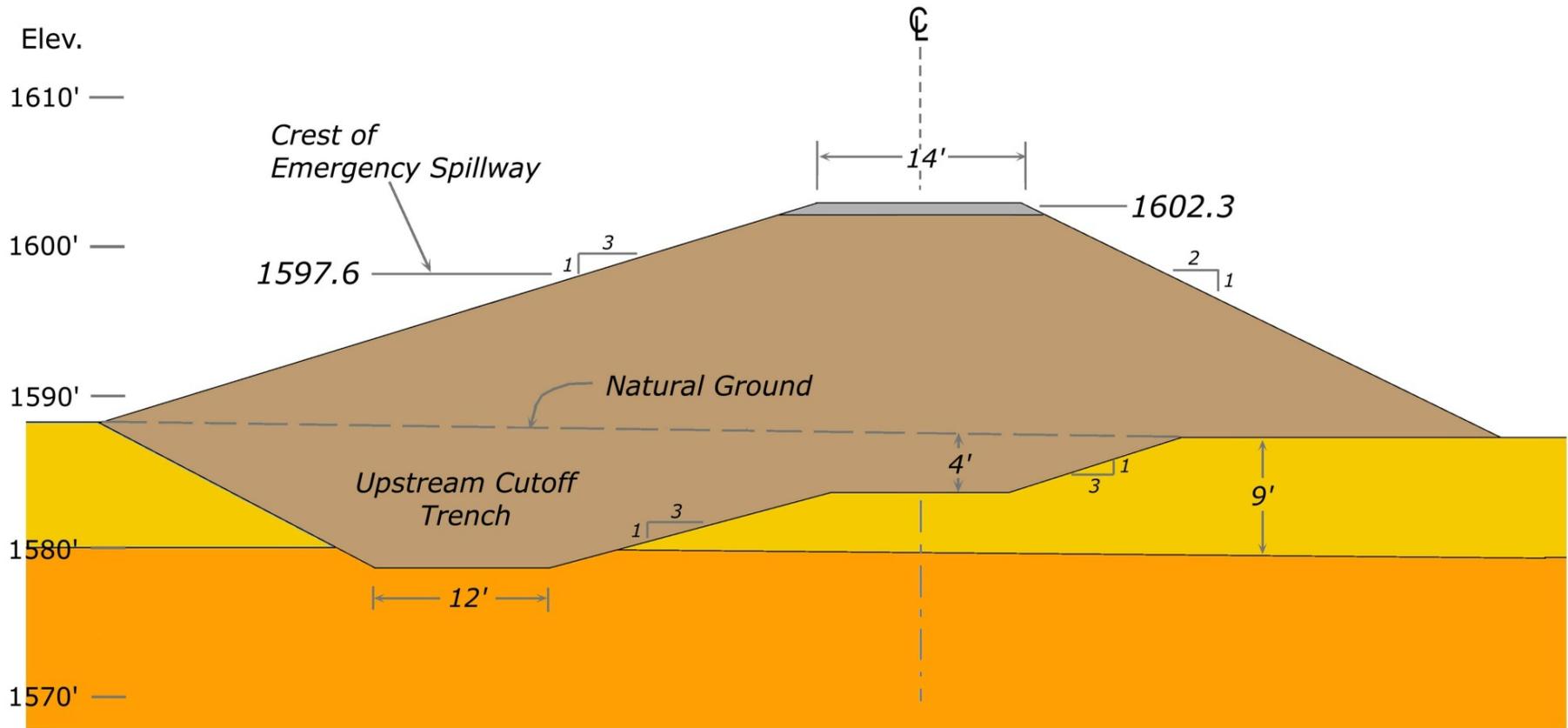
Identified Problems





TYPICAL CROSS SECTION

- ◆ Homogeneous embankment
- ◆ No central filter
- ◆ Upstream cutoff extends to cemented Late Pleistocene alluvium



 Embankment: Silty & clayey sand and fine gravel, sandy clay, sandy silt, and clayey silt

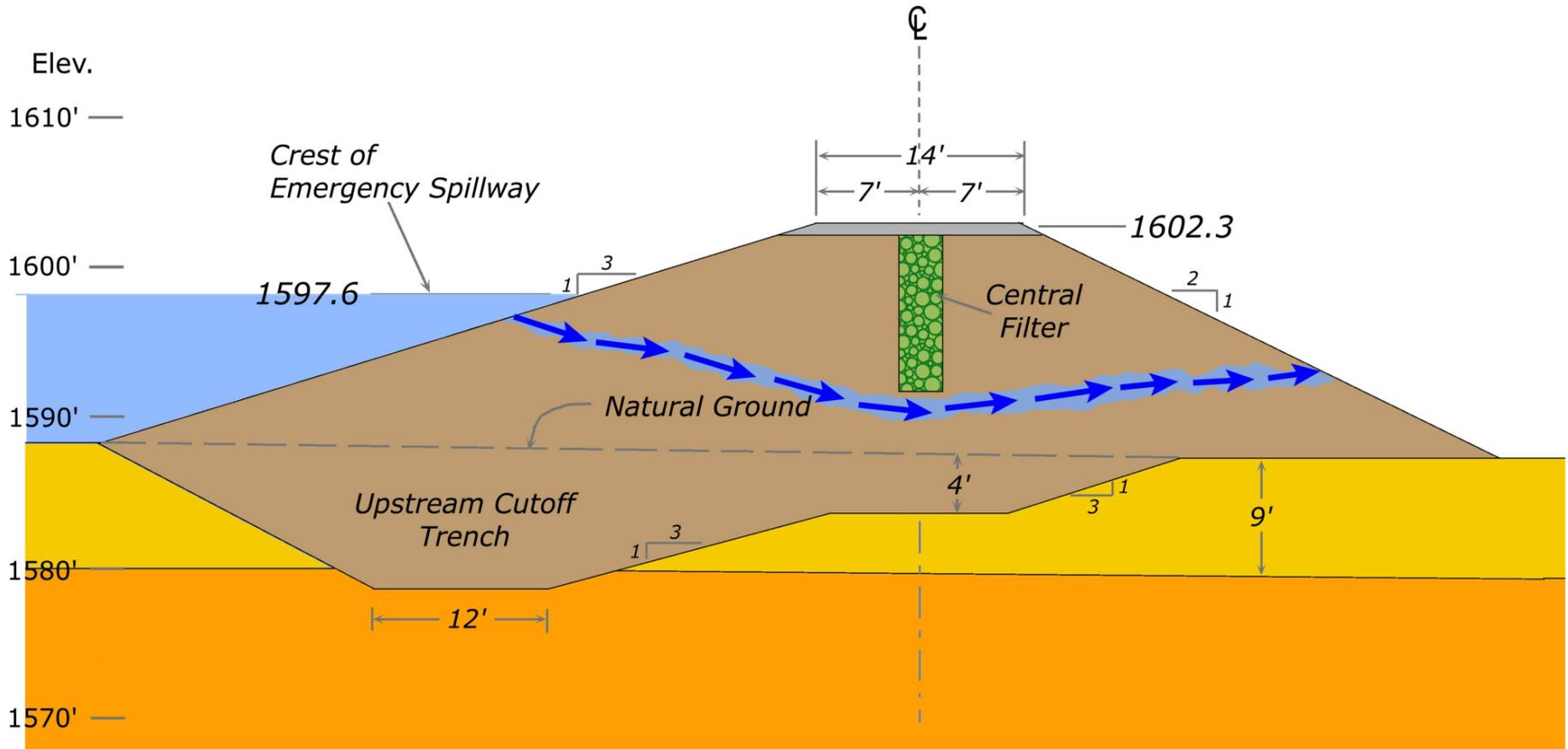
 Moderately to strongly cemented Late Pleistocene alluvium

 Collapsing Holocene alluvial fan deposits: Silty & clayey sand and fine gravel; sandy clay, sandy silt; clayey silt



CRACK-RELATED FAILURE MODE

Continuous leak along shrinkage/settlement cracks passing through embankment beneath central filter



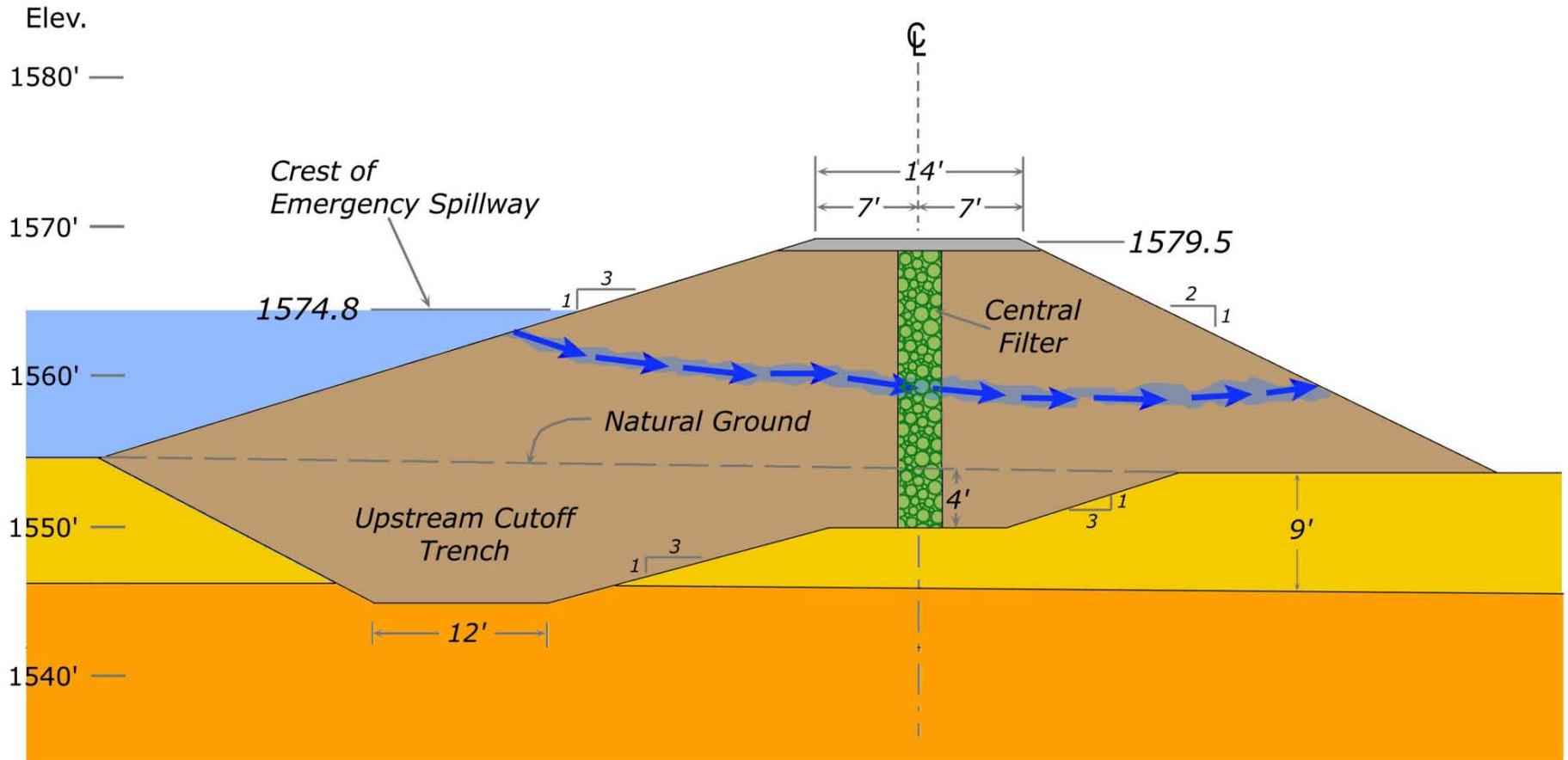
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- Collapsing Holocene alluvial fan deposits: Silty & clayey sand and fine gravel; sandy clay, sandy silt; clayey silt

- Moderately to strongly cemented Late Pleistocene alluvium
- Central Filter aggregate: sand & gravel with some silt



CRACK-RELATED FAILURE MODE

Continuous leak along shrinkage/settlement cracks through embankment and defect in central filter



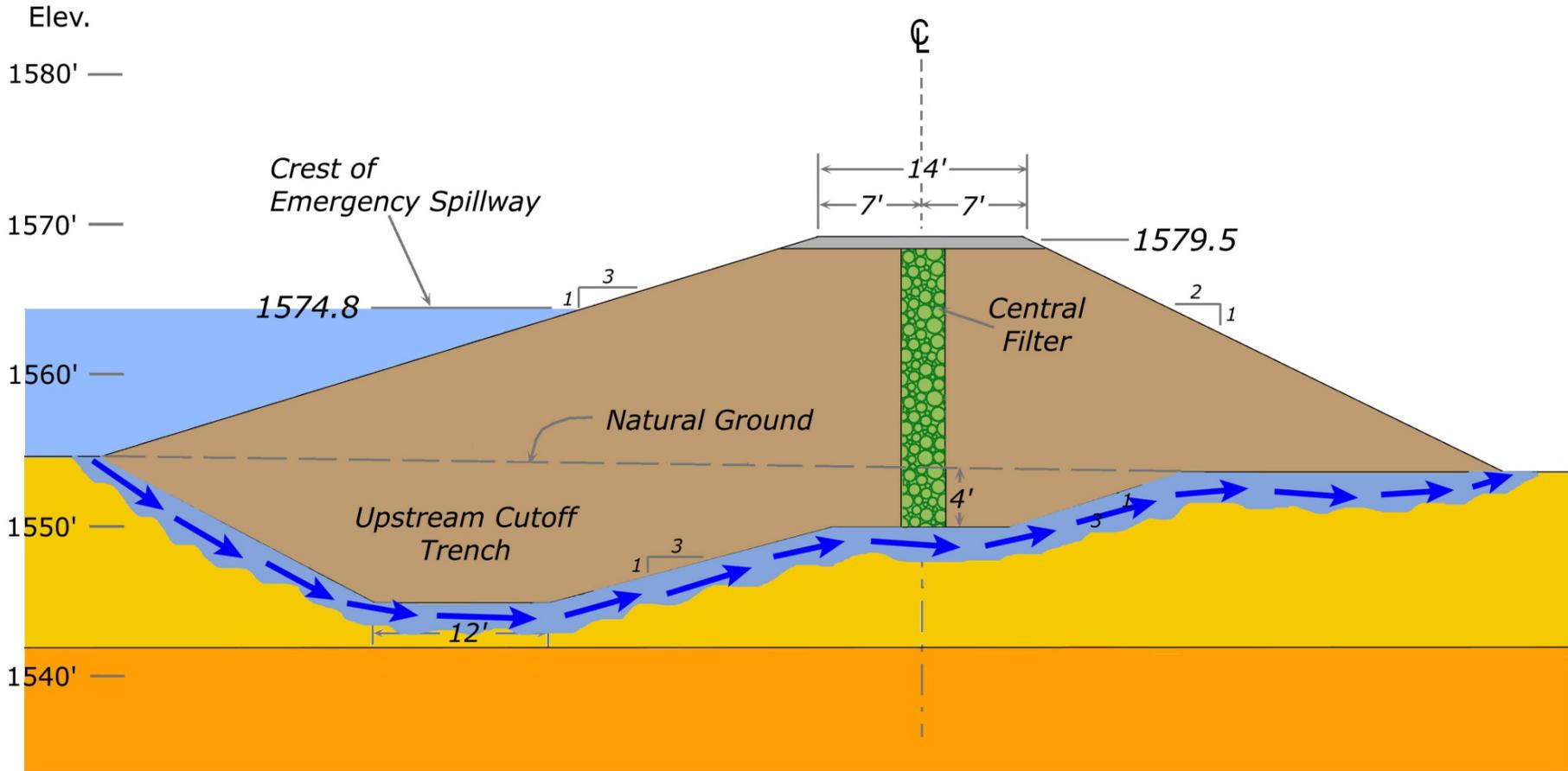
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-  Collapsing Holocene alluvial fan deposits: Silty & clayey sand and fine gravel; sandy clay, sandy silt; clayey silt

-  Moderately to strongly cemented Late Pleistocene alluvium
-  Central Filter aggregate: sand & gravel with some silt



CRACK-RELATED FAILURE MODE

Continuous leak along shrinkage/crack below central filter through highly erodible Holocene soils at embankment foundation interface



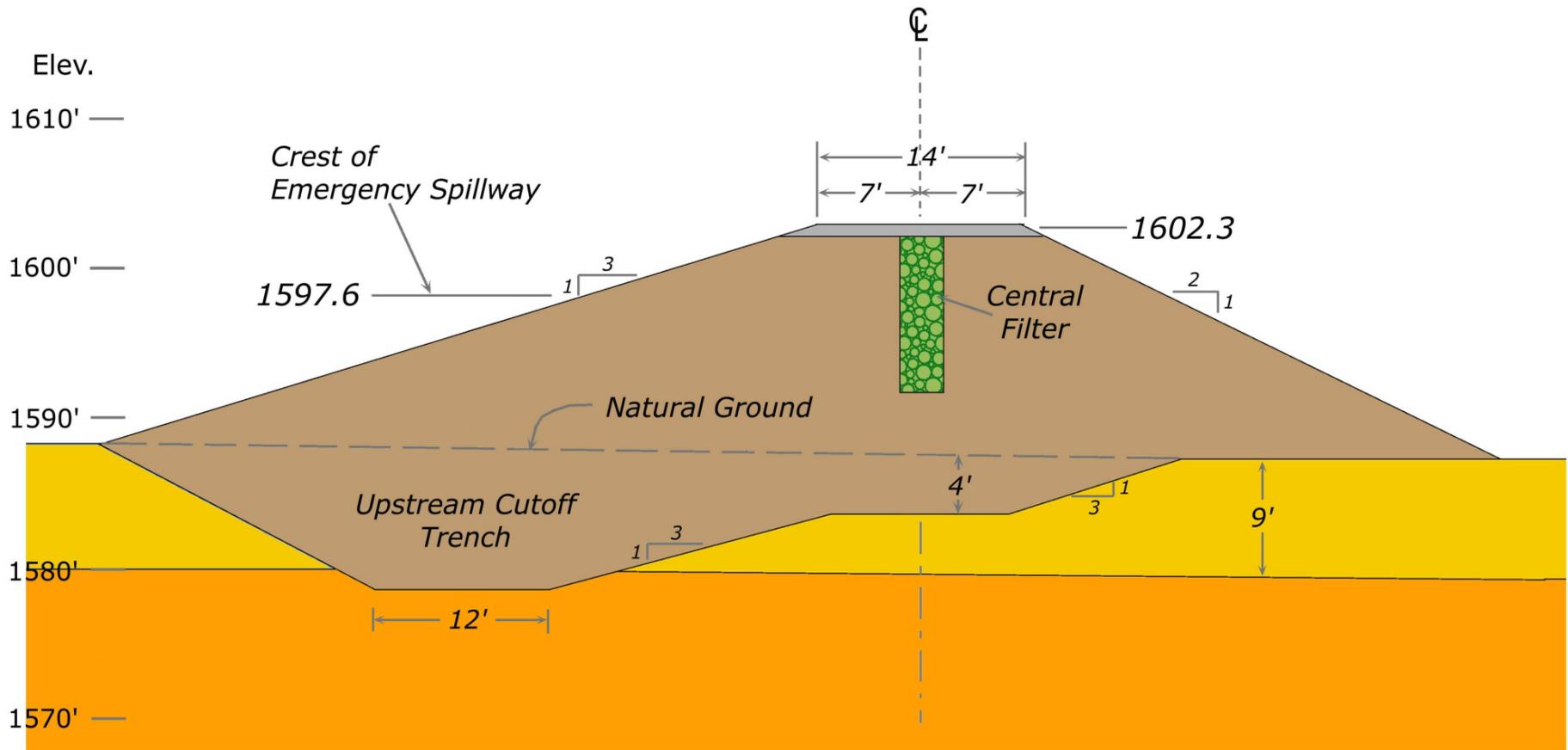
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-  Collapsing Holocene alluvial fan deposits: Silty & clayey sand and fine gravel; sandy clay, sandy silt; clayey silt

-  Moderately to strongly cemented Late Pleistocene alluvium
-  Central Filter aggregate: sand & gravel with some silt



TYPICAL CROSS SECTION

- ◆ Homogeneous embankment
- ◆ Partially penetrating central filter
- ◆ Upstream cutoff extends to cemented Late Pleistocene alluvium



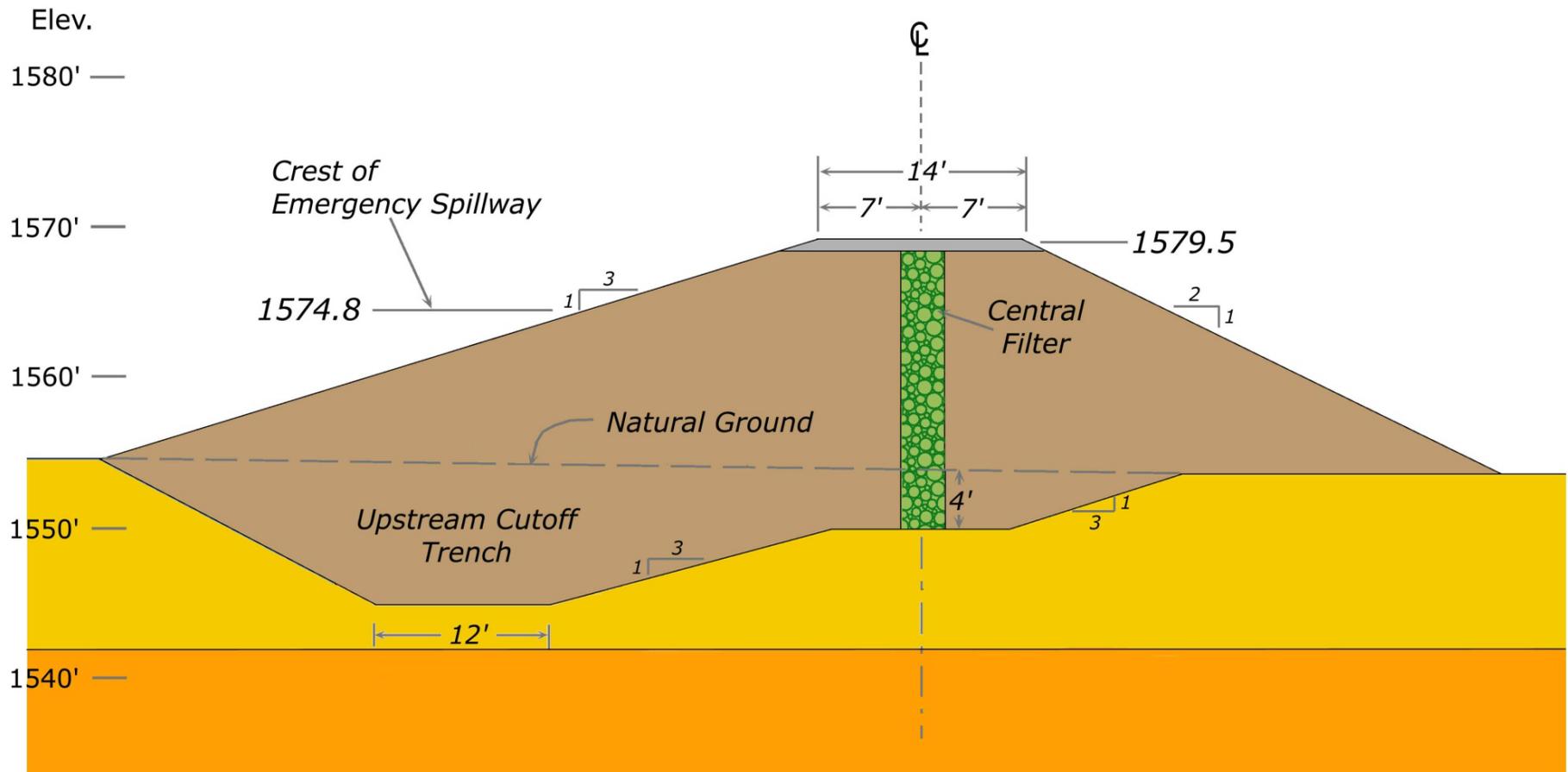
- Embankment: Silty & clayey sand and fine gravel, sandy clay, sandy silt, and clayey silt
- Collapsing Holocene alluvial fan deposits: Silty & clayey sand and fine gravel; sandy clay, sandy silt; clayey silt

- Moderately to strongly cemented Late Pleistocene alluvium
- Central Filter aggregate: sand & gravel with some silt



TYPICAL CROSS SECTION

- ◆ Homogeneous embankment
- ◆ Fully penetrating central filter
- ◆ Collapsing Holocene soil extends beneath entire foundation footprint



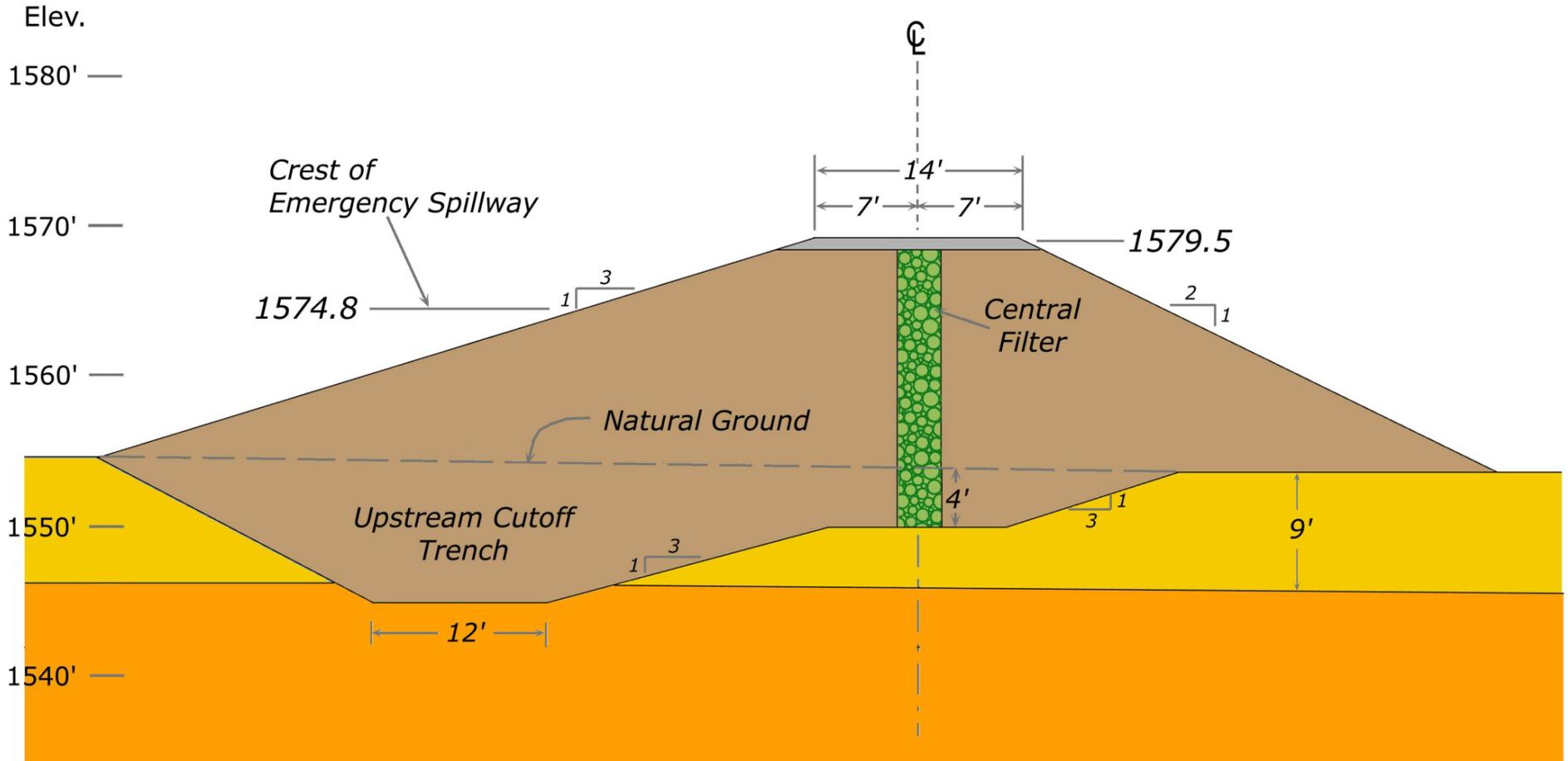
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- Moderately to strongly cemented Late Pleistocene alluvium
- Central Filter aggregate: sand & gravel with some silt



TYPICAL CROSS SECTION

- ◆ Homogeneous embankment
- ◆ Fully penetrating central filter
- ◆ Upstream cutoff trench extends to Late Pleistocene alluvium

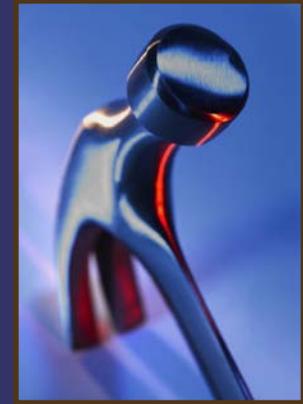


- Embankment: Silty & clayey sand and fine gravel, sandy clay, sandy silt, and clayey silt
- Collapsing Holocene alluvial fan deposits: Silty & clayey sand and fine gravel; sandy clay, sandy silt; clayey silt

- Moderately to strongly cemented Late Pleistocene alluvium
- Central Filter aggregate: sand & gravel with some silt

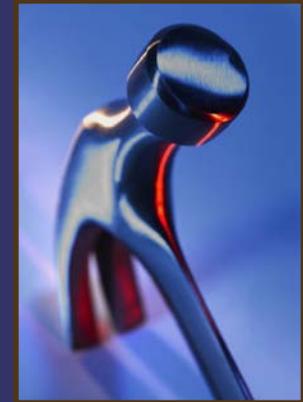
Mitigation Toolbox

- Overtopping
 - Raise Dam
 - Increase Pool Storage
 - Widen Auxiliary Spillways
 - Add Principal Outlets



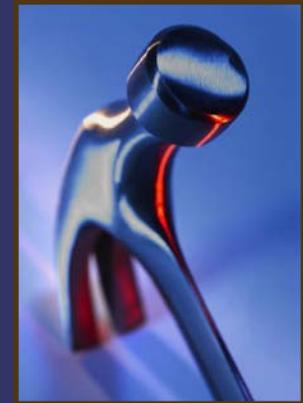
Mitigation Toolbox

- Auxiliary Spillway Erosion
 - Provide stabilized control section
 - Line spillway



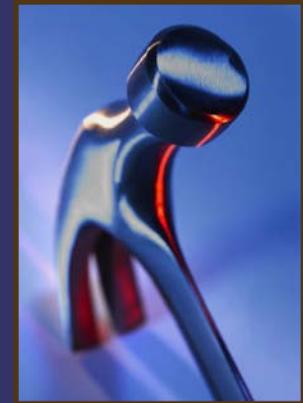
Mitigation Toolbox

- Slow Flood Pool Drain Time
 - Increase Principal Outlets
 - Add Principal Outlets
 - Utilize Irrigation Outlets
 - Raise Dam



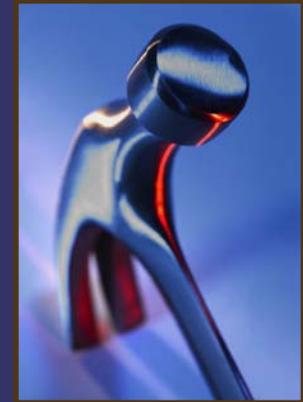
Mitigation Toolbox

- Central Filter
 - Replace Central Filter
 - Upstream or Downstream Filter
 - Upstream Impermeable Barrier
 - Add Central Filter to Rittenhouse FRS (southern 5,000 ft)



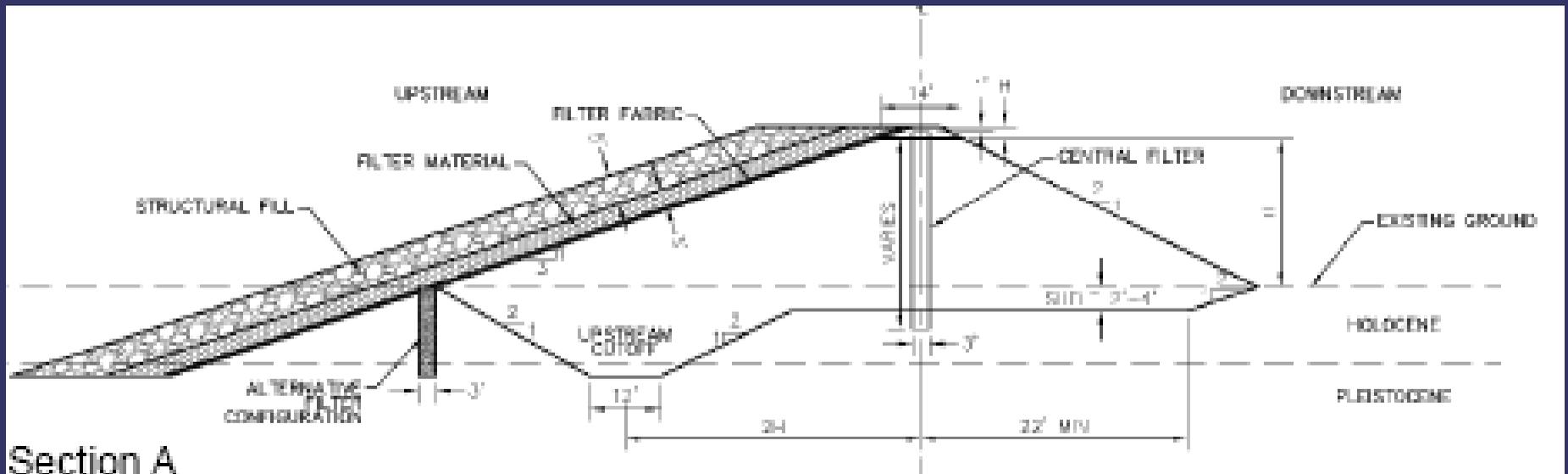
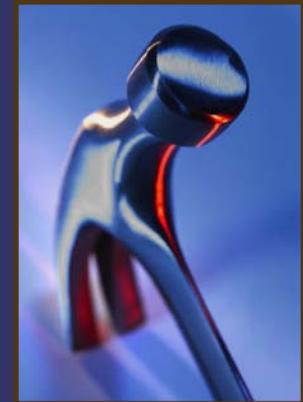
Mitigation Toolbox

- Foundation Soils
 - Upstream Cutoff Walls
 - Upstream Filter
 - Extend Upstream Cutoff into Pleistocene soils



Mitigation Toolbox

- Foundation Soils



Section A

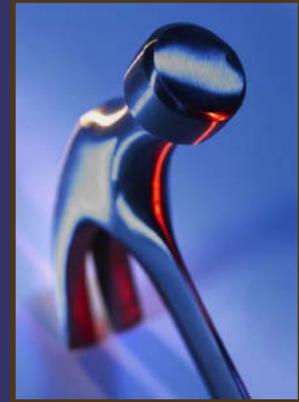


Mitigation Toolbox

- Land Subsidence
 - Raise Dam
 - Plan for Future Raise
 - Increase Flood Pool



Mitigation Toolbox

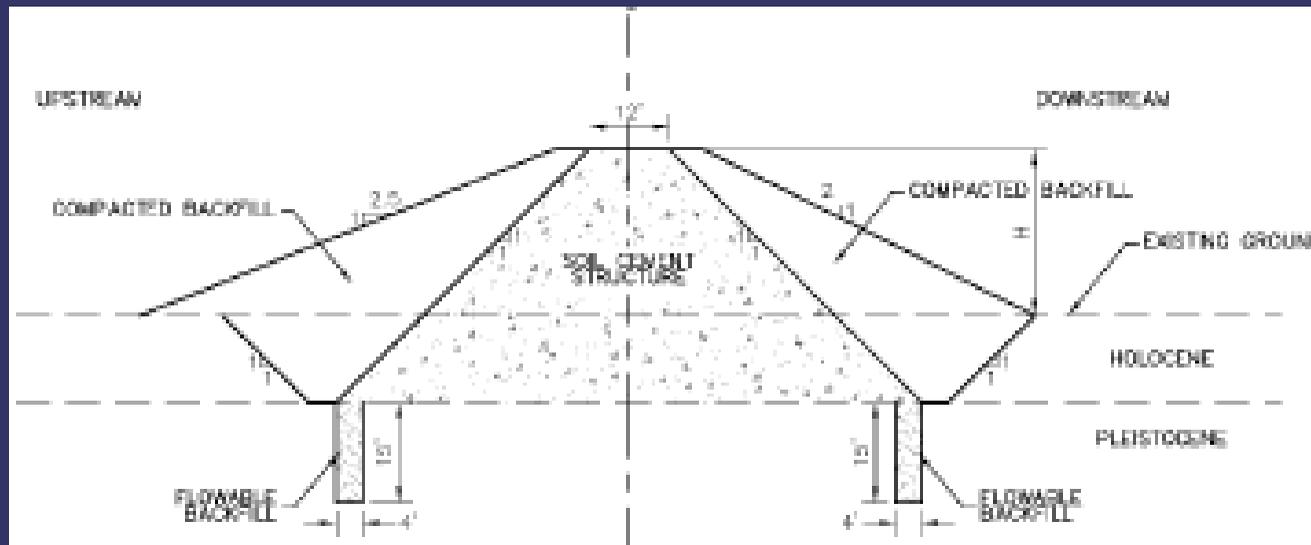
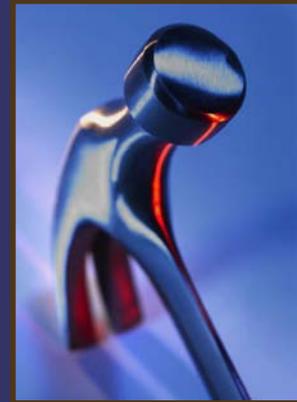


- Earth Fissure(s)
 - Cutoff Wall at upstream and downstream toe
 - Hardened embankment
 - Avoid Fissure Zone
 - Build New Embankment away from High Risk Zone
 - Other Flood Control Facility type (basin, channel)



Mitigation Toolbox

- Earth Fissure(s)



Break

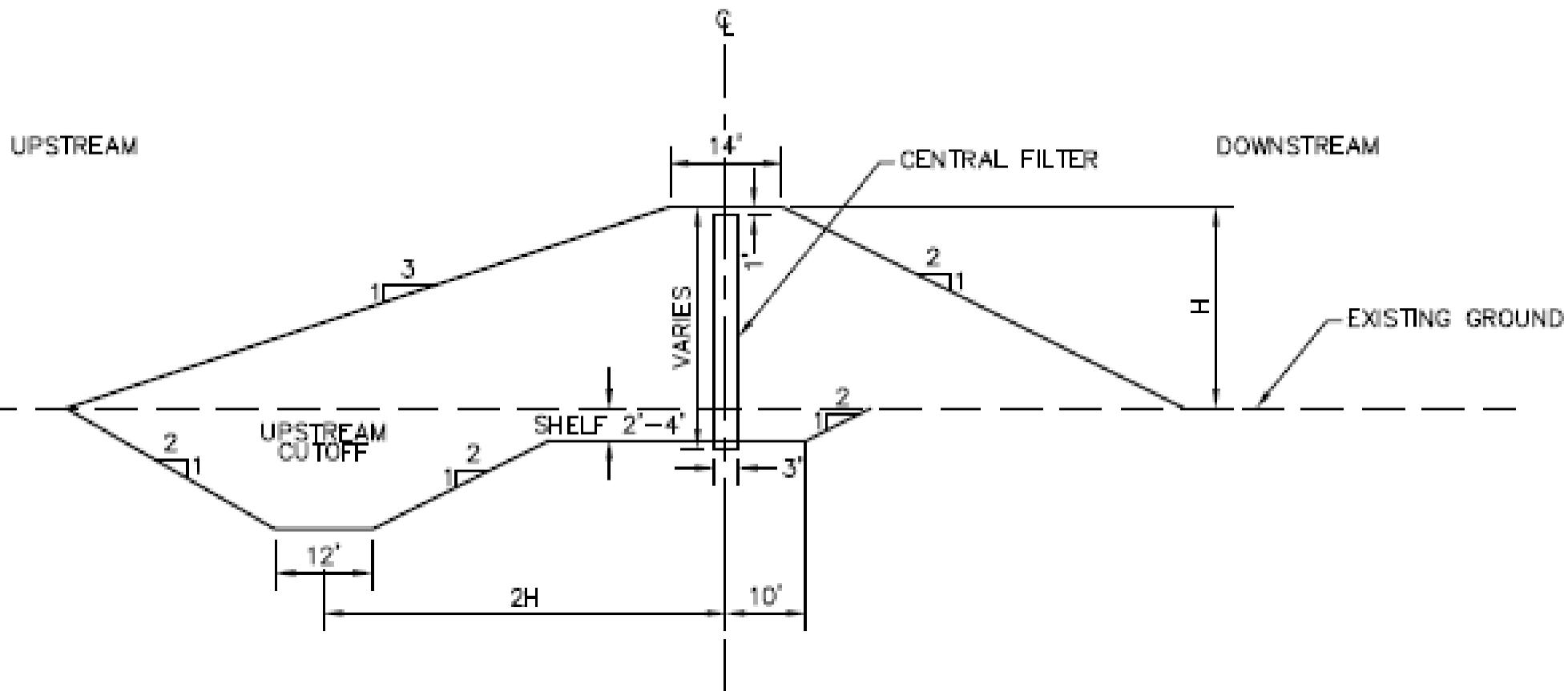




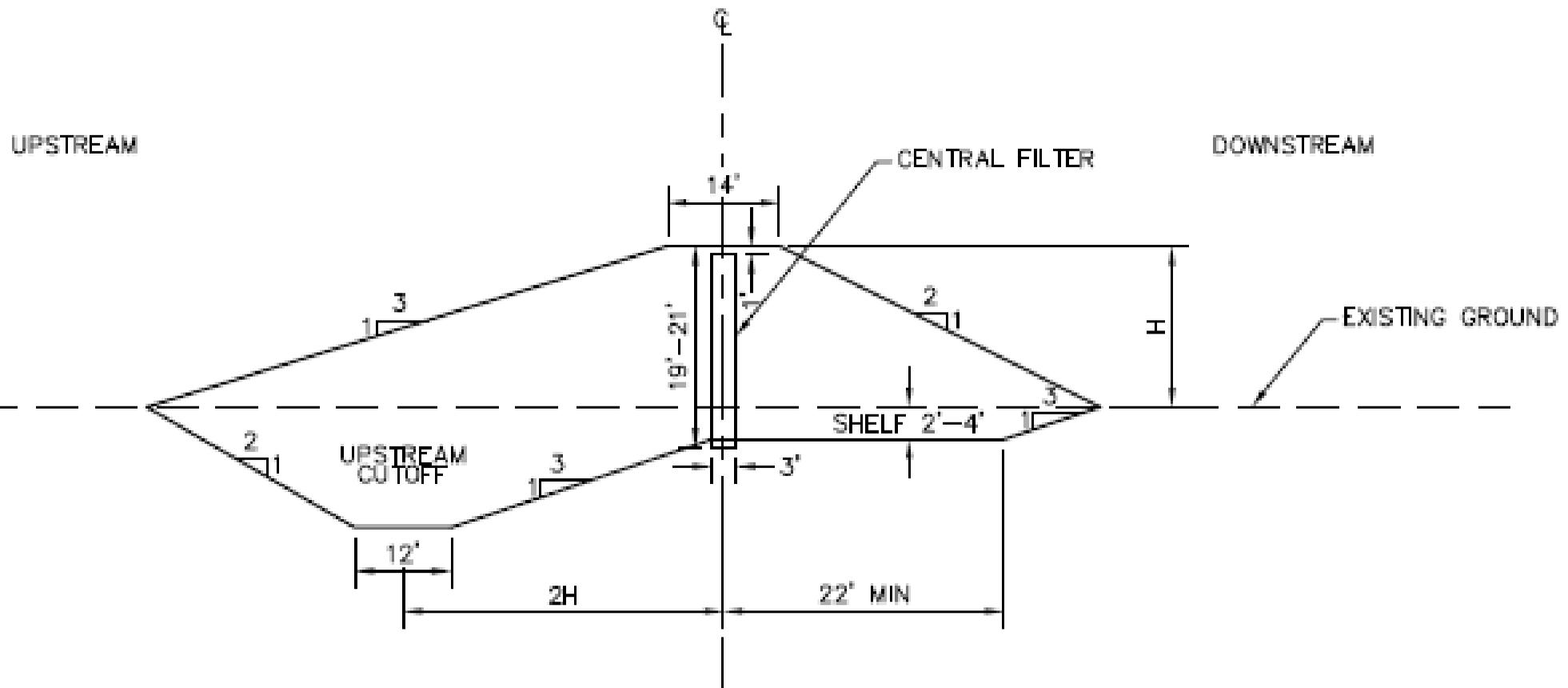
**Rehabilitation or Replacement of:
Powerline FRS
Vineyard Road FRS
Rittenhouse FRS**

Questions/Discussion ?

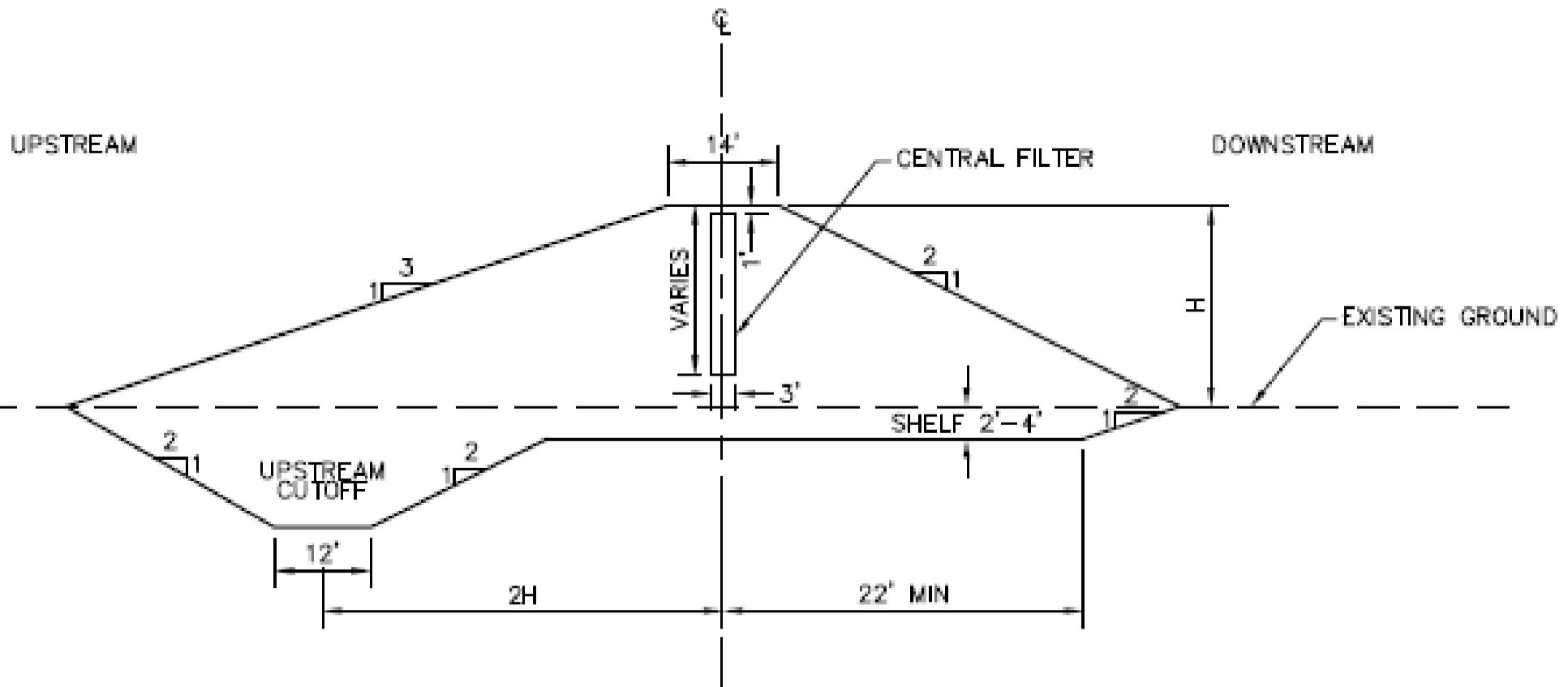
Powerline Typical

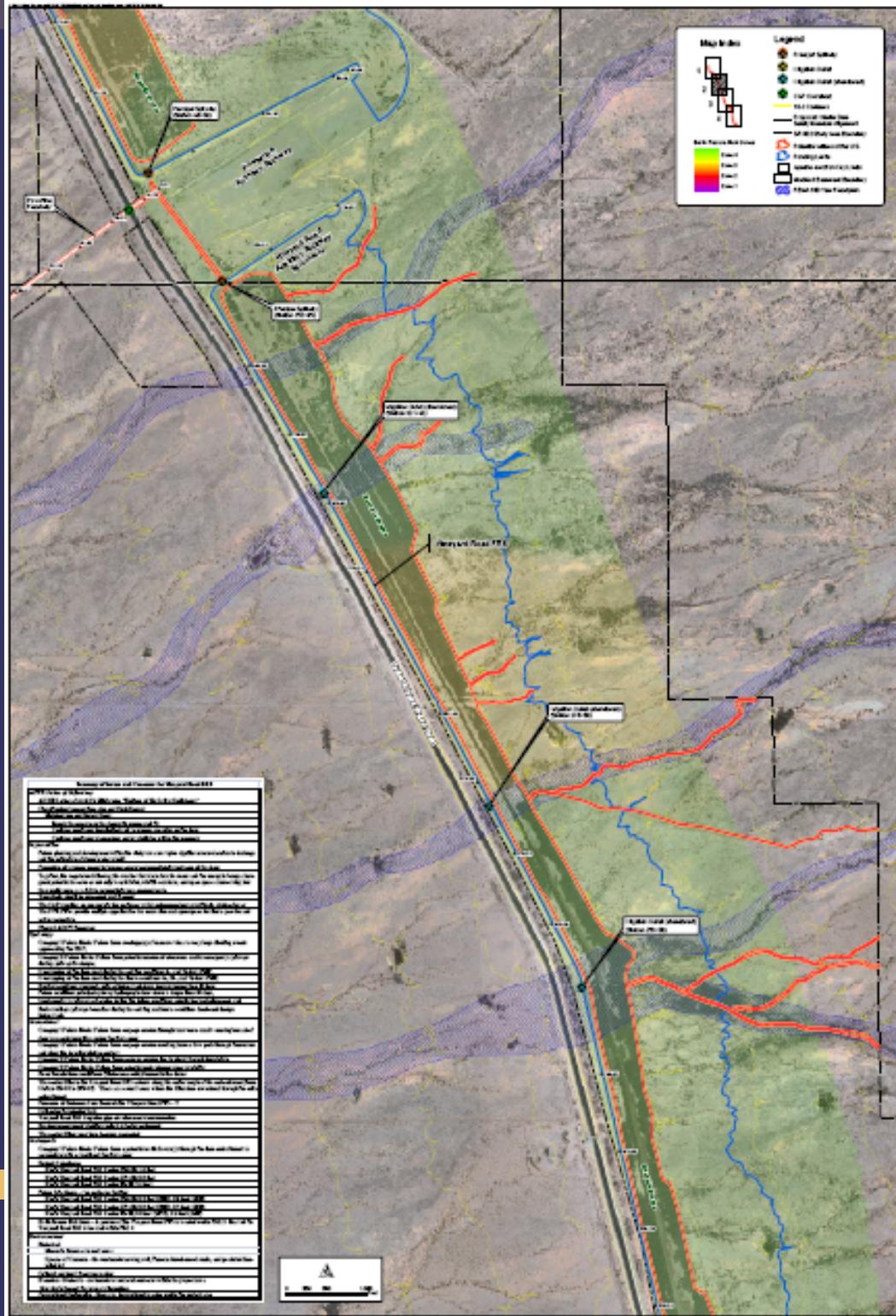


Vineyard Road Typical



Rittenhouse Typical

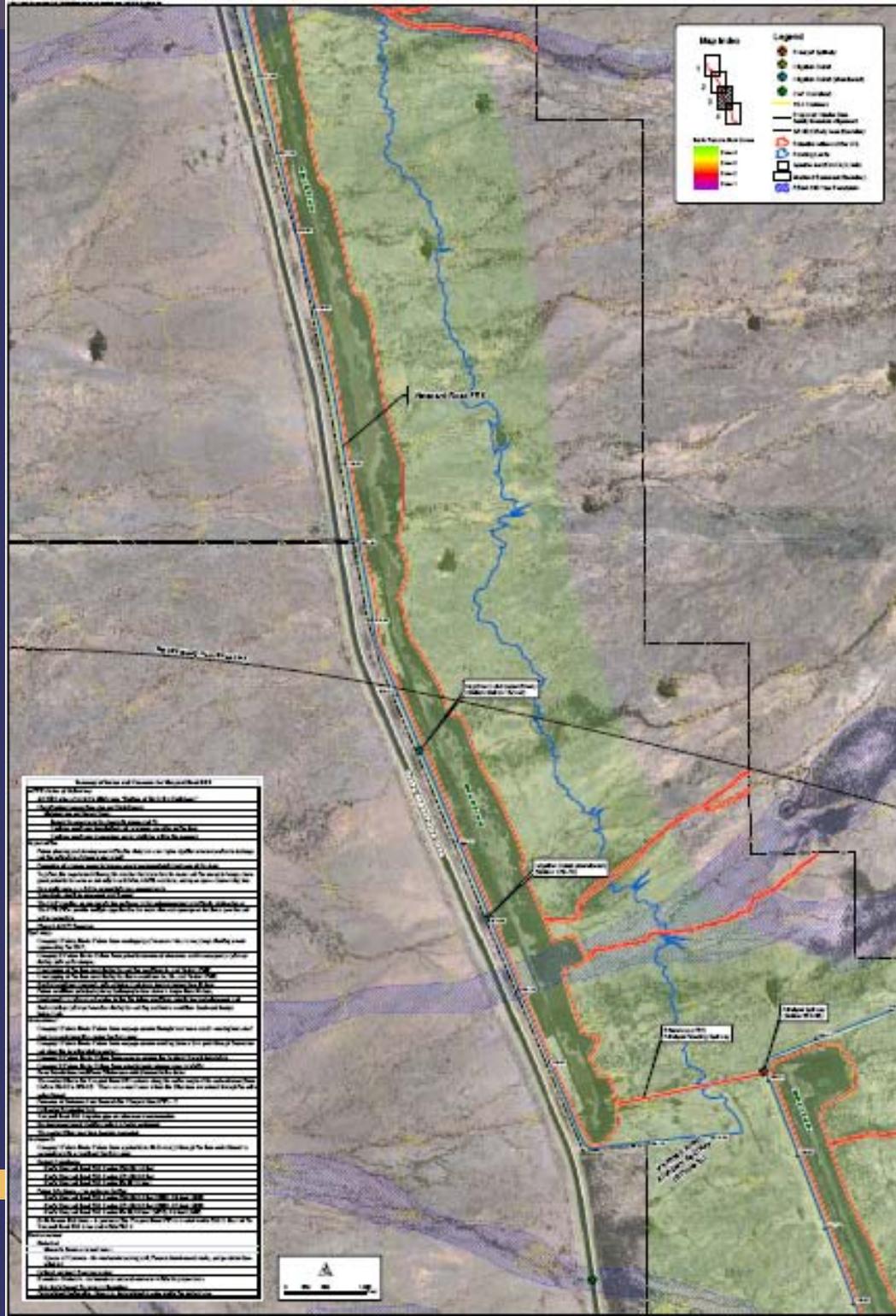




Summary of Water and Power for the Colorado River

Water Right	Priority	Quantity	Location
Colorado River	1	16.5	Colorado River
Colorado River	2	16.5	Colorado River
Colorado River	3	16.5	Colorado River
Colorado River	4	16.5	Colorado River
Colorado River	5	16.5	Colorado River
Colorado River	6	16.5	Colorado River
Colorado River	7	16.5	Colorado River
Colorado River	8	16.5	Colorado River
Colorado River	9	16.5	Colorado River
Colorado River	10	16.5	Colorado River
Colorado River	11	16.5	Colorado River
Colorado River	12	16.5	Colorado River
Colorado River	13	16.5	Colorado River
Colorado River	14	16.5	Colorado River
Colorado River	15	16.5	Colorado River
Colorado River	16	16.5	Colorado River
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Colorado River	18	16.5	Colorado River
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Colorado River	26	16.5	Colorado River
Colorado River	27	16.5	Colorado River
Colorado River	28	16.5	Colorado River
Colorado River	29	16.5	Colorado River
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Colorado River	38	16.5	Colorado River
Colorado River	39	16.5	Colorado River
Colorado River	40	16.5	Colorado River
Colorado River	41	16.5	Colorado River
Colorado River	42	16.5	Colorado River
Colorado River	43	16.5	Colorado River
Colorado River	44	16.5	Colorado River
Colorado River	45	16.5	Colorado River
Colorado River	46	16.5	Colorado River
Colorado River	47	16.5	Colorado River
Colorado River	48	16.5	Colorado River
Colorado River	49	16.5	Colorado River
Colorado River	50	16.5	Colorado River





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Legend

- 1. Canal Right-of-Way
- 2. Right-of-Way
- 3. Right-of-Way (Shaded)
- 4. Canal Corridor
- 5. PFE Corridor
- 6. PFE of Right-of-Way
- 7. Right-of-Way (Shaded)
- 8. Right-of-Way (Shaded)
- 9. Right-of-Way (Shaded)
- 10. Right-of-Way (Shaded)
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- 100. Right-of-Way (Shaded)

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