



**Addendum 1:**

CDBG-DR WATERSHED RESILIENCE & NRCS EMERGENCY WATERSHED  
PROTECTION IMPLEMENTATION PROJECT:

COAL CREEK CANYON EWP PROJECTS

**DATE:**

January 3, 2017

**This addendum contains responses to questions raised during the pre-bid meeting on December 22, 2016 and subsequently via email. Also included is an updated bid form for unit prices and updates to the planset, technical specifications, and vegetation plans. Also attached are permit applications submitted by CCCWP for this project.**

# MEMO

TO: David Kamin, Coal Creek Canyon Watershed Partnerships (CCCWP)  
FROM: Chance Uhrich, Olsson Associates  
RE: EWP Coal Creek  
Response to Questions from Pre-Bid on December 22, 2016  
DATE: November 06, 2015

This memo is in response to questions from contractors at the pre-bid meeting on December 22, 2016, regarding the EWP Upper Coal Creek Improvements project. Numbered items are the original questions from Contractors. Items in bold are the responses to said questions.

1. "Will CCCWP withhold a retainage through the vegetation warranty period?"

**No, due to the narrow time windows for program funding. Retainage will be held until the end of the 220-day NRCS contract period.**

2. "What is the warranty period, including warranty for vegetation?"

**CCCWP requires a one-year warranty from the Contractor for construction work and vegetation. Bid items should include the cost of the material, the installation cost, and the warranty cost.**

3. "Does the ecologist directing revegetation efforts share liability for plant survival? If so, to what degree?"

**No, the EWP program ecologist does not share liability for plant survival.**

4. "Trees removed during the project; are they hauled off or left on site?"

**Depending on the location and property owner, trees may be left on site or may be required to be hauled off-site and disposed of by the Contractor. The Contractor should assume that all trees removed during construction, not designated for use in root wad construction, should be hauled off-site and legally disposed of.**

5. "The RFP states three growing seasons for weed maintenance. Does this mean three years, or spring/fall/spring?"

**This means three seasons (spring/fall/spring).**

6. "The RFP specifies an on-site engineer or geomorphologist. Will that be the responsibility of the Contractor?"

**CCCWP will contract with the design team to provide an Engineer/Geomorphologist.**

7. “How detailed is the as-built survey and drawings provided by the Contractor?”

**In regards to as-builts and record drawings, please see the EWP Project Engineering Guidance for the 2013 Colorado Flood Recovery Phase 2 on the Colorado EWP website:**

**<https://coloradoewp.com/document/emergency-watershed-protection-ewp-program-2013-colorado-flood-recovery-phase-2-project>**

**Record drawing and as-built requirements are in Appendix A3.**

**For these projects, anticipate the following as a minimum for as-built survey:**

- 1. Thalweg survey capturing overall stream profile and grade breaks for instream structures including riffles, cross vanes, step pools, etc.**
- 2. Detailed in-stream structure survey following rock crests or edges and/or select survey at structures showing conformance to plans or changes from plans.**
- 3. Cross section survey at minimum of 200 feet (or as specified by the engineer – to match hydraulic modeling used for floodplain development permit) spanning the entire regulatory floodplain. Cross sections shall capture all grade breaks along a section including thalweg, toe of slope on each bank, flood benches, and other significant geographic features.**
- 4. All as-built survey to be provided in AutoCAD format and also include a PDF version certified by a Professional Land Surveyor.**

**Contractors need to make themselves familiar with the requirements checklist in the EWP Engineering Guidance document as noted above. During bidding, they should note if additional cross sections, beyond the 200 foot spacing noted above will be required as part of the as-built survey, i.e. if project is 1000 feet long, are more than 5 cross sections required?**

8. “Can on-site materials be used?”

**On-site materials may be used if they are available, not designated or directed to remain by the Engineer, Geomorphologist, or property owner, and conform to the project plans and specifications. “Red” Soil is excluded from on-site use. “Red” Soil shall not be used on site.**

9. “Are there areas identified to for sediment removal disposal? Is the Contractor or CCWP responsible to identified disposal sites?”

**The Contractor is responsible to identify disposal sites.**

10. “What are working hours? Sun up to sundown?”

**Assume sun up to sundown. CCCWP will work with landowners and the Contractor to coordinate schedules.**

11. “Who is responsible for restoration of accesses? If a homeowner’s driveway is damaged, who is responsible?”

**The Contractor is responsible for restoration of access to pre-construction conditions or better.**

12. “Can a drone be used for the as-built survey?”

**The as-built survey must meet vertical and horizontal requirements of CDOT Standard Specifications for Road and Bridge Construction dated 2011, Section 625. In addition, as stated above in 7.B. the as-built survey must be stamped by a Professional Land Surveyor. The Contractor is responsible for using a survey method to meet all requirements.**

13. “Will an erosion control plan be provided by the Engineer?”

**No. The Contractor is responsible for developing and implementing erosion control.**

14. “Has access been set for each site?”

**No. Access to each location will be coordinated with CCCWP, property owners, Engineer and the Contractor.**

15. “Per our supplier some of the seed mix you are requesting may not be available at the time and in the quantities. Could you please confirm if these subs would be sufficient?”

Zone 3-the rate of 21.82 PLS pounds and with the subs of Blue verbena (*Verbena hastata*) for Harebell (*Campanula rotundifolia*), Showy goldeneye (*Heliomeris multiflora*) for licorice, Sulfur flower (*Eriogonum umbellatum*) for wild mint, and Rocky Mountain penstemon (*Penstemon strictus*) for Tall fringed bluebells, Mountain bluebells (*Mertensia ciliata*). Please note Wild bergamot (*Monarda fistulosa*) is subject to availability at the time of order.

Zone 4-the rate of 27.25 PLS pounds and with the sub of Blackeyed susan (*Rudbeckia hirta*) for Low fleabane, Maximilian sunflower (*Helianthus maximiliani*) for dwarf sunflower, Rocky Mountain penstemon (*Penstemon strictus*) for Missouri goldenrod, and Sulfur flower (*Eriogonum umbellatum*) for goldenbanner.”

**All of the original seed mixes for the EWP program have been reviewed and accepted by their respective counties and sponsors. At this point, no substitutions are allowed, but it is possible to move the percentages around for the available species rather than start introducing new species. Specifics or substitutions or reallocations will be coordinated between CCCWP, the Contractor, and the program ecologists.**

Thank you,

Chance Uhrich, PE  
Olsson Associates

# MEMO

TO: David Kamin, Coal Creek Canyon Watershed Partnerships (CCCWP)  
FROM: Chance Uhrich, Olsson Associates  
RE: EWP Coal Creek  
Response to Questions from Phillip Todd of Riverwork on December 27,  
2016  
DATE: December 30, 2016

This memo is in response to questions from Phillip Todd of Riverwork submitted via email on December 27, 2016, regarding the EWP Upper Coal Creek Improvements project. Numbered items are the original questions from Contractors. Items in bold are the responses to said questions.

1. "Is an extension of the RFP response day possible? With a response date of 1/9/2017, the hard copy would have to be hand delivered on 1/9/2017 or sent on 1/6/2017 for mail delivery."

**As stated at the pre-bid meeting, RFP responses in electronic form are due on 1/9/17 by 4pm MST. Hard copy responses are for CCCWP records and may follow in the mail after this date.**

2. "Would the CCCWP be willing to extend the submittal bid date by a couple of days? Many submitters on the RFP are likely on holiday the week of 12/26/2016 and return to work on 1/2/2017."

**Unfortunately, due to the timing constraints of this program, CCCWP is unable to extend the submittal date.**

3. "What are the drainage areas of the stream reaches at the start and end of construction for each reach?"

**Drainage areas of the stream reaches at the start and end of construction for each reach have not been individually delineated but peak flow values have been included in the technical specifications.**

4. "Please summarize the conversations has that CCCWP had with regulatory and resource agencies regarding dewatering during project construction?"

**CCCWP has not had any specific conversations regarding dewatering. Dewatering may or may not be necessary based on Contractor means and methods in order to meet the requirements of the project permits and properly install the in-stream structures.**

5. “Is dewatering of the work area necessary to install the in-stream structures?”

**The Contractor is required to meet the requirements of the stormwater discharge permit, or any other permits required to do the work, and the Contractor is required to install the structures in accordance with the plans and specifications. Dewatering may or may not be necessary based on Contractor means and methods in order to meet the requirements of the project permits and properly install the in-stream structures.**

6. “Are there any in-stream moratorium required in this stream?”

**There are no in-stream moratorium for this stream. See attached Biological Assessment prepared by William J. Miller dated October 3, 2016, included in Addendum 1.**

Thank you,

Chance Uhrich, PE  
Olsson Associates

# MEMO

TO: David Kamin, Coal Creek Canyon Watershed Partnerships (CCCWP)  
FROM: Chance Uhrich, Olsson Associates  
RE: EWP Coal Creek  
Response to Question from Kurt Marshall of ESCO Construction  
Company on December 29, 2016  
DATE: December 30, 2016

This memo is in response to a question from Kurt Marshall of ESCO Construction submitted via email on December 29, 2016, regarding the EWP Upper Coal Creek Improvements project. Numbered items are the original questions from Contractors. Items in bold are the responses to said questions.

1. "The Bid Form calls out for 24" & 36" Boulders with EA quantity. The plans nor the details indicate where the different sizes are to be place. How should we proceed?"

**In-stream boulder structures and boulder toe protection will use a mix of 24- and 36-inch boulders. Bid quantities assume that for all in-stream structures and boulder toe protections, the ratio will be 2:1 36-inch to 24-inch boulders.**

Thank you,

Chance Uhrich, PE  
Olsson Associates

# MEMO

TO: David Kamin, Coal Creek Canyon Watershed Partnerships (CCCWP)  
FROM: Chance Uhrich, Olsson Associates  
RE: EWP Coal Creek  
Response to Questions from Claude Murray of RMC Consultants, Inc. on  
December 29, 2016  
DATE: December 30, 2016

This memo is in response to questions from Claude Murray of RMC Consultants, Inc. submitted via email on December 29, 2016, regarding the EWP Upper Coal Creek Improvements project. Numbered items are the original questions from Contractors. Items in bold are the responses to said questions.

1. "Q: Will Co State Forest Service provide all required plants at no charge to the contractor?"

**No. The Colorado State Forest Service (CSFS) has project-specified plants at a negotiated rate with the EWP program. Contractors are not required to procure plants through the CSFS but are highly encouraged.**

2. "Q: What % of boulders will be expected to be imported from offsite verses salvaged from each onsite property?"

**Bid quantities assume that 100% of boulders will be imported. On-site boulders may be available for salvage and use, however, the amount is un-known. It is recommended that Contractors view each site to determine if on-site boulders are present and bid accordingly.**

Thank you,

Chance Uhrich, PE  
Olsson Associates



# MEMO

TO: David Kamin, Coal Creek Canyon Watershed Partnerships (CCCWP)  
FROM: Chance Uhrich, Olsson Associates  
RE: EWP Coal Creek  
Response to Questions from Doug Dowden of H2 Enterprises on  
December 30, 2016  
DATE: January 3, 2017

This memo is in response to questions from Doug Dowden of H2 Enterprises submitted via email on December 30, 2016, regarding the EWP Upper Coal Creek Improvements project. Numbered items are the original questions from Contractors. Items in bold are the responses to said questions.

1. “Based on the RFP, the Contractor is responsible for the Traffic Control Plan and Permit and the Storm Water Discharge Permit and Plan. The RFP also contained the Army Corps 404 Requirements page. It is our understanding the CCCWP is obtaining all additional permits. Can a list of these additional permits be provided as well copies of the permits? Can a copy of the Army Corps 404, in its entirety, be provided? Being able to review these permits and their requirements will assist in the response to this RFP.”

**CCCWP has applied for a 404 permit and grading and floodplain permits with Jefferson County. The 404 permit application is included in this addendum, along with the cover pages for the Jefferson County permits. Supporting documentation for the Jefferson County permits is similar to that in the 404 permit.**

2. “If we are using all in-house employees for the Project, with the exception of traffic control, which will be a woman-owned business in the project area; would this meet the HUD Section 3 requirements? No additional hiring would be needed.”

**HUD Section 3 guidance refers to hiring of employees specifically for this work once the contract has been awarded. Once a contractor has been selected, CCCWP and DOLA program staff will work with the Contractor to ensure that hiring activities are compliant with Section 3 requirements.**

3. “What are the insurance requirements for the private landowners in the Project?”

**The Contractor is required to carry adequate insurance as specified in the draft contract. Per section 39 of the draft contract in the RFP: All Insurance policies (except Workers’ Compensation and Professional Liability) shall include CCCWP, Affected Landowners, CCCWP and its officers, directors, agents and employees as additional insureds as their interests may appear. The additional insured endorsement should be at least as broad as ISO form CG2010 for General Liability coverage and similar forms for Commercial Auto and Umbrella Liability.**

4. “Could you provide the cut/fill volumes on Sheets 3, 4, 6, 9, 10, 11 and 12? The values are not legible on the provided drawings.”

**Revised sheets are included in Addendum 1.**

5. “Can you provide the seed mix for Zone 2 for bidding purposes?”

**Due to the seeding timing on this project, Zone 2 seed was removed from the project due to its potential of being washed out with spring runoff. Zone 2 seeding was mistakenly left on the bid form. Item 25, Seeding, Broadcast, Zone 2 shall be removed from contract. An updated bid form is included in Addendum 1.**

6. “Does the culvert need to be replaced at the “entrance” to the fill area on the west side of Hwy 72 shown on Sheet 11? In addition, is the fill just to be pushed under the outbuilding with the address of 25789? Given the apparent damage to the structure, any lifting could damage the structure further.”

**No, the culvert will not be replaced as part of this project. The EWP program does not allow the use of funds for structural improvements, which extends to culverts.**

**Fill under the outbuilding will occur to the maximum extent practicable while not damaging the structure further.**

7. “Can the “Red” Soil be used as fill for the Project, specifically the large area shown on Sheet 11?”

**No. The “Red” soil/sediment shall not be used as fill on the project. The “Red” Soil/Sediment shall be removed to the site and legally disposed of.**

8. “Which application rate should be used for Verdyol “Green”; 3,500 or 2,000 lbs per acre?”

**3,500 LBS/AC**

9. “Can water from Coal Creek be used to water the container plants over the 6 month maintenance period? Just to clarify, the revegetation memorandum recommends watering once a week for “the first 3 years between early May and the first frost”. The maintenance program is only for the 6 months following planting or the first frost and not 3 years?”

**The Contractor shall import water for the container plant maintenance watering unless the Contractor can demonstrate that use of in-stream water does not injure the water rights of downstream users.**

**In accordance with Revision of Section 214 – Landscape Maintenance; *Watering in Non-irrigated Areas*– D-60 shrubs planted in Zone 4 shall be watered by the Contractor three times per week for the first three weeks after installation and once per week, after the first three weeks, until the first frost or end of the 220-day**

**contract period, whichever occurs first. A revision of Revision of Section 214 is included in Bid Addendum 1. Bid Addendum 1 also includes a revision to the Revegetation and Biostabilization Recommendations for Upper Coal Creek Restoration by Great Ecology.**

10. "Where are the 24 trees to be removed specified on the bid sheet?"

**With the exception of the trees shown on Sheet 4, upstream of the culvert, all tree removals will be determined in the field by the on-site Geomorphologist or Engineer. The quantity of trees removed is an estimate on the bid form and may or may not match the quantity removed in the field.**

Thank you,

Chance Uhrich, PE  
Olsson Associates

## Coal Creek EWP Pre-Bid Meeting- 12/22/16

### -Project scope and location

The overall project is comprised of three project reaches located along approximately 1.25-miles of Coal Creek Canyon in Jefferson County, Colorado. The sites are referred to as Area Start, Area 2, and Area 3.

### -Funding sources and requirements

- a. CCCWP has been awarded grant funding from the NRCS, with match funding from the Colorado Water Conservation Board (CWCB) and a Community Development Block Grant - Disaster Recovery (CDBG-DR) Watershed Resilience Pilot Program. The total funding available for this project is \$1,254,511. These programs are working in Colorado to help communities recover from damage sustained in the federally-declared flood event of 2013. Project implementation grants are meant to address long-term catalytic watershed system improvements that build resilience in watersheds.
- b. EWP & CDBG-DR goals/requirements – protect life and property, adding resiliency to reduce hazards and increase stream health because this is the best way to protect life and property
- c. Inflexibility of Federal funding – our hands are going to be tied on many issues/details
- d. Davis Bacon/Section 3 requirements

### -RFP process

**Proposals must be received no later than: 1/9/17 at or before 4:00 p.m. MST.**

One proposal shall be submitted in hard copy format and also via email as a PDF document.

Pay attention to required exhibits and forms

### -Project partners

The proposal price provided in the RFP will not be used as the final price. Instead, it is the intention of this process to bring the contractor on-board as part of a collaborative project partners team consisting of the CCCWP, the engineer, and the contractor. In the first 30 days or less, the contractor will operate under a contract to perform permitting tasks and to provide value engineering and support to the design team. This work will be paid using an hourly billing rate. The contractor and engineer will work together to clarify design details, design intent, discuss materials, and value engineer the project. Once a final plan set and quantities are developed, the contractor, using the **original unit costs** provided in the contractor's initial proposal, will prepare a final proposal to be used for the project change order covering the physical construction of the project. If, during the project partners process, further clarification of the design allows or necessitates that the contractor revise a unit price for the project the finalized unit costs may not exceed 10% above the original proposed unit costs. Unit costs will not be changed due to adjustments in quantities. This project partners' process to finalize the design and proposal will not exceed 30 days.

### -Anticipated permits

404 and Jeffco Grading and Floodplain permits applied for by CCCWP

Will need support for Jeffco permit (erosion control plan and traffic control plan)

Contractor responsible for: construction surveying, utility location and coordination, traffic control plans, stormwater discharge permit



## Sign in Sheet: Pre-Proposal Meeting for Coal Creek EWP, 12/22/16

Organization	Name(s) of Representatives	Contact email
ENERGES ENVIRONMENTAL	BEN MORGAN	BMORGAN@ENERGESENVIRONMENTAL.COM BROE@ENERGESENVIRONMENTAL.COM
DIETZLER CONSTRUCTION	JEFF PELSHE 720-428-9702 TERRY TILKES	estimating@dietzlerconstruction.com
ESCO CONSTRUCTION	JEFF LONG	jlong@escmailbox.com 303-653-8239
Earthworks Inc	Dan Hrusmanky	d.hrusmanky@ycbw.com 307-690-0958
Triton Environmental	Adam Beppe	adam@tritonenviro.com 720.545.4647
<del>BROCK FALK</del> HABITAT CONSTRUCTION HABITAT MANAGEMENT	BROCK FALK	bfalk@habitat-const.com
L4 Environmental	Brandon Lewis	blewis@L4Environments/
LT Environmental	Kyle Schildt	kschildt@ltenv.com
Arrow Civil, LLC	Stephen Harrington	SHARRINGTON@ARROWCIVIL.COM TBORKE@ARROWCIVIL.COM

Organization	Name(s) of Representatives	Contact email
American Civil Contractors	Travis Madsen	tmadsen@accbuild.com 303 419-2147
Peter Smith Smith Environmental + Engineering	Peter Smith	petersmith@smithdelivers.com 720-887-4928
RMC Consultants Inc.	Claude Murray	cmurray@rmc-consultants.com 3-980-4101
Lawrence Construction	MIKE Rachubinski	M.Rachubinski@ Lawrence-Construction.com 303-791-5642



## Sign in Sheet: Pre-Proposal Meeting for Coal Creek EWP, 12/22/16

Organization	Name(s) of Representatives	Contact email
RME	CODY COWAN	CODY.COWAN@RMECINC.COM
AMERICAN WEST CONST.	JACOB SPRIGGS	JSPRIGGS@AMWESTCON.COM
<del>NEZTUM</del> NEZTUM CONSTRUCTION	JUDSON KIRP	JUDSONKIRP@STUDIO7NEZTUM.COM
Frontier Environment	Nick Ochs	prent@frontierenvironmental.net
Ralph L. Wadsworth <del>Adams</del>	Lee Adams	Ladams@WadSCO.com
McCollum's Excavating	Brady Kutscher	bmccollumex@gmail.com
WESTERN STATES RECLAMATION	TYLER AMEN	tamen@wsreclamation.com
H2 Enterprises	T.J. Ivie Doug Dowden	tjivie@h-2e.com ddowden@h-2e.com

**Bid Form**  
**Tuesday, January 03, 2017**

**EWP**  
**Upper Coal Creek - Preliminary Design: Olsson Project No. 016-1310**  
**Area Start, Area 2, and Area 3**

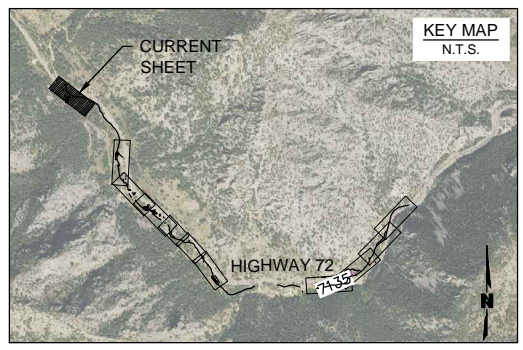
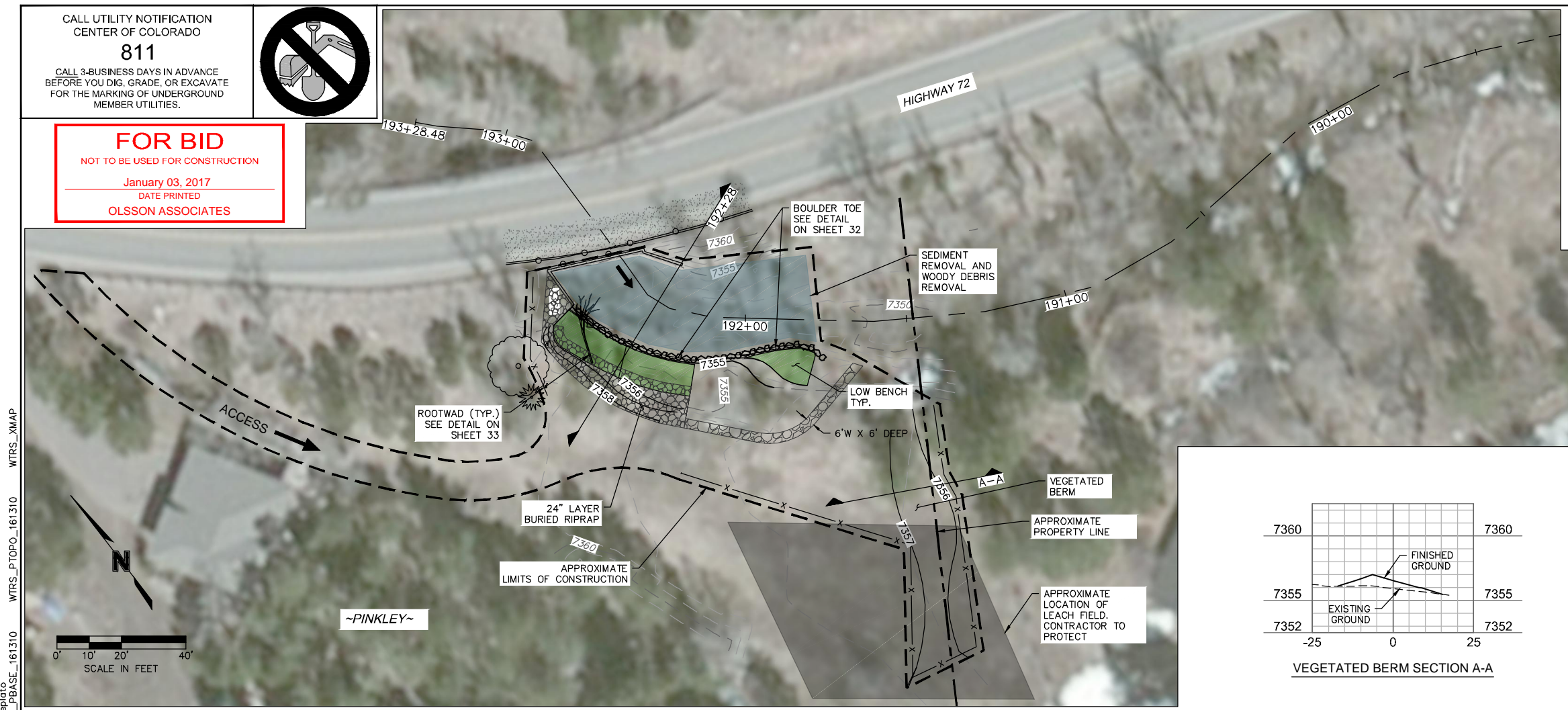
Item No.	Item Description	Unit	Quantity	Unit Cost	Item Cost
1	Mobilization	LS	1		
2	Construction Surveying	LS	1		
3	Dewatering Operations	LS	1		
4	Construction Zone Traffic Control	LS	1		
5	Erosion Control	LS	1		
6	Clearing and Grubbing	AC	2.9		
7	Temporary Construction Fence	LF	2,050		
8	Remove Tree	EA	24		
9	Rock Check Dam	EA	3		
10	Feature Boulder	EA	24		
11	Boulder Wall, 36-Inch, Double Stacked	LF	133		
12	Boulder, Toe, 24-Inch	EA	244		
13	Boulder, Toe, 36-inch	EA	408		
14	Boulder, Drop Structure, 24-Inch	EA	60		
15	Boulder, Drop Structure, 36-Inch	EA	134		
16	Willow Toe, Biolog	LF	635		
17	Willow Live Stakes	EA	1,076		
18	Rootwad	EA	5		
19	Unclassified Excavation, "Red" Sediment Removal	CY	2,576		
20	Unclassified Excavation, Complete in Place	CY	600		
21	Unclassified Excavation with Export of Excess Material	CY	845		
22	Riprap, D50 12-Inch, Void Filled	CY	1,064		
23	Removal of Debris	LOAD	21		
24	Soil Retention Covering, Erosion Control Fabric, Koirmat 700	SY	9,122		
25	Seeding, Broadcast, Zone 3	SF	15,948		
26	Seeding, Broadcast, Zone 4	SF	96,052		
27	Seeding, Broadcast, Zone 5	SF	1,336		
28	Nebraska Sedge, Carex nebrascensis, 10-Cubic Inch	EA	83		
29	Creeping Spikerush, Eleocharis palustris, 10-Cubic Inch	EA	73		
30	Mountain Rush, Juncus arcticus ssp. Littoralis, 10-Cubic Inch	EA	73		
31	Three-Stamened Rush, Juncus ensifolius, 10-Cubic Inch	EA	31		
32	Panicled Bulrush, Scirpus microcarpus, 10-Cubic Inch	EA	31		
33	Narrowleaf Willow, Salix bebbiana, 48-Inch Cutting	EA	31		
34	Drummond's Willow, Salix drummondiana, 48-Inch Cutting	EA	53		
35	Narrowleaf Willow, Salix exigua, 48-Inch Cutting	EA	64		
36	Bluestem Willow, Salix irrorata, 48-Inch Cutting	EA	31		
37	Strapleaf Willow, Salix ligulifolia, 48-Inch Cutting	EA	40		
38	Whiplash Willow, Salix lucida ssp. Caudata, 48-Inch Cutting	EA	31		
39	Rocky Mountain Willow, Salix monticola, 48-Inch Cutting	EA	34		
40	Narrowleaf Cottonwood, Populus angustifolia, 60-Inch Cutting	EA	89		
41	Thinleaf Alder, Alnus incana ssp. Tenuifolia, D-60	EA	38		
42	Leadplant, Amorpha fruticosa, D-60	EA	76		
43	Western River Birch, Betula occidentalis, D-60	EA	31		
44	Mountain Mahogany, Cercocarpus montanus, D-60	EA	42		
45	Redosier Dogwood, Cornus sericea, D-60	EA	18		
46	Rocky Mountain Juniper, Juniperus scopulorum, D-60	EA	37		
47	American Plum, Prunus americanum, D-60	EA	108		
48	Chokecherry, Prunus virginiana ssp. Melanocarpa, D-60	EA	149		
49	Threelobed Sumac, Rhus trilobata, D-60	EA	113		
50	Golden Currant, Ribes aureum, D-60	EA	97		
51	Wood's Rose, Rosa woodsii, D-60	EA	78		
52	Western Snowberry, Symphoricarpos occidentalis, D-60	EA	108		
53	Mulching (Woodstraw)	AC	2.8		
54	Soil Amendments	AC	2.9		
55	Landscape Maintenance	LS	1		
<b>Total Cost:</b>					



CALL UTILITY NOTIFICATION  
CENTER OF COLORADO  
**811**  
CALL 3-BUSINESS DAYS IN ADVANCE  
BEFORE YOU DIG, GRADE, OR EXCAVATE  
FOR THE MARKING OF UNDERGROUND  
MEMBER UTILITIES.

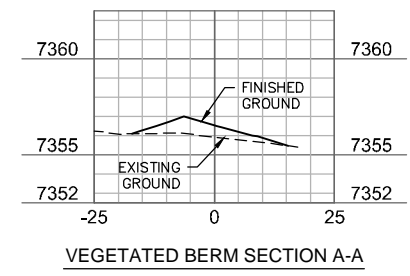


**FOR BID**  
NOT TO BE USED FOR CONSTRUCTION  
January 03, 2017  
DATE PRINTED  
**OLSSON ASSOCIATES**



**LEGEND**

- LIMITS OF CONSTRUCTION
- BURIED SOIL RIPRAP
- BURIED RIPRAP CHECK STRUCTURE
- BOULDER TOE
- "RED" SOIL
- WILLOW TOE
- ROOTWAD
- BOULDER GRADE CONTROL STRUCTURE
- LOW BENCH
- OVERFLOW
- SEDIMENT OR WOODY DEBRIS REMOVAL
- FEATURE BOULDER
- DIRECTION OF FLOW
- CONSTRUCTION FENCE

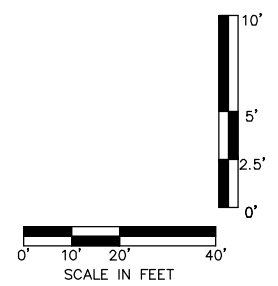
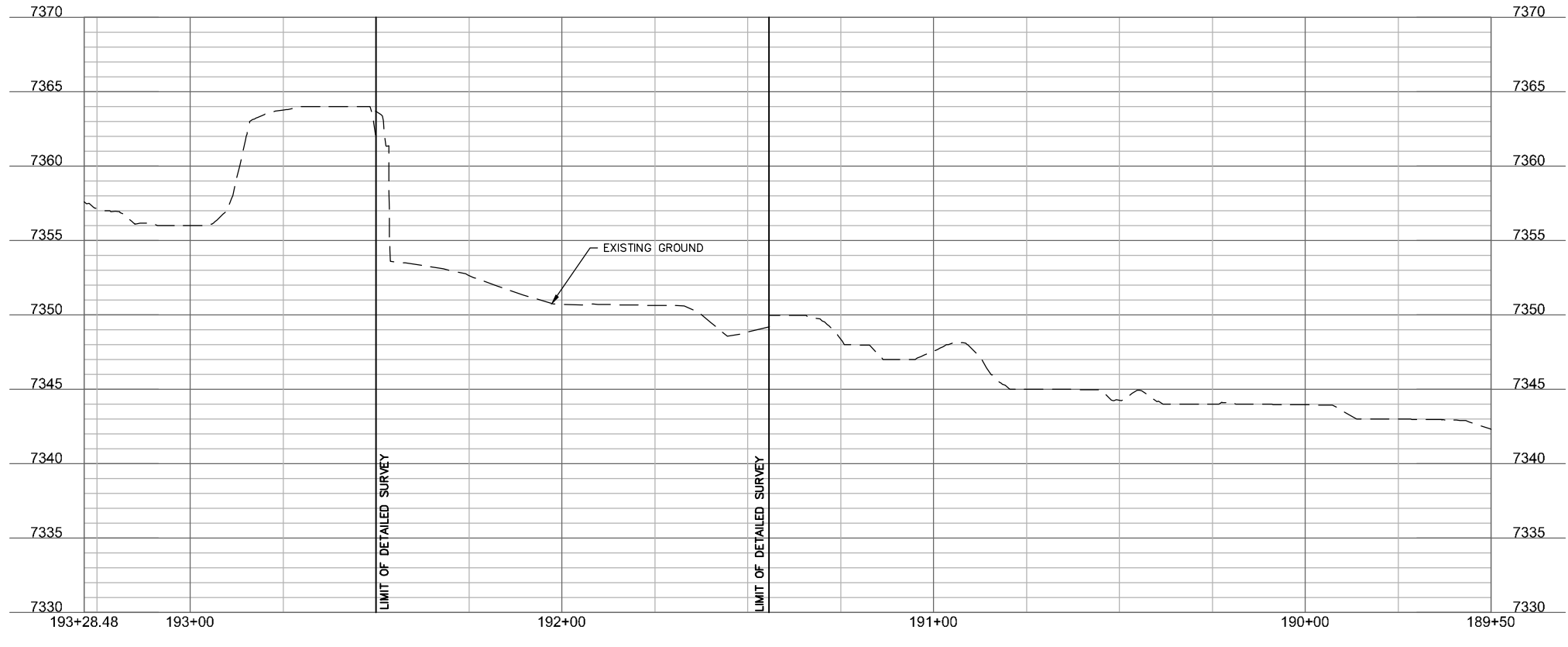


- NOTES:**
- ALL AREAS OF DISTURBANCE SHALL BE RE-VEGETATED.
  - ALL DISTURBED SLOPES INCLUDING LOW BENCH SHALL HAVE EROSION CONTROL FABRIC INSTALLED. FOR CLARITY, EROSION CONTROL BLANKET IS NOT SHOWN.
  - TREES NOT SHOWN FOR CLARITY. ALL TREES TO BE PROTECTED THROUGHOUT CONSTRUCTION UNLESS CALLED OUT FOR REMOVAL.
  - CONSTRUCTION FENCE IS SHOWN OFFSET FOR CLARITY.
  - ALL WORK SHALL BE DONE UNDER THE SUPERVISION OF A COLORADO PROFESSIONAL ENGINEER OR GEOMORPHOLOGIST.
  - RIPRAP SHALL BE VOID FILLED 12" D<sub>90</sub> PER NOTES ON SHEET 27.
  - AREAS OF "RED" SOIL REMOVAL SHALL BE GRADED AT A 2 PERCENT SLOPE TOWARD THE CHANNEL. INSTALL EROSION CONTROL BLANKET AND VEGETATE THE DISTURBED AREA.

**VOLUME TABLE**

CUT	15.29 CY
FILL	64.97 CY
<b>NET</b>	<b>49.68 CY &lt;FILL&gt;</b>

NOTE: QUANTITIES IN TABLE DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.



**OLSSON ASSOCIATES**  
TEL: 303.237.2072 FAX: 303.237.2659 www.olssonassociates.com  
4680 Table Mountain Drive, Suite 200 Golden, CO 80403

REV. NO.	DATE	DESCRIPTION

AREA 3 - PLAN AND PROFILE FINAL SUBMITTAL  
EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM COAL CREEK IMPROVEMENTS  
JEFFERSON COUNTY, COLORADO

drawn by: CE checked by: WS  
approved by: DR  
QA/QC by: DO  
project no.: 016-1310  
drawing no.: 2016.12.09  
date: 2016.12.09

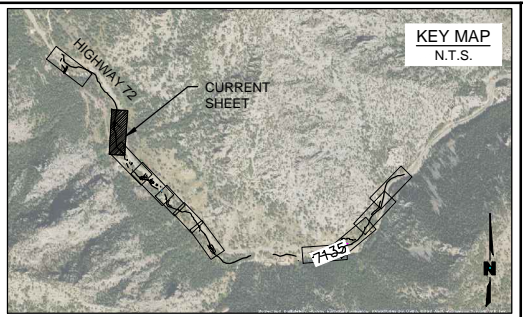
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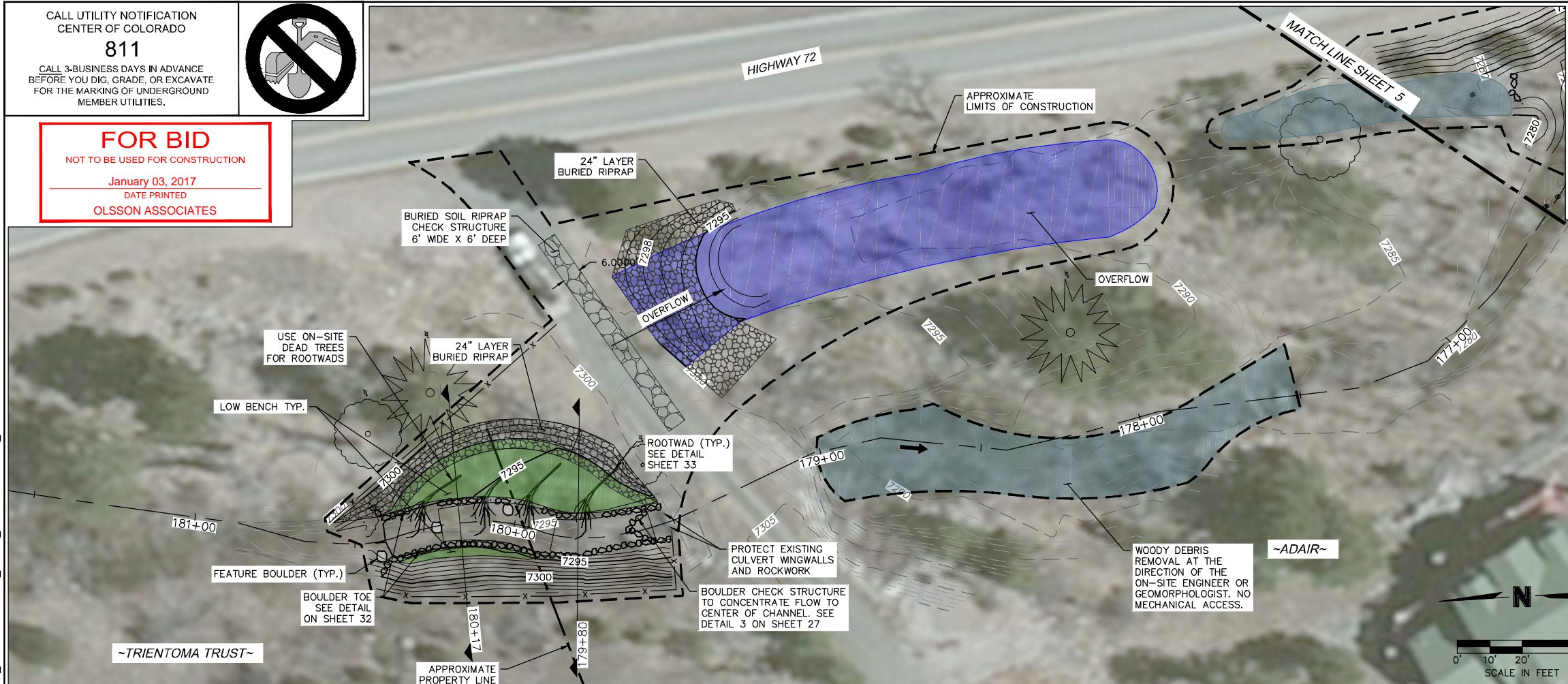
CALL UTILITY NOTIFICATION  
CENTER OF COLORADO  
**811**  
CALL 3-BUSINESS DAYS IN ADVANCE  
BEFORE YOU DIG, GRADE, OR EXCAVATE  
FOR THE MARKING OF UNDERGROUND  
MEMBER UTILITIES.



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NOT TO BE USED FOR CONSTRUCTION  
January 03, 2017  
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TEL 303.237.2072  
FAX 303.237.2659  
www.olssonassociates.com

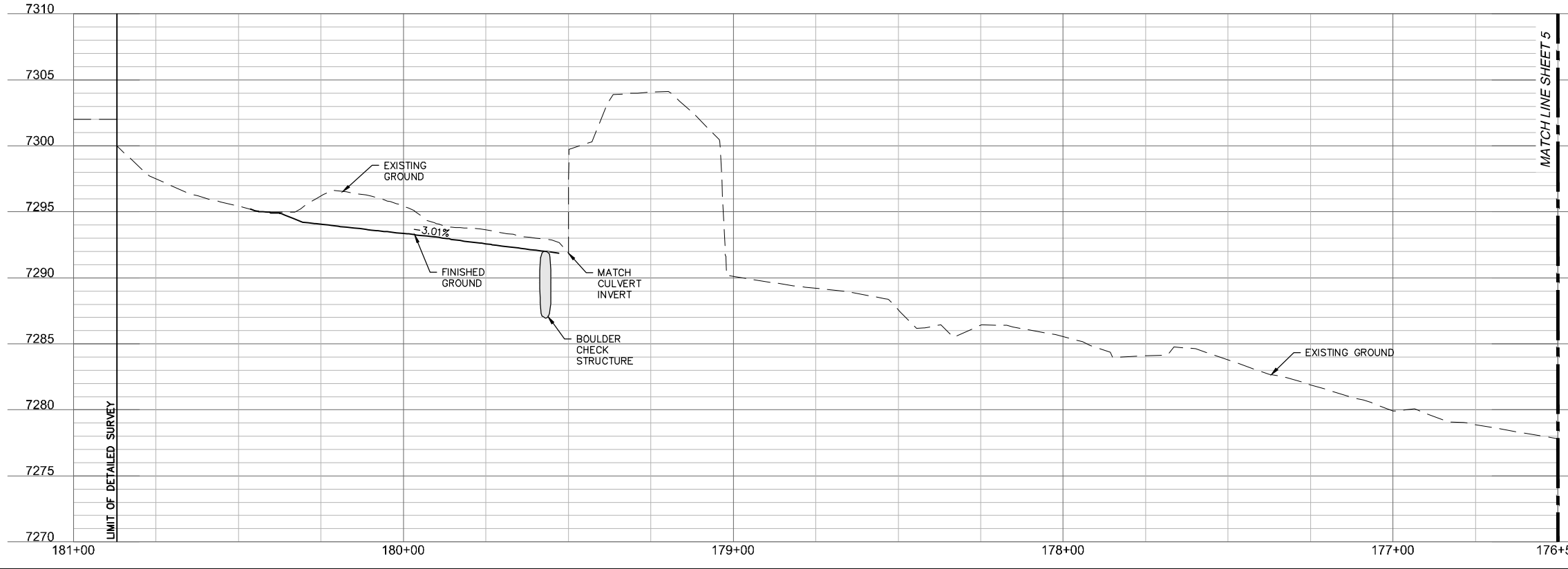


- LEGEND**
- LIMITS OF CONSTRUCTION
  - BURIED SOIL RIPRAP
  - BURIED RIPRAP CHECK STRUCTURE
  - BOULDER TOE
  - "RED" SOIL
  - WILLOW TOE
  - ROOTWAD
  - BOULDER GRADE CONTROL STRUCTURE
  - LOW BENCH
  - OVERFLOW
  - SEDIMENT OR WOODY DEBRIS REMOVAL
  - FEATURE BOULDER
  - DIRECTION OF FLOW
  - CONSTRUCTION FENCE

- NOTES:**
1. ALL AREAS OF DISTURBANCE SHALL BE RE-VEGETATED.
  2. ALL DISTURBED SLOPES INCLUDING LOW BENCH SHALL HAVE EROSION CONTROL FABRIC INSTALLED. FOR CLARITY, EROSION CONTROL BLANKET IS NOT SHOWN.
  3. TREES NOT SHOWN FOR CLARITY. ALL TREES TO BE PROTECTED THROUGHOUT CONSTRUCTION UNLESS CALLED OUT FOR REMOVAL.
  4. CONSTRUCTION FENCE IS SHOWN OFFSET FOR CLARITY.
  5. ALL WORK SHALL BE DONE UNDER THE SUPERVISION OF A COLORADO PROFESSIONAL ENGINEER OR GEOMORPHOLOGIST.
  6. RIPRAP SHALL BE VOID FILLED 12" D<sub>50</sub> PER NOTES ON SHEET 27.
  7. AREAS OF "RED" SOIL REMOVAL SHALL BE GRADED AT A 2 PERCENT SLOPE TOWARD THE CHANNEL. INSTALL EROSION CONTROL BLANKET AND VEGETATE THE DISTURBED AREA.

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REV. NO.	DATE	REVISIONS DESCRIPTION



**VOLUME TABLE**

TRIENTOMA TRUST	
CUT	268.47 CY
FILL	29.16 CY
NET	239.3 CY <CUT>

**VOLUME TABLE**

ADAIR	
CUT	0.65 CY
FILL	43.25 CY
NET	42.6 CY <FILL>

NOTE: QUANTITIES IN TABLES DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.

**AREA 2 - PLAN AND PROFILE FINAL SUBMITTAL**

**EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM COAL CREEK IMPROVEMENTS**

JEFFERSON COUNTY, COLORADO

2016

drawn by: CU  
checked by: WS  
approved by: DK  
QA/QC by: DB  
project no.: 016-1310  
drawing no.:  
date: 2016.12.09

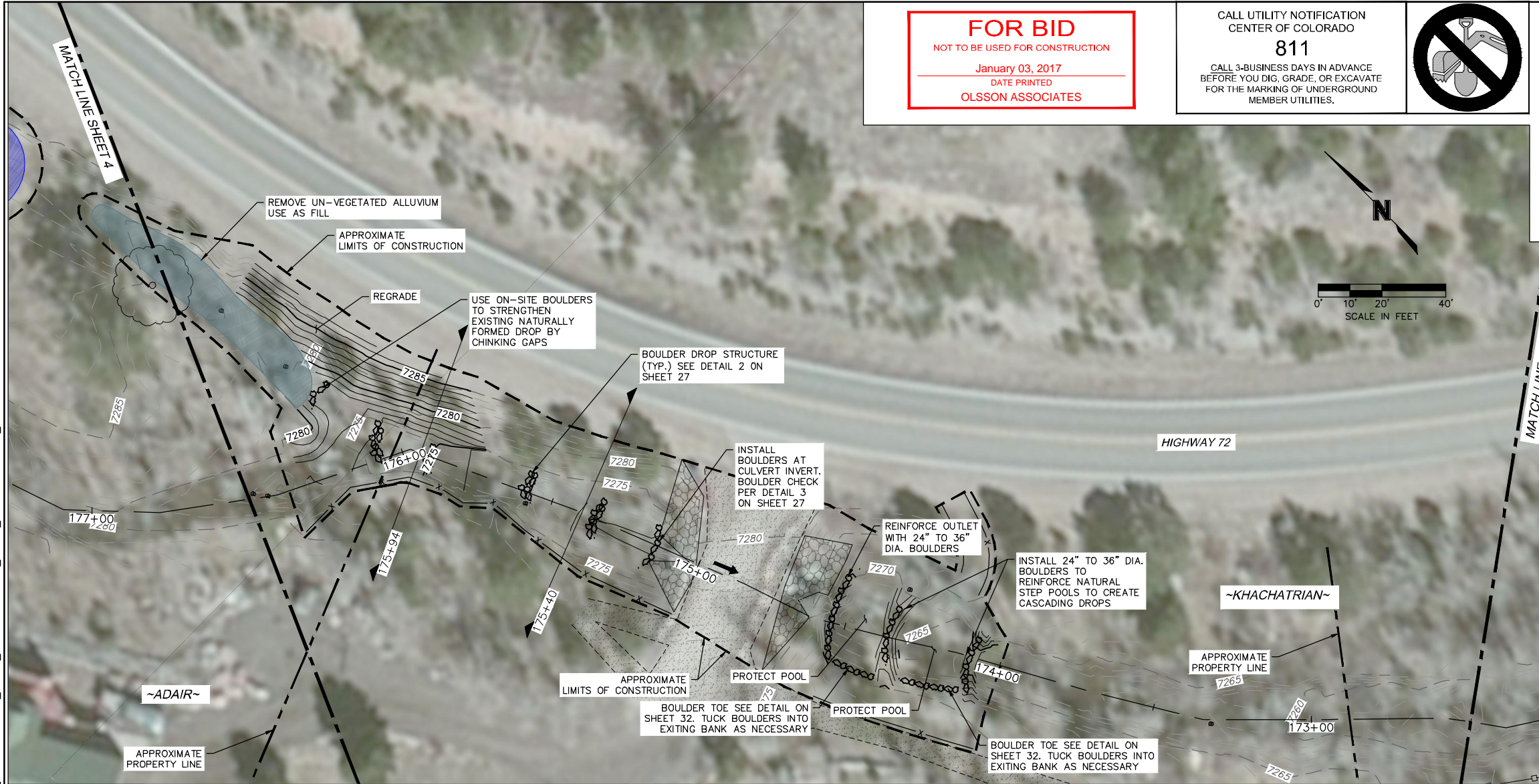
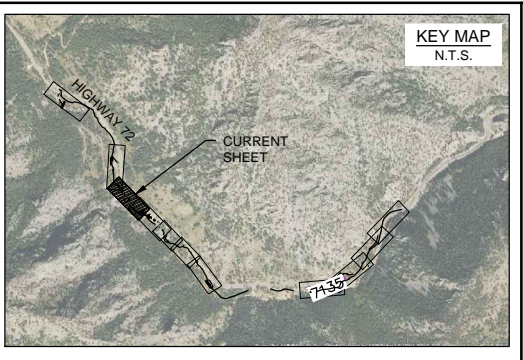
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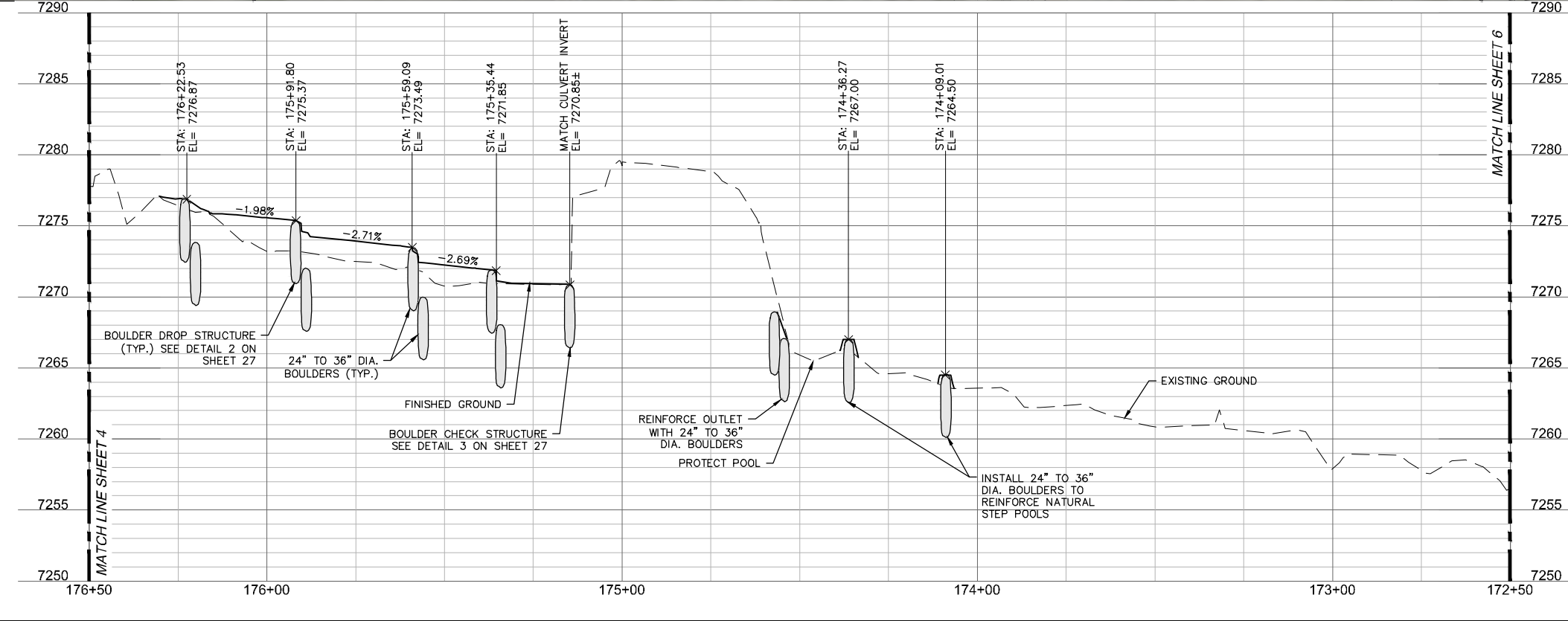


**LEGEND**

	LIMITS OF CONSTRUCTION
	BURIED SOIL RIPRAP
	BURIED RIPRAP CHECK STRUCTURE
	BOULDER TOE
	"RED" SOIL
	WILLOW TOE
	ROOTWAD
	BOULDER GRADE CONTROL STRUCTURE
	LOW BENCH
	OVERFLOW
	SEDIMENT OR WOODY DEBRIS REMOVAL
	FEATURE BOULDER
	DIRECTION OF FLOW
	CONSTRUCTION FENCE

**NOTES:**

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**VOLUME TABLE**

ADAIR AND KHACHATRIAN	
CUT	12.48 CY
FILL	47.43 CY
NET	34.95 CY <FILL>

NOTE: QUANTITIES IN TABLE DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.

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REV. NO.	DATE	REVISIONS DESCRIPTION

AREA 2 - PLAN AND PROFILE  
 FINAL SUBMITTAL

EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM  
 COAL CREEK IMPROVEMENTS

JEFFERSON COUNTY, COLORADO

2016

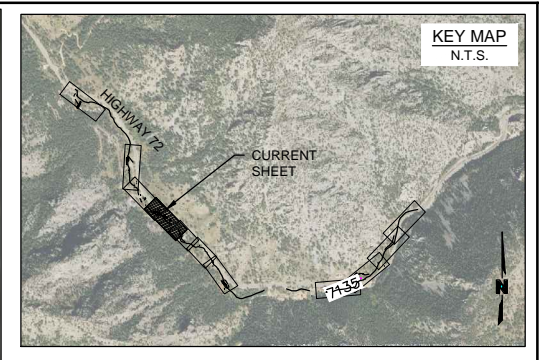
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 approved by: DK  
 QA/QC by: DB  
 project no.: 016-1310  
 drawing no.:  
 date: 2016.12.09

**SHEET**  
 5 of 33

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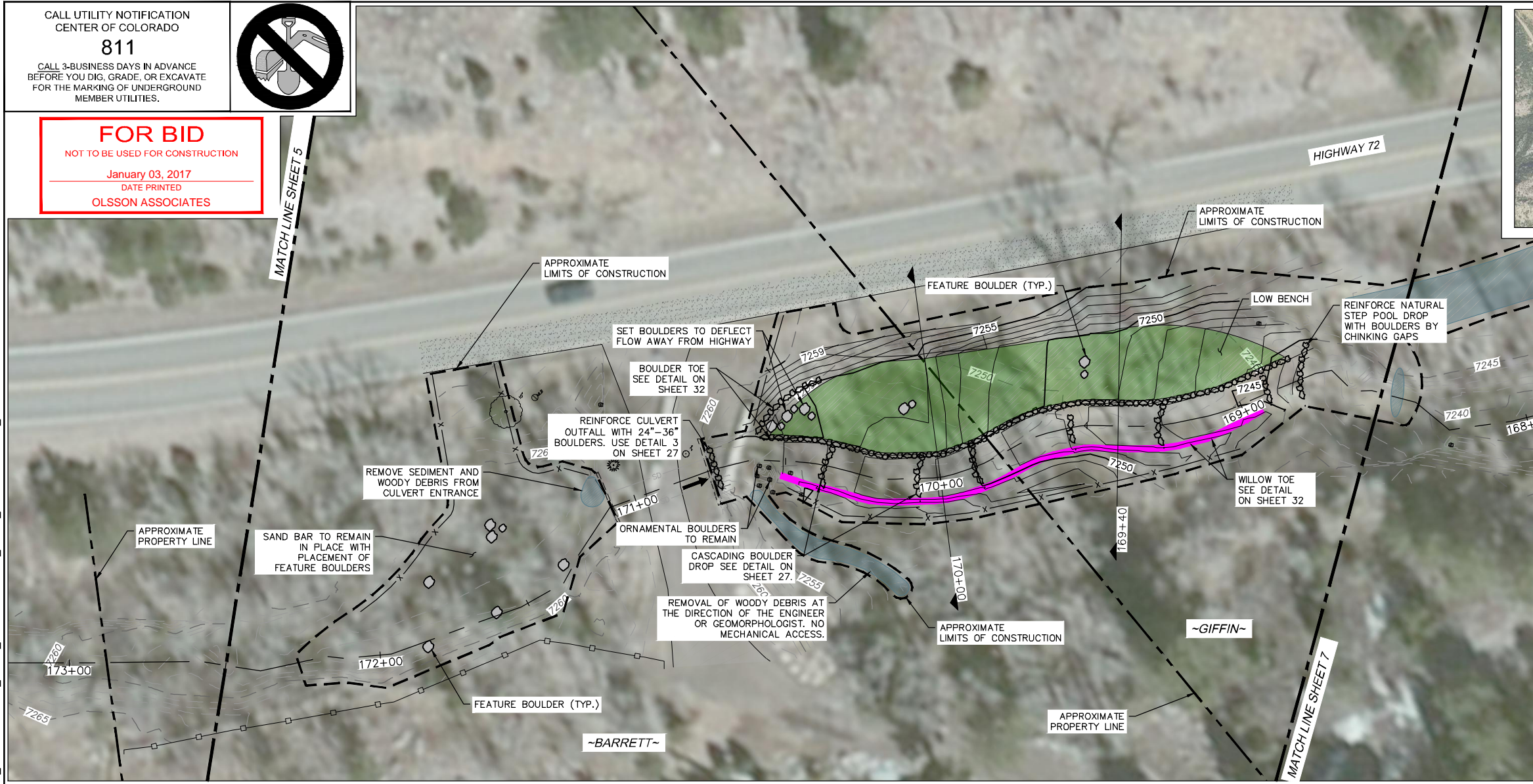


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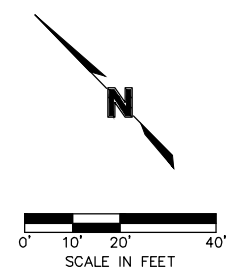
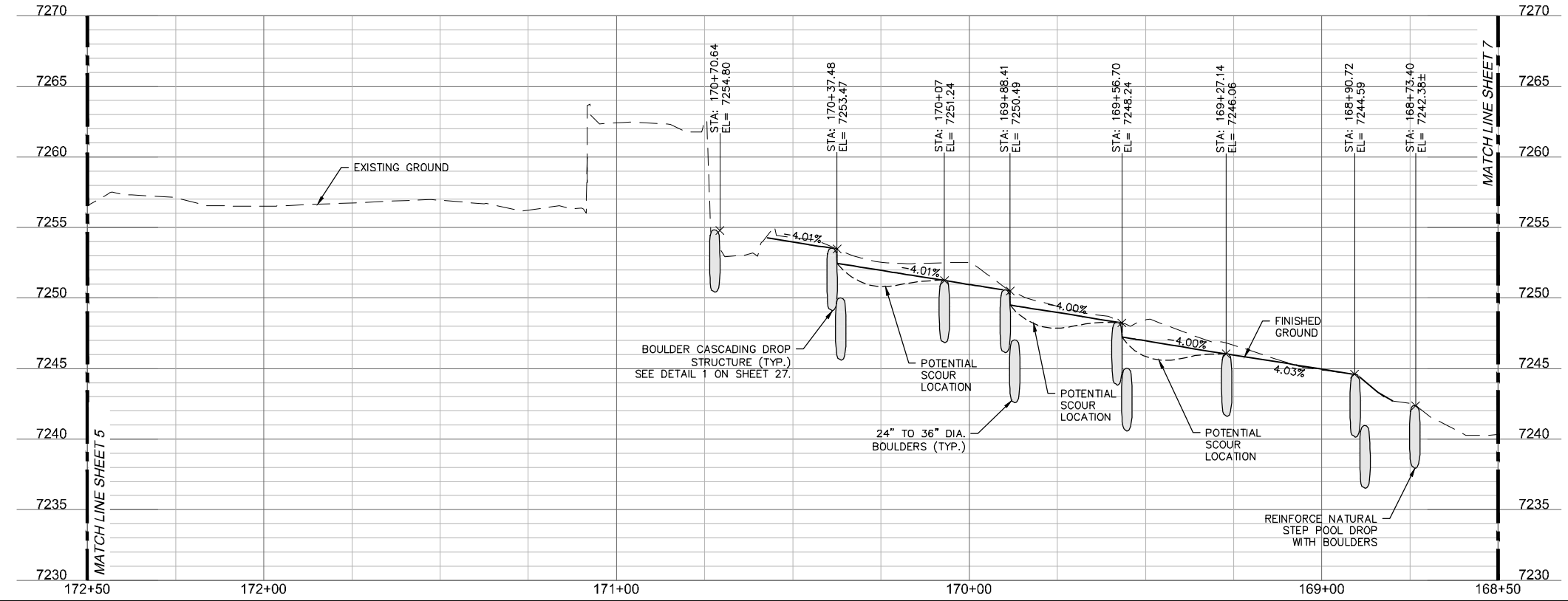


**LEGEND**

- LIMITS OF CONSTRUCTION
- BURIED SOIL RIPRAP
- BURIED RIPRAP CHECK STRUCTURE
- BOULDER TOE
- "RED" SOIL
- WILLOW TOE
- ROOTWAD
- BOULDER GRADE CONTROL STRUCTURE
- LOW BENCH
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- FEATURE BOULDER
- DIRECTION OF FLOW
- CONSTRUCTION FENCE

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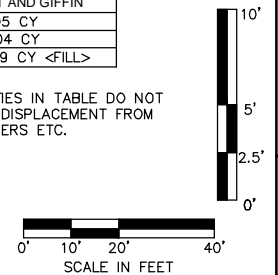
REV. NO.	DATE	REVISIONS DESCRIPTION



**VOLUME TABLE**

BARRETT AND GIFFIN	
CUT	127.05 CY
FILL	245.04 CY
NET	117.99 CY <FILL>

NOTE: QUANTITIES IN TABLE DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.



AREA 2 - PLAN AND PROFILE  
FINAL SUBMITTAL

EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM  
COAL CREEK IMPROVEMENTS

JEFFERSON COUNTY, COLORADO

2016

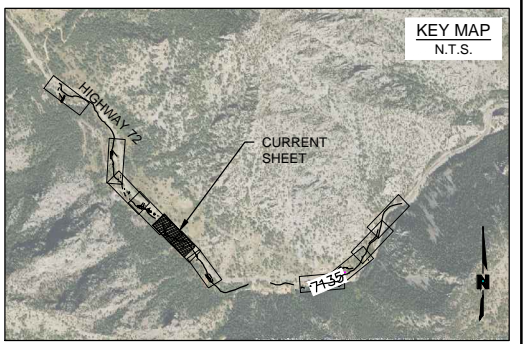
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checked by: WS  
approved by: DK  
QA/QC by: DB  
project no.: 016-1310  
drawing no.:  
date: 2016.12.09

**SHEET**  
6 of 33

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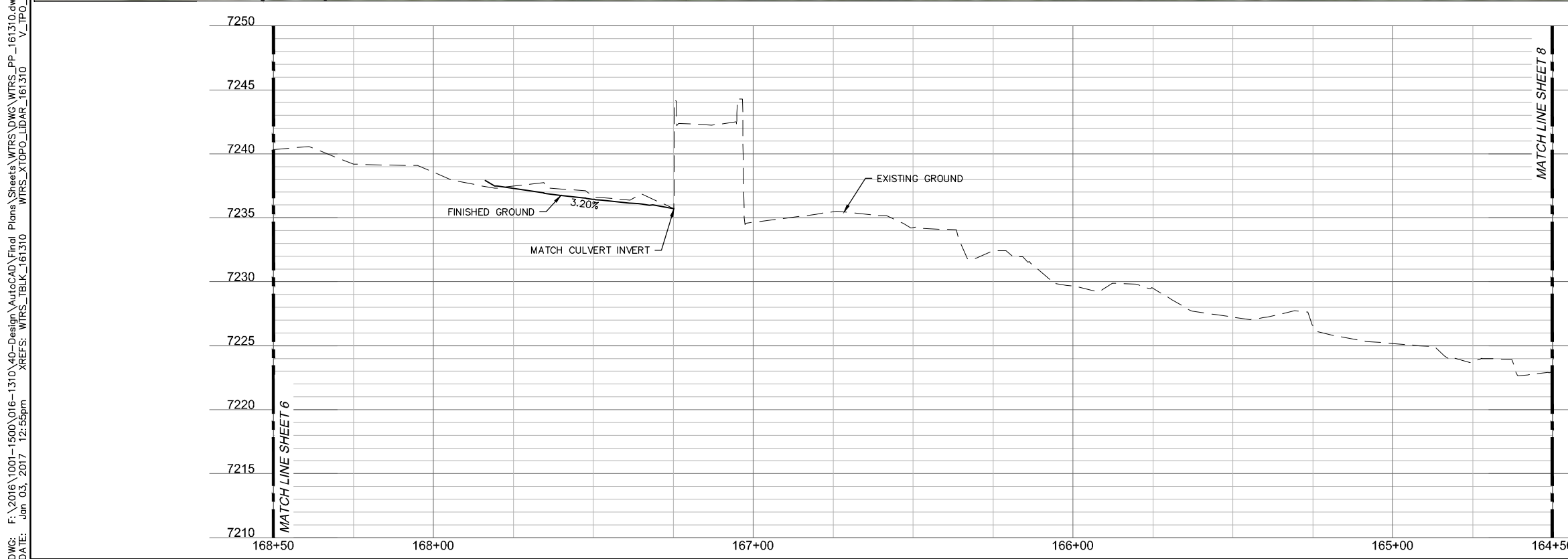


**LEGEND**

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- BURIED RIPRAP CHECK STRUCTURE
- BOULDER TOE
- "RED" SOIL
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**VOLUME TABLE**

GIFFIN	
CUT	15.53 CY
FILL	0.15 CY
NET	15.38 CY <CUT>

NOTE: QUANTITIES IN TABLE DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.

REV. NO.	DATE	REVISIONS DESCRIPTION

AREA 2 - PLAN AND PROFILE  
FINAL SUBMITTAL

EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM  
COAL CREEK IMPROVEMENTS

JEFFERSON COUNTY, COLORADO

2016

drawn by: CU  
checked by: WS  
approved by: DK  
QA/QC by: DB  
project no.: 016-1310  
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date: 2016.12.09

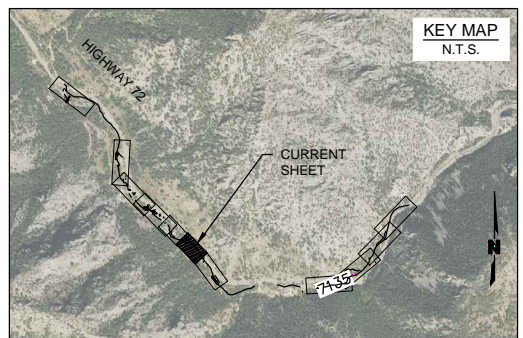
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7 of 33

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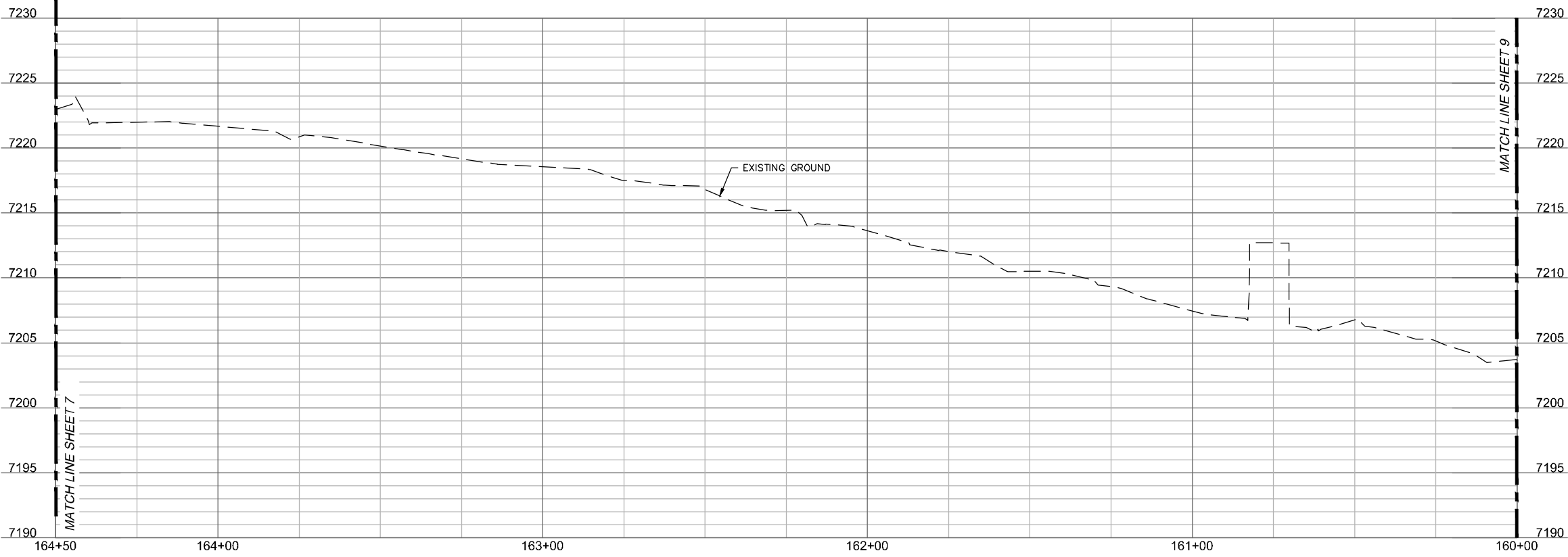
- LEGEND**
- LIMITS OF CONSTRUCTION
  - BURIED SOIL RIPRAP
  - BURIED RIPRAP CHECK STRUCTURE
  - BOULDER TOE
  - "RED" SOIL
  - WILLOW TOE
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 USER: ndeplato



**AREA 2 - PLAN AND PROFILE**  
**FINAL SUBMITTAL**  
**EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM**  
**COAL CREEK IMPROVEMENTS**  
 JEFFERSON COUNTY, COLORADO  
 2016

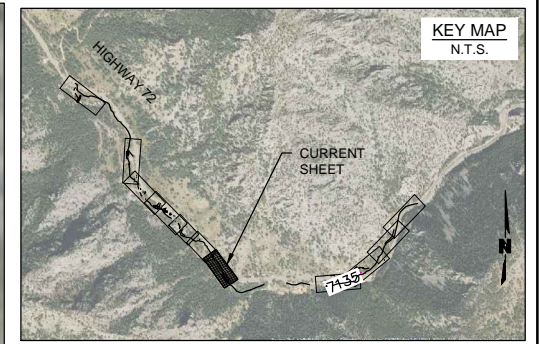
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 checked by:            WS  
 approved by:            DR  
 QA/QC by:            DB  
 project no.:            016-1310  
 drawing no.:            .  
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**SHEET**  
8 of 33

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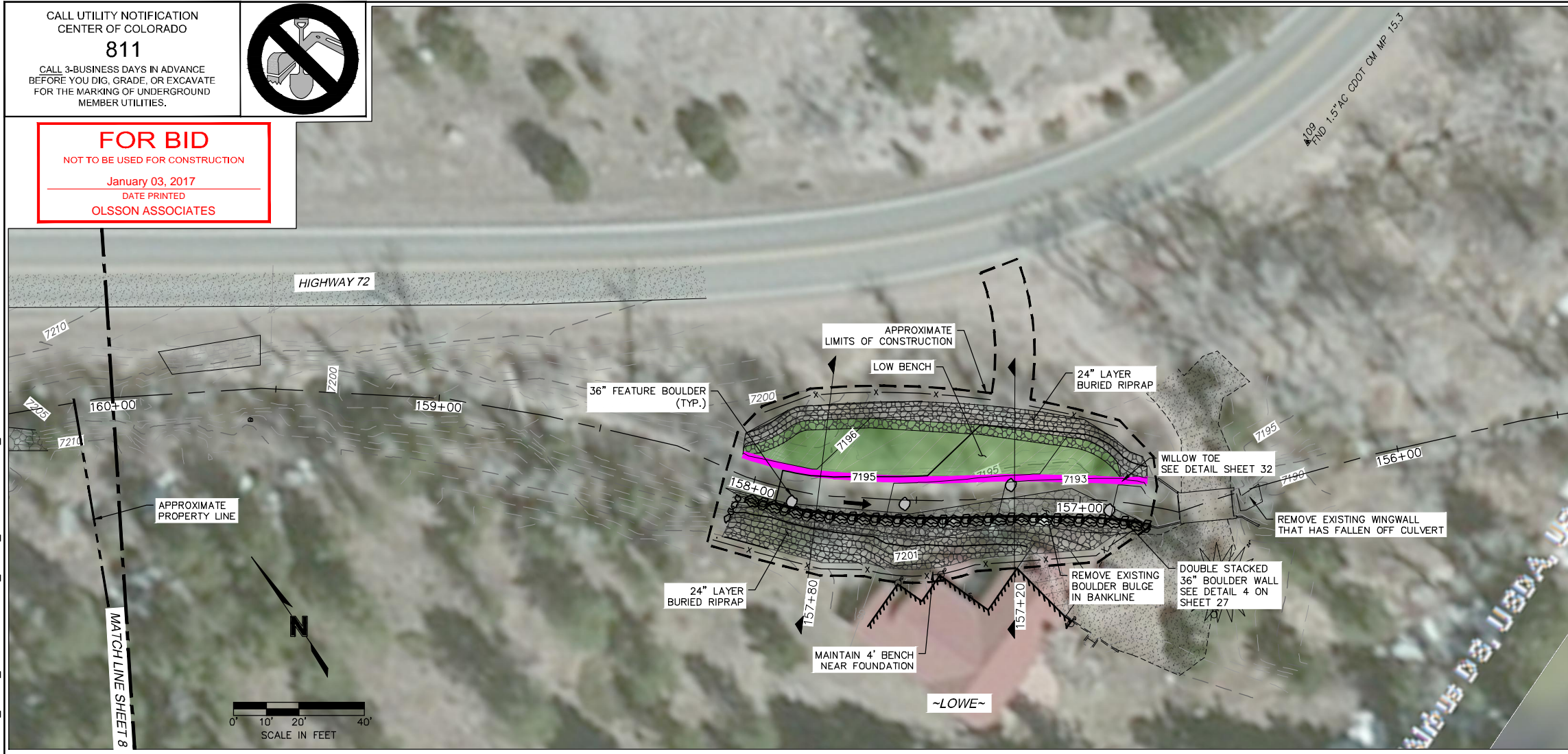


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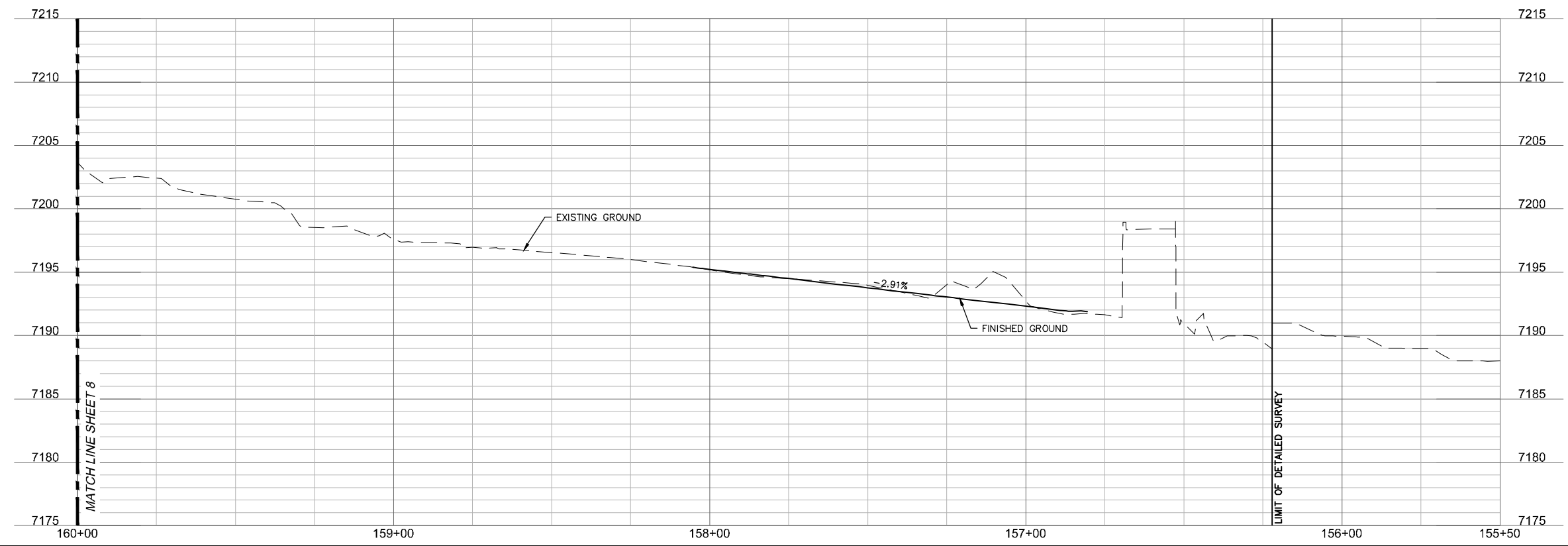


**LEGEND**

- LIMITS OF CONSTRUCTION
- BURIED SOIL RIPRAP
- BURIED RIPRAP CHECK STRUCTURE
- BOULDER TOE
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REV. NO.	DATE	REVISIONS DESCRIPTION



**VOLUME TABLE**

LOWE	
CUT	233.25 CY
FILL	22.66 CY
NET	210.59 CY <CUT>

NOTE: QUANTITIES IN TABLE DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.

AREA 2 - PLAN AND PROFILE  
FINAL SUBMITTAL

EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM  
COAL CREEK IMPROVEMENTS

JEFFERSON COUNTY, COLORADO

2016

drawn by:                       
checked by:                       
approved by:                       
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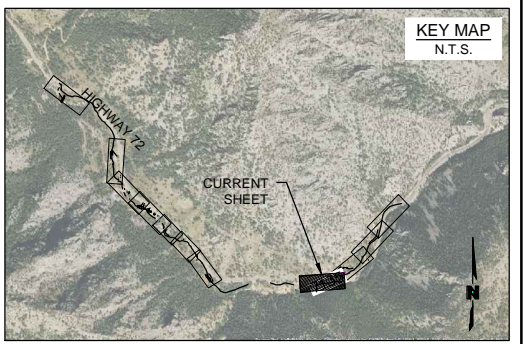
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**FOR BID**  
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January 03, 2017  
DATE PRINTED  
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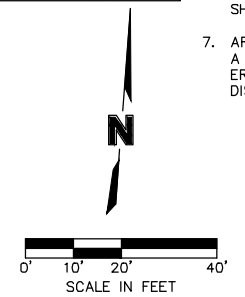
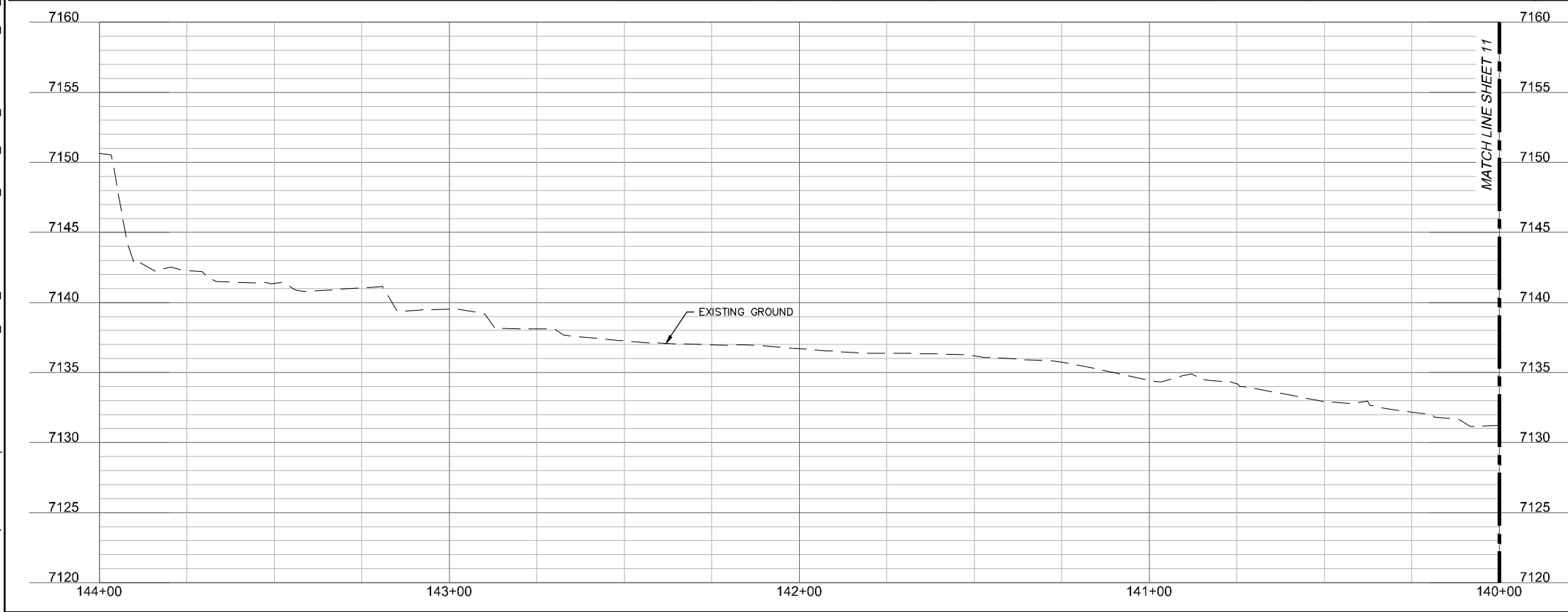


- LEGEND**
- LIMITS OF CONSTRUCTION
  - BURIED SOIL RIPRAP
  - BURIED RIPRAP CHECK STRUCTURE
  - BOULDER TOE
  - "RED" SOIL
  - WILLOW TOE
  - ROOTWAD
  - BOULDER GRADE CONTROL STRUCTURE
  - LOW BENCH
  - OVERFLOW
  - SEDIMENT OR WOODY DEBRIS REMOVAL
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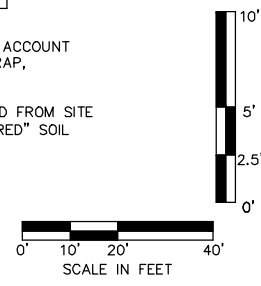
**VOLUME TABLE**

RUNE	
CUT	78 CY
FILL	14 CY
NET	64 CY <CUT>

**VOLUME TABLE**

RED SOIL REMOVAL	
CUT	1481.22 CY
FILL	1.77 CY
NET	1479.44 CY <CUT>

- NOTES:**
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  - "RED" SOIL SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. "RED" SOIL SHALL NOT BE USED ON-SITE.



AREA START - PLAN AND PROFILE  
FINAL SUBMITTAL

EMERGENCY WATERSHED PROTECTION (EWP) PROGRAM  
COAL CREEK IMPROVEMENTS

JEFFERSON COUNTY, COLORADO

2016

drawn by:                       
checked by:                       
approved by:                       
QA/QC by:                       
project no.: 016-1310  
drawing no.:                       
date: 2016.12.09

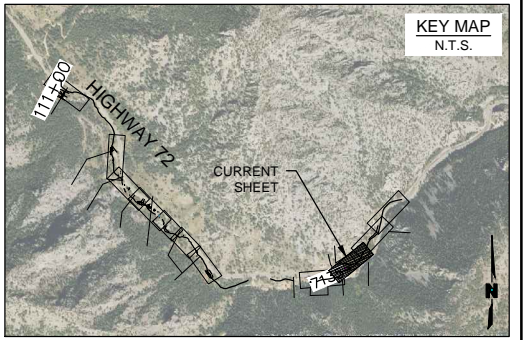
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10 of 33

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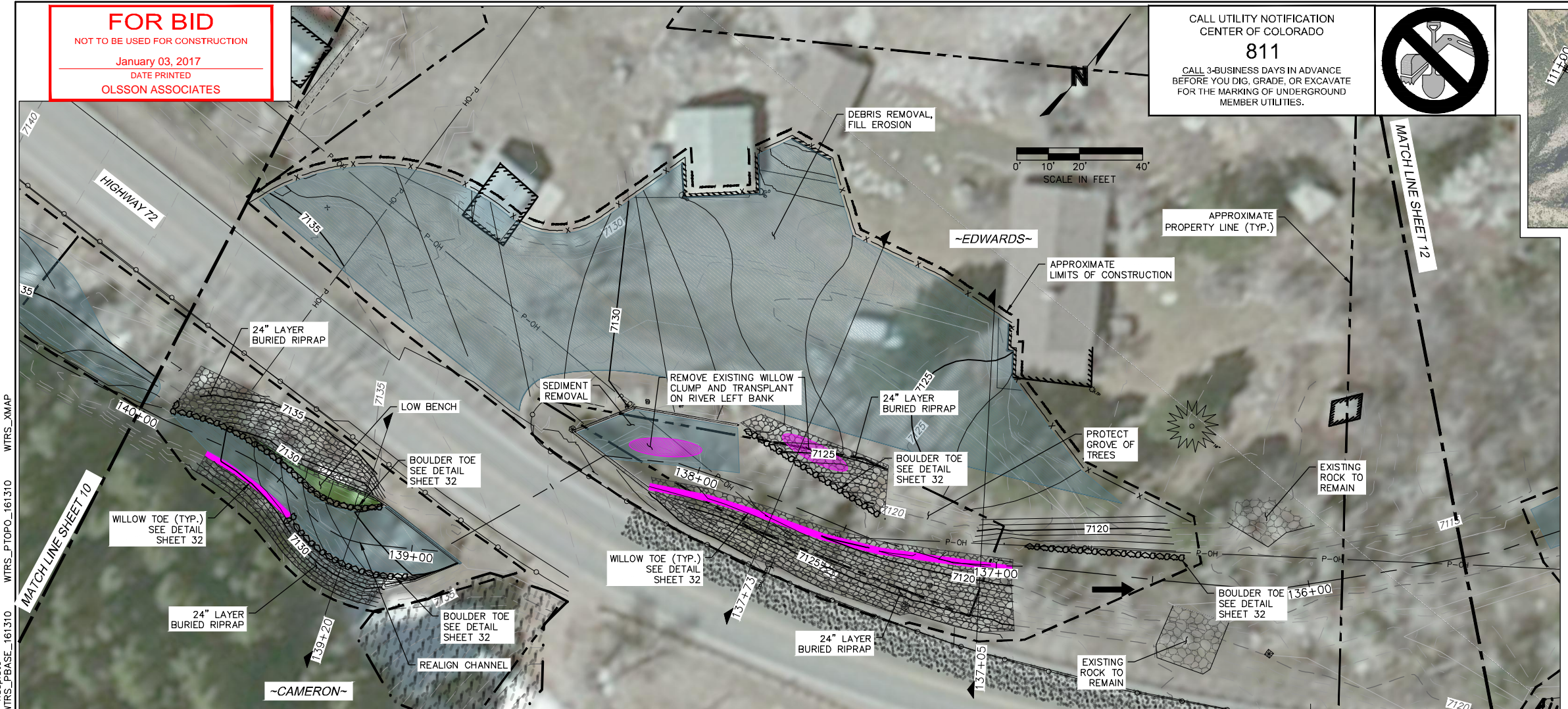
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**LEGEND**

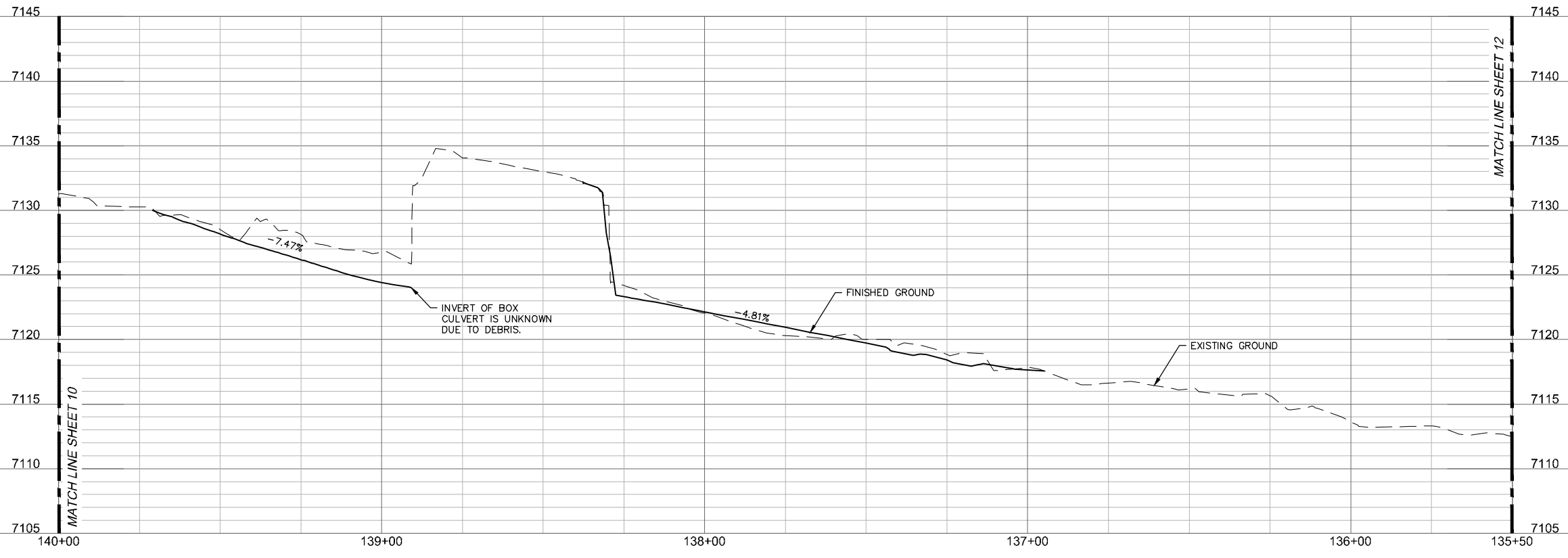
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drawn by: CU	checked by: WS	approved by: DK	QA/QC by: DB
project no.: 016-1310	drawing no.:	date: 2016.12.09	



**VOLUME TABLE**

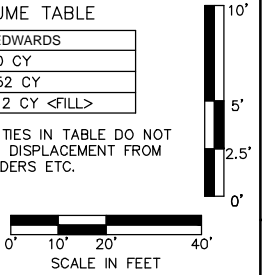
CAMERON	
CUT	753.50 CY
FILL	6.55 CY
NET	146.95 CY <CUT>

**VOLUME TABLE**

EDWARDS	
CUT	88.40 CY
FILL	786.52 CY
NET	698.12 CY <FILL>

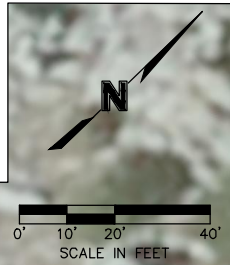
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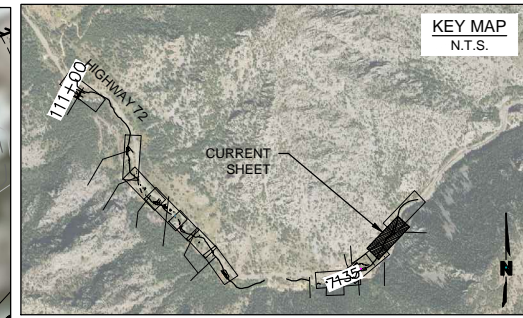


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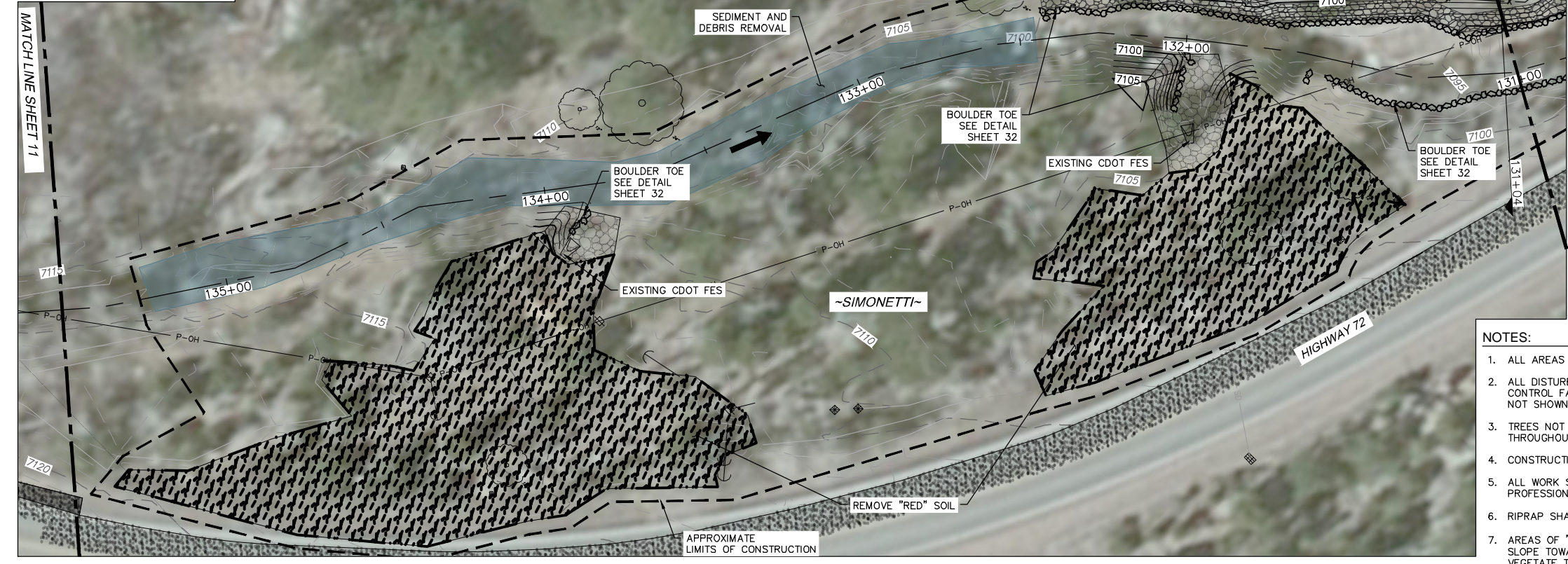
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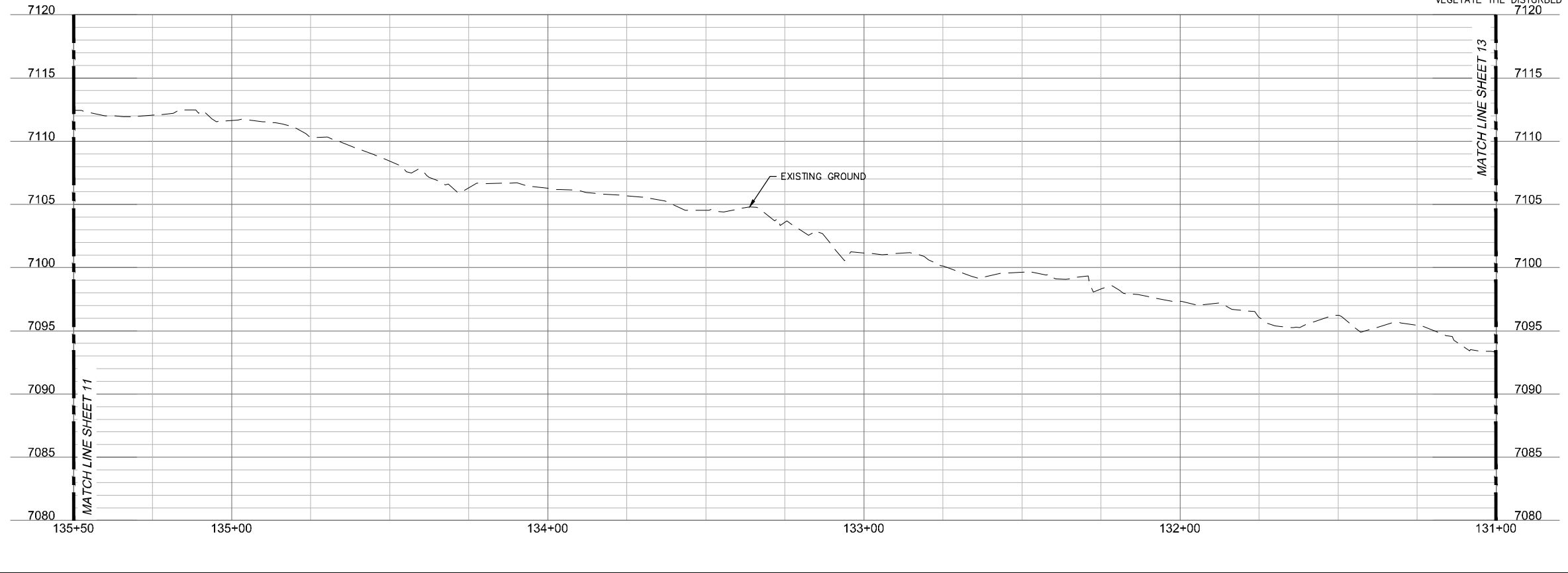
SHEET  
12 of 33



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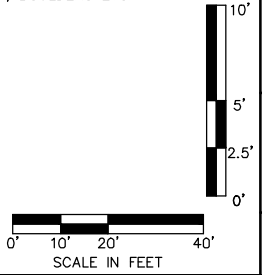
SIMONETTI	
CUT	7.99 CY
FILL	12.97 CY
NET	4.98 CY <FILL>

NOTE: QUANTITIES IN TABLE DO NOT ACCOUNT FOR DISPLACEMENT FROM RIPRAP, BOULDERS ETC.

**VOLUME TABLE**

RED SOIL REMOVAL	
CUT	1097.32 CY
FILL	---
NET	1097.32 CY <CUT>

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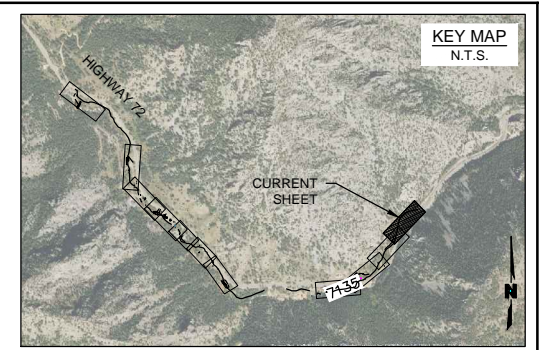
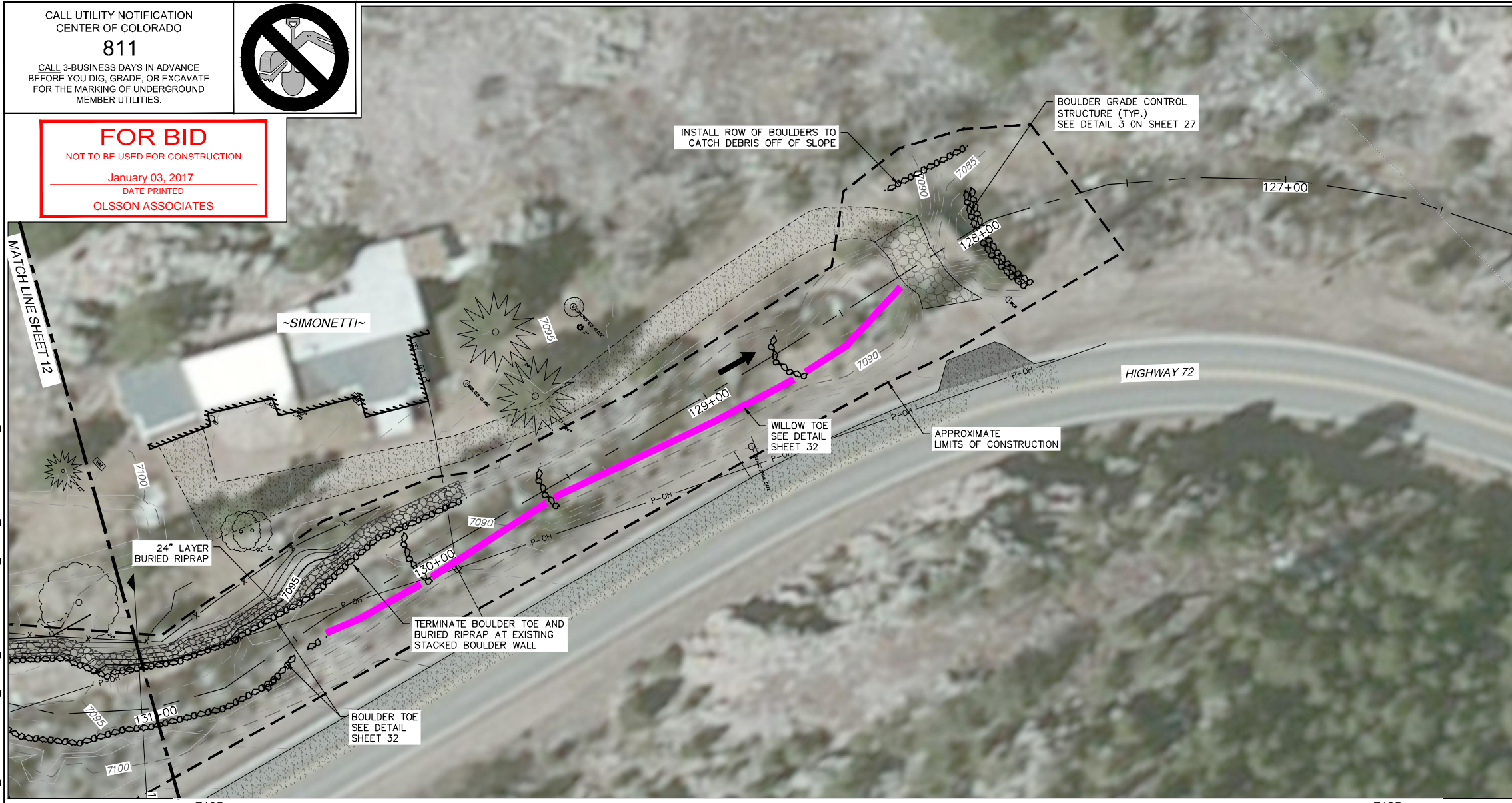
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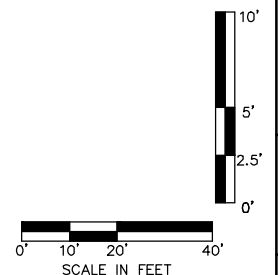
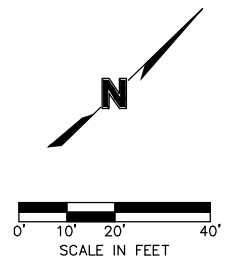
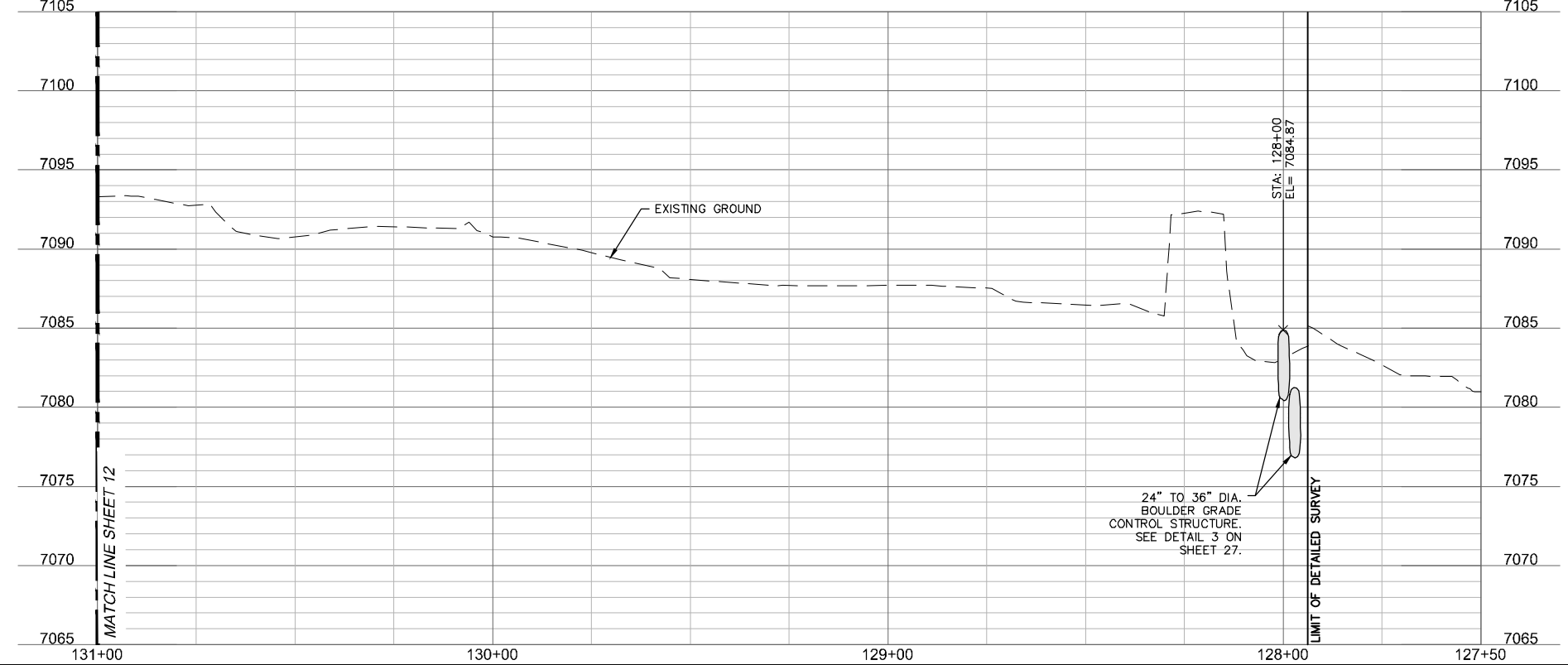
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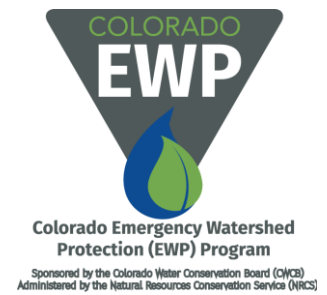
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COAL CREEK IMPROVEMENTS

JEFFERSON COUNTY, COLORADO

drawn by:            CE  
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approved by:            DK  
QA/QC by:            DB  
project no.:            016-1310  
drawing no.:              
date:            2016.12.09

**SHEET**  
13 of 33

2016



## REVEGETATION AND BIOSTABILIZATION RECOMMENDATIONS FOR UPPER COAL CREEK RESTORATION

---

### TECHNICAL MEMORANDUM

---

Submitted to:

**Natural Resources Conservation Service  
Denver Federal Center  
Building 56, Room 2604  
P.O. Box 25426  
Denver, Colorado 80225**

Date:

**January 3, 2017**

Prepared by



1435 Larimer Street, Suite 200  
Denver, CO 80202  
[www.greatecology.com](http://www.greatecology.com)  
P: (303) 872-0927

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## TECHNICAL MEMORANDUM

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### BACKGROUND

This technical memo contains three different projects, which are summarized below.

**Upper Coal Creek Restoration “Start”:** The goal of the Coal Creek project is to address the damage from 2013 flooding as well as to build a more resilient riverine system in response to future high flows. The “Start” is the most downstream segment of three separate areas slated for restoration. The project will include streambank restoration through sediment removal, bioengineering and/or armored features to stabilize stream banks and critical area treatments. These treatments are likely to include revegetation through container stock, willow staking, seeding, mulching, soil amendment and improvement, and/or cross vanes. Existing mature vegetation, such as woody vegetation, forbs, and grasses, will be preserved wherever possible.

**Upper Coal Creek Restoration “Area 2”:** The Area 2 restoration site along Coal Creek is a separate area located immediately upstream of the “Start” area. This site will undergo the same restoration treatments as the “Start” area, including those intended to improve ecological integrity and system resiliency. Area 2 represents a slightly longer segment of restoration along Coal Creek than the “Start” area.

**Upper Coal Creek Restoration “Area 3”:** The Area 3 restoration site is a separate section of Coal Creek upstream of the Area 2 site. This segment represents the smallest of the three sites along Coal Creek. Restoration treatments planned for this area are the same as those planned for the “Start” and Area 2 segments.

### PROJECT AREA DESCRIPTION

The Coal Creek project areas are located in Coal Creek Canyon in Jefferson, County, CO, along State Highway 72, approximately 4 miles west of Highway 93.

The overall project area spans approximately 1.25 miles of total stream length, although the specific restoration sites are somewhat less. The “Start” area is located approximately 4 miles west of the intersection of Highway 93 and Highway 72, and is roughly 1,600 feet in length. Area 2 is located approximately 4.7 miles from the intersection of Highway 72 and 93, and is roughly 2,100 feet in length. Area 3 is the most upstream of the three segments, and is located approximately 5.3 miles from the intersection of Highway 72 and 93. This site represents the shortest segment at roughly 125 feet along Coal Creek.

### HYDROLOGIC ZONE

To better facilitate plant material survival (seeds, cuttings and containers), the Upper Coal Creek restoration areas will be divided into hydrologic zones. Zones were identified using hydrologic models, aerial images, and base water surface elevation. The hydrologic zones will be flagged and identified by the Emergency Watershed Protection (EWP) restoration team (including design and revegetation specialists), prior to planting. Upper Coal Creek areas will be installed based on three hydrologic zones:

- Zone 2: 0 to 1 foot above surface elevation was estimated to be approximately 0.09 ac
  - 0.05 ac at Start
  - 0.04 ac at Area 2; and
  - 0 ac at Area 3.
- Zone 3: 1 to 2 feet above surface elevation was estimated to be approximately 0.35 ac

- 0.15 ac at Start
- 0.19 ac at Area 2; and
- 0.01 ac at Area 3.
- Zone 4: 2+ feet above surface elevation was estimated to be approximately 2.24 ac
  - 1.56 ac at Start
  - 0.48 ac at Area 2; and
  - 0.20 ac at Area 3.
- Zone 5: Slopes of 1.5:1 or steeper was estimated to be approximately 0.3 ac
  - 0 ac at Start
  - 0.03 ac at Area 2; and
  - 0 ac at Area 3.

## **SOIL AMENDMENTS**

For all areas disturbed by restoration activities, the soil and topsoil should be amended with Biocomp/Biosol with a recommended application rate of 1,300 lbs/ac. Biocomp/Biosol should be incorporated into the site through raking from 1/4-inch to a maximum of 3/8-inch in depth. Additionally, for all areas, soil should be “top dressed” with Verdyol “Green” with a recommended application rate of 3,500 lbs/ac (manufacturer recommendation rate, although can reduce this rate to 2,000 lb/ac, if necessary to reduce costs). Verdyol is provided in 50-lb bags, which should be mixed with water at a 1-to-1 ratio (100 lbs Verdyol per 100 gallons of water) and incorporated on to the site as an aqueous slurry.

## **SEEDING, PLANTING, AND MULCHING**

In the following sections, all seed and woody plant material recommendations were based on site elevation, county occurrence, hydrologic preference, topography, aspect preference, successional tier, habitat preference, soil texture, shade tolerance, and growth form, as well as attributes including root system structure and dimension (Ackerfield 2015, Mandel 2016). To maximize ecological fitness, all plant materials will be as ecotypic as possible. Ecotypic vegetation is beneficial in restoration efforts as it has co-evolved to live in local climates, soil types, and with local environmental pressures.

### **ZONE 2 (0 TO 1 FOOT ABOVE SURFACE WATER ELEVATION)**

Given that the timing of installation will occur prior to spring runoff, and the associated high water velocity of Left Hand Creek through project area, Zone 2 will not be seeded or covered with woodstraw prior to the Spring 2017 runoff. Instead, it is recommended by the EWP revegetation ecologist that the Lefthand Watershed Oversight Group should install seed and woodstraw within Zone 2 after spring runoff between September 1 and when the ground freezes, if possible.

Containerized graminoids and woody plant materials are recommended for site installation within Zone 2. Species should be planted in suites to create a mosaic based on site condition and the submitted revegetation plan. Recommended species and percentages are presented in [TABLE 1](#).

All plants should be installed in the indicated numbers and size. No additional soil amendments are recommended as the previously described soil treatments should be adequate. To maximize ecological fitness, all plant sources should be as site-specific to the project location as possible. Plants should be pre-inspected by the planting contractor to help ensure quality, proper hardening (2-week minimum), and species correctness. As based on quadratic equation, the contractor will install all woody plants on 6-foot centers (1,393 plants/ac) whereas all herbaceous plants within this hydrologic group should be installed as 10-cubic-inch plugs on 3-foot centers (5,578 plants/ac). Planting holes will be hand dug or drilled with an auger where necessary to allow deep root penetration and to



minimize the possibility of “j-rooting”. Holes will be dug to twice the width and equal to the depth of the root ball of the plant. Holes will be watered before planting, then filled, tamping down the soil to remove air pockets, and watered again immediately. Containerized materials should be planted into appropriate soil moisture conditions to help facilitate survival. It is recommended that transplanted containers be installed on a maximum of 60% of the restorable hydric area to reduce the chance for over-allocation of budget.

Post-restoration weed treatment is recommended for implementation by the watershed coordinator to increase survival rates following installation. Chemical and/or mechanical weed abatement is recommended to assist in eradication of invasive and noxious weeds. The control of noxious and/or invasive species should be based upon site monitoring for a minimum of three-growing seasons following establishment. An iterative weed management plan should be implemented by the watershed coordinator based upon the results of monitoring.

TABLE 1: ZONE 2 (0 TO 1 FOOT ABOVE SURFACE WATER ELEVATION) CONTAINERS/STAKES

Scientific Name	Common Name	% of mix	Material Type	Container Size	Start Plant Number	Area 2 Plant Number
<b><u>woody species</u></b>						
<i>Salix drummondiana</i>	Drummond's willow	12.5	cutting	48-inch cutting	9	7
<i>Salix exigua</i>	narrowleaf willow	13	cutting	48-inch cutting	10	8
<i>Salix monticola</i>	Rocky Mountain willow	12.5	cutting	48-inch cutting	9	7
<i>Salix irrorata</i>	bluestem willow	10	cutting	48-inch cutting	7	6
<i>Salix ligulifolia</i>	strapleaf willow	10	cutting	48-inch cutting	7	6
<i>Salix lucida ssp. caudata</i>	whiplash willow	10	cutting	48-inch cutting	7	6
<b><u>graminoids</u></b>						
<i>Carex nebrascensis</i>	Nebraska sedge	8	container	10 cubic inch	23	18
<i>Eleocharis palustris</i>	creeping spikerush	6	container	10 cubic inch	17	14
<i>Juncus arcticus ssp. littoralis</i>	mountain rush	6	container	10 cubic inch	17	14
<i>Juncus ensifolius</i>	three-stamened rush	6	container	10 cubic inch	17	14
<i>Scirpus microcarpus</i>	panicked bulrush	6	container	10 cubic inch	17	14
<b>Estimated Total</b>		<b>100</b>			<b>140</b>	<b>114</b>



### **ZONE 3 (1 TO 2 FOOT ABOVE SURFACE WATER ELEVATION):**

All seed should be from ecotypic sources and should represent the species and quantities presented in TABLE 2. Any deviation from the recommended species and quantities should be cleared through the project revegetation ecologist (R. Mandel and/or S. Copp Franz, Great Ecology). The contractor should apply the mix through broadcast seeding at a rate of 21.85 PLS lbs/ac, hand-raked to 1/8-to 1/4-inch depth to minimize seed loss, then surface-pressed through a water-filled press-wheel to facilitate good seed-to-soil contact. All seed must be labeled as “certified” and should not include the presence of noxious or invasive species prohibited under the Colorado Seed Act (as indicated on the tag by the Colorado Seed Growers Association approved labeling). All seed should be inspected by the revegetation ecologist and/or watershed coordinator prior to installation and all tags must be maintained for documentation by the watershed coordinator, or their designee. Prior to delivery, seed should be processed by the seed provider on a “gravity-table” to remove non-target seed types, such as yellow sweetclover, alfalfa, wood sorrel, and other potentially invasive species.

All seed recommendations are based on the 150 PLS per square foot, as determined on a percentage basis by species to facilitate ecological functionality, to minimize interspecific competition, and to promote proper revegetation. Once the seed has been properly applied to the site, the contractor should apply woodstraw or biodegradable 24-month erosion control blankets (e.g. KoirMat) within 24 hours of seed application as necessary. Biodegradable erosion control blanketing will be placed on steep and graded slopes. The remainder of the site, primarily within Zones 4S, will be applied with a 75% cover (5,000 lbs/ac) of woodstraw.

In addition to the seed mix, the contractor should install containerized graminoids and woody plant materials on the site. The contractor should select species in suites to create a mosaic based on site condition and submitted plan. Recommended species and percentages are presented in TABLE 3. The exact location of live plant material will be based on final grading, as determined by Emergency Watershed Protection revegetation expert who will be onsite during project implementation.

The contractor should install all plants in the indicated numbers and size. No additional soil amendments are recommended as the previously described soil treatments should be adequate. To maximize ecological fitness, all plant sources should be as site-specific to the project location as possible. Plants should be pre-inspected by the planting contractor to help ensure quality, proper hardening (2-week minimum), and species correctness. As based on quadratic equation, the contractor will install all woody plants on 6-foot centers (1,393 plants/ac) whereas all herbaceous plants within this hydrologic group should be installed as 10-cubic-inch plugs on 3-foot centers (5,578 plants/ac).

For containerized material, planting holes will be hand dug or drilled by the contractor with an auger where necessary to allow deep root penetration and to minimize the chance of “j-rooting”. The contractor will dig holes to twice the width and equal to the depth of the root ball of the plant. Holes will be watered before planting, then filled, tamping down the soil to remove air pockets, and watered again immediately by the contractor. Containerized materials should be planted into appropriate soil moisture conditions to help facilitate survival. It is recommended that transplanted containers be installed on a maximum of 60% of the restorable hydric area to help reduce the chance for over-allocation of budget. Care should be taken to ensure that the installed containerized materials are not covered by Woodstraw at the time of product application.

For live cutting material, the contractor should either: (1) harvest material from pre-identified site-specific collection locations for installation up to two weeks prior to planting, trimmed of side branches and apical growth, then soaked from five to seven days prior to planting; or (2) purchase professionally harvested cuttings through reputable vendors including, but not limited to, Colorado State Forest Service.

TABLE 2: ZONE 3 (1 TO 2 FEET ABOVE SURFACE WATER ELEVATION) SEED

Scientific Name	Common Name	% of mix	Seeds/sq ft	Pure Live Seed (PLS) Weight	PLS lb Required per Ac	Start PLS lb Required for Project Area	Area 2PLS lb Required for Project Area	Area 3 PLS lb required for project area
<b>forb species</b>								
<b>herbaceous dicot</b>								
				7,250,000	0.02	0.10	0.10	0.10
<i>Campanula rotundifolia</i>	harebell	2	3	55,334	2.36	0.40	0.44	0.10
<i>Glycyrrhiza lepidota</i>	wild licorice	2	3	4,800,000	0.03	0.10	0.10	0.10
<i>Mentha arvensis</i>	wild mint	2	3	1,000,000	0.13	0.10	0.10	0.10
<i>Mertensia ciliata</i>	alpine bluebells	2	3	1,250,625	0.10	0.10	0.10	0.10
<i>Monarda fistulosa</i>	wild bergamot	2	3	1,350,000	0.10	0.10	0.10	0.10
<b>graminoids</b>								
<i>Elymus lanceolatus</i> ssp. lanceolatus	thickspike wheatgrass	15	22.5	155,350	6.31	0.97	1.19	0.10
<i>Deschampsia caespitosa</i>	tufted hairgrass	10	15	1,812,500	0.36	0.10	0.10	0.10
<i>Glyceria grandis</i>	reed mannagrass	10	15	1,120,000	0.58	0.09	0.11	0.10
<i>Juncus arcticus</i> ssp. littoralis	mountain rush	10	15	6,950,000	0.09	0.10	0.10	0.10
<i>Nasella viridula</i>	green needlegrass	8	12	152,117	3.44	0.53	0.65	0.10
<i>Pascopyron smithii</i>	western wheatgrass	15	22.5	133,000	7.37	1.14	1.39	0.20
<i>Poa palustris</i>	fowl bluegrass	12	18	2,078,000	0.38	0.10	0.10	0.10
<i>Poa secunda</i>	Sandberg bluegrass	8	12	902,500	0.58	0.10	0.11	0.10
<b>Estimated Total</b>		<b>75</b>	<b>112.5</b>		<b>21.85</b>	<b>4.03</b>	<b>4.68</b>	<b>1.50</b>

TABLE 3: ZONE 3 (1 TO 2 FEET ABOVE SURFACE WATER ELEVATION) CONTAINERS/POLES/STAKES

Scientific Name	Common Name	%of mix	Material Type	Container Size	Start Plant Number	Area 2 Plant Number	Area 3 Plant Number *
<b>woody species</b>							
<i>Alnus incana ssp. tenuifolia</i>	thinleaf alder	10	container	D-60	13	16	3
<i>Betula occidentalis</i>	western river birch	10	container	D-60	11	13	3
<i>Cornus sericea</i>	redosier dogwood	5	container	D-60	7	8	0
<i>Populus angustifolia</i>	narrowleaf cottonwood	15	cutting	60-inch cutting	20	24	8
<i>Prunus virginiana ssp. melanocarpa</i>	chokecherry	10	container	D-60	13	16	3
<i>Ribes aureum</i>	golden currant	5	container	D-60	7	8	3
<i>Salix bebbiana</i>	Bebb's willow	8	cutting	48-inch cutting	11	13	3
<i>Salix drummondiana</i>	Drummond's willow	8	cutting	48-inch cutting	10	12	0
<i>Salix exigua</i>	narrowleaf willow	5	cutting	48-inch cutting	11	13	0
<i>Salix irrorata</i>	bluestem willow	5	cutting	48-inch cutting	7	8	0
<i>Salix lucida ssp. caudata</i>	whiplash willow	5	cutting	48-inch cutting	7	8	
<i>Salix ligulifolia</i>	strapleaf willow	5	cutting	48-inch cutting	7	8	0
<b>graminoids</b>							
<i>Carex nebrascensis</i>	Nebraska sedge	3	container	10 cubic inch	16	19	0
<i>Eleocharis palustris</i>	creeping spikerush	3	container	10 cubic inch	16	19	0
<i>Juncus arcticus ssp. littoralis</i>	mountain rush	3	container	10 cubic inch	16	19	0
<b>Estimated Total</b>		<b>100</b>			<b>172</b>	<b>204</b>	<b>23</b>
<b>*Species were combined for ecological dominance due to the small planting area.</b>							

To establish vegetation on riprap, the contractor will place planting medium over the riprap to promote establishment of live stakes, poles, and seedlings. Live stakes and/or poles will be installed between joints or open spaces of riprap (joint planting). A stinger (deep-reaching hydraulic probe or manual probe) and/or hammer-drill can also be used if joint planting will not allow stakes and/or poles to reach the requisite depth. The contractor should utilize stakes of an adequate length to reach six inches into the low-season water table, with enough stem remaining such that no fewer than three to four live buds remain above the ground surface. The contractor should place all stakes of an adequate length to reach six inches into the low-season water table, with enough stem remaining such that no fewer than three to four live buds remain above the ground surface helping to ensure good hydration and to assist with survival

Post-restoration weed treatment is recommended for implementation by the watershed coordinator to increase survival rates following installation. Chemical and/or mechanical weed abatement is recommended to assist in eradication of invasive and noxious weeds. The control of noxious and/or invasive species should be based upon site monitoring for a minimum of three-growing seasons following establishment. An iterative weed management plan should be implemented by the watershed coordinator based upon the results of monitoring.

#### **ZONE 4 (2 + FEET ABOVE SURFACE WATER ELEVATION):**

All seed should be from ecotypic sources, and should represent the species and quantities presented in TABLE 4. Any deviation from the recommended species and quantities should be cleared through the project revegetation ecologist (R. Mandel and/or S. Copp Franz, Great Ecology). The contractor should apply the mix through broadcast seeding at a rate of 27.39 PLS lbs/ac, hand-raked to 1/8- to 1/4-inch depth to minimize seed loss, then surface-pressed through a water-filled press-wheel to facilitate good seed-to-soil contact. All seed should be labeled as “certified” and should not include the presence of noxious or invasive species prohibited under the Colorado Seed Act (as indicated on the tag by the Colorado Seed Growers Association approved labeling). All seed must be inspected by the revegetation ecologist and/or watershed coordinator prior to installation and all tags must be maintained for documentation by the watershed coordinator, or their designee. Prior to delivery, seed should be processed by the seed provider on a “gravity-table” to remove non-target seed types, such as yellow sweetclover, alfalfa, wood sorrel, and other potentially invasive species.

All seed recommendations are based on the 150 PLS per square foot, as determined on a percentage basis by species to facilitate ecological functionality, to minimize interspecific competition, and to promote proper revegetation. Once the seed has been properly applied to the site, the contractor should apply woodstraw or biodegradable 24-month erosion control blankets (e.g. KoirMat) within 24 hours of seed application as necessary. Biodegradable erosion control blanketing will be placed on steep and graded slopes. The remainder of the site, primarily within Zones 4S, will be applied with a 75% cover (5,000 lbs/ac) of woodstraw.

In addition to the seed mix, the contractor should install containerized woody plant materials on the site. The contractor should plant graminoids and woody plant materials in suites to create a mosaic based on site condition and submitted plan. Recommended species and percentages are presented in TABLE 5. The exact location of live plant material will be based on final grading, as determined by Emergency Watershed Protection vegetation experts who will be onsite during project implementation.

TABLE 4: ZONE 4 (2+ FEET ABOVE SURFACE WATER ELEVATION) SEED

Scientific Name	Common Name	% of mix	Seeds/sq ft	Pure Live Seed (PLS) Weight	PLS lb Required per Ac	Start PLS lb / Project Area	Area 2 PLS lb / Project Area	Area 3 PLS lb / project area
<b>herbaceous dicot</b>								
<i>Erigeron pumilus</i>	low fleabane	2.5	3	1,450,000	0.09	0.14	0.10	0.10
<i>Gallardia aristata</i>	blanketflower	2.5	3	189,959	0.69	1.07	0.35	0.13
<i>Helianthus pumilus</i>	dwarf sunflower	2.5	3	200,000	0.65	1.02	0.33	0.20
<i>Solidago missouriensis</i>	Missouri goldenrod	4	4.8	1,350,000	0.15	0.24	0.10	0.10
<i>Thermopsis divaricarpa</i>	spreadfruit golden banner	1	1.2	30,600	1.71	2.66	0.90	0.40
<b>graminoids</b>								
<i>Achnatherum hymenoides</i>	Indian ricegrass	5	6	181,741	1.44	2.24	0.73	0.28
<i>Bouteloua gracilis</i>	blue grama	7	8.4	780,500	0.47	0.73	0.24	0.10
<i>Bromus marginatus</i>	mountain brome	5	6	104,843	2.49	3.89	1.26	0.48
<i>Elymus canadensis</i>	Canada wildrye	5	6	103,000	2.54	3.96	1.29	0.49
<i>Elymus lanceolatus ssp. lanceolatus</i>	thickspike wheatgrass	10	12	155,350	3.36	5.25	1.71	0.65
<i>Elymus trachycaulus</i>	Slender wheatgrass	10	12	215,000	2.43	3.79	1.23	0.47
<i>Koeleria macrantha</i>	junegrass	5	6	2,057,500	0.13	0.20	0.10	0.10
<i>Nasella viridula</i>	green needlegrass	8	9.6	152,117	2.75	4.29	1.39	0.53
<i>Pascopyron smithii</i>	western wheatgrass	15	18	133,000	5.90	9.19	2.99	1.14
<i>Poa secunda</i>	Sandberg bluegrass	10	12	902,500	0.58	0.90	0.29	0.11
<i>Schizachyrium scoparium</i>	little bluestem	7.5	9	195,000	2.01	3.13	1.02	0.39
<b>Estimated Total</b>		<b>100</b>	<b>150</b>		<b>27.39</b>	<b>42.70</b>	<b>14.04</b>	<b>5.69</b>

TABLE 5: ZONE 4 (2+ FEET ABOVE SURFACE WATER ELEVATION) CONTAINERS

Scientific Name	Common Name	% of mix	Material Type	Container Size	Start Plant Number	Area 2 Plant Number	Area 3 Plant Number
<b>woody species</b>							
<i>Amorpha fruticosa</i>	leadplant	10	container	D-60	53	20	3
<i>Cercocarpus montanus</i>	mountain mahogany	5	container	D-60	27	10	5
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	5	container	D-60	27	10	0
<i>Prunus americanum</i>	American plum	15	container	D-60	79	29	0
<i>Prunus virginiana ssp. melanocarpa</i>	chokecherry	15	container	D-60	79	29	3
<i>Rhus trilobata</i>	threeleaf sumac	15	container	D-60	79	29	5
<i>Ribes aureum</i>	golden currant	10	container	D-60	53	20	3
<i>Rosa woodsii</i>	Wood's rose	10	container	D-60	53	20	5
<i>Symphoricarpos occidentalis</i>	western snowberry	15	container	D-60	79	29	0
<b>Estimated Total</b>		<b>100</b>			<b>529</b>	<b>196</b>	<b>24</b>

The contractor should install all plants in the indicated numbers and size. No additional soil amendments are recommended as the previously described soil treatments should be adequate. To maximize ecological fitness, all plant sources should be site-specific to the project location. Plants should be pre-inspected by the planting contractor to help ensure quality, proper hardening (2-week minimum), and species correctness. As based on quadratic equation, the contractor should install all woody plant materials on 6-foot centers (1,393 plants/ac).

For containerized material, planting holes should be hand dug or drilled by the contractor with an auger where necessary to allow deep root penetration and to minimize “j-rooting”. The contractor will dig holes twice the width and equal to the depth of the root ball of the plant. Holes will be watered before planting, then filled, tamping down the soil to remove air pockets, and watered again immediately by the contractor. Containerized materials should be planted into appropriate soil moisture conditions to help ensure survival. It is recommended that transplanted containers be installed on a maximum of 60% of the restorable hydric area to minimize the chance for over-allocation of budget. Care should be taken to ensure that the installed containerized materials are not covered by woodstraw at the time of product application.

To increase survivability, temporary deep watering is recommended for container stock installed on drier soils within Zone 4. All container stock within Zone 4 should be watered three times a week for the first three weeks. After the first three weeks, the plants should be watered once a week until the first frost. For the first three years of plant establishment, the plants are recommended to be watered three times a week between early May and the first frost.

Post-restoration treatment is recommended for implementation by the watershed coordinator in order to increase survival rates following installation. Chemical and/or mechanical weed abatement is recommended to assist in eradication of invasive and noxious weeds. The control of noxious and/or invasive species should be based upon site monitoring for a minimum of three-growing seasons following establishment. An iterative weed management plan should be implemented by the watershed coordinator based upon the results of monitoring.

#### **ZONE 5 (STEEP SLOPES OF 1.5:1 OR STEEPER):**

Slopes of 1.5:1 or steeper occur within Area 2 reach of Upper Coal Creek. All seed should be from ecotypic sources, and should represent the species and quantities presented in [TABLE 6](#). Any deviation from the recommended species and quantities should be cleared through the project revegetation ecologist (R. Mandel and/or S. Copp Franz, Great Ecology). The contractor should apply the mix through broadcast seeding at a rate of 21.88 PLS lbs/ac, hand-raked to 1/8- to 1/4-inch depth to minimize seed loss, then surface-pressed through a water-filled press-wheel to facilitate good seed-to-soil contact. All seed should be labeled as “certified” and should not include the presence of noxious or invasive species prohibited under the Colorado Seed Act (as indicated on the tag by the Colorado Seed Growers Association approved labeling). All seed must be inspected by the revegetation ecologist and/or watershed coordinator prior to installation and all tags must be maintained for documentation by the watershed coordinator, or their designee. Prior to delivery, seed should be processed by the seed provider on a “gravity-table” to remove non-target seed types, such as yellow sweetclover, alfalfa, wood sorrel, and other potentially invasive species.

All seed recommendations are based on the 150 PLS per square foot, as determined on a percentage basis by species to facilitate ecological functionality, to minimize interspecific competition, and to promote proper revegetation. Once the seed has been properly applied to the site, the contractor should apply biodegradable 24-month erosion control blankets (e.g. KoirMat) within 24 hours of seed application as necessary.

In addition to the seed mix, the contractor should install woody plant materials on the site. The contractor should plant the woody plant materials in suites to create a mosaic based on site condition

and submitted plan. Recommended species and percentages are presented in TABLE 7. The exact location of live plant material will be based on final grading, as determined by Emergency Watershed Protection vegetation expert who will be onsite during project implementation.

TABLE 6: ZONE 5 SEED

Scientific Name	Common Name	% of mix	Seeds/sq ft	Pure Live Seed (PLS) Weight	PLS lb Required per Ac	PLS lb Required for Project Area
<b>graminoids</b>						
<i>Bouteloua gracilis</i>	blue grama	5	6	780,500	0.33	0.10
<i>Bromus marginatus</i>	mountain brome	5	6	104,843	2.49	0.10
<i>Calamagrostis canadensis</i>	bluejoint reedgrass	10	12	4,114,584	0.13	0.10
<i>Elymus canadensis</i>	Canada wildrye	5	6	103,000	2.54	0.10
<i>Elymus lanceolatus ssp. lanceolatus</i>	thickspike wheatgrass	15	18	155,350	5.05	0.15
<i>Elymus trachycaulus</i>	Slender wheatgrass	10	12	215,000	2.43	0.10
<i>Glyceria grandis</i>	reed mannagrass	10	12	1,120,000	0.47	0.10
<i>Koeleria macrantha</i>	junegrass	5	6	2,057,500	0.13	0.10
<i>Nasella viridula</i>	green needlegrass	5	6	152,117	1.72	0.10
<i>Pascopyron smithii</i>	western wheatgrass	15	18	133,000	5.90	0.18
<i>Poa palustris</i>	fowl bluegrass	5	6	2,078,000	0.13	0.10
<i>Poa secunda</i>	Sandberg bluegrass	10	12	902,500	0.58	0.10
<b>Estimated Total</b>		<b>100</b>	<b>150</b>		<b>21.88</b>	<b>1.34</b>

The contractor should install all plants in the indicated numbers and size. No additional soil amendments are recommended as the previously described soil treatments should be adequate. To maximize ecological fitness, all plant sources should be site-specific to the project location. Plants should be pre-inspected by the planting contractor to help ensure quality, proper hardening (2-week minimum), and species correctness. As based on quadratic equation, the contractor should install all woody plant materials on 3-foot centers (5,578 plants/ac).

For live cutting material, the contractor should either: (1) harvest material from pre-identified site-specific collection locations for installation up to two weeks prior to planting between fall dormancy and spring bud break, trimmed of side branches and apical growth, then soaked from five to seven days prior to planting; or (2) purchase professionally harvested cuttings through reputable vendors including, but not limited to, Colorado State Forest Service.

TABLE 7: ZONE 5 WOODY PLANT MATERIALS

Scientific Name	Common Name	% of mix	Material Type	Container Size	Plant Number
<b>woody species</b>					
<i>Populus angustifolia</i>	narrowleaf cottonwood	35	cutting	60-inch cutting	30
<i>Salix drummondiana</i>	Drummond's willow	15	cutting	48-inch cutting	13
<i>Salix exigua</i>	narrowleaf willow	20	cutting	48-inch cutting	18
<i>Salix monticola</i>	Rocky Mountain willow	20	cutting	48-inch cutting	18
<i>Salix ligulifolia</i>	strapleaf willow	10	cutting	48-inch cutting	9
<b>Estimated Total</b>		<b>100</b>			<b>88</b>

To establish vegetation on riprap, the contractor will place planting medium over the riprap to promote establishment of live stakes, poles, and seedlings. Live stakes and/or poles will be installed between joints or open spaces of riprap (joint planting). A stinger (deep-reaching hydraulic probe or manual probe) and/or hammer-drill can also be used if joint planting will not allow stakes and/or poles to





reach the requisite depth. The contractor should utilize stakes of an adequate length to reach six inches into the low-season water table, with enough stem remaining such that no fewer than three to four live buds remain above the ground surface. The contractor should place all stakes of an adequate length to reach six inches into the low-season water table, with enough stem remaining such that no fewer than three to four live buds remain above the ground surface helping to ensure good hydration and to assist with survival

Post-restoration weed treatment is recommended for implementation by the watershed coordinator to increase survival rates following installation. Chemical and/or mechanical weed abatement is recommended to assist in eradication of invasive and noxious weeds. The control of noxious and/or invasive species should be based upon site monitoring for a minimum of three-growing seasons following establishment. An iterative weed management plan should be implemented by the watershed coordinator based upon the results of monitoring.

## **CONCLUSION**

Ecotypic plant materials are available through the Colorado State Forest Service and other private entities within Colorado and the Rocky Mountains. Please note that the recommended containerized stock can be purchased from the Colorado State Forest Service. Any changes to seed mixes must be pre-approved by the EWP Vegetation Ecologist, Randy Mandel. Please let me know if there are any question and/or comments concerning the above information and we will work with you to find an answer and/or solution.

## **REFERENCES**

- Ackerfield, J. 2015. Flora of Colorado. Botanical Resource Institute of Texas. 818 p.
- Giordanengo, J.H. and R.H. Mandel. 2015. Field Guide for Harvesting and Installing Willow and Cottonwood Cuttings. Synergy Ecological Restoration through grant support provided by Colorado Department of Natural Resources Colorado Water Conservation Board. 10 p.
- Giordanengo, J., R.H. Mandel, W.J. Spitz, M.C. Bossler, M.J. Blazewicz, S.E. Yochum, K.R. Jagt, W.J. LaBarre; G. Gurnee, R. Humphries, and K.T. Uhing. 2016. Living Streambanks: A Manual of Bioengineering Treatments for Colorado Streams. Colorado Department of Natural Resources, Colorado Water Conservation Board. 244 p. Accessed at <http://cwcb.state.co.us/environment/watershed-protection-restoration/Pages/main.aspx>.
- Mandel, R. 2016. Plant Restoration Database Version 1.1. Colorado Department of Natural Resources, Colorado Water Conservation Board. Updated May 2016. Accessed at <http://cwcb.state.co.us/environment/watershed-protection-restoration/Pages/main.aspx>.

TECHNICAL SPECIFICATIONS  
FOR  
UPPER COAL CREEK IMPROVEMENTS PROJECT  
OLSSON PROJECT NO. 016-1310

GENERAL

This scope of work incorporates by reference the Colorado Department of Transportation (CDOT) Standard Specifications for Road and Bridge Construction (2011). The Contractor shall use the 2011 CDOT specifications for the subject work, with the following exceptions as amended below and additional Project Special Provisions and Supplemental Specifications.

Per CDOT Section 105.09, in case of a discrepancy the order of precedence is as follows:

- 1) Special Provisions
  - a. Project Special Provisions
  - b. Standard Special Provisions
- 2) Plans
  - a. Detailed Plans
  - b. Standard Plans
- 3) Supplemental Specifications
- 4) Standard Specifications

Per CDOT Section 105.09, “the Contractor shall not take advantage of any apparent error or omission in the Contract. If the Contractor discovers an error or omissions, the Engineer shall immediately be notified. The Engineer will make corrections and interpretations as necessary to fulfill the intent of the Contract.”

**PROJECT SPECIAL PROVISIONS**

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**REVISION OF SECTION 101 —  
DEFINITIONS AND TERMS**

Section 101 of the Standard Specifications is hereby revised for this project as follows:

Delete Subsection 101.29 and replace with the following:

**101.29 Engineer.** The Engineer who designed the project acting directly or through an authorized representative, who is responsible for engineering and administrative supervision of the project.

**REVISION OF SECTION 201 —  
CLEARING AND GRUBBING**

Section 201 of the Standard Specifications is hereby revised for this project as follows:

**DESCRIPTION**

Subsection 201.01 is replaced with the following:

The work consists of clearing of vegetation and within the limits of grading areas, staging areas, and access routes. The work also includes landfill disposal of debris (i.e. trash or vegetation that is not salvageable) that cannot be beneficially reused onsite. Vegetation and objects designated to remain shall be preserved free from injury or defacement, including the limbs and rootwads of large wood.

**CONSTRUCTION REQUIREMENTS**

Subsection 201.02 shall include the following:

The contractor shall retain and stockpile large boulders encountered during clearing and grubbing for reuse in structures and bank protection (Refer to Revision of Section 506—In-Channel Boulder Features). Management of large boulders for reuse will be paid for under Section 203.

The Engineer and/or Ecologist shall flag vegetation that shall not be disturbed before construction begins. The Contractor shall not disturb existing stands of vegetation that have been flagged for protection. The Contractor shall review flagged vegetation stands with the Engineer and/or Ecologist prior to the start of work.

**BASIS OF PAYMENT**

Subsection 201.04 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Clearing and Grubbing	Acre

Removal of woody material for beneficial reuse onsite or in the vicinity will be paid for under Section 202.

**REVISION OF SECTION 201—  
REMOVAL OF DEBRIS**

Section 201 of the Standard Specifications is hereby revised for this project to include the following:

Subsection 201.01 shall include the following:

This work includes, but is not limited to, the removal of flood generated downed trees, stumps, woody debris, sediment, trash, and all other debris that are not designated or permitted to remain, as shown in the plans or as directed by the Engineer. Except in areas to be excavated, the resulting trenches, holes, and pits shall be backfilled and revegetated at no additional cost to the project.

**CONSTRUCTION REQUIREMENTS**

Subsection 201.02 shall include the following:

The contractor shall submit to the Engineer methods that will be utilized to remove debris along the project corridor. Methods proposed by the contractor will need approval by the Engineer, especially for areas that impact the active stream environment.

**METHOD OF MEASUREMENT**

Subsection 201.03 shall include the following:

Removal of debris will be measured per load based on a standard tandem dump truck estimated at 10 cubic yards.

**BASIS OF PAYMENT**

Subsection 201.04 shall include the following:

The accepted quantities to complete removals as identified will be paid for on a unit price for all work required to remove and dispose of debris from the site.

<b>Pay Item</b>	<b>Pay Unit</b>
Removal of Debris	Load

**REVISION OF SECTION 202 —  
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

Section 202 of the Standard Specifications is hereby revised for this project as follows:

**CONSTRUCTION REQUIREMENTS**

Subsection 202.02 is shall include the following:

The Contractor shall remove all trees designated for removal or as directed by the Engineer. Approximately 5trees (pay item Remove Tree) are estimated to be beneficially reused onsite for pay item Rootwad construction. See revisions to section 214 for Rootwad specifications. Trees removed that are not designated for use in Rootwad construction shall be legally disposed of off site unless designated for additional on-site use by the Engineer.

**BASIS OF PAYMENT**

Subsection 202.12 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Remove Tree	Each

**REVISION OF SECTION 203 —  
EXCAVATION AND EMBANKMENTS**

Section 203 of the Standard Specifications is hereby revised for this project as follows:

**DESCRIPTION**

Subsection 203.02 shall include the following:

*Unclassified Excavation* This work consists of excavation and fills within the Coal Creek channel and floodplain, as well as, disposal of excess material off site. This work includes the sorting and stockpiling of in-situ riprap, larger, alluvial rounded rock and boulder material located in the existing river bottom, banks, floodplain, and soil piles, to be used in later stages of construction to form river features (Section 506– In Channel Boulder Feature). The project scope also includes removal and disposal of “Red” sediment at the locations designated in the plans or as directed by the Engineer.

**CONSTRUCTION REQUIREMENTS**

Subsection 203.05 (Excavation) shall include the following:

Final grade cuts and fills shall not be steeper than 1.5: 1. The grading limits shown in the plan set shall be field fit based on site specific conditions at the direction of the Engineer.

Existing river conditions prior to mass grading shall be carefully documented with photographs or other approved method. Riprap materials (competent angular, sub-angular materials, and cobbles conforming to the requirements of Section 506 (Riprap)) shall be retained for re-grading and re-use on the Project; All rounded large cobbles (greater than 21-inch) and boulders suitable for use with in-channel Boulder Features (as shown on the river plans; see Section 506 (In-Channel Boulder Feature)) shall be removed and stockpiled as close to the work area as possible. Sorting and stockpiling of in-situ riprap, larger alluvial rounded rock and boulder material located in the existing river bottom, banks, floodplain, and soil piles, to be used in later stages of construction to form river features will not be paid for separately but shall be included in cost of the work. The proposed channel and floodplain shall be formed according to the typical sections and grading contours as shown on the plans or as directed by the Engineer.

The Engineer may direct the creation of micro-topography at their discretion to create small-scale stream channel and landscape features not shown on the plan set provided they are in-line with the vision of the project and not time intensive.

**BASIS OF PAYMENT**

Subsection 203.14 shall include the following:

Payment includes the total volume excavated and reshaped into the final dimensions of the channel and floodplain. Payment includes haul away of any excess material to an approved on-site or offsite location. Payment includes the detailed sorting, stripping, stockpiling and replacement of select existing river materials as described above.

The work to be paid under pay item *Unclassified Excavation, "Red" Sediment Removal* consists of excavation in the locations shown in the plans, or as directed by Engineer, hauling, and disposal of "Red" sediment.



The work to be paid under pay item *Unclassified Excavation, Complete in Place* consists of excavation, placement, and compaction of material to be handled as part of channel grading, floodplain grading, and excavation to install structures.

The work to be paid under pay item *Unclassified Excavation with Export of Excess Material* consists of excavation, hauling, and disposal of excess cut material that is not used as fill.

The final compaction level of graded areas shall be consistent with the intent to re-establish vegetation. Final compaction level shall be approved by the Engineer.

**Pay Item**

Unclassified Excavation, "Red" Sediment Removal  
Unclassified Excavation, Complete in Place  
Unclassified Excavation with Export of Excess Material

**Pay Unit**

Cubic Yards  
Cubic Yards  
Cubic Yards

**REVISION TO SECTION 208 —  
EROSION CONTROL**

**DESCRIPTION**

Subsection 208.01 shall include the following:

The Contractor shall develop a Stormwater Management Plan (SWMP) and obtain a construction stormwater permit and construction dewatering permit from CDPHE as applicable.

Erosion control measures shall be installed and maintained in the locations specified and as described in the SWMP. Erosion control measures will consist of, but is not limited to, silt fence, erosion control log, check dam, or other approved measures needed to satisfy the requirements of the stormwater and construction dewatering permits.

**CONSTRUCTION REQUIREMENTS**

Subsection 208.06 shall include the following:

Biodegradable hydraulic fluids shall be used for all heavy machinery.

Contractor will comply with equipment cleaning protocols to prevent the spread of New Zealand Mud Snails, other aquatic nuisance species (hitchhikers) , and noxious plant species prior to entering the site per requirements of the 404 Permits(details provided at the end of this specifications package).

A spill kit, including absorbent socks and booms, shall be kept onsite during all work with machinery (emergency pollutant isolation and clean-up materials, with procedures). All crew members shall be trained on how to use the spill kit equipment and where the materials are kept onsite. Engineer to approve Contractor plan for leaking equipment extraction from river (spill plan information to be included in SWMP).

Vehicle tracking pads are required to prevent tracking debris on Highway 42.

**BASIS OF PAYMENT**

Subsection 208.12 shall include the following:

Erosion Control shall include all materials and work necessary to satisfy the requirements of the stormwater and construction dewatering permits.

<b>Pay Item</b>	<b>Pay Unit</b>
Erosion Control	Lump Sum

**REVISION OF SECTION 211—  
DEWATERING**

Section 211 is hereby added to the Standard Specifications for this project as follows:

This work consists of dewatering temporary excavations in accordance with Colorado Department of Health and Environment dewatering regulations to facilitate construction activities.

**MATERIALS**

The Contractor shall provide all required materials and equipment to facilitate dewatering. On-site materials meeting specifications may be used within the limits of construction to construct temporary dams and berms. Other materials such as plastic sheeting and sand bags may also be used if desired by the Contractor.

**CONSTRUCTION REQUIREMENTS**

The Contractor shall dewater, by pumping or by excavating trenches leading to a positive gravity outlet.

General: For all work, the Contractor shall provide suitable equipment and labor to remove water, and he shall keep the excavations dewatered so that construction can be carried on under dewatered conditions where required by the Drawings and Specifications. Water control shall be accomplished such that no damage is done to adjacent banks or structures. The Contractor is responsible for investigating and familiarizing himself with all site conditions that may affect the work including surface water, level of groundwater and the time of year the work is to be done. All excavations made as part of dewatering operations shall be backfilled with the same type material as was removed and compacted to 95 percent of maximum density (ASTM D698) or to 75 percent relative density (ASTM D2049), except where replacement by other materials and/or methods are required.

Surface Water Control: Surface water control generally falls in to the following categories:

- 1) Normal low flows along Coal Creek;
- 2) Storm/flood flows along Coal Creek;
- 3) Flows from existing storm drain pipelines; and
- 4) Local surface inflows.

The Contractor shall coordinate, evaluate, design, construct, and maintain temporary water control conveyance systems. These systems will not worsen flooding, alter major flow paths, or worsen flow characteristics during construction. The Contractor is responsible to ensure that any such worsening of flooding does not occur. The following is approximate storm flow data for Coal Creek is for information only. This information was obtained from the Upper Coal Creek Watershed Restoration Master Plan by ICON Engineering, Inc., dated November 0214.

2-year Flood	53 cfs
5-year Flood	180 cfs
10-year Flood	374 cfs
25-year Flood	870 cfs
50-year Flood	1650 cfs
100-year Flood	3120 cfs

The Contractor will be responsible for diverting surface flow around the construction area so that the excavation for boulders and riprap remain free of surface water for the time it takes to install these materials, and the time required for curing of the concrete in the channel structures.

The Contractor shall, at all times, maintain a flow channel or route for Coal Creek. Temporary structures such as berms, sandbags, pipeline diversions, etc., shall be permitted for the control of creek flow, as long as such measures are not a major obstruction to flood flows, do not worsen flooding, or alter historic flow routes. Existing trees and vegetation should be preserved. In the event existing trees or vegetation require removal for dewatering operations, no such removal can occur without the approval of the Engineer.

**Groundwater Control:** The Contractor shall install adequate measures to maintain the level of groundwater below the foundation subgrade elevation and maintain sufficient bearing capacity for structures, pipelines, earthwork, and rock work. Such measures may include, but are not limited to, installation of perimeter subdrains, pumping from drilled holes or by pumping from sumps excavated below the subgrade elevation. The foundation bearing surfaces are to be kept dewatered and stable until the structures or other types of work are complete and backfilled. Disturbance of foundation subgrade by Contractor operations shall not be considered as originally unsuitable foundation subgrade and shall be repaired at Contractor's expense.

**Special Dewatering Provisions for Instream Structures:** The Contractor shall isolate the work area from surface waters, and then draw down the groundwater level to an elevation below subgrade in a manner which will prevent "quick" conditions. The dewatering operation will be continuous, 24 hours per day, until the affected portion of the drop structures is complete and the groundwater level can be allowed to rise without endangering the stability of existing or new structures.

The Contractor should anticipate that even with the groundwater level lowered below subgrade where boulders and riprap is to be placed, conditions will be moist and possibly soft and easily disturbed by his activities. The Contractor is responsible to control such conditions and prevent loosening of the subgrade material and refrain from activities which would make the materials more permeable and/or inadequate to support the structure.

The Contractor may use special drain zones in his design for dewatering trenches or well points, as long as the system does not harm the permanent weep drain system or toe drain filter system's effectiveness. Any temporary dewatering trenches or well points will be restored following dewatering operations to reduce permeability in those areas as approved by the Engineer. Dewatering trenches are not acceptable on the drop slope where they may compromise the integrity of the sloped subgrade material.

#### METHOD OF MEASUREMENT

Dewatering will not be measured, but will be paid for on a Lump Sum basis.

#### BASIS OF PAYMENT

<b>Pay Item</b>	<b>Pay Unit</b>
Dewatering	Lump Sum

**REVISION OF SECTION 212 —  
SEED AND SOIL CONDITIONING**

Section 212 of the Standard Specifications is hereby revised for this project as follows:

**DESCRIPTION**

Subsection 212.01 is replaced with the following:

The work consists of revegetating areas that have been disturbed as part of floodplain benching, channel grading, debris removal, staging, construction access, or otherwise. This work also includes revegetation that is specified as part of bank stabilization treatments (refer to Revision of Section 506)

**CONSTRUCTION REQUIREMENTS**

Subsection 212.06 shall include the following:

Onsite soil shall be amended with Biocomp/Biosol and Verdial in accordance with the plans.

**BASIS OF PAYMENT**

Subsection 212.08 shall include the following:

<b><u>Pay Item</u></b>	<b><u>Pay Unit</u></b>
Seeding, Broadcast, Zone 2)	Square Feet
Seeding, Broadcast, Zone 3	Square Feet
Seeding, Broadcast, Zone 4	Square Feet
Seeding, Broadcast, Zone 5	Square Feet
Soil Amendments	Acre

Payment for Seeding shall include seed acquisition, transport, installation, and all other work necessary to complete the work.

Payment for Soil Amendments shall include amendments acquisition, transport, installation, and all other work necessary to complete the work.

**REVISION OF SECTION 213 —  
MULCHING**

Section 213 of the Standard Specifications is hereby revised for this project as follows:

**BASIS OF PAYMENT**

Subsection 213.05 shall include the following:

<b>Pay</b>	<b>Pay Unit</b>
Mulching (Wood straw)	Acre

Payment for wood straw mulch will be full compensation for all work and materials necessary to furnish and apply the mulch.

**REVISION OF SECTION 214 —  
PLANTING**

Section 214 of the Standard Specifications is hereby revised for this project as follows:

**DESCRIPTION**

Subsection 214.01 shall include the following:

The work consists of furnishing all plants, labor, materials and equipment and performing all work necessary and incidental to installing container stock, piles and live cuttings as indicated in the plan set.

**CONSTRUCTION REQUIREMENTS**

Subsection 214.03 shall include the following:

It is recommended that the contractor source as much of the plant material as possible through the Colorado State Forest Service (CSFS). Willow cuttings may also be harvested on site if available. Live willow cuttings shall be done in coordination with Ecologist and shall conform to the special provisions in Revision of Section 214, Willow Cuttings.

**BASIS OF PAYMENT**

Subsection 214.06 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Willow Live Stakes	Each
Nebraska Sedge, <i>Carex nebrascensis</i> , 10-Cubic Inch	Each
Creeping Spikerush, <i>Eleocharis palustris</i> , 10-Cubic Inch	Each
Mountain Rush, <i>Juncus arcticus</i> ssp. <i>Littoralis</i> , 10-Cubic Inch	Each
Three-Stamened Rush, <i>Juncus ensifolius</i> , 10-Cubic Inch	Each
Panicled Bulrush, <i>Scirpus microcarpus</i> , 10-Cubic Inch	Each
Narrowleaf Willow, <i>Salix bebbiana</i> , 48-Inch Cutting	Each
Drummond's Willow, <i>Salix drummondiana</i> , 48-Inch Cutting	Each
Narrowleaf Willow, <i>Salix exigua</i> , 48-Inch Cutting	Each
Bluestem Willow, <i>Salix irrorata</i> , 48-Inch Cutting	Each
Strapleaf Willow, <i>Salix ligulifolia</i> , 48-Inch Cutting	Each
Whiplash Willow, <i>Salix lucida</i> ssp. <i>Caudata</i> , 48-Inch Cutting	Each
Rocky Mountain Willow, <i>Salix monticola</i> , 48-Inch Cutting	Each
Narrowleaf Cottonwood, <i>Populus angustifolia</i> , 60-Inch Cutting	Each
Thinleaf Alder, <i>Alnus incana</i> ssp. <i>Tenuifolia</i> , D-60	Each
Leadplant, <i>Amorpha fruticosa</i> , D-60	Each
Western River Birch, <i>Betula occidentalis</i> , D-60	Each
Mountain Mahogany, <i>Cercocarpus montanus</i> , D-60	Each
Redosier Dogwood, <i>Cornus sericea</i> , D-60	Each
Rocky Mountain Juniper, <i>Juniperus scopulorum</i> , D-60	Each
American Plum, <i>Prunus americanum</i> , D-60	Each
Chokecherry, <i>Prunus virginiana</i> ssp. <i>Melanocarpa</i> , D-60	Each
Threeleaf Sumac, <i>Rhus trilobata</i> , D-60	Each
Golden Currant, <i>Ribes aureum</i> , D-60	Each
Wood's Rose, <i>Rosa woodsii</i> , D-60	Each
Western Snowberry, <i>Symphoricarpos occidentalis</i> , D-60	Each

Payment for plantings will be full compensation for all work and materials necessary to furnish and install said plant.



**REVISION OF SECTION 214—  
WILLOW CUTTINGS AND WILLOW TOE (BIOLOG)**

Section 214 of the Standard Specifications is hereby revised for this project as follows:

Subsection 214.01 shall include the following:

This work consists of furnishing all plants, labor, materials and equipment and performing all work necessary and incidental to installing live willow cuttings and willow toe (biology) for the stabilization of soil. Willows may be harvested on-site, if available, from parent material identified by Ecologist. On-site harvesting must have the appropriate property access permission.

Subsection 214.02 shall include the following:

(e) *Willow cuttings*— Willow stakes shall be approximately the length specified in the pay item or plans, and between ½ and ¾ inches in diameter. All side branches shall be trimmed. Willow cuttings shall be cut from branches with smooth undamaged bark. Branches with thick, cracked bark shall not be used because there will not re-sprout effectively. Cuttings shall be cut about one foot from the ground. Cuts must be clean, without stripping the bark or splitting the wood. The base cuts shall be at a 45 degree angle to identify the root end of the cutting. The top shall be cut off, with a square cut so that the top of the stake is easily distinguishable from the bottom. Willow cuttings for use in Willow Toe (Biolog) do not require specific measurements or trimming. The harvesting site shall be left clean and tidy, to the satisfaction of the Engineer or Ecologist.

(k) *Transportation*. Immediately after cutting, all live cuttings shall be place in water so that the cut ends are covered in water, and the cuttings shall be stored in a cool location. Plants shall be stored in containers with water at least one foot deep. The containers shall be continuously shaded and protected from the wind. Cuttings shall be protected from drying at all times.

During transportation, the cuttings shall be placed in containers with water at least 1 foot deep in orderly fashion to prevent damage and to facilitate handling.

Upon arrival at the construction site, cuttings shall be inspected for acceptability. Only healthy, undamaged material will be accepted.

Subsection 214.06 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Willow Toe, Biolog	Lineal Foot

**REVISION OF SECTION 214—  
LANDSCAPE MAINTENANCE**

Section 214 of the Standard Specifications is hereby revised for this project as follows:

Subsection 214.04 (b) 2 shall be replaced with the following:

*Watering in Non-irrigated Areas*— D-60 shrubs planted in Zone 4 shall be watered by the Contractor three times per week for the first three weeks after installation and once per week, after the first three weeks, until the first frost or end of the 220-day contract period, whichever occurs first.

Subsection 214.06 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Landscape Maintenance	Lump Sum

**REVISION OF SECTION 214—  
LARGE WOODY MATERIAL AND ROOTWAD**

Section 214 of the Standard Specifications is hereby revised for this project as follows:

**DESCRIPTION**

Subsection 214.01 shall include the following:

Rootwad. This work includes all equipment, materials, labor, and other costs associated with supplying and installing rootwads as indicated in the plans.

**MATERIALS**

Subsection 214.02 shall include the following:

Large woody material (LWM) are trees or tree trunks, preferentially sourced or harvested on site with intact root mass, used to construct rootwads and develop riparian habitat features and for low-flow to bankfull-discharge stabilization.

Large woody material shall be harvested per the details below.

Coal Creek  
Start, Area 1 and Area 2

Biological Assessment  
Fish

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October 3, 2016



## Overview

This assessment is focused on aquatic species, in particular, fish and aquatic habitat for Coal Creek restoration sites, Start, Area 2 and Area 3. The assessment included contacts with Colorado Parks and Wildlife to obtain fish distribution data, online searches for additional data, and a site visit to verify existing conditions. The flood impact in the project area and proposed restoration was taken from the EWP website and is described below.

“Proposed work for this project begins approximately four miles west of Highway 93 on Highway 72, in Coal Creek Canyon. The project covers three separate areas along approximately 1.25 miles of the canyon; Start, Area 2, and Area 3. All sites have one or more of the following treatments: sediment removal to establish a floodplain, bioengineering to stabilize stream banks, armored resiliency to stabilize stream banks, critical area treatment including willow planting, seeding, mulching and top soiling, and cross vanes. Mature trees and bushes in the existing riparian corridor will be preserved where possible and removed only if absolutely necessary. Trees and bushes removed during the project will be utilized, if possible, onsite within the channel or on the banks for stabilization and/or fish habitat.

The focus for the project is not only to repair damage caused by the 2013 flooding, but also to build a more resilient floodplain corridor in order to better protect life, homes and structures in the event of high flows.” (Colorado EWP website 2016:).

## Aquatic Habitat Requirements:

Fish species in the project area is Brook Trout (Table 1) (B. Swigle and A. Treble, Colorado Parks and Wildlife, personal communication September 2016). Several brook trout of multiple age classes were observed at the site during the site visit. Brook trout spawn in the fall and bury their eggs in nests (redds) created in clean gravel (Lee et al. 1980, Scott and Crossman, 1998).

Habitat needed for trout species includes pools, riffles and runs. The project area is a high gradient stream with large boulders, cobbles and bedrock that create step pools. The stream flows are extremely low in the late summer resulting in poor habitat conditions.

Current aquatic habitat in the sites has low complexity with a few small pools, and high gradient riffles and cascades as the dominant habitat type. (Figure 1). The stream substrate is dominated by large cobbles and boulders. The stream channel is single stage in most locations with very little connection with the flood plain. The project area rates as “poor” habitat using the NRCS Stream Visual Assessment protocol (Figure 2).

Increased habitat diversity is needed in the restoration reaches to improve aquatic habitat. Pool habitat is lacking throughout the reaches and should be increased where possible. Creation of pools in proximity to constructed riffles or resilient bank protection

features would provide more habitat diversity in the reach. Resilient bank protection measures such as large wood provides both refuge habitat for fish and benthic macroinvertebrates.

A multi-stage channel with a meandering low flow channel, low bench between low flow and bank full, and flood plain connection above bank full provides habitat during all flow regimes. The low benches with vegetation planting of wetland or riparian species resilient to high flows provide velocity refuge habitat for fish species during mid to high flows.

### Species of Concern and Habitat that needs evaluation

There are no federally listed aquatic species in the project area. There are no State listed species in the project area.

**Table 1. Fish species known to occur in the Coal Creek project area.**

<b>CommonName</b>	<b>Scientific name</b>
Brook Trout	<i>Salvelinus fontinalis</i>

### Fish Passage Requirements

There are several fish passage obstructions in the project area. Any fish passage provided with the restoration should be designed for trout passage (Table 2). The culverts at the entrance to each residence are passage impediments for upstream migration. Water in the culverts is too shallow at low flows for fish to successfully pass. The downstream end of most of the culverts are perched above the water surface elevation and are inaccessible to migrating fish (Figure 1). At higher flows when the culvert entrances are accessible, the water velocity in the culvert may impede upstream fish passage.

There are two new road culverts being installed as part of a separate project in the Coal Creek project area, a downstream location in the Start area and an upstream location in Area 3. The current draft design specifies a multiple bay concrete box culvert. The design also shows a rock ramp at either end of the culverts. These rock ramps would allow fish to gain access to the culverts, however, the smooth concrete bottom may have water velocities too high for successful upstream passage. A natural bottom material would create a more variable velocity and depth pattern through the culvert and provide a better opportunity for fish passage.

**Table 2. Hydraulic design criteria for fish passage structures in the Colorado Front Range (Source: Richer et al. 2015)**

Species Assemblage	Velocity (ft/s)	Minimum Depth (ft)	Vertical Drop (ft)	Turbulence (*EDF)
Native minnows and darters	1-2	0.5	0.0	<7
Native dace and suckers	3-4	0.5	0.0	<7
Trout	3-6	0.5-1.0	0.5-1.0	<7

### **Floodplain, lateral and longitudinal connectivity requirements**

Channel design should include a multi-stage channel as recommended by the post-flood restoration guidelines (Richer et al. 2015). Lateral connectivity to the flood plain provides refuge habitat for aquatic species during high flows. In addition, organic input from the flood plain provides energy inputs in the form of leaf litter and other detritus. Longitudinal connectivity allows resident species to move within shorter reaches of the stream for feeding and reproductive needs.

Connectivity to the flood plain in the upper portion of the site is restricted due to the steep banks or constructed berms place to protect structures. There are some areas of lateral connection within the high banks and some connection to the flood plain in the lower half of the site. The low benches near the stream channel are vegetated and mostly stable in the lower half of the site. There is very little connection between the channel and flood plain in the upper portion of the site due to lack of space between the stream and adjacent structures.

Longitudinal connectivity may be seasonally fragmented within the project area due to current low water crossing. The design should include fish passage for trout where practical. Grade control structures such as a series of pool-riffle sequences with step pools at each riffle would provide the potential for longitudinal connectivity. Several riffle and pool riffle sequences are better for habitat diversity than steeper structures. The pools created downstream of the riffles would provide refuge habitat during low flows. Boulder/cobble riffles with a space between bed elements would replicate the natural riffles and drops in the stream. These types of riffles would also provide habitat conditions needed for stream benthic macroinvertebrates and their food sources.

### **Existing and potential invasive species**

No existing or potential invasive aquatic species were identified for this project area.

### Construction windows for sensitive species

The project area has non-native trout species that spawn in fall. These species require clean gravel substrate for successful reproduction. Construction timing should not occur during fall and winter, if possible to avoid impacts to spawning and incubating trout. Late summer through early fall construction would avoid impacts to trout.



**Figure 1. Coal Creek stream channel at Area 2 showing cobble boulder substrate, wide undefined channel and culverts.**



B. Element Scores *Coal Creek Start, Area 2, Area 3*

Element	Score	Element	Score
1. Channel Condition	2	14. Aquatic Invertebrate Community	
2. Hydrologic Alteration		15. Riffle Embeddedness	5
3. Bank Condition	4	16. Salinity	
4. Riparian Area Quantity	1	A. Sum of all elements scored	40
5. Riparian Area Quality	4	B. Number of elements scored	11
6. Canopy Cover	4	<b>Overall score: A/B <u>3.64</u></b> 1 to 2.9 Severely Degraded 3 to 4.9 <u>Poor</u> 5 to 6.9 Fair 7 to 8.9 Good 9 to 10 Excellent	
7. Water Appearance	8		
8. Nutrient Enrichment			
9. Manure or Human Waste			
10. Pools	4		
11. Barriers to Movement	4		
12. Fish Habitat Complexity	2		
13. Aquatic Invertebrate Habitat	2		

Figure 2. Coal Creek Stream Visual Assessment Summary sheet.

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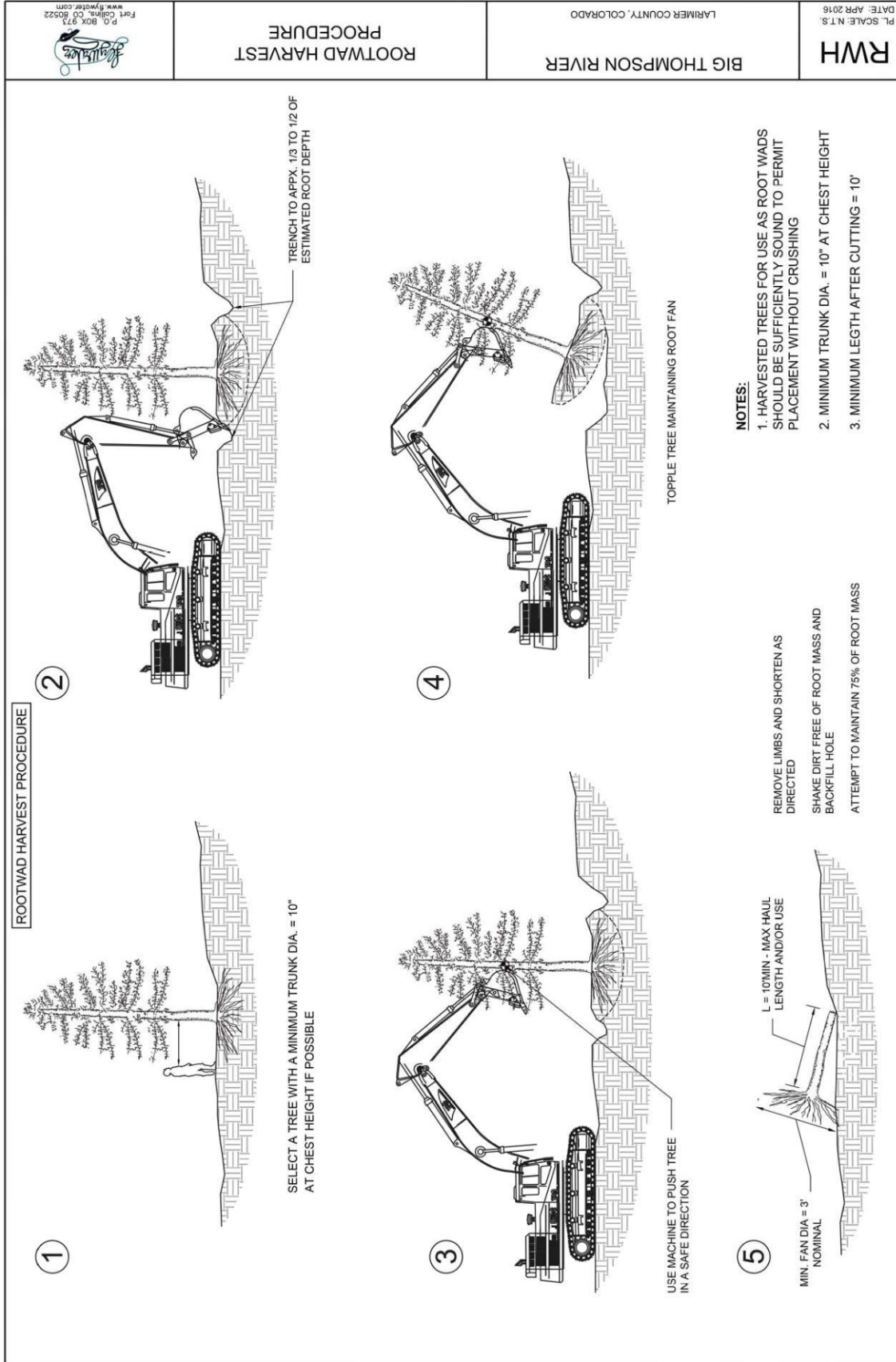
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Scott, W.B. and E.J. Crossman. 1998. Freshwater Fishes of Canada. Galt House Publications, Oakville, Ontario, Canada.

Swigle, B. 2016. Colorado Parks and Wildlife: Email communication regarding fish species in Left Hand Creek, Little Thompson River, Big Thompson River, North Fork Big Thompson River and Coal Creek. September 15, 2016.

Treble, A. 2016. Colorado Parks and Wildlife: Email communication regarding fish species in Left Hand Creek, Little Thompson River, Big Thompson River, North Fork Big Thompson River and Coal Creek. September 14, 2016.



LWM elements shall not be hollow or rotten, shall include bark, and be source from a coniferous tree. LWM may be limbed to 18" maximum length from trunk for transport, handling, and installation. Large woody material for construction shall include root mass and be measured as following:

- (1) Diameter: at 4.5 feet from the top of the rootwad.
  - a. Minimum diameter of 8- to 9-inches.
  - b. Nominal diameter of 10- to 12-inches.
  - c. Maximum diameter of 14- to 16-inches.
- (2) Length: 10 feet (minimum); longer trunk lengths up to the maximum practicable length (assumed 35+ feet) shall be provided. Length to be measured from top of log to bottom of log, which is to include the root wad.
- (3) The rootwad fan diameter shall be 3 feet minimum and 4 feet maximum.

Tree trunks without intact root mass shall be used as the footer log of the rootwad.

LWM shall be sourced from within the Project, be of non-invasive species, and be sourced from a coniferous tree. If insufficient LWM elements are generated by the Project, then LWM may be imported. Any LWM sourced from outside the Project boundaries shall be certified disease- and parasitic insect-free by a qualified Forester and shall be approved by the Engineer prior to use.

Anchor rocks/boulders used in rootwad construction shall be per Revision of Section 506, Boulders.

#### Delivery, Storage, and Handling:

LWM shall be harvested, handled, and stored according to subsection 202.101 Removal of Trees.

The contractor shall take care to protect the root wads and branches from damage during handling and installation of the rootwad.

### CONSTRUCTION REQUIREMENTS

Subsection 214.04 shall include the following:

Add the following subsections immediately following subsection 214.04 as follows:

**214.041 Rootwad placement.** Rootwad material shall be placed per the following:

- (a) Place Rootwads as specified and indicated in the Plans.
- (b) The contractor shall immediately notify the engineer if a specified log size is not available.
- (c) The location, element number, and configuration of rootwads may vary in field due to site conditions, and the final location of these structures will be approved by the Engineer in the field prior to construction. After construction, final rootwad number shall be totaled for payment.
- (d) Large woody material in the rootwad shall be secured in placement locations by designated anchoring method detailed on the plans. The contractor shall notify the engineer of additional measures needed to secure elements beyond those outlined in the plans.
- (e) Trench widths associated with log installation shall be limited to the log diameter plus 2 feet, and the contractor shall take care to minimize bank disturbance. Following construction, the contractor shall stabilize any disturbed banks using methods noted on the plans.

**214.042 Large woody material (LWM) Quality Control and Acceptance.** Large woody material shall be accepted per the following:

- (a) Verify that LWM delivered to the placement site meets the applicable quality, size, type, and number of elements presented in the Plans. Verification of materials sourced within Project limits shall be by visual inspection of quality and by measurement of trunk length/diameter.
- (b) Any LWM sourced from outside Project limits shall include Forester certification documentation.
- (c) Rejected materials shall be transported off-site and disposed of at Contractor expense outside of Project limits.
- (d) Verify that LWM has been placed to lines and grades indicated in plans. Verification shall be by visual inspection and survey of grade if specific elevations are identified on the Plans.

**METHOD OF MEASUREMENT**

Subsection 204.05 shall include the following:

Rootwads shall be measured by the number of installed rootwads assemblies as indicated in the Plans. Rootwad pay item shall include the large woody material with root mass intact, footer log, six anchor rocks/boulders, and all other materials or work necessary to complete the work. Willow stakes installed with rootwads will be counted and paid for separately.

**BASIS OF PAYMENT**

Subsection 204.06 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Rootwad	Each

**REVISION OF SECTION 216—  
SOIL RETENTION COVERING, EROSION CONTROL FABRIC, KOIRMAT 700**

Section 216 of the Standard Specifications is hereby revised for this project as follows:

**MATERIALS**

Subsection 216.02 (a) shall include the following:

5. *Soil Retention Covering, Erosion Control Fabric, Koirmat 700.* Blanket shall be Koirmat 700 manufactured by Nedia Enterprises, Inc., or approved equal.

Subsection 216.02 (b) shall be replaced with the following:

*Blanket Anchors.* Blanket anchors shall be 18- to 24-inch wood stakes made from cutting a 2"x4" at a diagonal per details in the plan set.

**CONSTRUCTION REQUIREMENTS**

Subsection 216.03 (b) shall include the following:

Soil Retention Covering, Erosion Control Fabric, Koirmat 700 shall be installed in accordance with the plans.

**METHOD OF MEASUREMENT**

Subsection 216.04 shall be replaced with the following:

216.04 Soil retention covering, including anchors, complete in place and accepted, will be measured by the square yard of finished surface. No allowance will be made for overlap.

**BASIS OF PAYMENT**

Subsection 214.05 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Soil Retention Covering, Erosion Control Fabric, Koirmat 700	Square Yard

**REVISION OF SECTION 506 —  
RIPRAP, VOID FILLED**

DESCRIPTION

Subsection 506.01 shall include the following:

The work consists of placing buried void filled riprap in accordance with the materials and placement specifications for riprap described in Section 506 or as modified in these Project Special Provisions.

MATERIALS

Subsection 506.02 shall include the following:

*Riprap, D50 12-Inch, Void Filled* - Rock requirement are to comply with riprap as specified in 506.02 or as modified herein.

The color of riprap and void-fill materials used to fill the riprap voids shall be light gray or tan and shall be uniform. Samples of riprap and void-fill materials shall be submitted for the review and approval of the ENGINEER prior to construction.

Where "Riprap, D50 12-Inch, Void Filled" is designated on the Contract Drawings, riprap shall be mixed with the materials and associated proportions listed in the table below to fill the voids of the riprap:

Approximate Proportions (loader buckets)	Material Type	Material Description
5	Riprap	D50 12-Inch riprap
3	Void-fill material	7-inch minus crushed rock surge (100% passing 7- inch sieve, 80-100% passing 6-inch sieve, 35-50% passing 3-inch sieve, 10-20% passing 1.5-inch sieve)
1	Void-fill material	2 to 4-inch cobble (round washed river rock that is well-graded, 100% passing 6-inch sieve, 35-50% passing 3-inch sieve 5-20% passing 2-inch sieve)
1	Void-fill material	4-inch minus pit run surge (round river rock and sand, well-graded 90-100% passing 4-inch sieve, 70-80% passing 1.5-inch sieve 40-60% passing 3/8-inch sieve 10-30% passing #16 sieve)
1	Void-fill material	Type II bedding
½ to 1	Void-fill material	Native topsoil
Top layer	Top dressing	Additional 4 to 12-inch cobbles (round washed river rock that is well graded, 80-100% passing 12-inch sieve. 35-50% passing 6-inch sieve, 5-20% passing 4-inch sieve) shall be mixed in on the surface of the void-filled riprap (covering approximately 40% of the surface) prior to compaction of the void-filled riprap. Cobbles shall be fully embedded into the mass of the void-filled riprap.

Note: Mix proportions and material gradations are approximate and are subject to adjustment by the ENGINEER. No adjustment in unit price for void-filled riprap will be allowed based on modifications to the mix proportions.

Subsection 506.03 shall be replaced with the following:

The riprap and void-fill materials shall be thoroughly mixed prior to placement and shall be installed and compacted so that a dense, interlocked layer of riprap and void-fill material is provided with riprap voids completely filled. The loose material shall be placed in a single lift of sufficient height such that final grade will be achieved upon compaction. If the compacted material is below final grade. Placement of only the smaller void-fill materials to achieve final grade will not be permitted. Segregation of materials shall be avoided and in no case shall the combined material consist primarily of the void-fill materials. The density and interlocking nature of riprap in the mixed material shall essentially be the same as if the riprap was placed without filling the voids.

A top dressing of cobbles shall be mixed in on the surface of the void-filled riprap material prior to compaction of the riprap material. The cobbles shall consist of rounded river rock that is well graded, ranging in size from 4 to 12 inches and of uniform gray or tan color.

Compaction of the void-filled riprap shall be performed by running over the void-filled riprap with a large, heavy duty track excavator or dozer. The moisture content of the mixture shall be at optimum conditions prior to compaction and water shall be added as necessary at the direction of the ENGINEER. Compaction of void-filled riprap shall be reviewed and approved by the ENGINEER.

Where indicated on the DRAWINGS, a surface layer of moist topsoil shall be placed over the void-filled riprap. The topsoil surface layer shall be compacted to approximately 85% of maximum density and within two percentage points of optimum moisture in accordance with ASTM D698. Topsoil shall be added to any areas that settle.

The Contractor shall install a test section of at least 60 square feet of void-filled riprap for the review and approval of the Engineer prior to installation of the remaining void filled-riprap.

Elevation tolerance for the void-filled riprap shall be 0.10 feet. Thickness of void-filled riprap shall be no less than thickness shown and no more than 2-inches greater than the thickness shown.

#### BASIS OF PAYMENT

Subsection 506.05 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Riprap, D50 12-Inch, Void Filled	Cubic Yard

Payment for riprap will be full compensation for all work and materials necessary to furnish and install.



**REVISION OF SECTION 506 —  
BOULDERS**

Section 506 of the Standard Specifications is hereby revised for this project to include the following:

**GENERAL**

Subsection 506.01 shall include the following:

This work includes construction of in-channel boulder features, including bank toe stabilization treatments, within Coal Creek. Each feature contains a variable number of boulders and rocks from on-site sources. Work includes the selection and placement of approved boulders and cobbles into distinct features as shown on the plans, including:

- a. Checks
- b. Drops
- c. Feature Boulder
- d. Boulder\ Toe

Delineations of what constitutes a single “feature” is depicted on the plans. Construction will be limited to areas as shown on the plans or as agreed to by the Engineer.

**MATERIALS**

Subsection 506.02 shall include the following:

**BOULDERS**

1. Boulders used shall be the type designated on the DRAWINGS and shall conform to Table 1.

*Table 1: Boulder Properties*

Boulder Classification	Nominal Size (inches)	Range of Smallest Dimension of Individual Rock Boulders (inches)	Maximum Ratio of Largest to Smallest Rock Dimension of Individual Boulders
B18	18	17-20	1.50
B24	24	22-26	1.50
B30	30	28-32	1.50
B36	36	34-38	1.50
B42	42	40-44	1.50
B48	48	45-51	1.50

2. The specific gravity of the boulders shall be two and one-half (2.5) or greater.

3. Boulder specific gravity shall be according to the bulk-saturated, surface-dry basis, in accordance with AASHTO T85.
4. The bulk density for the boulder shall be 1.3 ton/cy or greater.
5. The boulders shall have a percentage loss of not more than forty percent (40%) after five hundred (500) revolutions when tested in accordance with AASHTO T96.
6. The boulders shall have a percentage loss of not more than ten percent (10%) after five (5) cycles when tested in accordance with AASHTO T104 for ledge rock using sodium sulfate.
7. The boulders shall have a percentage loss of not more than ten percent (10%) after twelve (12) cycles of freezing and thawing when tested in accordance with AASHTO T103 for ledge rock, procedure A.
8. Rock shall be free of calcite intrusions. Revised 05/2016 31 37 00 - 5
9. Color:
  - a. The color of the boulders shall be gray with gray/blue hues or other acceptable colors approved by ENGINEER prior to delivery to the PROJECT site.
  - b. Color shall be consistent on the entire PROJECT and shall match the color of rock to be used for all other portions of the WORK.

#### CONSTRUCTION REQUIREMENTS

Subsection 506.03 shall include the following:

1. Following excavation and acceptance of subgrade by ENGINEER Boulder placement shall commence as follows:
  - a. Boulders shall be placed on the prepared subgrade in a manner which will minimize voids.
  - b. Voids between boulders exceeding 4" shall be chinked.
2. Feature Boulders serve an aesthetic function and as such shall be placed and rotated into final position as directed by ENGINEER in order to achieve the desired result.

#### METHOD OF MEASUREMENT

Subsection 506.04 shall include the following:

Construction of boulder features will be measured by either each boulder or lineal foot, constructed and completed in place and shall include all materials and work necessary to complete the work.

#### BASIS OF PAYMENT

Subsection 506.05 shall include the following:

The accepted quantities will be paid for at the contract unit price for each feature, including all labor and equipment required to complete the work.

<b>Pay Item</b>	<b>Pay Unit</b>
Feature Boulder	Each
Boulder Wall, 36-Inch, Double Stacked	Lineal Foot
Boulder Toe, 24-Inch	Each
Boulder Toe, 36-Inch	Each
Boulder, Drop Structure, 24-Inch	Each
Boulder, Drop Structure, 36-Inch	Each

Vegetation associated with each feature will be paid for under Sections 212-214.

**REVISION OF SECTION 625 —  
CONSTRUCTION LAYOUT AND SURVEYING**

**DESCRIPTION**

Subsection 625.01 shall include the following:

The work consists of pre-construction surveying and layout, an As-Built survey, and utility locating.

**CONSTRUCTION REQUIREMENTS**

Subsection 625.03 shall include the following:

A pre-construction survey shall be conducted to mark the limits of grading and location of proposed in-stream features as indicated in the construction plan set.

A post-construction survey shall be conducted to survey the final stations, elevations, and dimensions of constructed in-channel features and bench grading, at a minimum.

Prior to mobilization of construction equipment, Ecologists on the Emergency Watershed Protection (EWP) team shall field flag critical stands of existing vegetation which are not to be disturbed. The Engineer shall review flagged areas with the Contractor prior to initiation of construction activities. Construction equipment shall not be mobilized before the Contractor has reviewed the flagged vegetation with the Engineer.

The Contractor shall be responsible for coordinating with local Utility owners (i.e. Colorado811) and conducting a private utility survey to locate utilities on-site.

Overhead facilities exist within the project area near Highway 42. The Contractor shall use caution when operating large vehicles beneath these lines, and maintain minimum clearance as required by utility owners.

**REVISION OF SECTION 626 —  
MOBILIZATION AND DEMOBILIZATION**

**DESCRIPTION**

Subsection 626.01 shall include the following:

The contractor shall establish staging areas in coordination with the Engineer and Owner. The grading associated with creating this staging area is described in Section 203 and the revegetation after demobilization for this area is described in Section 212-214.) The Contractor shall use BMPs to best protect the floodplain area per Section 208. The Contractor shall restore any areas disturbed by staging that are outside the proposed grading as shown on the plans to pre-disturbance grade and native revegetation.

**REVISION OF SECTION 630 —  
CONSTRUCTION ZONE TRAFFIC CONTROL**

DESCRIPTION

Subsection 630.01 shall include the following:

This work consists of developing and implementing a traffic control/management plan (TCP). The TCP shall be approved by a Traffic Control Supervisor and submitted to Jefferson County for review and approval.

The Contractor shall obtain Oversize/Overweight permits from CDOT if applicable.

**REQUIREMENTS OF THE 404 PERMIT AND SB 40  
REGARDING PREVENTION OF THE SPREAD OF AQUATIC INVASIVE SPECIES**

Equipment and gear that were previously used in another stream, river, lake, pond or wetland, and that are to be used in or near the waters on the project, shall be treated to prevent the spread of aquatic invasive species. These species include, but are not limited to:

- (1) Eurasian watermilfoil
- (2) Zebra mussel
- (3) Quagga mussel
- (4) New Zealand mudsnail

Equipment that shall be treated includes all parts of machinery and vehicles of all types and sizes that came into contact with the live water.

Gear that must be treated includes boots, waders, hand tools, and all other materials and attire used previously in the live water.

The Contractor shall use one of the following two treatments:

- Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.)
- Spray/soak equipment with a solution of commercial grade quaternary ammonium disinfectant compound containing at least 8.0% active ingredient diluted in solution to achieve at least 0.8% concentration (roughly 12 ounces of product per gallon of water). Specifically, a 1:15 solution of Quat 4 or Super HDQ Neutral institutional cleaner and water, could be used for effective treatment.
- Treated equipment should be kept moist for at least 10 minutes, managing rinsate as a solid waste in accordance with local, county, state, or federal regulations

or

- Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.)
- Spray/soak equipment with water hotter than 140 degrees Fahrenheit for at least 10 minutes.
  
- Do not move water from one water body to another
- Be sure Equipment is dry before use.

Prior to moving such equipment onto the project, the Contractor shall submit to the Engineer a written list of the equipment and a signed certification that it was treated using one of the two methods specified above.

After project completion, this equipment shall be treated prior to its use in another stream, river, lake, pond or wetland.



P.O. Box 7093  
Golden, CO 80403

November 18, 2016

United States Army Corps of Engineers  
Attention: Kiel Downing  
Omaha District, Denver Regulatory Office  
9307 South Wadsworth Blvd.  
Littleton, CO 80128

Subject: Nationwide Permit 37 Pre-Construction Notification  
EWP Program Coal Creek Canyon Projects

Dear Mr. Downing,

The Coal Creek Canyon Watershed Partnership (CCCWP) is submitting this Nationwide Permit (NWP) 37 Pre-Construction Notification (PCN) for the Emergency Watershed Protection (EWP) Program's Coal Creek Canyon Projects in Jefferson County, Colorado.

NWP 37 – Emergency Watershed Protection and Rehabilitation was authorized on March 19, 2012 by the U.S. Army Corps of Engineers (Corps) and includes work done or funded by:

- (a) The Natural Resources Conservation Service (NRCS) for a situation requiring immediate action under its emergency Watershed Protection Program (7 CFR part 624);
- (b) The U.S. Forest Service under its Burned-Area Emergency Rehabilitation Handbook (FSH 2509.13);
- (c) The Department of the Interior for wildland fire management burned area emergency stabilization and rehabilitation (DOI Manual part 620, Ch. 3);
- (d) The Office of Surface Mining, or states with approved programs, for abandoned mine land reclamation activities under Title IV of the Surface Mining Control and Reclamation Act (30 CFR Subchapter R), where the activities does not involve coal extraction; or
- (e) The Farm Service Agency under its Emergency Conservation Program (7 CFR part 701).

The Coal Creek Canyon Projects fall under item (a) listed above, and complies with all relevant Nationwide General and Regional Permit Conditions. This PCN has been prepared following the general outline of NWP General Condition 31. The following Attachments are included in this PCN:

- Attachment A – Figures
- Attachment B – Design Plans
- Attachment C – Field Investigation Photolog and OHWM Forms
- Attachment D – Environmental Review Consultation
- Attachment E – Application for Department of the Army Permit





P.O. Box 7093  
Golden, CO 80403

### (1) Perspective Permittee

#### Applicant

Coal Creek Canyon Watershed Partnership  
Attn: David Kamin  
PO Box 7093  
Golden, CO 80537  
303.586.1491  
David@ccwp.org

#### Authorized Agent

Nan Elzinga  
Olsson Associates  
4690 Table Mountain Drive, Suite 200  
Golden, CO 80403  
303.374.3166  
nelzinga@olssonassociates.com

### (2) Project Location

The project is comprised of three project reaches located along approximately 1.25-miles of Coal Creek Canyon in Jefferson County, Colorado. The sites are referred to as Area Start, Area 2, and Area 3. The project is located in Sections 10, 14 and 15, Township 2N Range 71W and is located in upper foothills/lower montane riparian areas at an elevations ranging from approximately 7,100 to 7,300 feet. Please see Figure 1 in Attachment A for project location information.

### (3) Project Description

Heavy rains fell over the Coal Creek watershed in September 2013, causing flooding. Significant erosion occurred along many reaches of the Coal Creek, particularly on outer bends of the channel and adjacent to residential drive culverts. Imminent threats to structures and infrastructure were addressed with emergency repair projects implemented by the NRCS. This repair work was referred to as "Phase I" repairs, which would be followed by "Phase II" repairs. The intent of a second phase of projects is to accomplish longer term restoration measures.

The project proposes to remove unstable sediment and, where feasible, establish a vegetated floodplain. The project will also realign Coal Creek to better cross under Hwy 72, as well as provide bioengineering and rock toe protection to stabilize streambanks throughout the reach. Disturbed areas throughout the project site will be planted with willows, trees, and shrubs, and/or will be seeded and mulched. Specifically, the project will include the following work:

**Table 1. Project Components**

<b>Project Components</b>	<b>Coal Creek – Start, Area 2, Area 3</b>
Check Dam	92 linear feet
Bioengineering and Streambank Shaping	2,392 linear feet
Sediment/debris removal	200 cubic yards
Tree/shrub planting	2.34 acres
Seeding, mulching, and topsoiling	2.34 acres
<b>Total project footprint</b>	<b>3.84 acres</b>

Refer to Attachment B for the specific Design Plans.



#### **(4) Field Investigation**

Olsson Associates (Olsson) reviewed the National Wetland Inventory (NWI) information for the Coal Creek Canyon Project sites prior to going into the field and confirmed that no wetlands were on the NWI maps or present in the field. An NWI map of the project area is included as Figure 3 in Attachment A. A field investigation was conducted to determine the Ordinary High Water Mark (OHWM) at this section of Coal Creek.

Olsson staff visited the site on September 22, 2016, to conduct the field investigation. Olsson biologists walked the study area and closely inspected areas to investigate the site for hydric soils, hydrophytic vegetation, and wetland hydrologic regimes. Olsson confirmed absence of wetlands in the project area. Olsson biologists determined the OHWM for these sections of Coal Creek by assessing physical characteristics such as shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. See Figures 4A-4D in Attachment A for the field investigation maps. Photographs were taken during the site visit to document on-site conditions; the photolog of the field investigation and the OHWM forms are included as Attachment C.

Data points and the boundary of the OHWM were recorded using a Trimble Global Positioning System (GPS) with sub-meter accuracy. Olsson identified the OHWM of Coal Creek, which is classified by the NWI, and field validated as riverine non-wetland, jurisdictional waters with stream channels totaling 2,392 linear feet within the study area.

#### **(5) Non-Wetland and Waters of the U.S (WoUS) Impacts**

Total stream length within the jurisdictional waters to be improved with the work at this site is 2,392 linear feet. Impacts within the channel (total footprint of work within the OHWM) is 0.89 acres which will be permanent. Temporary impacts to 2.95 acres will be to upper foothills/lower montane riparian areas from streambank shaping, bioengineering, and seeding/mulching/topsoiling.

**Table 2. Non-Wetland WoUS Impacts**

<b>Non-Wetland WoUS</b>	<b>Cowardin Classification</b>	<b>Size</b>	<b>Potential Impacts within OHWM</b>
Coal Creek	Riverine	2,392 linear feet	0.89 acres

#### **(6) Mitigation and Restoration of Temporary Impacts**

For purposes of this submittal, the stream restoration project is anticipated to substantially improve stream health and function. Short term impacts of the construction process would be offset overtime by the stream improvements. Temporary stormwater and sediment control measures will be implemented in accordance with the Stormwater Construction Permit and Stormwater Management Plan required by Colorado Department of Public Health and Environment (CDPHE).



## (7) Threatened and Endangered Species

The Coal Creek Canyon projects underwent an environmental review in addition to the assessment of potential impacts to wetlands and waterbodies which included review of federal and state threatened and endangered species. Concurrence on a Biological Assessment prepared by NRCS for these EWP projects was received from the U.S. Fish and Wildlife on July 13, 2016. A copy of this concurrence is included as Attachment D.

**Table 3. Habitat Impact Table**

Species of Critical Habitat	Effects Determination	Biological Rationale
Preble's meadow jumping mouse	Not Likely to Adversely Affect	Project will improve habitat for PMJM by reducing erosion and sedimentation of streambanks and riparian area.
Greenback cutthroat trout	No Effect	Lack of fish passage from diversions and presence of predator species makes greenback cutthroat presence unlikely in this reach.
Mexican spotted owl-	No Effect	Sites do not have suitable forest/canyon habitat.
Ute ladies-tresses	No Effect	Projects are located above 6500' upper elevation for Ute ladies'-tresses.
Colorado butterfly plant	No Effect	Projects are located above the 5000-6400' elevation range where the butterfly plant occurs.
Canada lynx	No Effect	None expected here because of lack of suitable forest habitat and low elevation.
Black-footed ferret	No Effect	Project is in foothills/montane riparian habitat, not suited to ferrets or their prey species.
Arapahoe snowfly	Candidate species-no negative effects	Site is not in the stream reaches where this species is found
Greater sage grouse	No Effect	Species does not occur in our project area. Nearest occurrence is in the Laramie River drainage in Larimer County.
North Park phacelia	No Effect	Not found in Jefferson County where these sites are located
Least tern, Piping plover, Whooping crane, Pallid sturgeon, & Western prairie fringed orchid	No Effect	These species occur in Nebraska and are only affected if we do a water depleting project. This project does not deplete water from the Platte basin, so these species were not considered further for this project.
Eagles/Raptors	No Effect	No nests in area. Following Raptor Buffer Guidelines (CDOW 2008).

## (8) Cultural and Historic Resources

Cultural resources for this project area were evaluated by NRCS and were summarized in a Cultural Resources Inventory Report for NRCS Colorado Emergency Watershed Protection Locations along Coal Creek, Jefferson County, Colorado. The report was submitted to the Colorado State Historic Preservation Officer (SHPO) on April 12, 2016, and concurrence for the EWP Program projects along Coal Creek in Jefferson County, Colorado was received on April 20, 2016. A copy of the Inventory Report and the signed concurrence letter from the Colorado SHPO are included in Attachment D.



P.O. Box 7093  
Golden, CO 80403

## **(9) Floodplains**

The project areas are not located within a FEMA regulatory floodplain, but the applicant will procure a floodplain development permit from Jefferson County.

## **(10) Conclusion**

There would be work within non-wetland waters of the U.S., which could impact approximately 2,392 linear feet of Coal Creek, and 0.89 surface acres of waters within the OHWM. This would result in a temporary increase in fine sediment mobilization in the Coal Creek. Temporary stormwater and sediment control measures will be implemented in accordance with the Stormwater Construction Permit and Stormwater Management Plan required by CDPHE.

The net result of the project would be increased riparian habitats, improved stream health, reduced erosion, and improved flood retention and system stability. There would be no impact to cultural resources or threatened or endangered species.

Based on the above descriptions and assumptions, the 404 Permit Application is attached to this Report as Attachment E. Larimer County is requesting coverage under Nationwide Permit 37 for activities within 2,392 linear feet of the Coal Creek, and potentially occurring within 0.89 acres of non-wetland waters of the U.S. within the OHWM of Coal Creek.

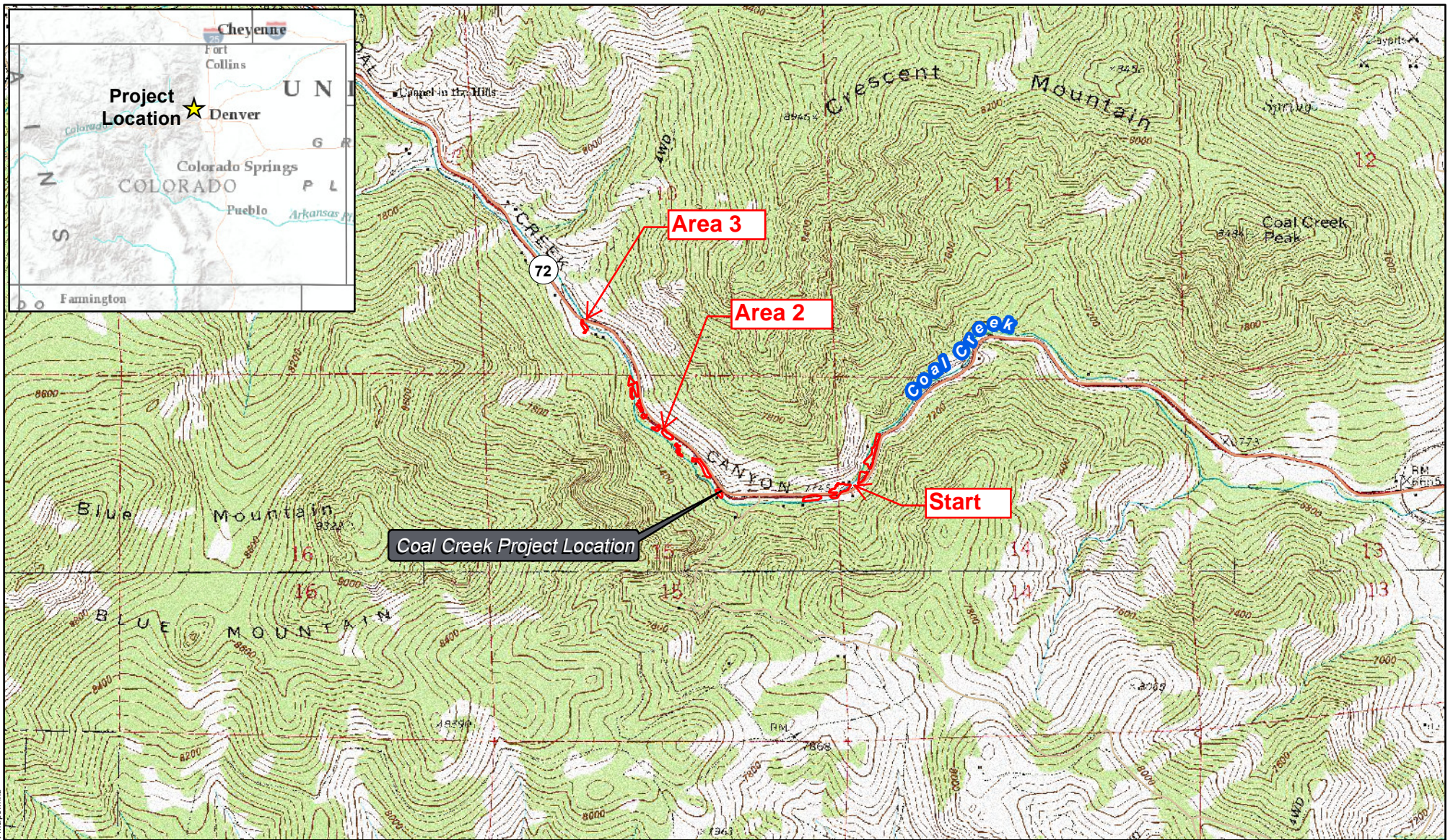
Thank you for your help on this project; if you have questions or comments concerning this PCN or any other aspects of this project, please contact David Kamin at 303.586.1491 and [David@ccwp.org](mailto:David@ccwp.org).


Sincerely,

David Kamin  
Watershed Coordinator

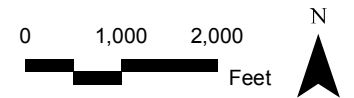
# Attachment A

## Figures



 Limits of Construction

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.



Project Number: 016-1310

Drawn By: JDF

Revision Date: 11/17/2016

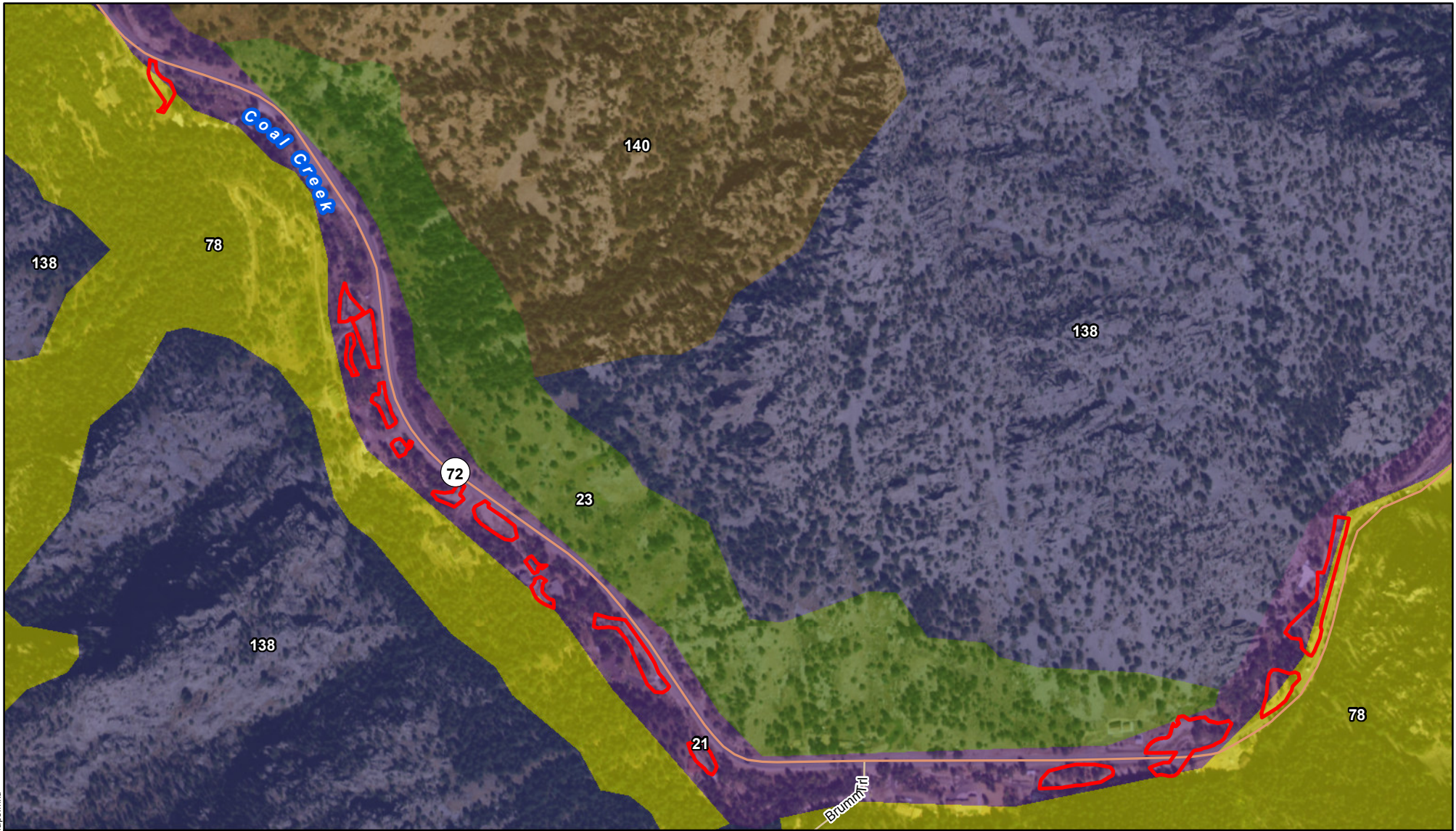
**USGS Topographic Map**  
 EWP Project - Coal Creek  
 Jefferson County, Colorado



4690 Table Mountain Drive  
 Suite 200  
 Golden, Colorado 80403  
 T: 303.237.2072  
 F: 303.237.2659

Figure

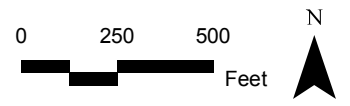
**1**



Limits of Construction

- Soil Type**
- 21 - Cryofluvents, 0 to 5 percent slopes
  - 23 - Curecanti very stony sandy loam, 15 to 50 percent slopes
  - 78 - Legault-Tolvar-Rock outcrop complex, 50 to 70 percent slopes
  - 138 - Rock outcrop, igneous and metamorphic
  - 140 - Rock outcrop-Cathedral-Ratake complex, 50 to 100 percent slopes

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.



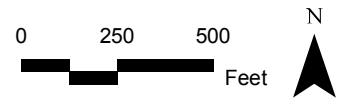
F:\2016\1001-1500\016-1310\40-Design\GIS\CoalCreek\_FCH\_Maps.mxd

Project Number: 016-1310	<b>SSURGO Soils Map</b> EWP Project - Coal Creek Jefferson County, Colorado	 4690 Table Mountain Drive Suite 200 Golden, Colorado 80403 T: 303.237.2072 F: 303.237.2659	Figure <b>2</b>
Drawn By: JDF			
Revision Date: 11/17/2016			



- Limits of Construction
- NWI Wetlands
- ~ Riverine

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.



F:\2016\1001-1500\016-1310\00-Design\GIS\Coal\_Creek\_PCN\_Maps.mxd

<i>Project Number: 016-1310</i>	<h3 style="margin: 0;">NWI Map</h3> <p style="margin: 0;">EWP Project - Coal Creek Jefferson County, Colorado</p>		4690 Table Mountain Drive Suite 200 Golden, Colorado 80403 T: 303.237.2072 F: 303.237.2659	<b>Figure</b>  <b>3</b>
<i>Drawn By: JDF</i>				
<i>Revision Date: 11/17/2016</i>				





- Limits of Construction
- ~ OHWM - 2,392 feet
- ~ Impacted Waters - 0.89 acre

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.



Project Number: 016-1310

Drawn By: JDF

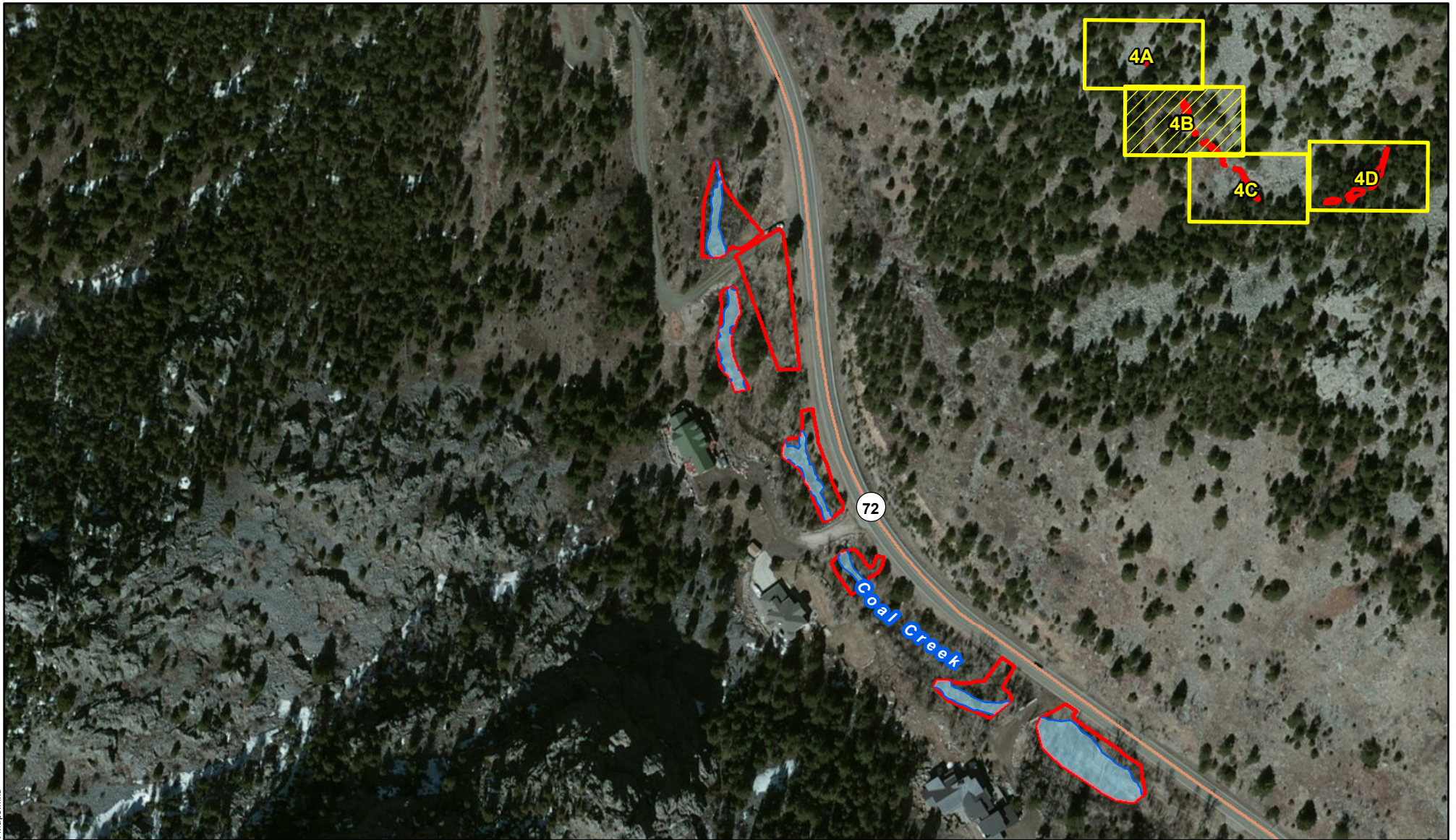
Revision Date: 11/17/2016

**Field Investigation Map**  
 EWP Project - Coal Creek  
 Jefferson County, Colorado



4690 Table Mountain Drive  
 Suite 200  
 Golden, Colorado 80403  
 T: 303.237.2072  
 F: 303.237.2659

Figure  
**4A**



- Limits of Construction
- ~ OHWM - 2,392 feet
- Impacted Waters - 0.89 acre

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.



Project Number: 016-1310

Drawn By: JDF

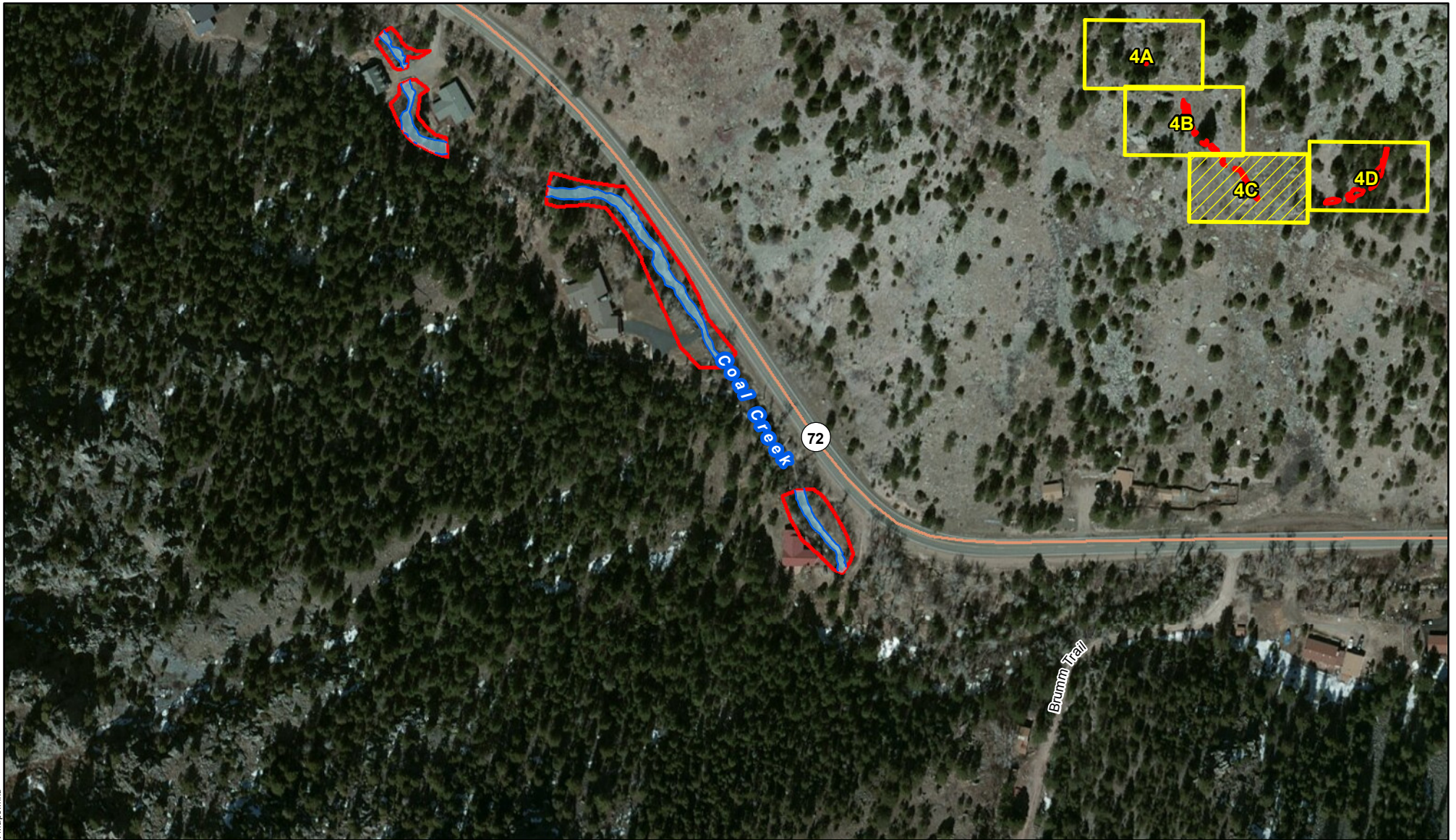
Revision Date: 11/17/2016

**Field Investigation Map**  
 EWP Project - Coal Creek  
 Jefferson County, Colorado



4690 Table Mountain Drive  
 Suite 200  
 Golden, Colorado 80403  
 T: 303.237.2072  
 F: 303.237.2659

Figure  
**4B**



- Limits of Construction
- ~ OHWM - 2,392 feet
- Impacted Waters - 0.89 acre

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Project Number: 016-1310

Drawn By: JDF

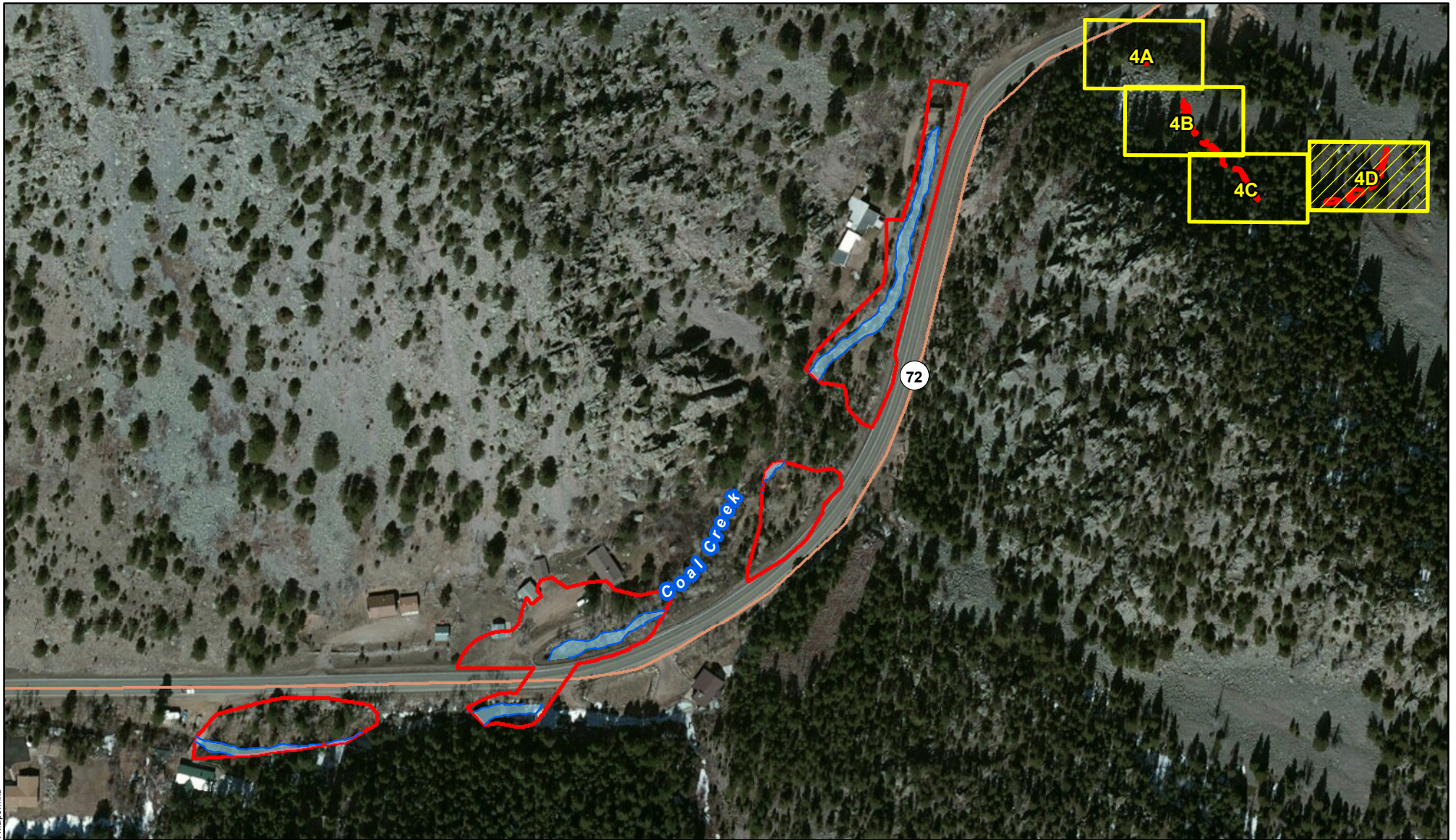
Revision Date: 11/17/2016

**Field Investigation Map**  
 EWP Project - Coal Creek  
 Jefferson County, Colorado



4690 Table Mountain Drive  
 Suite 200  
 Golden, Colorado 80403  
 T: 303.237.2072  
 F: 303.237.2659

Figure  
**4C**



- Limits of Construction
- ~ OHWM - 2,392 feet
- Impacted Waters - 0.89 acre

DISCLAIMER : This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Recorders office or the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.



Project Number: 016-1310

Drawn By: JDF

Revision Date: 11/17/2016

**Field Investigation Map**  
 EWP Project - Coal Creek  
 Jefferson County, Colorado



4690 Table Mountain Drive  
 Suite 200  
 Golden, Colorado 80403  
 T: 303.237.2072  
 F: 303.237.2659

Figure  
**4D**

# **Attachment C**

**Field Investigation Photolog and OHWM Forms**

**Photographic Log  
EWP Coal Creek Project**



**PHOTO 1**

**Subject:** Area 1 from the east end of the Project area.  
**View:** Upstream (northwest).



**PHOTO 2**

**Subject:** Property along southwest side of Area 1  
Project area.  
**View:** West.

**Photographic Log  
EWP Coal Creek Project**

**PHOTO 3**



**Subject:** Western end of Area 2 Project area.  
**View:** Upstream (north)

**PHOTO 4**



**Subject:** Midsection of Area 2 Project area.  
**View:** Downstream (southeast)

**Photographic Log  
EWP Coal Creek Project**



**PHOTO 5**

**Subject:** East end of Area 2 Project area.  
**View:** Upstream (northwest)



**PHOTO 6**

**Subject:** North side of Highway 72 within Start Project area.  
**View:** Downstream (northeast).



**PHOTO 7**

**Subject:** Eastern extent of Start Project area.  
**View:** Upstream (southwest)



**Project:** Coal Creek - Start Project**Date:** 9/22/2016**Location:** Jefferson County, Colorado**Investigator(s):** J. Katalinich**Project Description:**

Stream restoration project along Coal Creek.

**Describe the river or stream's condition (disturbances, in-stream structures, etc.):**

This section of Coal Creek is a moderate gradient stream with a single, narrow channel. Stream morphology consists of riffles and pools. The stream channel bottom mainly consists of cobble and gravel.

**Off-site Information**

**Remotely sensed image(s) acquired?**  Yes  No [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

Aerial imagery looked at prior to on-site investigation.

**Hydrologic/hydraulic information acquired?**  Yes  No [If yes, attach information to datasheet(s) and describe below.] Description:

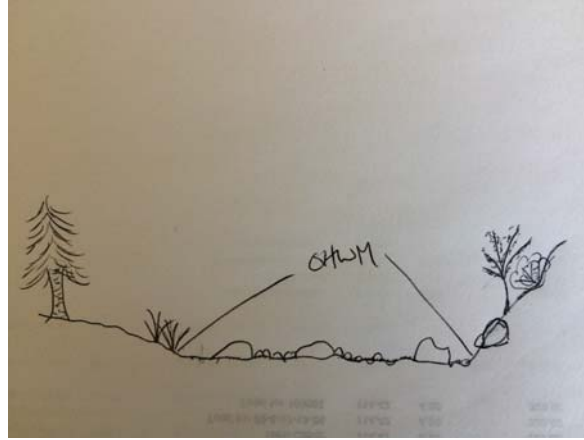
NWI map assessed prior to on-site investigation.

**List and describe any other supporting information received/acquired:**

NA

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

**Transect (cross-section) drawing:** (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



**Break in Slope at OHWM:**  Sharp (> 60°) |  Moderate (30–60°) |  Gentle (< 30°) |  None

Notes/Description:

Narrow channel generally confined to roadside and mountain hillside.

**Sediment Texture:** Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	10	30	10	40	10	
Below OHWM	10	20	15	30	25	

Notes/Description:

Stream bed consisted mostly of sand and silt with some gravel. Above the OHWM consisted mainly of sand and silt.

**Vegetation:** Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	60	30	10	0
Below OHWM	0	0	10	90

Notes/Description:

The vegetation profile above the OHWM consisted mostly of trees and shrubs. Below the OHWM was dominated by rock and bare ground with some herb species along the bank below the OHWM.

**Other Evidence:** List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Change in sediment structure and waterlines along rocks were the primary indicators of OHWM.

**Project:** Coal Creek - Area 2 Project**Date:** 09/22/2016**Location:** Jefferson County, Colorado**Investigator(s):** J. Katalinich**Project Description:**

Stream restoration project along Coal Creek.

**Describe the river or stream's condition (disturbances, in-stream structures, etc.):**

This section of the Coal Creek is a low gradient stream, single channel. Stream morphology consists of riffles. The stream channel bottom mainly consists of cobble and boulders.

**Off-site Information**

**Remotely sensed image(s) acquired?**  Yes  No [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

Aerial imagery looked at prior to on-site investigation.

**Hydrologic/hydraulic information acquired?**  Yes  No [If yes, attach information to datasheet(s) and describe below.] Description:

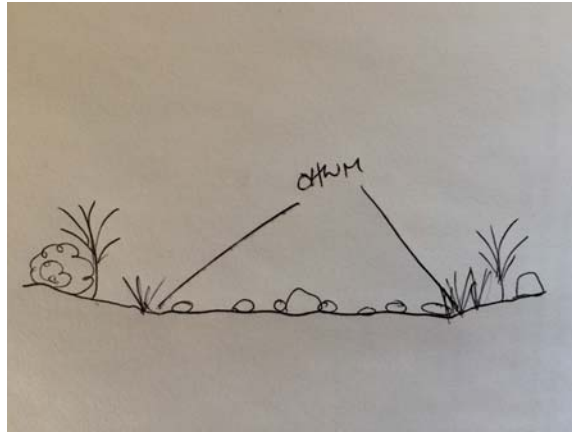
NWI map assessed prior to on-site investigation.

**List and describe any other supporting information received/acquired:**

NA

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

**Transect (cross-section) drawing:** (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



**Break in Slope at OHWM:**  Sharp (> 60°) |  Moderate (30–60°) |  Gentle (< 30°) |  None

Notes/Description:

Short channel section on bend.

**Sediment Texture:** Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	20	65	10	5	0	
Below OHWM	2	3	5	75	10	

Notes/Description:

Stream bed consisted mostly of cobble and small boulders.

**Vegetation:** Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	30	20	40	10
Below OHWM	0	0	10	90

Notes/Description:

The vegetation profile above the OHWM consisted mostly of shrubs and saplings. Below the OHWM was dominated by bare ground, with grasses along the bank below the OHWM.

**Other Evidence:** List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Change in vegetation and sediment structure were the primary indicators of OHWM.

**Project:** Coal Creek - Area 3 Project **Date:** 09/22/2016

**Location:** Jefferson County, Colorado **Investigator(s):** J. Katalinich

**Project Description:**

Stream restoration project along Coal Creek.

**Describe the river or stream's condition (disturbances, in-stream structures, etc.):**

This section of the Coal Creek is a moderate to low gradient single channel stream. Stream morphology consists of riffles and pools. The stream channel bottom mainly consists of cobble and boulders.

**Off-site Information**

**Remotely sensed image(s) acquired?**  Yes  No [If yes, attach image(s) to datasheet(s) and indicate approx. locations of transects, OHWM, and any other features of interest on the image(s); describe below] Description:

Aerial imagery looked at prior to on-site investigation.

**Hydrologic/hydraulic information acquired?**  Yes  No [If yes, attach information to datasheet(s) and describe below.] Description:

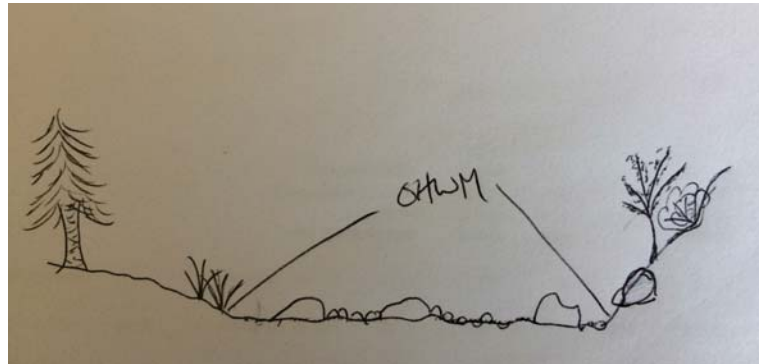
NWI map assessed prior to on-site investigation.

**List and describe any other supporting information received/acquired:**

NA

Instructions: Complete one cover sheet and one or more datasheets for each project site. Each datasheet should capture the dominant characteristics of the OHWM along some length of a given stream. Complete enough datasheets to adequately document up- and/or downstream variability in OHWM indicators, stream conditions, etc. Transect locations can be marked on a recent aerial image or their GPS coordinates noted on the datasheet.

**Transect (cross-section) drawing:** (choose a location that is representative of the dominant stream characteristics over some distance; label the OHWM and other features of interest along the transect; include an estimate of transect length)



**Break in Slope at OHWM:**  Sharp (> 60°) |  Moderate (30–60°) |  Gentle (< 30°) |  None

Notes/Description:

Channel confined to area between hillslope and roadside.

**Sediment Texture:** Estimate percentages to describe the general sediment texture above and below the OHWM

	Clay/Silt <0.05mm	Sand 0.05 – 2mm	Gravel 2mm – 1cm	Cobbles 1 – 10cm	Boulders >10cm	Developed Soil Horizons (Y/N)
Above OHWM	20	20	10	25	25	
Below OHWM	2	3	5	55	30	

Notes/Description:

Stream bed consisted mostly of cobble and small boulders.

**Vegetation:** Estimate absolute percent cover to describe general vegetation characteristics above and below the OHWM

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	30	20	40	10
Below OHWM	0	0	10	90

Notes/Description:

The vegetation profile above the OHWM consisted mostly of trees and shrubs. Below the OHWM was dominated by bare ground with grasses and weedy herbaceous species along the bank and below the OHWM.

**Other Evidence:** List/describe any additional field evidence and/or lines of reasoning used to support your delineation

Change in vegetation and sediment structure were the primary indicators of OHWM.

# **Attachment D**

## **Environmental Review Consultation**

## **U.S. Fish and Wildlife Service Concurrence**





# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
P.O. Box 25486, DFC (65412)  
Denver, Colorado 80225-0486



IN REPLY REFER TO:  
ES/CO: NRCS  
06E24000-2016-I-0609

Mr. Clint Evans  
State Conservationist  
Natural Resources Conservation Service  
Denver Federal Center  
Building 56, Room 2604  
P.O. Box 25526  
Lakewood, Colorado 80225

Dear Mr. Evans:

This responds to your letter received January 15, 2016, regarding the Natural Resource Conservation Service's (NRCS) proposed Phase II projects for the Emergency Watershed Program (EWP) in response to the 2013 September Flood in northern Colorado (Weld, Larimer, Boulder, and Jefferson counties). Additional projects were added in a letter received on April 11, 2016. You requested concurrence with your determination that the proposed projects may affect, but are not likely to adversely affect the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Prebles), Ute ladies' tresses orchid (*Spiranthes diluvialis*), and the Colorado butterfly plant (*Gaura neomexicana* var. *coloradensis*). You reached a No Effect determination for the greenback cutthroat trout (*Oncorhynchus clarkii stomias*), Mexican spotted owl (*Strix occidentalis lucida*) and the Canada lynx (*Lynx canadensis*). One of the sites includes water depletions and will involve consultation for the Platte River endangered species. These comments have been prepared under the provisions of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.).

The proposed action consists of 64 projects in sites damaged by the 2013 September Flood. Project activities include: bank stabilization and protection including bioengineering and rip-rap, streambank shaping, sediment/debris removal, and tree/shrub/grass plantings.

On June 6, 2016, we provided a letter that concurred with your determination for projects on four streams (Fall River, 5 sites; Upper Fish Creek, 1 site; Fish Creek, 2 sites; Fourmile Creek, 1 site).

In this letter, we also requested additional information on the remainder of the projects included in this consultation in order to better evaluate the site conditions and potential impacts of these proposed projects. We received additional site photographs and maps from your office on June 15, 2016.

Following our review of these site photographs and maps, we are able to provide a concurrence for your determination that the proposed projects may affect but are not likely to adversely affect the Preble's mouse. Our concurrence is provided for the following projects:

- Little Thompson – Private Ranch
- Little Thompson – Stagecoach Trail
- Big Thompson – North Fork Glen Haven Site (West Creek)
- Big Thompson – North Fork Glen Haven Site (Fox Creek)
- Big Thompson – Upper and Lower Canyon (Waltonia)
- Big Thompson – Upper and Lower Canyon (Mountain Shadow)
- Big Thompson – Upper and Lower Canyon (Mountain Shadow 2)
- Big Thompson – Upper and Lower Canyon (West Drake)
- Big Thompson – Upper and Lower Canyon (North Fork)
- Big Thompson – Upper and Lower Canyon (Confluence)
- Big Thompson – Upper and Lower Canyon (Moodie)
- Big Thompson – Upper and Lower Canyon (Cedar Grove)
- Big Thompson – Upper and Lower Canyon (Jasper)
- Upper Big Thompson – Estes Park (Riverside 1)
- Upper Big Thompson – Estes Park (Site 3)
  
- Upper Big Thompson – Estes Park (Visitor's Center)
  
- Upper Big Thompson – Estes Park (Living Town)
- Upper Big Thompson – Estes Park (Rock and Roll)
- Upper Big Thompson – Estes Park (Riverside 2)
- Fall River – FR1
- Fall River – FR2
- Fall River – FR4
- Fourmile Creek Canyon – Wagonwheel Gap
- Fourmile Creek Canyon – Reach 1
- Fourmile Creek Canyon – Ingram Gulch
- Fourmile Creek Canyon – Wallstreet
- North Saint Vrain Creek – Apple Valley
- South Saint Vrain Creek – 1
- South Saint Vrain Creek – 2
- South Saint Vrain Creek – 3

- Saint Vrain River – Breaches
- Left Hand Creek – Plains Reach (Haystack Golf)
- Left Hand Creek – Plains Reach (63<sup>rd</sup> St.)
- Left Hand Creek – Plains Reach (Nimbus Bridge)
- Left Hand Creek – Plains Reach (73rd)
- Left Hand Creek – Plains Reach (Deutshteing)
- Left Hand Creek – James Creek (LH-Lower James Creek)
- Left Hand Creek – James Creek (LH-Mill Street)
- Left Hand Creek – James Creek (LH-Jamestown)
- Left Hand Creek – James Creek (LH-2013 EWP Blowout)
- Upper Left Hand Creek – Upper LH Creek
- Upper Coal Creek – Start
- Upper Coal Creek – Area 2
- Upper Coal Creek – Area 3

If any additional species that are Federally-listed, proposed for Federal listing, or candidate for Federal listing are found at the project site, or if project plans change for the projects for which we are providing concurrence in this letter, this office should be contacted to determine if further consultation will be required.

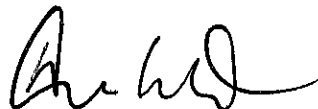
We continue to coordinate with Terri Sage of your office to more fully evaluate the remainder of the projects. These remaining projects appear to have some Preble's habitat present, based on the site photographs, and this habitat may be impacted by the proposed projects, although more project information is needed in order to fully evaluate these projects. These projects include:

- Little Thompson – Millikin
- Little Thompson – Green Bridge
- Little Thompson – 83<sup>rd</sup> St. Bridge
- Upper Big Thompson – Estes Park (Broadview)
- Upper Big Thompson – Estes Park (L. Broadview 1 up)
- Upper Big Thompson – Estes Park (L. Broadview 2 down)
- Middle South Platte – Latham Diversion
- Middle South Platte – Confluence
- Middle South Platte – Hwy 60
- Saint Vrain River – McConnel Dr.
- Left Hand Creek – Plains Reach (41<sup>st</sup> St. Bridge)
- Left Hand Creek – Plains Reach (81<sup>st</sup> St. Bridge)
- Left Hand Creek – Plains Reach (Airport Road Bridge)
- Left Hand Creek – Plains Reach (B-H)

- Left Hand Creek – Streamcrest (LH-Ranch)
- Left Hand Creek – Streamcrest (LH-Streamcrest)
- Left Hand Creek – Streamcrest (LH-Lefthand CD)

We look forward to continuing to coordinate with you on these remaining projects. If you require additional information, please contact Leslie Ellwood of this office at (303) 236-4747.

Sincerely,

A handwritten signature in black ink, appearing to read "Drue DeBerry". The signature is fluid and cursive, with a large initial "D" and "B".

Drue DeBerry  
Acting Colorado Field Supervisor

cc: CFO (L. Ellwood)

Ref: Projects\NRCS\NRCS\_EWP\_2016\_Flood Response\_Northern CO\_FWS concur\_Select Projects

## **Colorado SHPO Consultation and Concurrence**

United States Department of Agriculture



United States Department of Agriculture

Denver Federal Center  
Bldg. 56, Rm. 2604  
P.O. Box 25426  
Denver, CO 80225-0426

April 12, 2016

Ms. Amy J. Pallante  
Intergovernmental Services Unit Director  
Office of Archaeology and Historic Preservation  
History Colorado Center, 1200 Broadway  
Denver, Colorado 80203

Reference: *Cultural Resources Inventory of Emergency Watershed Protection (EWP) Locations Along Coal Creek, Jefferson County, Colorado*

Dear Ms. Pallante:

Enclosed are a project CD and a cultural resources reports for a Natural Resources Conservation Service (NRCS) Colorado Emergency Watershed Protection (EWP) undertaking in Jefferson County, Colorado. In brief, NRCS Colorado is providing technical and financial assistance to complete emergency watershed protection projects on Coal Creek in Jefferson County. Specifically, the undertaking proposes to complete stream embankment stabilization, sediment and debris removal, and infrastructure repairs. The goal of the undertaking is to restore stream conditions while protecting property and public infrastructure from further damage or destruction.

The NRCS completed a cultural resources inventory in the summer and fall of 2015. Three previously-identified archaeological sites were observed within or adjacent to the work locations. The NRCS has determined the undertaking will result in no adverse effects to any known historic properties and recommends that repair work proceed as planned.

The NRCS requests concurrence for the determination project effects for these undertakings. If you have any questions, comments, or concerns, please contact me at 801-524-4556 at your earliest possible convenience.

Sincerely,

A handwritten signature in green ink, appearing to read "Andrew M. Williamson".

ANDREW M. WILLIAMSON  
NRCS Utah State Cultural Resources Specialist  
Acting NRCS Federal Preservation Officer

Enclosures

cc: (w/o encl)

Greg Langer, District Conservationist, NRCS, Colorado Springs, Colorado  
Tod Boldt, EWP Specialist, NRCS, Fort Collins, Colorado  
Tim Macklin, WGA Liaison, NRCS, Denver Colorado

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An Equal Opportunity Provider and Employer



**LIMITED-RESULTS CULTURAL RESOURCE SURVEY FORM**  
(Page 1 of 3)

This form (#1420) is for small scale limited results projects - block surveys less than 160 acres with linear surveys under four miles. Additionally, there should be no sites and a maximum of four Isolated Finds. This form must be typed.

**I. IDENTIFICATION**

1. **Report Title:** 2015 Cultural Resources Inventory of Emergency Watershed Protection (EWP) Locations Along Coal Creek, Jefferson County, Colorado
2. **Date of Field Work:** December 9, 2015
3. **Form completed by:** Andrew M. Williamson **Date:** April 12, 2016
4. **Survey Organization/Agency:** NRCS Colorado  
**Principal Investigator:** Andrew M. Williamson (FPO) and Marsha Sims (CRS- Retired)  
**Principal Investigator's Signature:**   
**Other Crew:** Joshua Tashiro  
**Address:** P.O. Box 25426, Denver, Colorado, 80225
5. **Lead Agency / Land Owner:** USDA- NRCS  
**Contact:** Andrew M. Williamson (FPO) and Marsha Sims (CRS- Retired)  
**Address:** P.O. Box 25426, Denver, Colorado, 80225
6. **Client:** Colorado Department of Natural Resources
7. **Permit Type and Number:**
8. **Report / Contract Number:**
9. **Comments:** For specific land owner information contact: Colorado Department of Natural Resources-CWCB, 1313 Sherman St. Room 721, Denver, CO, 80203; (303) 866-3441, Kevin.Houck@state.co.us.

**II. DESCRIPTION OF UNDERTAKING / PROJECT**

10. **Type of Undertaking:** Emergency Watershed Protection and Restoration
11. **Size of Undertaking (acres):** 4.81 **Size of Project (if different)**
12. **Nature of the Anticipated Disturbance:** Rebuild and stabilize a diversion for irrigation.
13. **Comments:** NRCS Colorado is providing technical and financial assistance under the Emergency Watershed Protection (EWP) Program to help protect private infrastructure along Coal Creek in Jefferson County. As designed the undertaking proposes to remove sediment and debris from three locations along Coal Creek. The undertaking also proposes to install embankment protection and grade stabilization structures to restore the channel to pre-flood conditions. Once completed, the undertaking will complete vegetation planting to help prevent erosion during future flood events.

**III. PROJECT LOCATION**

Please attach a photocopy of USGS Quad. clearly showing the project location. The Quad. should be clearly labeled with the Prime Meridian, Township, Range, Section(s), Quad. map name, size, and date. Please do not reduce or enlarge the photocopy.

14. Description: The undertaking is located within the Coal Creek stream channel adjacent to Coal Creek Canyon Road in Jefferson County.

15. Legal Location: Quad. Map: Eldorado Springs Date(s):

Principal Meridian: 6th  NM  Ute

NOTE: Only generalized subdivision ("quarter quarters") within each section is needed

Township: 02 South Range: 71 West Section(s): 10 1/4s SW, SE ;

Township: 02 South Range: 71 West Section(s): 10 1/4s NW ;

Township: 02 South Range: 71 West Section(s): 14 1/4s NW, NE, and SW ;

If section(s) is irregular, explain alignment method:

16. Total number of acres surveyed: 4.81

17. Comments: The project APE has been heavily eroded.

**IV. ENVIRONMENT**

18. General Topographic Setting: Stream channel and embankments on Coal Creek in Jefferson County

Current Land Use: Stream Channel surrounded by agricultural land

19. Flora: Native species, pine, cottonwood, invasive grasses

20. Soils/Geology: colluvium and alluvium gravels

21. Ground Visibility: high (70-90%)

22. Comments: Heavy undergrowth on either side of stream channel.

**V. LITERATURE REVIEW (to be completed by NRCS Cultural Resources Specialist)**

23. Location of File Search: Compass Online Database Date: 3/8/2016

24. Previous Survey Activity Limited inventories restricted to roadwork on Highway 72.  
In the project area:

In the general region:

A number of block pedestrian cultural resources inventories have been completed within a mile of the project APE. These were completed by SWCA Environmental Consultants in 2000 in support of the proposed Coal Creek Canyon Open Space Park.



**VI. LITERATURE REVIEW** (continued)

25. **Known Cultural Resources** Three sites (5JF.2235, 5JF.2236, and 5JF4638) are within or adjacent to the project APE. All three have been determined ineligible for the NRHP.  
In the project area:

In the general region: Literature review indicates historic period culverts along Highway 72. Sites in the surrounding area include isolated mining features, historical residences, and historical structural remains.  
(summarize)

26. **Expected Results:** It is expected that little prehistoric evidence would remain within the project area given the disturbed nature of the project APE within an active floodplain. It is also expected that historical sites and features would be present within the project area, most of which would be culverts or infrastructure related to Highway 72 or the surrounding residences.

**VII. STATEMENT OF OBJECTIVES**

27. The objectives of the undertaking are to restore the Coal Creek stream corridor to conditions that existed prior to the 2013 flood, and to install stream embankment protective measures that insure the safety of residents and public infrastructure within the project APE. For the pedestrian cultural resources inventory, the objective is to identify historic properties that could be adversely affected as a result of the proposed repair work.

**VIII. FIELD METHODS**

28. **Definitions: Site** Five or more artifacts or items that provide specific locus of human activity.

IF Four or fewer artifacts or items that do not show a specific locus of human activity.

29. **Survey Method:** All areas of physical ground disturbance were examined by NRCS personnel in transects spaced less than 50 feet apart. The eroded embankments were also visually inspected for evidence of subsurface archaeological deposits.

**IX. RESULTS (to be completed by NRCS Cultural Resources Specialist)**

30. List IFs if applicable. Indicate IF locations on the map completed for Part III.

- A. Smithsonian Number: 5JF.2235      Description: Historical culvert (within APE)
- B. Smithsonian Number: 5JF.2236      Description: Historical culvert (within APE)
- C. Smithsonian Number: 5JF.4638      Description: Historical Residence (adjacent to the APE)
- D. Smithsonian Number:                  Description:

31. Using your professional knowledge of the region, why are there none or very limited cultural remains in the project area? Is there subsurface potential?

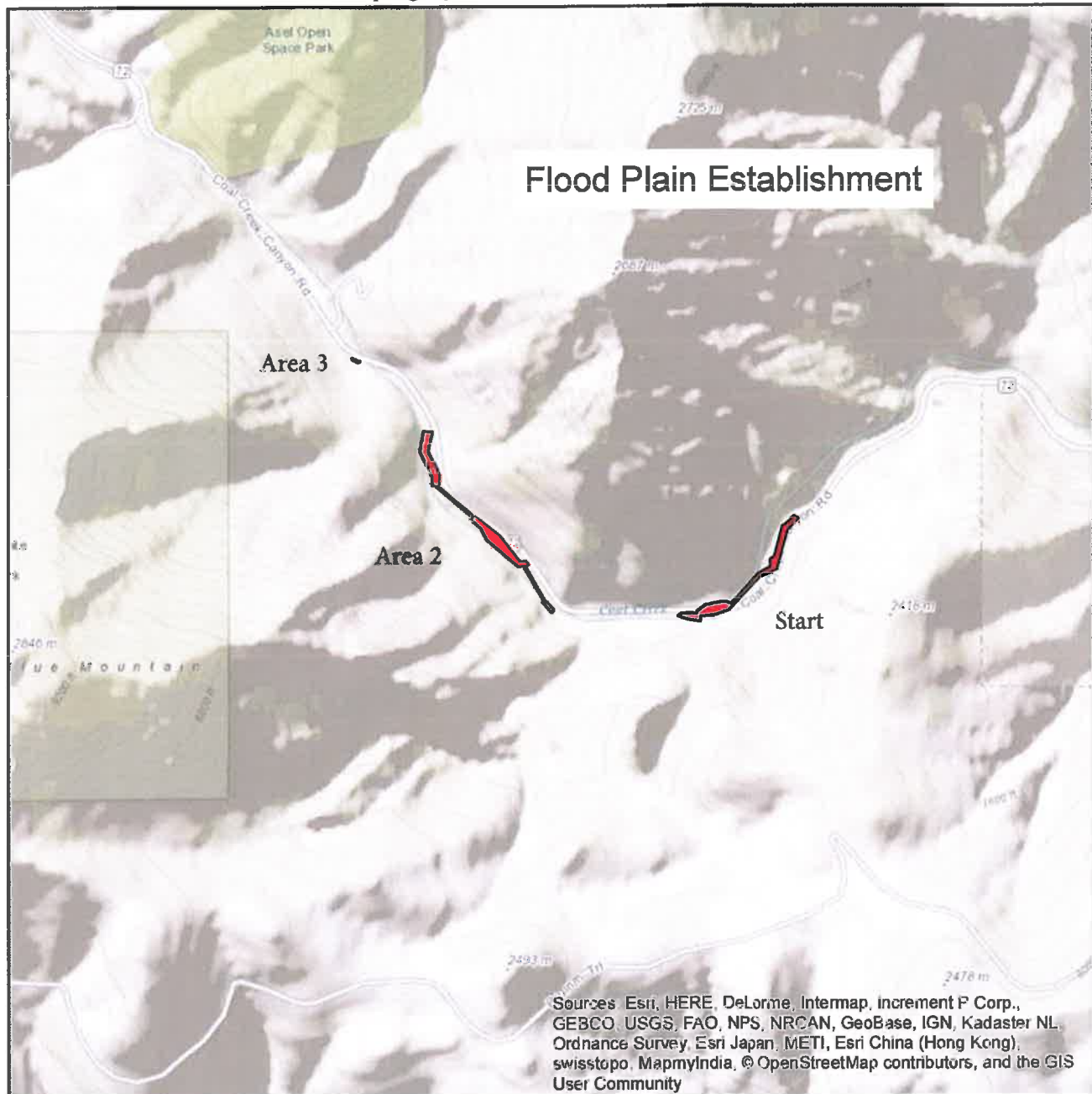
Two previously-recorded historical culverts (5JF.2235 and 5JF.2236) were identified within the project APE. A third historical residence (5JF.4638) was observed adjacent to the APE. All three sites have been determined not eligible for the NRHP and will not be affected as a result of the proposed undertaking. Therefore, the NRCS has determined that no historic properties will be affected as a result of the proposed undertaking. Cultural resources and subsurface potential within the APE is generally limited due to the high amount of flood activity within the Coal Creek stream channel.

# Cultural Resources Map

Date: 9/16/2015

Customer(s): Colorado Department of Natural Resources-CWCB  
Project: Area 3, Area 2, Start  
Acres: 0.03 ac, 2.59 ac, 2.19 ac  
Legal Description:  
SW 1/4 SE 1/4 Sec 10 2S 71W Eldorado Springs Quad,  
NE 1/4 Sec 10 2S 71W Eldorado Springs Quad,  
W 1/2 NW 1/4 Sec 14 2S 71W Eldorado Springs Quad

Field Office: EWP Task Force  
Agency: USDA NRCS  
Assisted By: Josh Tashiro  
State and County: CO, Jefferson



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

## Legend

 Area Surveyed

0 0.125 0.25 0.5 0.75 1 Miles



# Cultural Resources Map

Date: 9/16/2015

Customer(s): Colorado Department of Natural Resources-CWCB

Project: Area 3, Area 2, Start

Acres: 0.03 ac, 2.59 ac, 2.19 ac

Legal Description:

SW 1/4 SE 1/4 Sec 10 2S 71W Eldorado Springs Quad,

NE 1/4 Sec 10 2S 71W Eldorado Springs Quad,

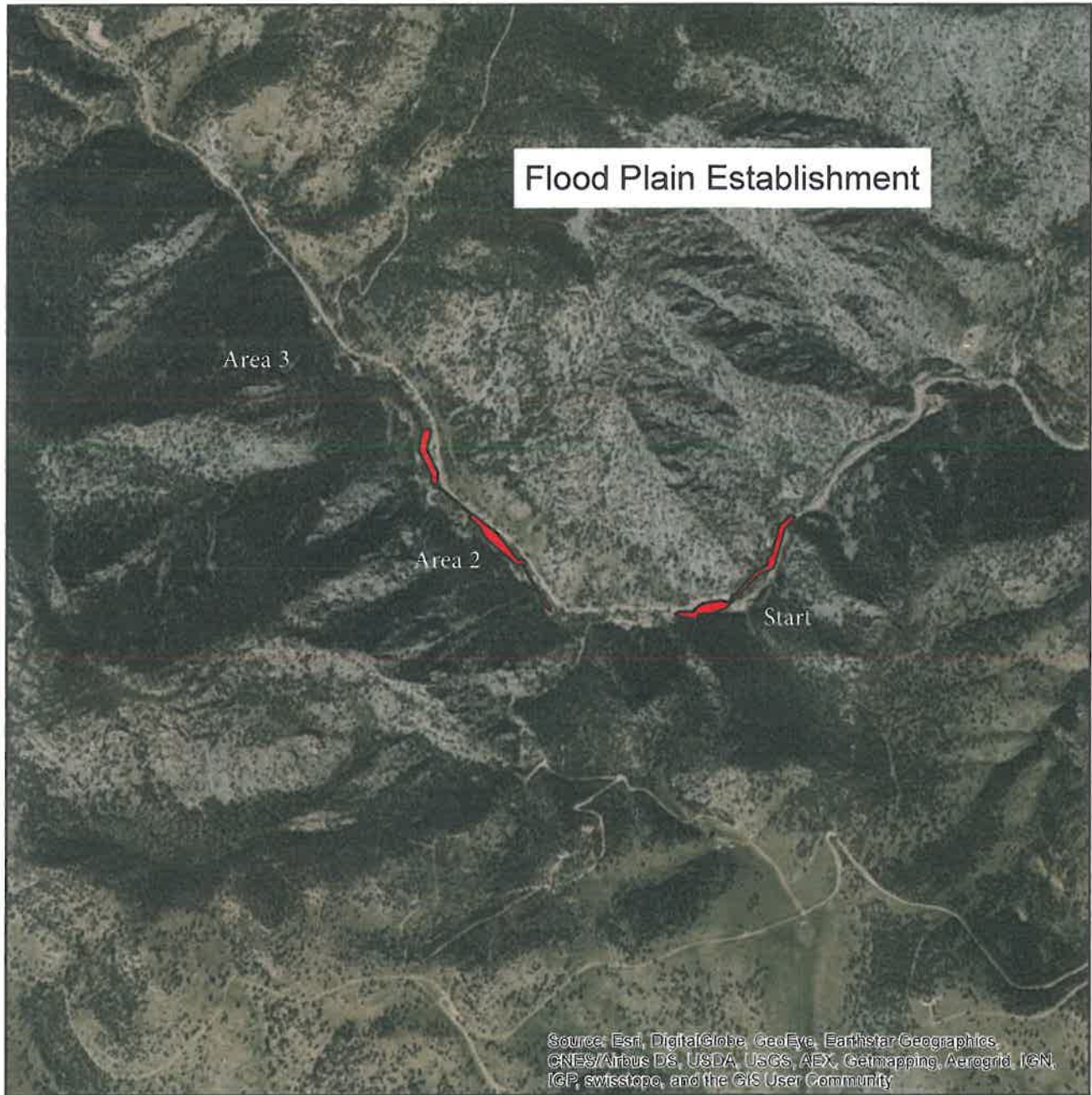
W 1/2 NW 1/4 Sec 14 2S 71W Eldorado Springs Quad

Field Office: EWP Task Force

Agency: USDA NRCS

Assisted By: Josh Tashiro

State and County: CO, Jefferson



## Legend



Area Surveyed

0 0.125 0.25 0.5 0.75 1 Miles





**Overview of erosion and debris at the Start location.**



**Overview of erosion and debris at the Start location.**



**Closeup view of debris at road crossing at Start location.**



**Overview of erosion along Coal Creek from 2013 flooding.**



**Closeup view of erosion adjacent to Highway 72.**



**Closeup view of eroded and exposed culvert.**



**Overview of debris accumulation along Coal Creek.**



**Overview of debris accumulation along Coal Creek.**



April 20, 2016

Andrew M. Williamson  
Utah State Cultural Resources Specialist  
Acting NRCS Federal Historic Preservation Officer  
Natural Resource Conservation Service  
Denver Federal Center  
Bldg. 56, Rm. 2604  
P.O. Box 25426  
Denver, Colorado 80225-0426

Re: Cultural Resources Inventory of Emergency Watershed Protection (EWP) Locations Along Coal Creek, Jefferson County, Colorado (HC #70097)

Dear Mr. Williamson:

We received your correspondence dated April 12, 2016 on April 18, 2016 initiating Section 106 consultation with our office for the above referenced undertaking.

In consideration of the information provided to our office, we concur with your finding that the undertaking will result in no historic properties affected pursuant to 36 CFR 800.4(d)(1).

Should unidentified archaeological resources be discovered in the course of the undertaking, work must be interrupted until the resources have been evaluated in terms of the National Register eligibility criteria (36 CFR 60.4) in consultation with our office pursuant to 36 CFR 800.13. Also, should the consulted-upon scope of the work change please contact our office for continued consultation under Section 106.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings. Please note that our compliance letter does not end the 30-day review period provided to other consulting parties.

Thank you for the opportunity to comment. If we may be of further assistance please contact Mark Tobias, Section 106 Compliance Manager, at (303) 866-4674 or [mark.tobias@state.co.us](mailto:mark.tobias@state.co.us).

Sincerely,

A handwritten signature in blue ink that reads "Steve Turner".

for Steve Turner, AIA  
State Historic Preservation Officer  
ST/mt





Jefferson County, Colorado  
Planning & Zoning Division

100 Jefferson County Parkway, Suite 3550, Golden, Colorado 80419-3550  
☎ 303.271.8700 • Fax 303.271.8744 • <http://planning.jeffco.us>

# FLOODPLAIN PERMIT

Permit #  FL

Drainageway

Date

Fees are on-line at our web site or call 303-271-8700. Make checks payable to Jefferson County Treasurer.

Name of Applicant	Phone #	Email
<input type="text"/>	<input type="text"/>	<input type="text"/>
Name of Engineer	Phone #	Email
<input type="text"/>	<input type="text"/>	<input type="text"/>
Name of Builder/Contractor	Phone #	Email
<input type="text"/>	<input type="text"/>	<input type="text"/>

## General Provisions

- No work of any kind may start until a permit is issued.
- The permit may be revoked if any false statements are made herein.
- Proposed building shall not be occupied until a Certificate of Occupancy is issued.
- The permit will expire in 2 years after permit approval. A maximum of one 180-day extension is allowed.
- The applicant is hereby informed that other permits may be required to fulfill local, state, and federal regulatory requirements.

I hereby certify that all statements herein and the attachments to this application are, to the best of my knowledge true and accurate.

In Consideration for the granting of this permit by Jefferson County, I hereby give permission for County staff, County board members, or County contractors to enter upon my property for the purpose of site inspections and investigations and to remove or correct and hazardous or unsafe conditions.

Please specify any extraordinary circumstances of which staff should be aware i.e., dogs on the site, locked gate, etc.


Signature of Applicant

Address of Proposed Development

Address or Legal Description of Site

## Description of Project *(Please check appropriate boxes)*

<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> Assessory	<input type="checkbox"/> New Construction <input type="checkbox"/> Addition/Improvements	Market Value of Existing Structure \$ <input type="text"/>
<input type="checkbox"/> Mobile Home	In Manufactured Home Park <input type="checkbox"/> Yes <input type="checkbox"/> No	Market Value after Proposed Construction \$ <input type="text"/>
<input type="checkbox"/> Fill <input type="checkbox"/> Deck <input type="checkbox"/> Watercourse <input type="checkbox"/> Utilities <input type="checkbox"/> Fence <input type="checkbox"/> Sign <input type="checkbox"/> Storage <input type="checkbox"/> Other <input type="text"/>	See Section 30 of the Jefferson County Zoning Resolution for Submittal Requirements.  All submittals shall be electronic.	

**Staff Use Only**

The proposed development is located on FIRM Panel No.  Dated February 5th 2014

The proposed development is located in the:  Floodway  Floodfringe

**For additions/improvements**

Previous cumulative improvement percent during the past 5 years

Project improvement percent is  Total improvement percentage is

The proposed building addition and/or improvement is  Substantial  Not Substantial

The Base Flood Elevation or depth number at the development site is

**Base Flood Elevation Determined By:**

Firm  Flood Insurance Study  Urban Drainage Study  Owners Engineers Study  Other

**Additional Information**

MSL Elevation, or depth number to which structure is to be elevated  feet.

Mean Sea Level (MSL) Elevation or depth number to which the structure is to be floodproofed  feet.

All necessary information and certificates are attached.

**Design Certification provided for the following criteria**

- Floodway *(always required)*  Elevation  Floodproofing *(assessory buildings only)*
- Contruction Materials  Anchoring  Utilities

**Action**

- PERMIT IS CONDITIONALLY APPROVED** *(I have reviewed the plans and materials submitted in support of the proposed development and find them in compliance with applicable Floodplain Management Standards).*

County Approval  Date

**Conditions as required by Section 30 of the Zoning Resolution**

- Conditioned on Submittal and Approval of an Elevation Certificate  *Received and Approved*
- Conditioned on Submittal and Approval of a Floodproofing Certificate  *Received and Approved*
- Conditioned on Submittal and Approval of As Built Drawings  *Received and Approved*
- Conditioned on Submittal and Approval of a Construction Certification  *Received and Approved*

FW    
 *(within floodway)*

BL    
 *(flood fringe building)*

NBL    
 *(non-building flood fringe)*

- PERMIT IS APPROVED**

County Approval  Date

- PERMIT IS DENIED** *(The proposed development is not in conformance with applicable Floodplain Management Standards. See explanation attached).*

**REFER TO THE BOARD OF ADJUSTMENT FOR VARIANCE ACTION** *(The proposal is not in conformance with applicable Floodplain Management Standards. See explanation attached).*

Board of Adjustment Case Number

Affected Properties:

Also see attached design documents for a detailed map of the project area. CCCWP holds access agreements from these landowners which will allow Jefferson County staff to enter these properties for the purposes of inspections and permitting.

START		
SIMONETTI PIETRO	27469 STATE HWY 72	GOLDEN, CO 80403
EDWARDS DAVID M	27589 STATE HWY 72	GOLDEN, CO 80403
CAMERON LARRY D	VACANT	
RUNE DONNA G	27750 STATE HWY 72	GOLDEN, CO 80403
AREA 2		
LOWE JACK E JR	28110 STATE HWY 72	GOLDEN, CO 80403
GIFFIN JOHN E	28220 STATE HWY 72	GOLDEN, CO 80403
BARRETT TERRY	28300 STATE HWY 72	GOLDEN, CO 80403
TRIENTOMA VOEGELIUM 2013 TRUST	28590 STATE HWY 72	GOLDEN, CO 80404
TRIENTOMA VOEGELIUM 2013 TRUST	28540 STATE HWY 72	GOLDEN, CO 80405
ADAIR GLENN	28460 STATE HWY 72	GOLDEN, CO 80406
KHACHATRIAN MIKAEL	28380 STATE HWY 72	GOLDEN, CO 80406
AREA 3		
PINKLEY DAVID R	28670 STATE HWY 72	GOLDEN, CO 80403

Project description and additional notes:

The Coal Creek Canyon Watershed Partnership (CCCWP) projects are a Phase II project being implemented under the NRCS's Emergency Watershed Protection (EWP) Program. Project funding comes from the NRCS, the Colorado Water Conservation Board, and a matching grant from the Community Development Block Grant for Disaster Recovery (CDBG-DR).

The Coal Creek project areas are located in Coal Creek Canyon in Jefferson, County, CO, along State Highway 72, approximately 4 miles west of Highway 93.

The overall project area spans approximately 1.25 miles of total stream length, although the specific restoration sites are somewhat less. The "Start" area is located approximately 4 miles west of the intersection of Highway 93 and Highway 72, and is roughly 1,600 feet in length. Area 2 is located approximately 4.7 miles from the intersection of Highway 72 and 93, and is roughly 2,100 feet in length. Area 3 is the most upstream of the three segments, and is located approximately 5.3 miles from the intersection of Highway 72 and 93. This site represents the shortest segment at roughly 125 feet along Coal Creek.

**Upper Coal Creek Restoration "Start":** The goal of the Coal Creek project is to address the damage from 2013 flooding as well as to build a more resilient riverine system in response to future high flows. The "Start" is the most downstream segment of three separate areas slated for restoration. The project will include streambank restoration through sediment removal, bioengineering and/or armored features to stabilize stream banks and critical area treatments. These treatments are likely to include revegetation through container stock, willow staking, seeding, mulching, soil amendment and improvement, and/or cross vanes. Existing mature vegetation, such as woody vegetation, forbs, and grasses, will be preserved wherever possible.

**Upper Coal Creek Restoration "Area 2":** The Area 2 restoration site along Coal Creek is a separate area located immediately upstream of the "Start" area. This site will undergo the same restoration treatments as the "Start" area, including those intended to improve ecological integrity and system resiliency. Area 2 represents a slightly longer segment of restoration along Coal Creek than the "Start" area.

**Upper Coal Creek Restoration "Area 3":** The Area 3 restoration site is a separate section of Coal Creek upstream of the Area 2 site. This segment represents the smallest of the three sites along Coal Creek. Restoration treatments planned for this area are the same as those planned for the "Start" and Area 2 segments.

The design plans were prepared by Olsson Associates, who will act as construction oversight on this project. The RFP process is underway to select a contractor to construct these designs, with anticipated contractor on board by mid January, 2017.

***Attached below are 30% design plans and calculations for this project. Following those pages is a technical report for this project with more background information.***



Jefferson County, Colorado  
Planning & Zoning Division

100 Jefferson County Parkway, Suite 3550, Golden, Colorado 80419-3550  
 ☎ 303.271.8700 • Fax 303.271.8744 • <http://planning.jeffco.us>

# GRADING PERMIT APPLICATION

Is this property currently in a county platting process?  Yes  No (Please check one)

Permit #  GP

Project Location/Name (Street Address or Legal Description)

Parcel ID #



Section	Township	Range	Project Acreage
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Subdivision Name	Zoning
<input type="text"/>	<input type="text"/>

Purpose of Land Disturbance

Name of Company/Owner	Contact Name	Email Address
<input type="text"/>	<input type="text"/>	<input type="text"/>

Address

Street	City	State	ZIP
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

☎ Home	☎ Work	☎ Cell	☎ FAX
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

In consideration for the granting of this permit by Jefferson County, I hereby give permission for County staff, County board members or County contractors to enter upon my property for the purposes of site inspection and investigation and to remove or correct any hazardous or unsafe conditions and to complete or correct any work or any portion of work not done as required by the plans submitted and approved by the County as part of this grading permit application. If the County does any work on the project site, I understand that the County will use the funds available from the improvement security which I submitted to guarantee the performance of this work to pay for the County's costs and expenses.

I hereby acknowledge that total sum of the security submitted can be utilized as necessary to complete the project or stabilize the site. Further, I understand and acknowledge that any grading done prior to platting is done at my own risk and that additional grading may be required as a result of final plat approval.

Please specify any extraordinary circumstances of which staff should be aware, i.e., dogs on the site, locked gates, etc.

Owner's Signature	Date
<i>Cinda Pierapan</i>	<input type="text"/>

Name of Engineer	Company Name	Email Address
<input type="text"/>	<input type="text"/>	<input type="text"/>

Address

Street	City	State	ZIP
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

☎ Home	☎ Work	☎ Cell	☎ FAX
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Name of Contractor	Signature	Email Address
<input type="text"/>	<input type="text"/>	<input type="text"/>

Contact Name

Address

Street	City	State	ZIP
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

☎ Home	☎ Work	☎ Cell	☎ FAX
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

See page 2 for complete list of items to be submitted with this application

## Submittal Requirements

Please submit one (1) electronic copy of all supporting material and the grading and erosion and sediment control plans. Please refer to Section 16 of the Zoning Resolution for specific grading regulations, as some projects may require a Minor Variation or Board of Adjustment approval.

1. **Fees are on-line at our web site** or call 303-271-8700. Make checks payable to Jefferson County Treasurer.
2. Proof of Ownership: A copy of a deed that shows ownership of the parcel, tract or lot.
3. Legal Parcel Letter (if unplatted): A letter stating that the affected property(ies) under the ownership of the applicant has (have) been legally subdivided. Obtain letter from Jefferson County Zoning Administration, 100 Jefferson Pkwy, Suite 3550, Golden, Colorado 80419-3550, Phone 271-8700.
4. Legal Access Letter (if property does not adjoin a County, City, Town, or State maintained street/road): A letter stating that the affected property(ies) under the ownership of the applicant has (have) legal access in conformance with Section 2 of the Zoning Resolution. Obtain letter from Jefferson County Zoning Administration, 100 Jefferson County Pkwy, Suite 3550, Golden, Colorado 80419-3550, Phone 271-8700.
5. This office will mail the grading application and plans, as applicable, to the adjacent and affected property owners and outside reviewing agencies. We will require reimbursement for the postage fees during the processing of the grading application.
6. Grading, Erosion, and Sediment Control Plan: Plans shall include a vicinity map, title block, date, scale, north arrow, site and property boundaries, easements and rights-of-way, location of site features, location of hazard areas, topographic map, floodplain boundaries, receiving water(s), drainage facilities, finished slopes, stockpile locations, existing vegetative cover and location of major rock outcrops, typical cross sections, cut/fill quantities, project schedule, erosion and sediment control BMPs according to the construction and final grade phases of the project, permanent and, if applicable, temporary revegetation including seed mixture(s), seeding rates and dates plus their method of application. The final grading plan requires the signature and stamp of a registered professional engineer. In addition to the plan, design of drainage structures and devices and calculations for both will be required.
7. Drainage Report: A drainage report in accordance with the Storm Drainage Design and Technical Criteria if drainage facilities are proposed or are required, if the proposal will include the impervious area by more than 10,000 square feet, if the proposal will alter patterns of storm drainage into irrigation ditches increasing flow rates, volumes or changing points of concentration, or the proposal will alter an existing drainageway.
8. A materials handling plan: A proposed materials handling plan including Best Management Practices for controlling construction and building material wastes, location of dumpsters, portable toilets, and spill prevention and containment.
9. Retaining wall engineered design (required for retaining walls over 36" in height): Construction plans, details and support calculations for retaining walls.
10. Geologic/Soils Report (required for cut/fill slopes greater than 2:1): Reports shall include the signature of a professional geologist or the signature and stamp of a registered professional engineer, site map, soil types, geologic description, instability areas, groundwater conditions, investigative techniques, soil boring logs, grading procedures and recommendations, drainage and erosion control recommendations, mitigation of geological hazards, date of field work and design of retaining walls.
11. Cost Estimate (Exhibit "A"): An itemized cost estimate (see sample format) of all proposed grading and erosion control plans, plus 10% contingency, must be submitted with plans. The County will request the actual amount as soon as the plans are ready for approval. The performance guarantee must be in the form of cash, letter of credit, or a certified or cashier's check made payable to Jefferson County Treasurer. The performance guarantee should not be generated until the cost estimate (Exhibit "A") has been approved by Jefferson County staff.
12. Other: Other documents may be required; i.e. fugitive dust, wetlands, easements, etc.

☛ Please see the **Vegetative Cover Note and Land Disturbance Table and Grading Erosion Sediment Control Standard Notes and Details** available on our web site: <http://planning.jeffco.us> - Forms and Applications - Land Disturbance

☛ The applicant has the responsibility to contact the fire district prior to the submittal about required fire district review fee(s).