Reconnecting Waterways

Case Study for Managing Construction Site Sediment

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Case Study – Wainwright Mill Dam Removal, Salisbury

Dam Removal and Stream Restoration: DA = 1.6 sm, Wbkf = 11', Dbkf = 1', Slope = 0.55%

Owner: Private, Engineer: SRL, Sponsor: VT Natural Resource Council, Contractor: Markowski Excavating

Case Study – Stream Alteration Individual Permit (IP)

IP Required: *due to sediment volume to remain and tributary listed on 303(d) as impaired due to nutrients; Impounded Sediment = 22,000 cyds, Sediment Removed = 10,700 cyds over 770 linear feet of stream*

3 years of Site Visits – Annual during low flow period and after rainfall events of 5+ inches over 48 hours

Water Quality Monitoring – Threshold of 30.5 NTU determined to be the 'Action Level' for maintenance

Monitoring Reports – Submitted with 45 days to USACE and VT DEC, summary memo and map with photos

Maintenance Activities – Based on sediment source(s), to be completed within 3 months of observation

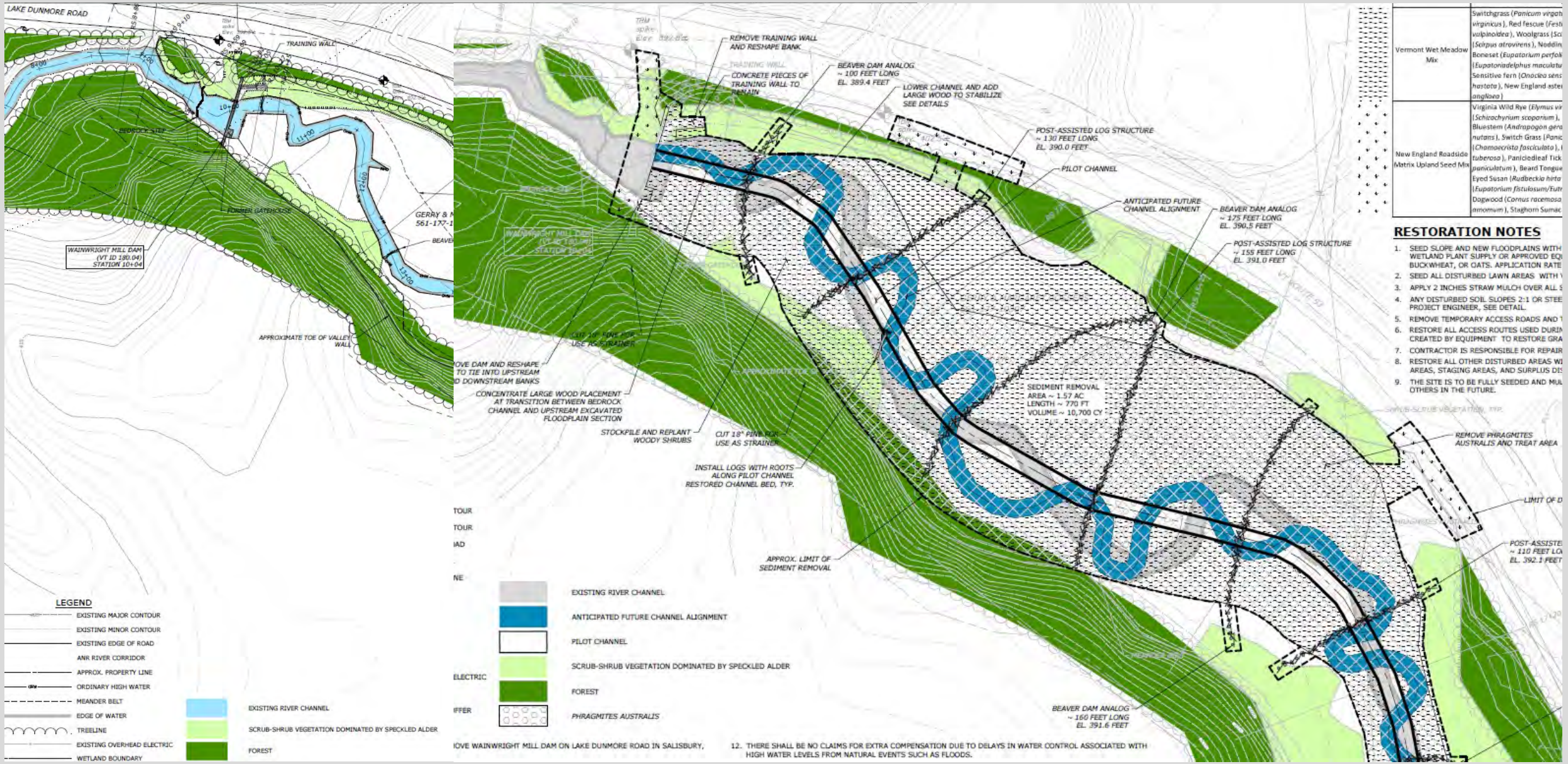
Table 1: Maintenance Matrix

Observation	Maintenance Action	Metrics to Cease Maintenance
Headcut with >1.5-foot water surface drop	Bolstering or installation of either PALS or BDA in area	Headcut drop decreases below 1.5 feet.
PALS structure with full vertical breach at least 5 feet wide or partial breach of more than 75% of height of structure more than 10 feet wide with turbidity export	Rebuild PALS structure to repair breached section	Channel vertically stable and no turbidity export.
BDA breached	No action required	N/A
Vegetation goals are more than 25% below expected coverage compared to goal for the duration past construction	Reseed areas with less than 80% coverage with approved native seed mix.	Vegetation goals met
If the turbidity is above the established monitoring threshold, perform an additional stream walk to confirm the source of sediment and identify alternatives to stabilize the sediment.	Alternatives (below) shall be reviewed with regulators and a preferred alternative shall be collaboratively agreed upon, see list of water quality alternatives to be considered below. The project team shall discuss an implementation plan including timing, required permitting, funding, and installation.	Re-check turbidity level to determine if turbidity has returned to below threshold values.

If turbidity above 30.5 NTU exists, consider the following water quality maintenance alternatives with the project team.

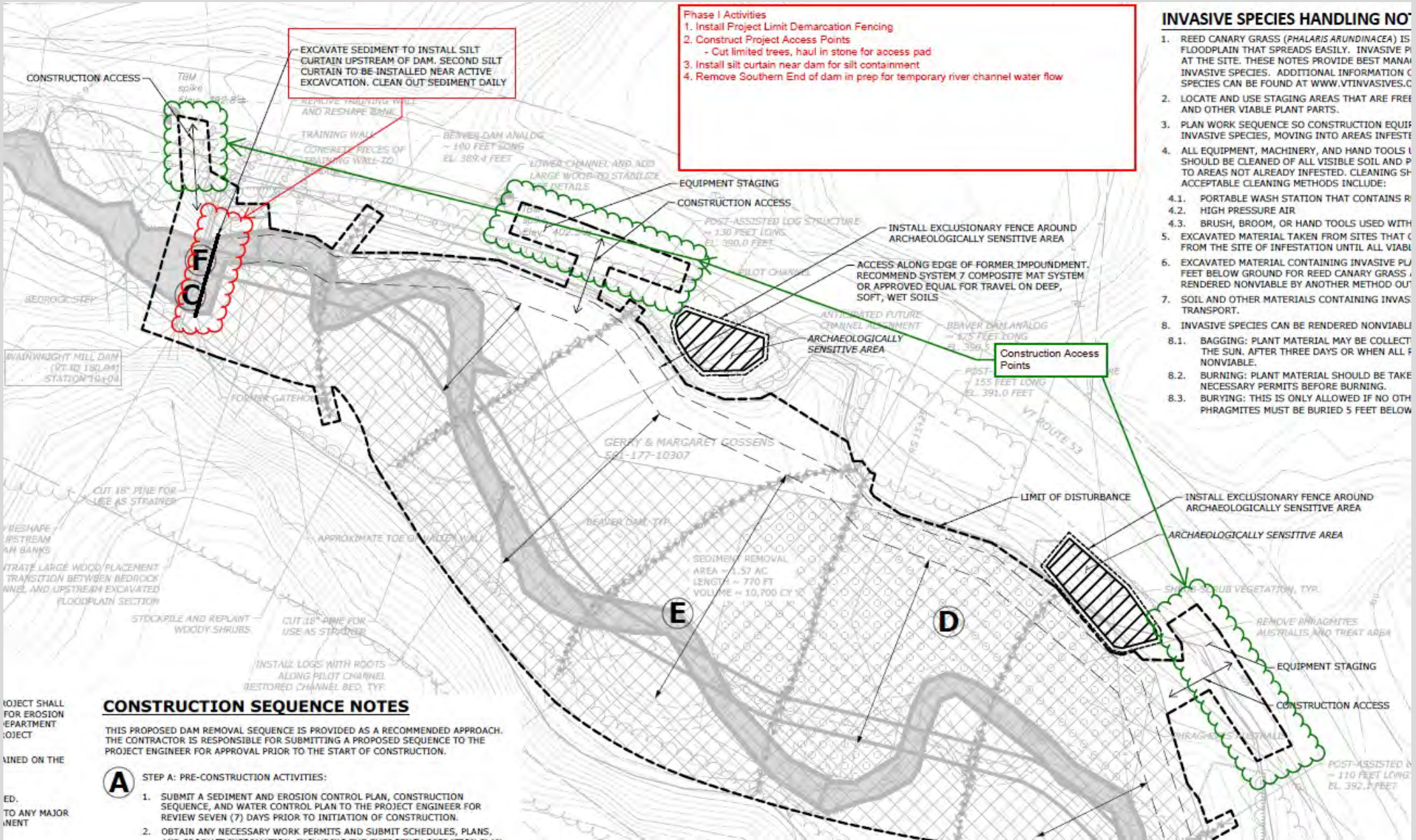
1. Spot fix (i.e., revegetate, shape by hand or small machine, stabilize with wood, bioengineering) banks areas that are the source of baseflow turbidity.
2. Adjust large wood structures by hand or small machine if baseflow turbidity originating at installed BDAs or PALs.
3. If baseflow turbidity originating over full project length, reseed/plant and continue monitoring vegetation reestablishment. Install erosion control matting to cover the exposed floodplain leading to turbidity.
4. If baseflow turbidity originating over only upstream portion of project area where sediment was not removed, either revegetate upstream areas with seed or plantings, and consider erosion control matting or install wood structures using PALS or BDA structures.
5. If excessive sediment transport is ongoing with heavy turbidity originating over the upstream portion of project area where sediment was not removed, develop and implement a sediment removal plan.

Case Study – Existing and Proposed Conditions

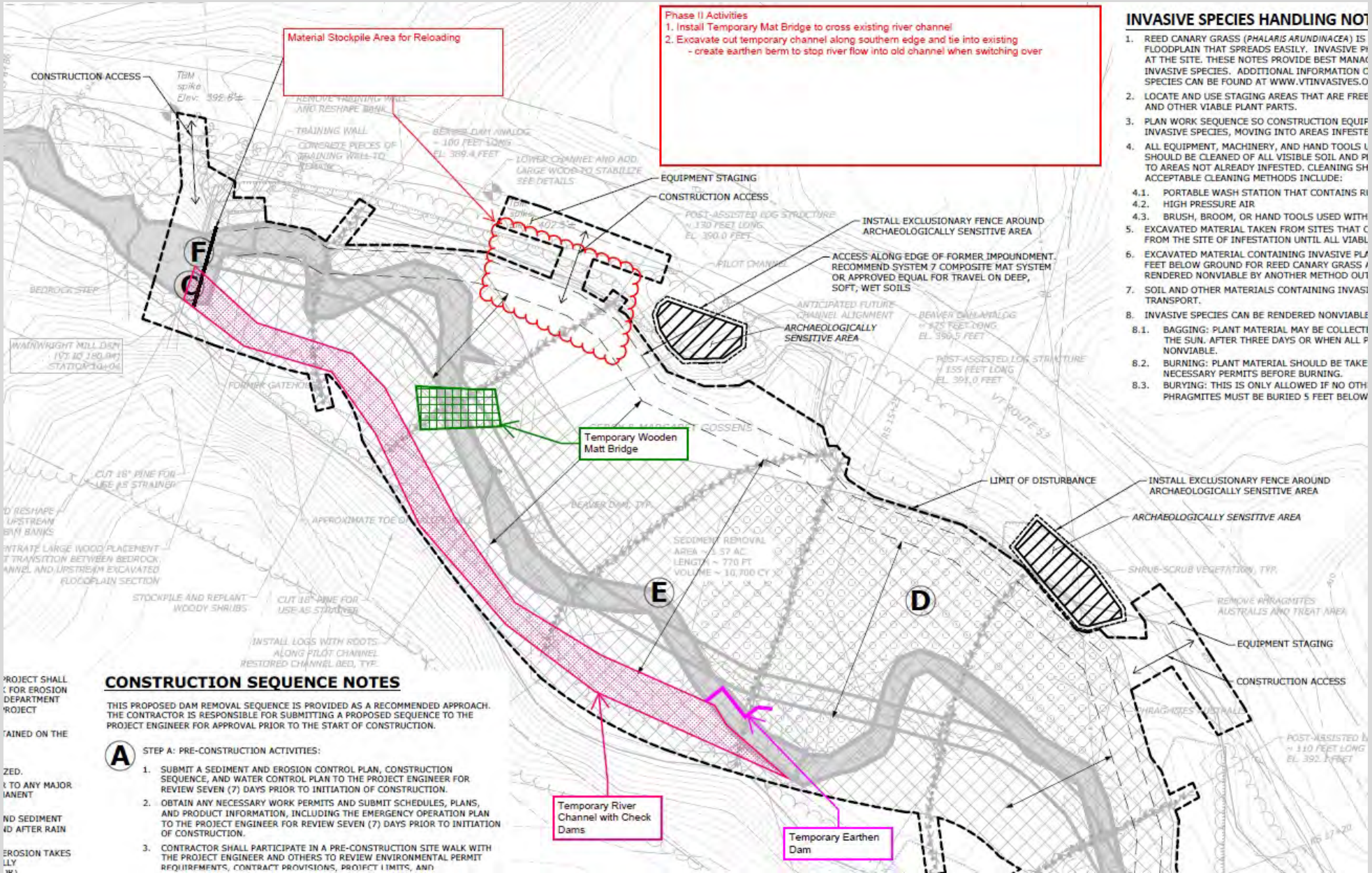


PROPOSED Phasing and Flow Control Plan

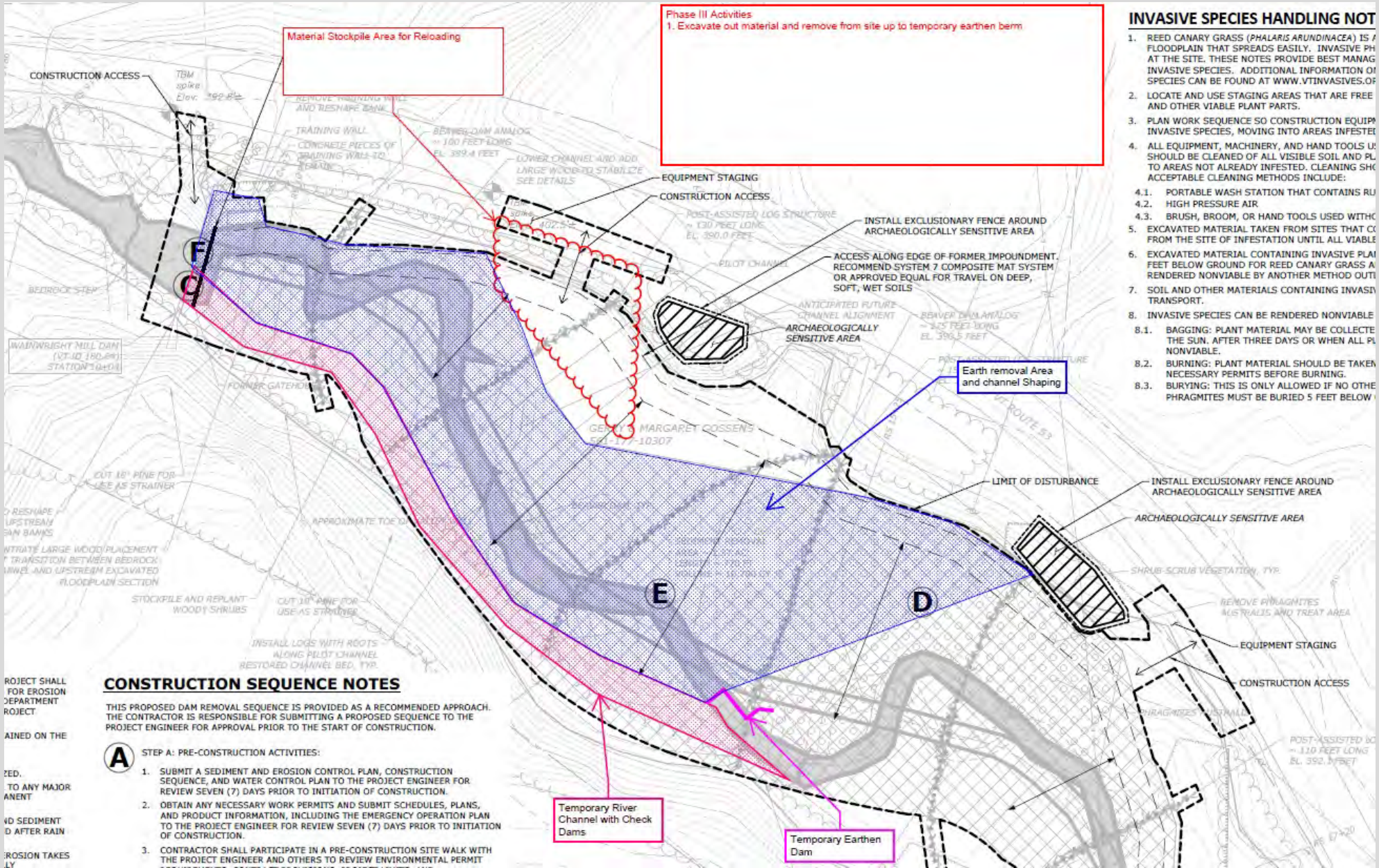
PHASE 1 - Wainwright Mill Dam Removal



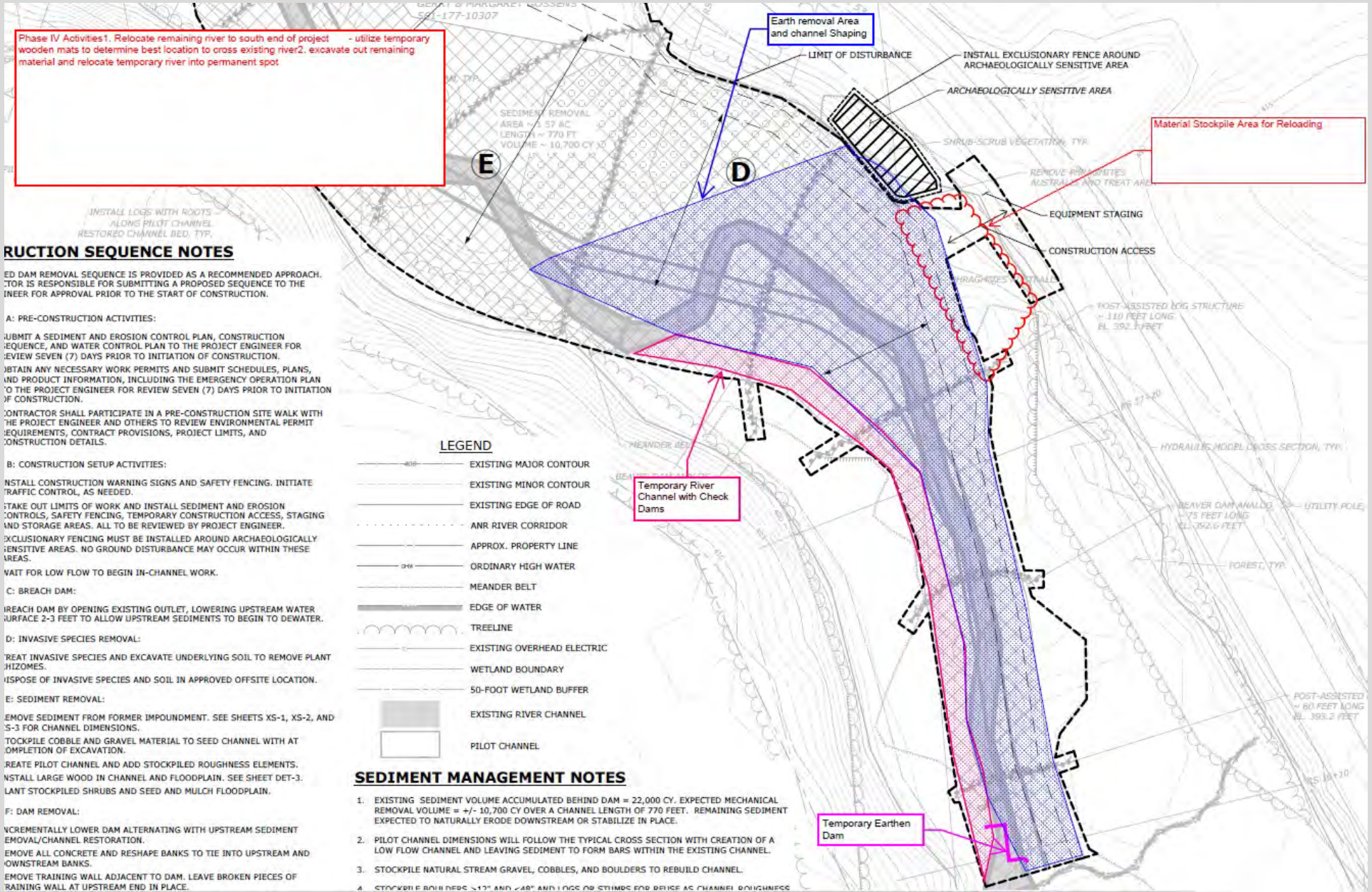
PHASE II - Wainwright Mill Dam Removal



PHASE III - Wainwright Mill Dam Removal

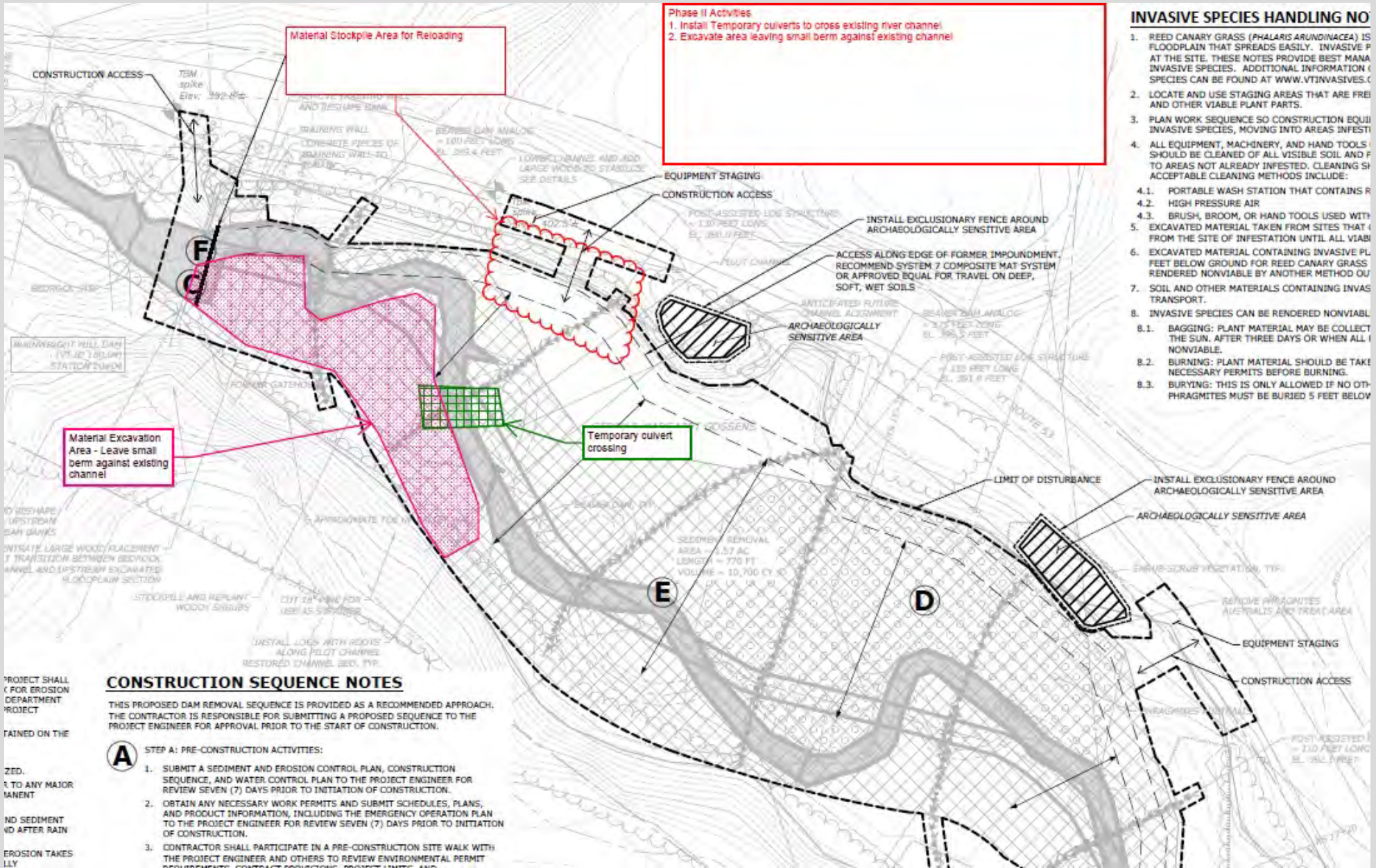


PHASE IV - Wainwright Mill Dam Removal



REVISED Phasing and Flow Control Plan

PHASE II - Wainwright Mill Dam Removal



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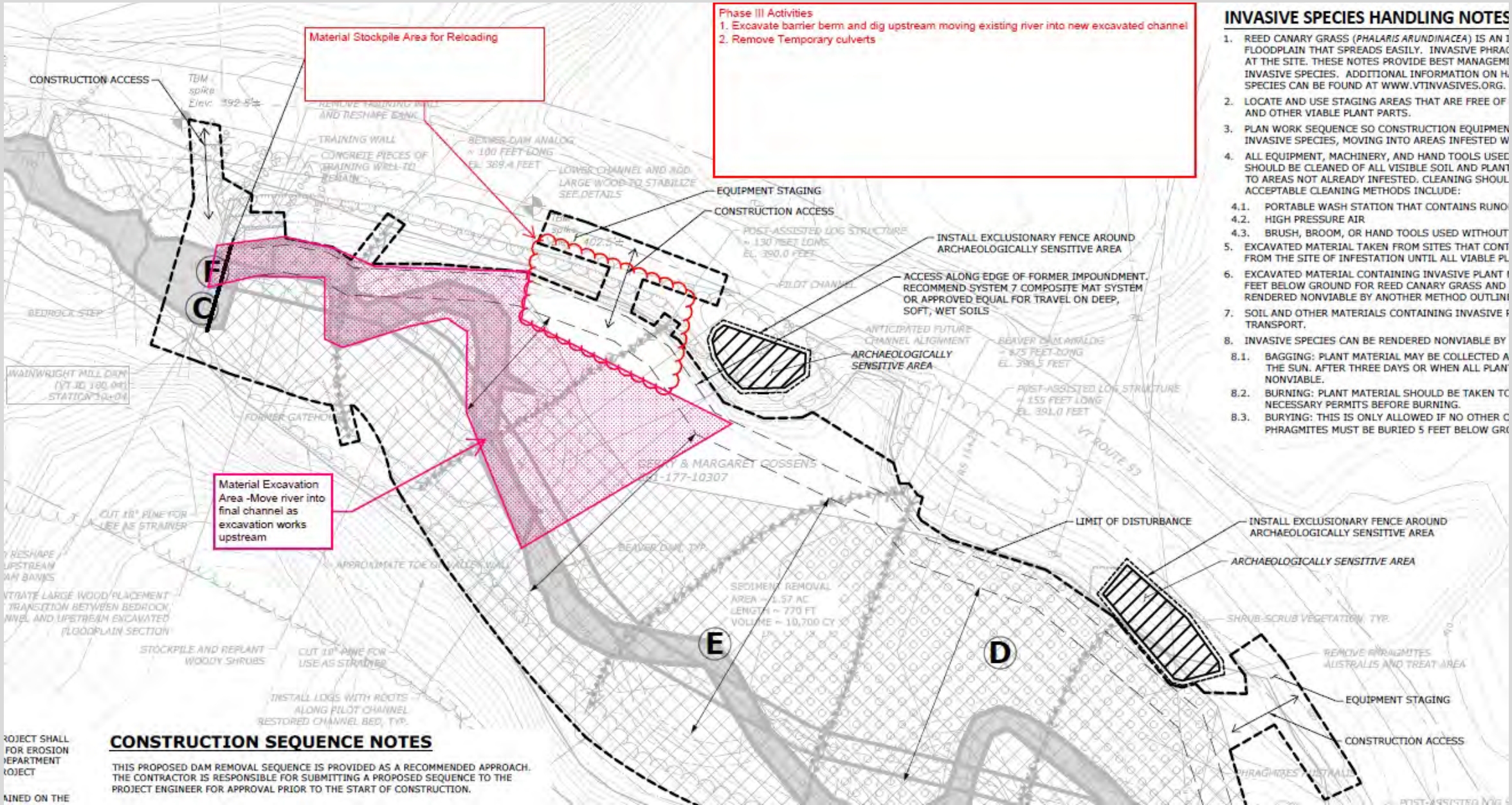

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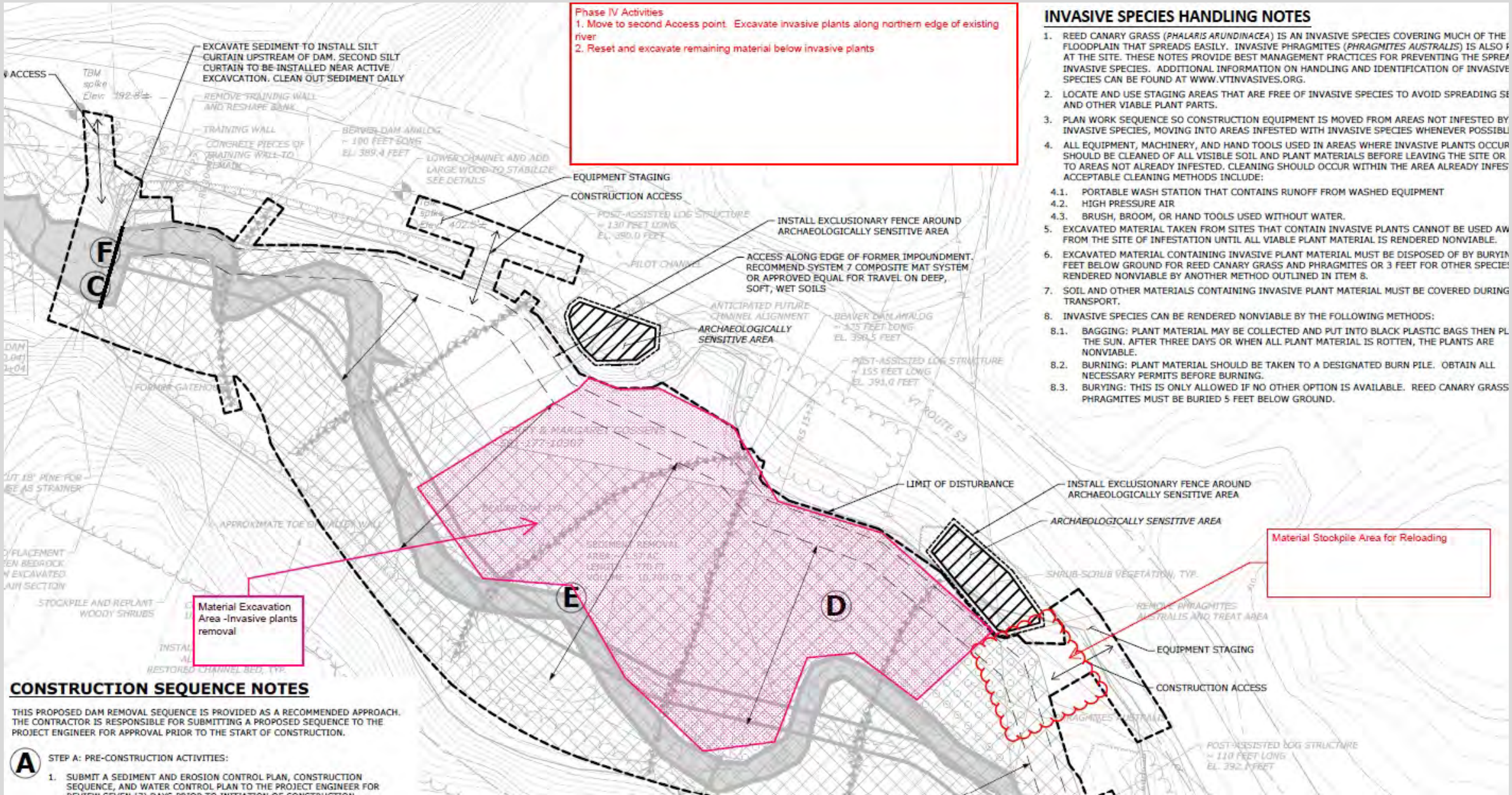


INVASIVE SPECIES HANDLING NOTES

1. REED CANARY GRASS (*PHALARIS ARUNDINACEA*) IS AN INVASIVE SPECIES COVERING MUCH OF THE FLOODPLAIN THAT SPREADS EASILY. INVASIVE PHRAGMITES (*PHRAGMITES AUSTRALIS*) IS ALSO P AT THE SITE. THESE NOTES PROVIDE BEST MANAGEMENT PRACTICES FOR PREVENTING THE SPREA INVASIVE SPECIES. ADDITIONAL INFORMATION ON HANDLING AND IDENTIFICATION OF INVASIVE SPECIES CAN BE FOUND AT WWW.VTINVASIVES.ORG.
2. LOCATE AND USE STAGING AREAS THAT ARE FREE OF INVASIVE SPECIES TO AVOID SPREADING SE AND OTHER VIABLE PLANT PARTS.
3. PLAN WORK SEQUENCE SO CONSTRUCTION EQUIPMENT IS MOVED FROM AREAS NOT INFESTED BY INVASIVE SPECIES, MOVING INTO AREAS INFESTED WITH INVASIVE SPECIES WHENEVER POSSIBL
4. ALL EQUIPMENT, MACHINERY, AND HAND TOOLS USED IN AREAS WHERE INVASIVE PLANTS OCCUR SHOULD BE CLEANED OF ALL VISIBLE SOIL AND PLANT MATERIALS BEFORE LEAVING THE SITE OR TO AREAS NOT ALREADY INFESTED. CLEANING SHOULD OCCUR WITHIN THE AREA ALREADY INFES ACCEPTABLE CLEANING METHODS INCLUDE:
   - 4.1. PORTABLE WASH STATION THAT CONTAINS RUNOFF FROM WASHED EQUIPMENT
   - 4.2. HIGH PRESSURE AIR
   - 4.3. BRUSH, BROOM, OR HAND TOOLS USED WITHOUT WATER.
5. EXCAVATED MATERIAL TAKEN FROM SITES THAT CONTAIN INVASIVE PLANTS CANNOT BE USED AW FROM THE SITE OF INFESTATION UNTIL ALL VIABLE PLANT MATERIAL IS RENDERED NONVIABLE.
6. EXCAVATED MATERIAL CONTAINING INVASIVE PLANT MATERIAL MUST BE DISPOSED OF BY BURYIN FEET BELOW GROUND FOR REED CANARY GRASS AND PHRAGMITES OR 3 FEET FOR OTHER SPECIE RENDERED NONVIABLE BY ANOTHER METHOD OUTLINED IN ITEM 8.
7. SOIL AND OTHER MATERIALS CONTAINING INVASIVE PLANT MATERIAL MUST BE COVERED DURING TRANSPORT.
8. INVASIVE SPECIES CAN BE RENDERED NONVIABLE BY THE FOLLOWING METHODS:
   - 8.1. BAGGING: PLANT MATERIAL MAY BE COLLECTED AND PUT INTO BLACK PLASTIC BAGS THEN PL THE SUN. AFTER THREE DAYS OR WHEN ALL PLANT MATERIAL IS ROTTEN, THE PLANTS ARE NONVIABLE.
   - 8.2. BURNING: PLANT MATERIAL SHOULD BE TAKEN TO A DESIGNATED BURN PILE. OBTAIN ALL NECESSARY PERMITS BEFORE BURNING.
   - 8.3. BURYING: THIS IS ONLY ALLOWED IF NO OTHER OPTION IS AVAILABLE. REED CANARY GRASS PHRAGMITES MUST BE BURIED 5 FEET BELOW GROUND.

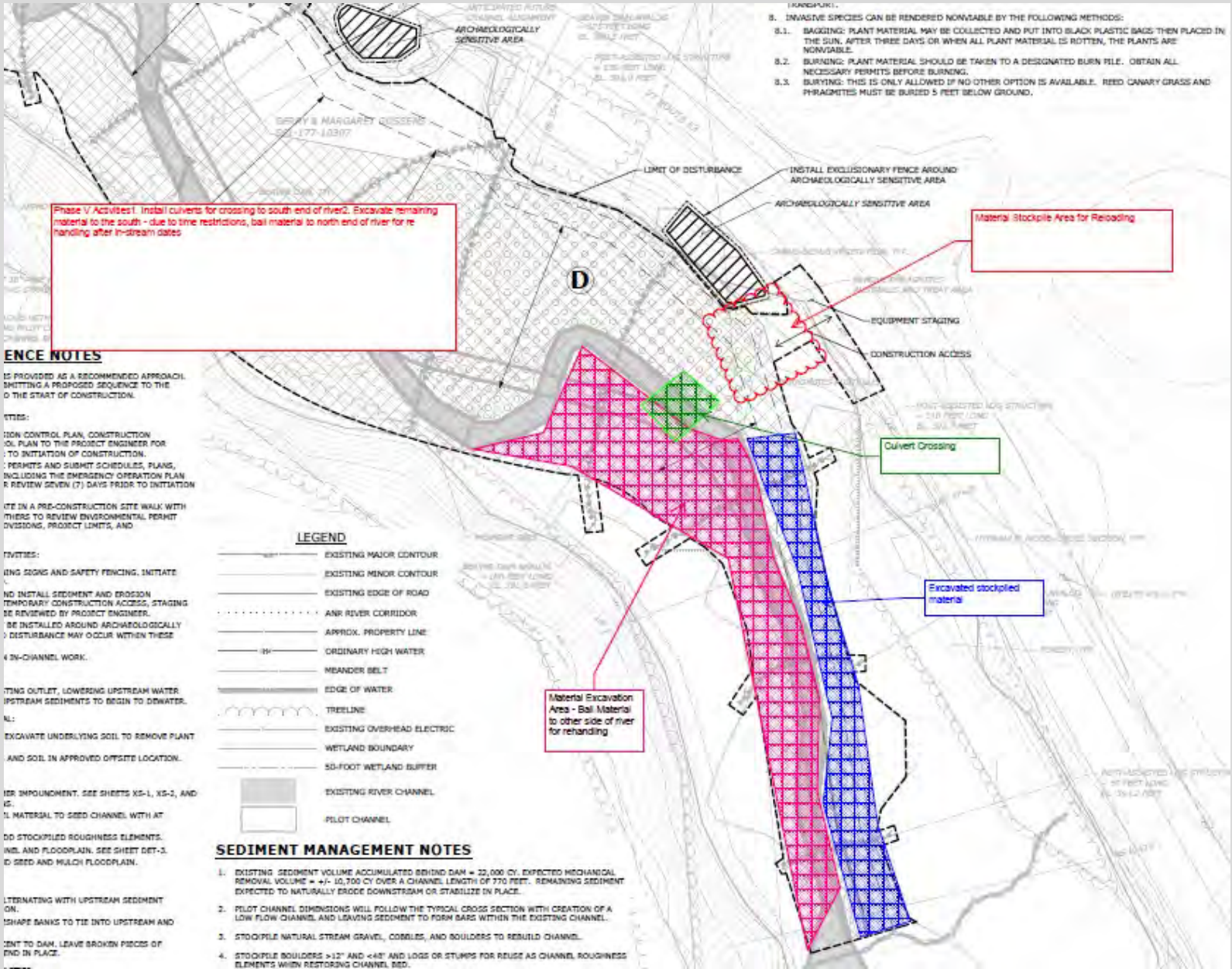
CONSTRUCTION SEQUENCE NOTES

THIS PROPOSED DAM REMOVAL SEQUENCE IS PROVIDED AS A RECOMMENDED APPROACH. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED SEQUENCE TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION.

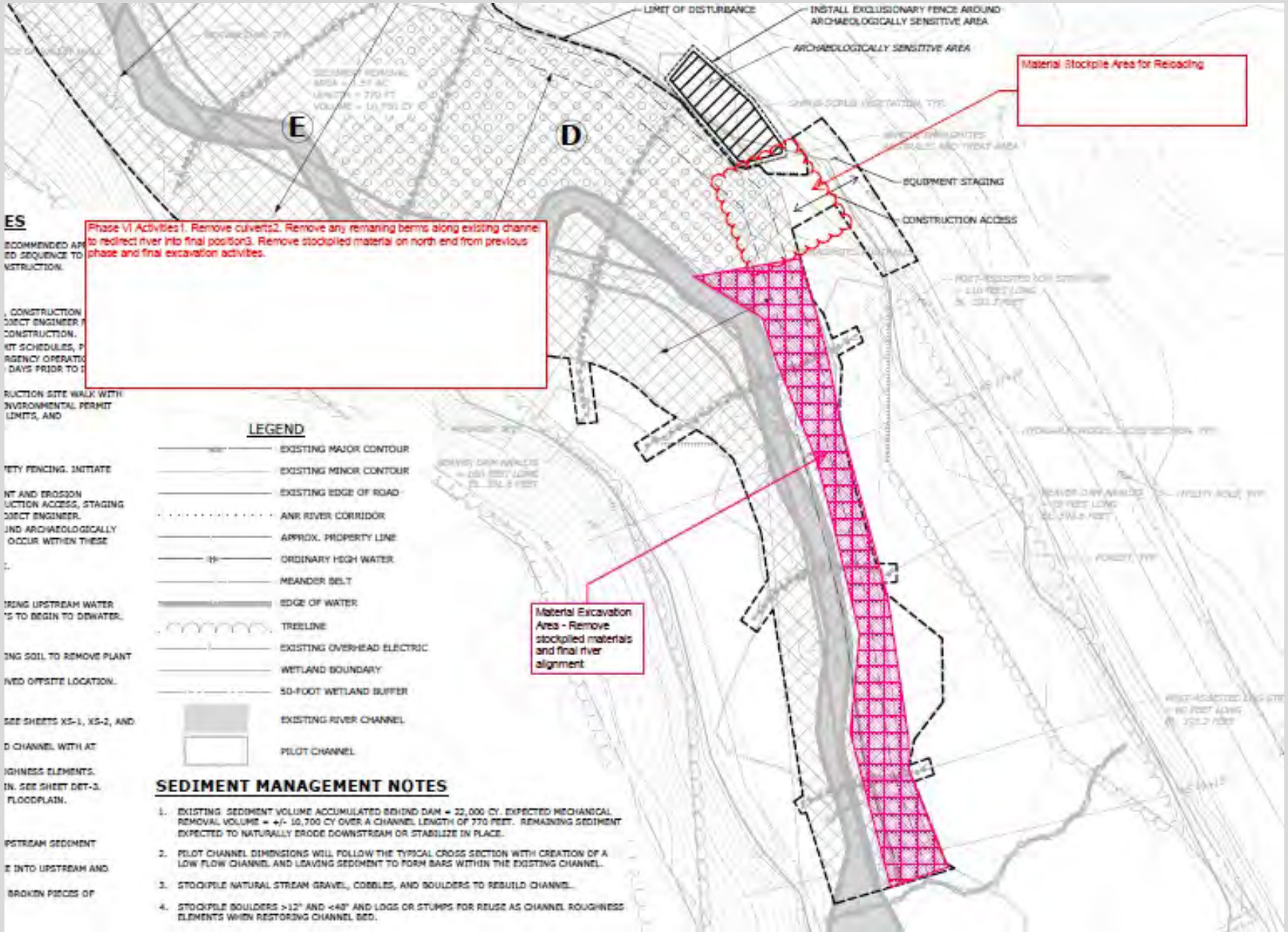
A STEP A: PRE-CONSTRUCTION ACTIVITIES:

1. SUBMIT A SEDIMENT AND EROSION CONTROL PLAN, CONSTRUCTION SEQUENCE, AND WATER CONTROL PLAN TO THE PROJECT ENGINEER FOR

PHASE V - Wainwright Mill Dam Removal



PHASE VI - Wainwright Mill Dam Removal

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Wainwright