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## DEVIATION REQUEST AND DECISION FORM

Updated: 6/26/2019

### PROJECT INFORMATION

Project Name : Eagle Rising PCD File No. SP205 & SF2225  
Schedule No.(s) : 52290-00-034 & 52290-00-035  
Legal Description : See Attached

### APPLICANT INFORMATION

Company : Casas Limited Partnership #4, MyPad, Inc., General Partner, Stephen J. Jacobs Jr., President; and  
Name : IQ Investors, LLC, Managed by SESMAR Corp., Stephen J. Jacobs, MD., President  
☒ Owner ☐ Consultant ☐ Contractor  
Mailing Address : P.O. Box 2076  
Colorado Springs, CO 80901  
  
Phone Number : (719) 359-1473  
FAX Number :  
Email Address : stripejacobs@gmail.com

### ENGINEER INFORMATION

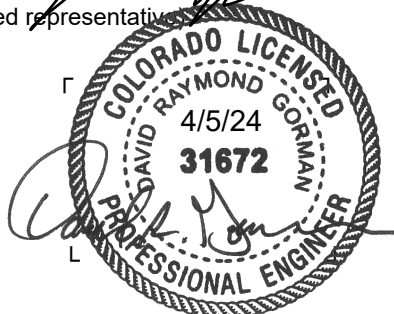
Company : M.V.E., Inc.  
Name : David Gorman Colorado P.E. Number : 31672  
Mailing Address : 1903 Lelaray St, Ste 200  
  
Phone Number : (719) 635-5736  
FAX Number :  
Email Address : daveg@mvecivil.com

### OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

Signature of owner (or authorized representative) Stephen Jacobs Jr. Date 4/5/24

Engineer's Seal, Signature  
And Date of Signature



**DEVIATION REQUEST** (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section(s) **ECM 3.3.3 B and C** of the Engineering Criteria Manual (ECM) is requested.

Identify the specific ECM standard which a deviation is requested:

ECM 3.3.3.B: Conformance with DCM Volume 1 Sections 6.5.2, Table 10-4 Channel Velocity.  
Concrete, riprap, or soil cement linings as approved by the City/County shall be used where channel bottom velocities exceed 6.0 ft/sec. Grass lined channels shall not be used where velocity exceeds permissible velocities in Table 10-4, or the Froude number is greater than 0.9 for the 100-year storm.

DCM Volume 1 Sections 10.2.1 Soft Lined Channels

Grass lined channels are the preferred means of conveying storm water runoff because of their desirability from the standpoint of erosion protection, maintainability, accessibility, and aesthetics.

Grasses typically used for channel lining are Bermudagrass, Kentucky bluegrass, orchardgrass, redtop, St. Alban's ryegrass, and buffalograss.

ECM 3.3.3.C Channel Types

1. Soft-Lined Channels
2. Hard-Lined Channels

State the reason for the requested deviation:

Table 10-4 and DCM Volume 1 Section 10.2.1 do not include provisions or standards for the type of willow, sedge, rush and reed vegetation present in Cottonwood Creek within the project reach. Excellent stream stabilization exists within the subject reach of Cottonwood Creek consisting of mature dense vegetation (grasses, sedges, rushes, reeds, 6 species of willows, numerous shrubs and trees), pond embankments which support wetland vegetation and provide stormwater storage, and large boulder grade check and pond bank lining. For more than a decade, the owners, Entech Engineering, Inc. and ERO Resources Corporation consultants have observed and reported on the natural conditions of stream and riparian corridor within the site. All referenced parties support the preservation of the creek in its existing stabilized and well-vegetated state. See reports uploaded in Applicants submittal EPC Project Numbers SP205, SF2225, SP126 and SF1829.

"Natural Channel" is not listed as a channel type in ECM 3.3.3.C

Other sections of the DCM refer to "natural channels" however it is not included as a channel type in the ECM standard.

In the DCM Open Channels and Structures 10.1 General Statement "Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable."

DCM 2.2.1 Channelization "A stable natural channel reaches "equilibrium" over many years."

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

Utilize the stabilizing value of the existing established pond embankments, existing willow vegetation and existing boulder placements as fully adequate stabilization and not require additional stabilization where hydraulic analysis indicates channel velocities are less than 6 fps, Froude Number values are lower than 1.0 in accordance with the criteria of DCM Section 6.5.2.

The Cottonwood Creek channel within the Eagle Rising Preliminary Plan contains two existing constructed ponds with stabilized embankments, existing boulder thalweg and pond stabilization, along with established dense willow growth that supports established wetlands. The entire wetlands provide natural aesthetic qualities, wildlife habitat, erosion control, and pollutant removal. The aforementioned boulders and pond stabilization were installed over 40 years ago and consist of rocks ranging in size between 4'x4'x2' and 7'x4.5'x5' that are imbedded and integrated with the surrounding soils. Boulder thalweg protection is located just upstream of the northerly pond while the boulder pond protection is located along the east bank of the northerly pond. The two ponds themselves are stabilizing features within the creek that provide the added benefits of controlling flow rates in the creek. Also, an important engineering consideration is that the slope of the creek for the project reach is mild at 1% to 2% with an average of 1.2% as compared to other offsite creek locations in the immediate vicinity. The existing pond spillway at DP 104 will require additional riprap installation at time of final plat as noted on the Drainage Plan. This will further protect the spillway during severe storm water overflows from the pond to the downstream creek drainageway. The Spillway at DP 126 has adequate existing riprap in place. If Pond 2 fills to capacity, the overflows will overtop the embankment at the southeast corner and inundate an open area at the southeast corner of the site. Overflows will then be released at the existing riprap spillway under weir flow conditions. Pondered water in the inundated area is not released at locations other than the riprap protected spillway. The ponds and creek bed have withstood repeated significantly sized rainfall events throughout decades of existence including owner observations of the large rainfall events of 2015 and 2023.

The creek bed, wetland areas and riparian overstory of Cottonwood Creek throughout the site are well vegetated native grasses, shrubs and trees as illustrated by the photos contained in the appendix of this report. The Natural Resources Assessment by ERO

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

Resources Corporation lists with botanic specificity the various plants found. The ERO report also contains photographic documentation of the plants and site conditions. Wetland areas feature native grasses such as Nebraska Sedge, Baltic Rush, Redtop and Broadleaf Cattail. The wetlands also contain mature, dense and well-established willows which serve to anchor the soil of the creek bed throughout the site. Specific willow species include Sandbar Willow, Greenleaf Willow, Peachleaf Willow, Strapleaf Willow, Park Willow and Shining Willow. The riparian overstory is described as containing Peachleaf Willow and Plains Cottonwood trees. Shrubs present in the riparian corridor through the site include Snowberry, Wood's Rose, Golden Current, and Chokecherry. All these species act together to preserve the existing creek alignment and grades that are observed at the site and documented by photographic evidence as attached.

Supplemental information concerning permissible velocities and permissible shear stresses for channel lining materials is included in the appendix. The information includes suggested permissible values for the native grasses, willows and trees that grow in the project reach. Live willow stakes are included and listed to have permissible velocities of 3 to 10 f/sec with permissible shear stress of 2.10 to 3.10 lbs/sf. However, the supplemental information assumes that the vegetation is newly planted, as in Reed Plantings, Hardwood Tree Plantings and Live Willow Stakes. In this case, the vegetative cover throughout the site is not plantings or stakes, but well established, robust, and dense cover that has served to stabilize the creek bed and banks for decades. The upper end (and beyond) of the permissible value range applies in this project reach.

The results of the hydraulic analysis contained in this report indicate four cross-sections at two locations that exhibit channel flow velocities that approach or exceed 6 fps and/or have Froude Number values that equal or exceed 1.0. Two cross sections are located at the north pond overflow spillway and the two cross sections are located at the south pond overflow spillway are protected with riprap indicated on the Drainage Map contained in the MDDP Drainage Report. The presence of dense vegetation throughout the project reach serves to provide additional stabilization. The existing boulder structure and thalweg protection, located upstream of the pond at DP 104 provides stabilization. Portions of the banks inside the DP 104 pond are lined with large boulders. The boulders have been in place for approximately 40 years and are well embedded and incorporated into the creek terrain. They appear to range in size from 3'x3'x2.5' to 7'x4.5'x5'. Based on site observation and riprap sizing calculations that show Type VL (D50 = 6") is more than adequate to remain in place at this location, it is M.V.E., Inc.'s opinion and engineering judgement, that the existing boulders adequately fulfill stabilization function and will remain in place during the 100-year rainfall event. No further improvements are needed in the creek assuming the existing vegetation is preserved. The vegetation is naturally occurring and has been in place for many years. During this time, it has survived various meteorologic cycles. Additionally, with the present level of development in the upstream watershed, the amount of runoff in this section of Cottonwood Creek is not likely to be altered in the future. Considering all these factors, the exiting vegetation is persistent and not in danger of failing. The owners will preserve and sustain the vegetation.

The allowances in Section 6.5.2 and Table 10-4 do not account for the types and condition of the vegetation present in the creek channel and are not applicable to this case. The type and quality of the existing vegetation, which consists of mature dense grasses, sedges, rushes, reeds, six species of willows, numerous shrubs and trees, are not anticipated in the allowed flow velocities as found in DCM Section 6.5.2 and Table 10-4. Furthermore, hydraulic analysis results for the channel reach comply with the provision of Section 6.5.2 except at the two pond overflow spillways, is expected and addressed with riprap protection at each spillway.

Alternative Information is provided in the form of attached Table 2 containing Permissible Velocity and Shear Stress values for Long Native Grasses, Hardwood Tree Plantings and Live Willow Stakes complete with a list of sources including documentation from U.S. Army Engineer Research and Development Center, U.S. Dept. of Transportation, Federal Highway Administration, and others.

The DCM provides that concrete, riprap, or soil cement linings as approved by the City/County shall be used where channel bottom velocities exceed 6.0 ft/sec. Grass lined channels shall not be used where velocity exceeds permissible velocities in Table 10-4 or the Froude number is greater than 0.9 for the 100-year storm. Table 10-4 does not account for the type of vegetation present in the creek throughout the project reach as stated above. Alternatively, M.V.E., Inc. recommends the allowance of velocities associated with willow vegetation and native grasses as shown in the Table 2 that is attached in the Appendix of this request. In the referenced Table 2, Long Native Grasses have permissible velocities of 4 fps to 6 fps, while Live Willow Stakes have permissible velocities of up to 10 fps. Allowable Shear stresses are also noted in the cited sources of up to 3.10 lbs. per sf. Shear Stresses at HEC-RAS model section 3700, 3500, 2703, 2669, 2101, 1900, 1700, 1500, 1400, 1200, 409 and 374 exceed 3.10 lbs. per sf. However, all these locations also have velocities and Froude Number that comply with the DCM. Furthermore, the actual vegetation on the site is well established and exhibits dense growth. The existing plants possess stabilizing characteristics far beyond those of recent plant stakings. Although the hydraulic analysis of the creek reach indicates acceptable velocities in accordance with the DCM, except at pond spillways, a Deviation Request is submitted in support of the higher allowable velocities for the specific type of creek vegetation found at the site. Existing conditions at section 3500 exhibit dense willow growth and native grass vegetation that is well established. There is no evidence of erosion present at this location. Sections 2703 and 2669 is the location of the Pond 1 emergency spillway which will have riprap protection added in developed conditions. Existing conditions at sections 2101, 1900, 1700, 1500, 1400 and 1200 exhibit dense willow growth and native grass vegetation that is well established. There is no evidence of erosion present at these locations. Sections 409 and 374 is the location of the Pond 2 emergency spillway which has existing riprap protection installed. The property owners will preserve and manage the creek bed and vegetation as required through the Owner's Association (OA) or individually in accordance with a drainage maintenance agreement with El Paso County.

Natural well-established creeks typically don't require maintenance. The creek bed and banks within this subdivision are very well established with dense vegetation as detailed above. The owners **elect ECM 3.3.3.K.2.**, which provides that "When the lack of an access road is not considered detrimental to the maintenance and integrity of the channel, the access road can be omitted under

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

the following conditions: • Where suitable exit-entry ramps are provided to intermediate channels with a minimum bottom width of 8 feet at roadway crossings and at other approved, needed locations to facilitate travel or maintenance of emergency vehicles in the channel bottom. At a minimum, one access ramp must be provided at each end of a channel. • Where vehicular access to the channel on a maximum spacing of 1,000 feet and at other approved, needed locations is provided to small channels with a bottom width of less than 8 feet.” The proposed easements will include restrictions on the placement of new trees, fencing, or other new improvements that would prevent effective access over the easement. This access alternative allows lot line easements to serve as access pathways and omits construction of 15’ wide access roads which would unnecessarily deface and destabilize the creekside and interfere with the use and enjoyment of the private residential lots. The 15’ access road may be omitted in recognition that the available corridors through the lot line easements are adequate with regard to available travel width and the traversable terrain. See the attached Creek Access Exhibit. These access conditions meet the criteria and intent of ECM 3.3.3.K.2.

## LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- ☐ The ECM standard is inapplicable to the particular situation.
- ☒ Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

The allowances in Section 6.5.2 and Table 10-4 do not account for the types and condition of the vegetation present in the creek channel and the types of vegetation listed in 10-4 are not present at this site. The existing creek on this site, and potentially others in El Paso County, contains established, mature and dense stands of tall native grasses, sedges, rushes, reeds, six species of willows along with numerous shrubs and trees. The supplemental information provided with this deviation request (Table 2 in the Appendix) suggests allowable flow velocities and shear stresses that are more closely applicable to the type of vegetation found within the subject creek reach and site. The results of hydraulic analysis using this appropriate supplemental engineering data show that all sections of the creek channel comply with the provision of Section 6.5.2.

The two overflow spillways at the two ponds do not contain vegetation, but instead are protected by riprap lining.

Furthermore the U.S. Army Core of Engineers has, after staff viewing the site, verbally recommended that the existing wetlands and natural channel and features not be disturbed, seeing no beneficial outcomes to further structural stabilization.

The application of the requested data to this project will preserve the existing stabilizing vegetation and natural terrain for the benefit of the site, natural aesthetics, wildlife, and future lot owners.

## CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

"Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable." DCM 10.1

Allowance of the deviation is superior to the level of stabilization available from other stabilization options because it does not involve the alteration of the current natural terrain and natural features of the site. The property owners will preserve the creek bed and vegetation as required through the OA or individually as provided in the CCR's to be recorded with the Final Plat and in accordance with the drainage maintenance agreement.

The existing established mature willow growth along with the existing sedges, reeds, rushes, brush, trees and native grasses currently prevent erosion of the creek to a sufficient degree as demonstrated with the photographs contained in the Appendix of this request. Other existing features of the site, consisting of the two ponds and boulder placements which were installed prior to the time of current ownership, act together with the vegetation to promote stability of the creek reach. This deviation allows continuance



The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

of the existing terrain and vegetation, which provides comparable stabilizing effects as other more invasive methods, but without disturbance of the current natural environment. It is desirable that the natural features of the existing riparian creek, wetlands and wildlife habitat be preserved and protected. Therefore, the owners do not wish to see the creek destabilized or the existing terrain, plantings, and natural beauty of the creek harmed or destroyed by the mechanized interventions required to install unnecessary, functionally inferior and maintenance intensive hard drainage structures.

The deviation will not adversely affect safety or operations.

The existing vegetation already fulfills all stabilization requirements for the creek. The allowance of the deviation will not adversely affect safety or operations. The presence of the existing natural terrain and vegetation poses no additional safety risks to people or the environment. Safe and adequate access to the creek is provided within the proposed lot line easements as discussed, which allows performance of potential maintenance. These easements on the site allow physical access to the pond embankments and operation of the pond outlet works.

The deviation will not adversely affect maintenance and its associated cost.

All observation, preservation and management of the creek and riparian corridor within the Drainage Easement will be undertaken by the owners and the Owners Association in accordance with CCR's which are to be recorded at the time of Final Plat recording and in accordance with the drainage maintenance agreement. The deviation will not adversely affect maintenance or maintenance costs.

It is understood that "Grass lined channels" are dependent upon continuous growth of "grass." As noted above, the native willow and other dense vegetation in place is significantly superior to grass and is already very well established. It is naturally occurring and has been in place for many decades. During this time, it has survived various meteorologic cycles from drought to overly wet seasons. Additionally, with the present level of development in the upstream watershed, the amount of runoff in this section of Cottonwood Creek is not likely to be altered in the future. Considering all these factors, the existing vegetation is vigorously persistent and not in danger of failing. The owners agree to continue to observe the waterway and to take appropriate steps to preserve the vegetation if its survival is threatened. No maintenance is anticipated at this time and is to be provided in the drainage maintenance agreement with El Paso County.

The deviation will not adversely affect aesthetic appearance.

"Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable." DCM 10.1

Preserving the natural aesthetic appearance of the site is exactly the intent of this deviation request. Granting this deviation will continue the beauty and tranquility inherent to the site with its functioning ecosystem. This includes the existing flora and fauna which remain intact and in place. Conversely, the introduction of constructed stabilization irreparably alter the natural features of the site and harm the site's biodynamic stability and aesthetic appearance. It would be a shame if the naturally stabilizing features of the site were to be removed for the sake of installing an artificial means of accomplishing the same level of stabilization that already exists.

The deviation meets the design intent and purpose of the ECM standards.

The supporting documentation provided in this deviation request and the MDDP/Preliminary Drainage Report shows that the existing vegetation has served and will serve as the required stabilization within the creek. The purpose of the ECM standard is met.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

- The proposed deviation request meets the control measure requirements specified by the County's MS4 Permit.
- The allowance of this deviation will avoid and prevent disturbance of the creek bed and banks and therefore prevent erosion and sedimentation within the creek.
- Stormwater quality treatment for the development site will be provided as required.
- Appropriate stormwater control measures will be implemented for any land disturbance as required in accordance with an approved Grading and Erosion Control Plan.

**REVIEW AND RECOMMENDATION:**

**Approved by the ECM Administrator**

This request has been determined to have met the criteria for approval. A deviation from Section 3.3.3 B and C of the ECM is hereby granted based on the justification provided.

┌ **APPROVED** ┐  
└ Engineering Department ┘  
04/16/2024 1:22:21 PM  
dotnijkamp  
┌ EPC Department of Public ┐  
└ Works ┘

**Denied by the ECM Administrator**

This request has been determined not to have met criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby denied.

┌ ┐  
└ ┘

**ECM ADMINISTRATOR COMMENTS/CONDITIONS:**

This approval is contingent on completion of the stormwater facility maintenance agreement.

## **1.1. PURPOSE**

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

## **1.2. BACKGROUND**

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

## **1.3. APPLICABLE STATUTES AND REGULATIONS**

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

## **1.4. APPLICABILITY**

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

## **1.5. TECHNICAL GUIDANCE**

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

## **1.6. LIMITS OF APPROVAL**

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

## **1.7. REVIEW FEES**

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.

**NORTH PORTION – ( 10195 KURIE ROAD)**

LEGAL DESCRIPTION:

THAT PORTION OF SECTION 29, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6<sup>TH</sup> P.M., EL PASO COUNTY, COLORADO DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SAID SECTION 29, SAID POINT BEING ON THE SOUTHERLY BOUNDARY OF PARK FOREST ESTATES FILING NO 2 (PLAT BOOK B-2 AT PAGE 52); THENCE S 00° 13'40"E ON THE WEST LINE OF THE EAST HALF OF SAID SECTION 29, A DISTANCE OF 1413.98 FEET TO THE TRUE POINT OF BEGINNING; THENCE N 00° 13'40"W, 1413.98 FEET; THENCE N89°14'16"E, ON THE SOUTHERLY BOUNDARY OF SAID PARK FOREST ESTATES, A DISTANCE OF 375.32 FEET TO THE SOUTHEAST CORNER OF LOT 14, BLOCK 18 OF SAID PARK FOREST ESTATES; THENCE N89°13'46"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 60.00 FEET TO THE EAST LINE OF KURIE ROAD; THENCE N89°33'17"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 237.50 FEET; THENCE N89°20'43"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 149.96 FEET; THENCE S00°39'26"E, DEPARTING SAID SOUTHERLY BOUNDARY OF PARK FOREST ESTATES, A DISTANCE OF 231.57 FEET; THENCE S43°12'03"E, A DISTANCE OF 433.08 FEET; THENCE S43°12'03"E, A DISTANCE OF 56.61 FEET; THENCE N88°33'24"E, A DISTANCE OF 0.10 FEET TO THE NORTHWEST CORNER OF LOT 1 POCO SUBDIVISION ACCORDING TO THE TO THE OFFICIAL MAP THEREOF FILED IN THE OFFICE OF THE COUNTY RECORDER OF EL PASO COUNTY, COLORADO, AS RECEPTION NO. 2406425; THENCE SOUTHERLY ALONG THE WESTERLY LINE OF SAID LOT 1 THE FOLLOWING SIX (6) COURSES:

S16°04'20"E, 158.01 FEET;

S02°43'41"W, 265.73 FEET;

N84°46'48"W, 71.67 FEET;

S00°11'34"W, 147.46 FEET;

N88°32'26"E, 150.00 FEET;

S01°27'34"E, 275.63 FEET;

THENCE S89°45'28"W DEPARTING SAID WESTERLY LINE OF SAID LOT 1, A DISTANCE OF 766.08 FEET; THENCE N00°14'32"W, 100.00 FEET; THENCE S89°45'28"W, 152.00 FEET; THENCE S00°14'32"E, 200.00 FEET; THENCE S89°45'28"W, 152.00 FEET; THENCE N00°14'32"W, 100.00 FEET; THENCE S89°45'28"W, 201.18 FEET TO A POINT ON SAID WEST LINE OF THE EAST HALF OF SAID SECTION 29, SAID POINT BEING THE TRUE POINT OF BEGINNING.

DESCRIPTION PREPARED BY:

M & S CIVIL CONSULTANTS, INC.  
102 EAST PIKES PEAK AVE. STE.306  
COLORADO SPRINGS, COLORADO

**SOUTH PORTION –(10115 KURIE ROAD)**

LEGAL DESCRIPTION:

THAT PORTION OF SECTION 29, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6<sup>TH</sup> P.M., EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SAID SECTION 29, SAID POINT BEING ON THE SOUTHERLY BOUNDARY OF PARK FOREST ESTATES FILING NO. 2 (PLAT BOOK B-2 AT PAGE 52), THENCE N89°14'16"E, ON THE SOUTHERLY BOUNDARY OF SAID PARK FOREST ESTATES, A DISTANCE OF 375.32 FEET TO THE SOUTHEAST CORNER OF LOT 14, BLOCK 18 OF SAID PARK FOREST ESTATES; THENCE N89°13'46"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 60.00 FEET TO THE EAST LINE OF KURIE ROAD; THENCE N89°33'17"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 237.50 FEET; THENCE N89°20'43"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 149.96 FEET; THENCE S00°39'26"E, DEPARTING SAID SOUTHERLY BOUNDARY OF PARK FOREST ESTATES, A DISTANCE OF 231.57 FEET; THENCE S43°12'03"E, A DISTANCE OF 433.08 FEET; THENCE S43°12'03"E, A DISTANCE OF 56.61 FEET; THENCE N88°33'24"E, A DISTANCE OF 0.10 FEET TO THE NORTHWEST CORNER OF LOT 1 POCO SUBDIVISION ACCORDING TO THE OFFICIAL MAP THEREOF FILED IN THE OFFICE OF THE COUNTY RECORDER OF EL PASO COUNTY, COLORADO, AS RECEPTION NO. 2406425; THENCE SOUTHERLY ALONG THE WESTERLY LINE OF SAID LOT 1 THE FOLLOWING SIX (6) COURSES:

S16°04'20"E, 158.01 FEET;

S02°43'41"W, 265.73 FEET;

N84°46'48"W, 71.67 FEET;

S00°11'34"W, 147.46 FEET;

N88°32'26"E, 150.00 FEET;

S01°27'34"E, A DISTANCE OF 275.63 FEET TO THE TRUE POINT OF BEGINNING; THENCE S01°27'34"E, A DISTANCE OF 178.87 FEET; THENCE S34°54'56"W, A DISTANCE OF 563.22 FEET; THENCE S00°00'00"E, A DISTANCE OF 344.55 FEET; THENCE N90°00'00"E, A DISTANCE OF 87.56 FEET; THENCE S00°00'00"E, A DISTANCE OF 459.65 FEET; THENCE S89°59'26"W, A DISTANCE OF 1035.05 FEET TO A POINT ON THE WEST LINE OF THE EAST HALF OF SAID SECTION 29; THENCE N00°13'40"W, ALONG SAID WEST LINE, A DISTANCE OF 1439.98 FEET TO A POINT WHICH IS DRAWN S 89° 45'28" W FROM THE POINT OF BEGINNING; THENCE N 89°45'28"E, A DISTANCE OF 201.18 FEET; THENCE S00°14'32"E, 100.00 FEET; THENCE N89°45'28"E, 152.00 FEET; THENCE N00°14'32"W, 200.00 FEET; THENCE N89°45'28"E, 152.00 FEET; THENCE S00°14'32"E, 100.00 FEET; THENCE N89°45'28"E, 766.08 FEET, MORE OR LESS TO THE TRUE POINT OF BEGINNING.

DESCRIPTION PREPARED BY:

M & S CIVIL CONSULTANTS, INC.

102 EAST PIKES PEAK AVE. STE 306

COLORADO SPRINGS, COLORADO

80903



**Table 2. Permissible Shear and Velocity for Selected Lining Materials<sup>1</sup>**

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
<u>Soils</u>	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
<u>Gravel/Cobble</u>	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 6	A
	6-in.	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
<u>Vegetation</u>	Class A turf	3.7	6 – 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 – 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	F, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.65	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 – 4	E, M
<u>Temporary Degradable RECPs</u>	Fiberglass roving	2.00	2.5 – 7	E, H, M
	Unvegetated	3.00	5 – 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	8 – 21	F, L, M
	6 – in. d <sub>50</sub>	2.5	5 – 10	H
<u>Non-Degradable RECPs</u>	9 – in. d <sub>50</sub>	3.8	7 – 11	H
	12 – in. d <sub>50</sub>	5.1	10 – 13	H
	18 – in. d <sub>50</sub>	7.6	12 – 16	H
	24 – in. d <sub>50</sub>	10.1	14 – 18	E
	Wattles	0.2 – 1.0	3	C, I, J, N
<u>Riprap</u>	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.90-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, F, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H
<u>Soil Bioengineering</u>				
<u>Hard Surfacing</u>				

<sup>1</sup> Ranges of values generally reflect multiple sources of data or different testing conditions.

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USACE TR EL 97-8



# Eagle Rising Hydraulic Analysis Results

## Velocity, Froude Number & Shear Stress at Selected Channel Sections

Hydraulic Data from HEC-RAS Analysis, M.V.E., Inc.

Shear Stress  $\tau = \gamma RS$

$\tau$  = Shear Stress (lbs/sf)

$\gamma$  = Weight Density of Water (lb/cf) = 62.4

R = Hydraulic Radius = Area/Wetted Perimeter (ft)

S = Energy Grade Slope (ft/ft)

Froude No.  $Fr = \frac{V}{\sqrt{gD}}$

V = Channel Velocity (ft/sec)

D = Hydr Depth = Flow Area / Top Width

g = Acceleration of gravity = 32.2 ft/sec<sup>2</sup>

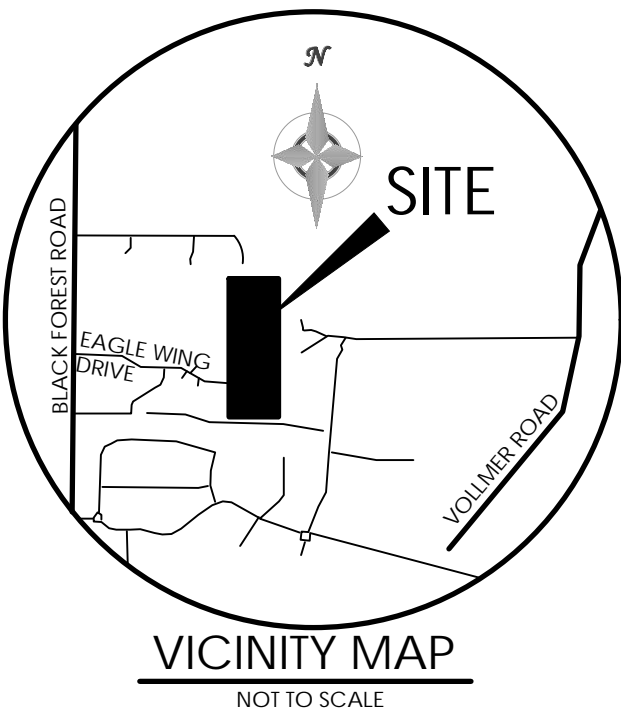
Channel Section	Q100 (cfs)	S Energy Slope (ft/ft)	Max Channel Depth (ft)	D Hydraulic (Ave) Depth (ft)	P Wetted Perimeter (ft)	R Hydraulic Radius (ft)	A Flow Area (sf)	W Top Width (ft)	V Channel Velocity (ft/sec)	Fr Froude No.	$\tau$ Shear Stress (lbs/sf)	Notes:
3800	410	0.013	3.3	2.5	72	2.5	180	71	2.3	0.25	1.98	dense vegetation existing
3700	410	0.026	3.5	2.5	49	2.4	119	48	3.3	0.37	3.98	dense vegetation existing
3600	410	0.007	4.1	3.1	73	3.1	222	72	1.9	0.19	1.26	dense vegetation existing
3500	470	0.079	3.0	2.2	71	2.1	152	70	3.1	0.38	10.52	dense vegetation existing Shear Greater than 3.10 - See Report
3400	470	0.010	3.3	2.5	88	2.5	223	88	2.1	0.23	1.58	dense vegetation existing
3300	470	0.011	2.5	1.9	95	1.9	184	94	2.6	0.32	1.34	dense vegetation existing
3200	470	0.008	2.1	1.5	115	1.5	175	115	2.7	0.39	0.79	boulder check existing
3100	470	0.001	3.5	2.2	210	2.2	464	210	1.0	0.12	0.10	native grasses and pond existing
3000	560	0.001	3.7	2.9	188	2.9	536	187	1.1	0.11	0.10	native grasses and pond existing
2900	560	0.000	5.4	3.7	223	3.6	814	223	0.7	0.06	0.04	native grasses and pond existing
2801	560	0.000	6.9	5.0	278	4.9	1372	277	0.4	0.03	0.01	native grasses and pond existing
2745	700	0.005	2.1	1.2	303	1.2	354	303	2.2	0.36	0.37	native grasses and pond existing
2722	700	0.018	1.7	1.4	139	1.4	190	139	3.7	0.56	1.56	native grasses and pond existing
2703	700	0.057	1.8	1.0	122	1.0	123	122	6.1	1.06	3.62	spillway riprap proposed Shear Greater than 3.10 - Riprap Spillway
2669	700	0.036	3.0	1.6	65	1.6	106	64	7.9	1.09	3.66	spillway riprap proposed Shear Greater than 3.10 - Riprap Spillway
2451	700	0.015	3.7	2.4	125	2.4	295	124	2.4	0.27	2.25	dense vegetation existing
2200	700	0.013	3.2	2.7	115	2.7	311	114	2.3	0.24	2.23	dense vegetation existing
2101	750	0.024	3.4	2.9	84	2.8	238	83	3.2	0.33	4.22	dense vegetation existing Shear Greater than 3.10 - See Report
2000	750	0.011	3.9	2.2	144	2.2	318	144	2.2	0.27	1.48	dense vegetation existing
1900	820	0.020	3.4	2.5	117	2.5	291	116	2.8	0.31	3.19	dense vegetation existing Shear Greater than 3.10 - See Report
1800	820	0.012	3.9	3.2	107	3.2	340	106	2.4	0.24	2.33	dense vegetation existing
1700	820	0.018	3.4	3.0	100	3.0	298	99	2.8	0.28	3.26	dense vegetation existing Shear Greater than 3.10 - See Report
1600	820	0.010	5.1	3.7	85	3.6	309	84	2.7	0.25	2.33	dense vegetation existing
1500	820	0.026	4.6	3.1	80	3.1	244	79	3.4	0.34	5.01	dense vegetation existing Shear Greater than 3.10 - See Report
1400	820	0.035	4.6	2.5	129	2.4	315	128	2.6	0.30	5.34	dense vegetation existing
1299	820	0.005	4.4	3.5	105	3.5	369	104	2.2	0.21	1.19	dense vegetation existing
1200	820	0.036	3.1	1.6	113	1.6	183	113	4.5	0.62	3.64	dense vegetation existing Shear Greater than 3.10 - See Report
1099	820	0.005	1.9	1.5	243	1.5	375	243	2.3	0.32	0.51	native grass existing
1000	820	0.000	4.9	3.3	293	3.3	963	293	1.0	0.10	0.06	native grasses and pond existing
791	820	0.000	6.9	5.3	393	5.3	2092	392	0.4	0.03	0.01	native grasses and pond existing
598	820	0.000	9.0	6.4	321	6.4	2045	320	0.5	0.03	0.01	native grasses and pond existing
449	820	0.000	4.9	4.0	409	4.0	1626	409	0.5	0.05	0.02	native grasses and pond existing
409	820	0.059	2.9	1.8	62	1.7	108	62	7.6	1.01	6.42	spillway riprap Shear Greater than 3.10 - Riprap Spillway
374	820	0.062	1.8	1.5	77	1.5	116	77	7.0	1.01	5.82	spillway riprap Shear Greater than 3.10 - Riprap Spillway
300	820	0.003	3.7	2.7	121	2.7	326	121	2.6	0.28	0.55	dense vegetation existing
200	820	0.008	3.3	2.5	157	2.5	391	156	1.8	0.20	1.19	dense vegetation existing
100	820	0.050	1.6	1.5	184	1.5	282	183	2.9	0.42	4.77	dense vegetation existing Shear Greater than 3.10 - See Report

\* NOTE:

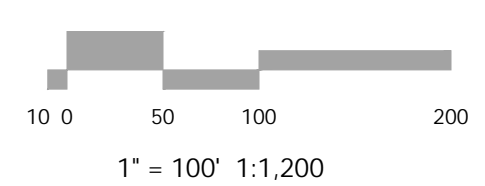
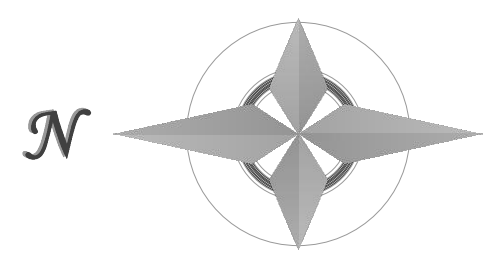
SHEAR STRESSES AT HEC-RAS MODEL SECTION 3700, 3500, 2703, 2669, 2101, 1900, 1700, 1500, 1400, 1200, 409 AND 374 EXCEED 3.10 LBS. PER SF. HOWEVER, ALL THESE LOCATIONS ALSO HAVE VELOCITIES AND FROUDE NUMBER THAT COMPLIES WITH THE DCM. FURTHERMORE, THE ACTUAL VEGETATION ON THE SITE IS WELL ESTABLISHED AND EXHIBITS DENSE GROWTH. THE EXISTING PLANTS POSSESS STABILIZING CHARACTERISTICS FAR BEYOND THOSE OF RECENT PLANT STAKINGS. THERE IS NO EVIDENCE OF EXISTING EROSION CONDITIONS AT THESE LOCATIONS.

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOT LINE
- EXISTING
  - INDEX CONTOUR
  - INTERMEDIATE CONTOUR
- PROPOSED
  - INDEX CONTOUR
  - INTERMEDIATE CONTOUR



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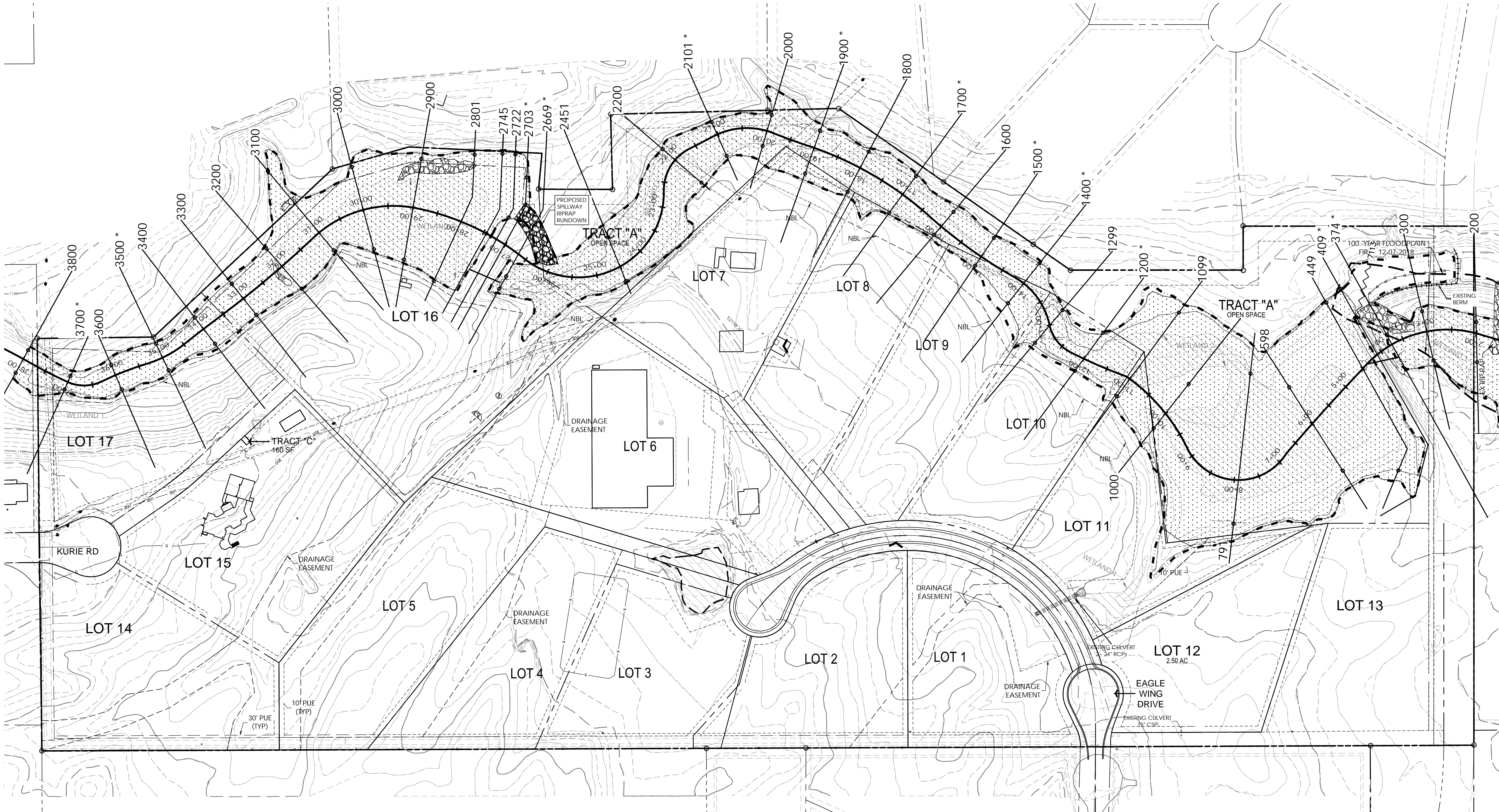
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CHECKED BY

EAGLE RISING  
FILING NO.1

PROPOSED  
DRAINAGE MAP  
HECRAS SECTIONS

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MVE DRAWING DRN-MAP-HECRAS

MARCH 7, 2024  
SHEET 1 OF 1





# HEC-RAS Cross Section Location and Photo Key Map

LEGEND

PROPERTY LINE

EASEMENT LINE

LOT LINE

EXISTING

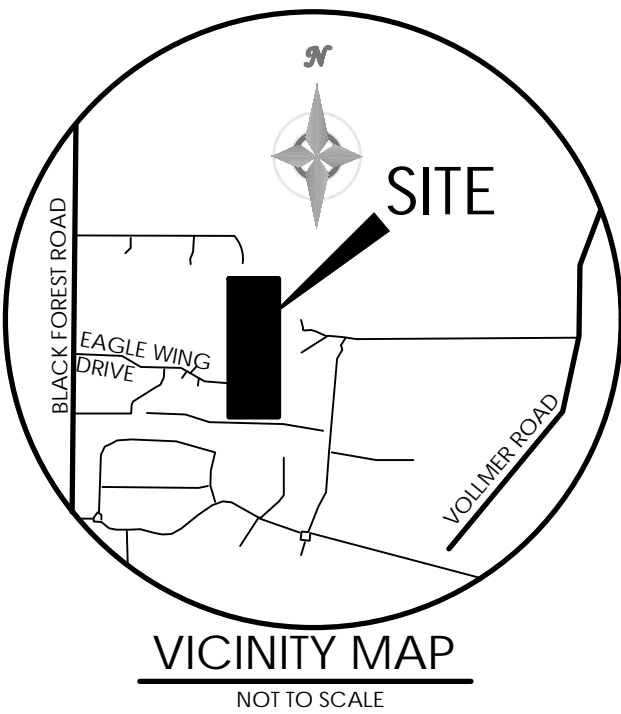
INDEX CONTOUR

INTERMEDIATE CONTOUR

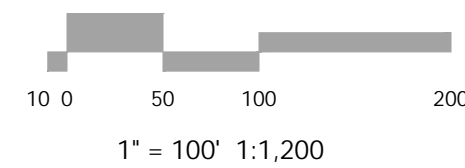
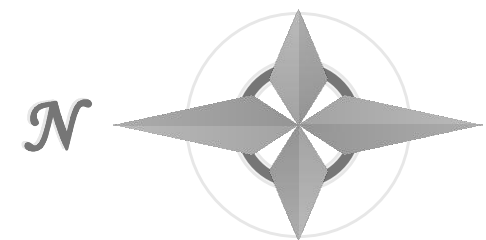
DBPS DESIGN POINT

LOCAL DESIGN POINT

DRAINAGE REPORT PHOTO NUMBER / DIRECTION



BENCHMARK



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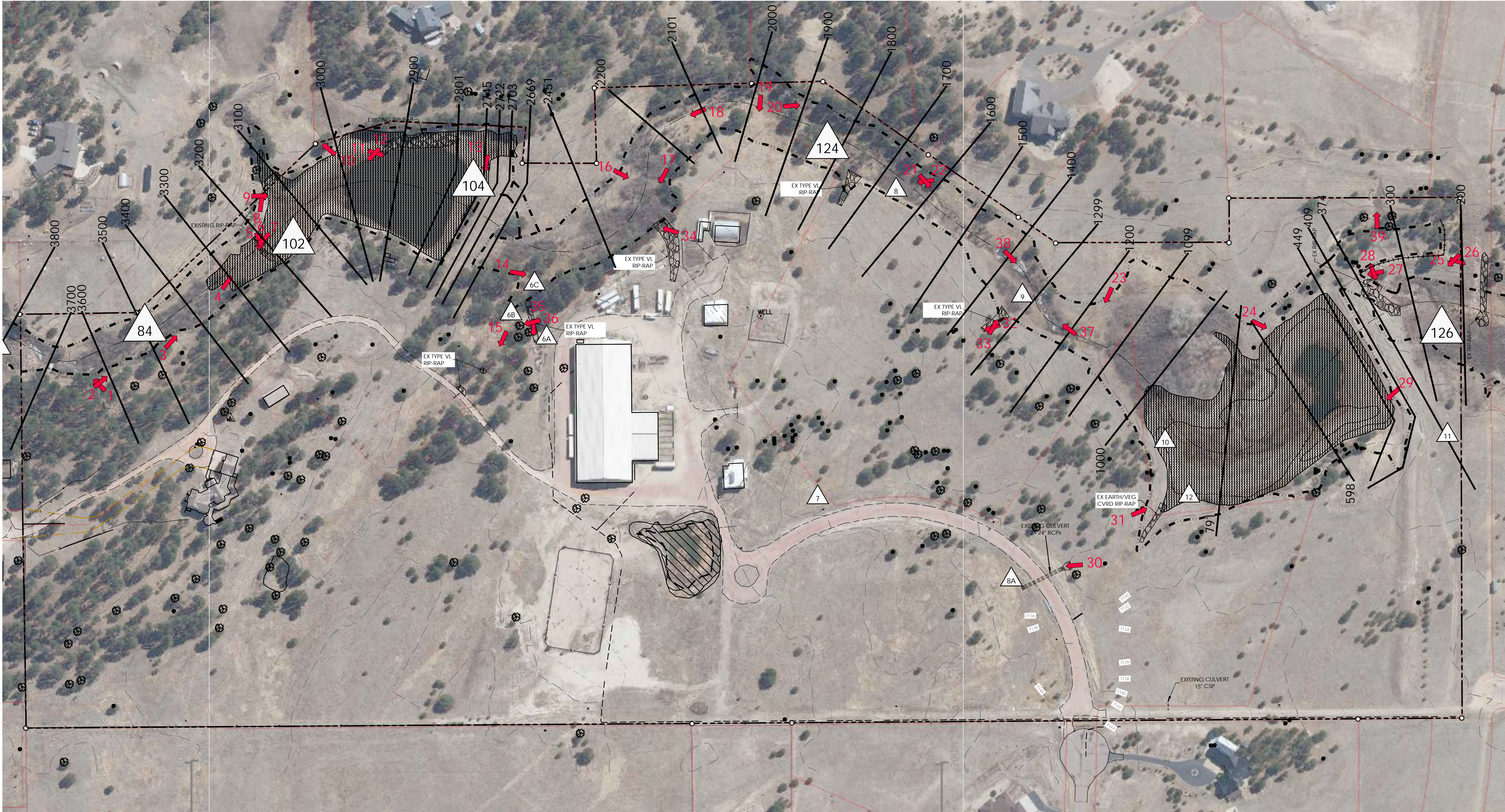
EAGLE RISING  
FILING NO.1

STREAM VEGETATION  
PHOTO LOCATIONS

MVE PROJECT 61145  
MVE DRAWING DRN-MAP-HECRAS

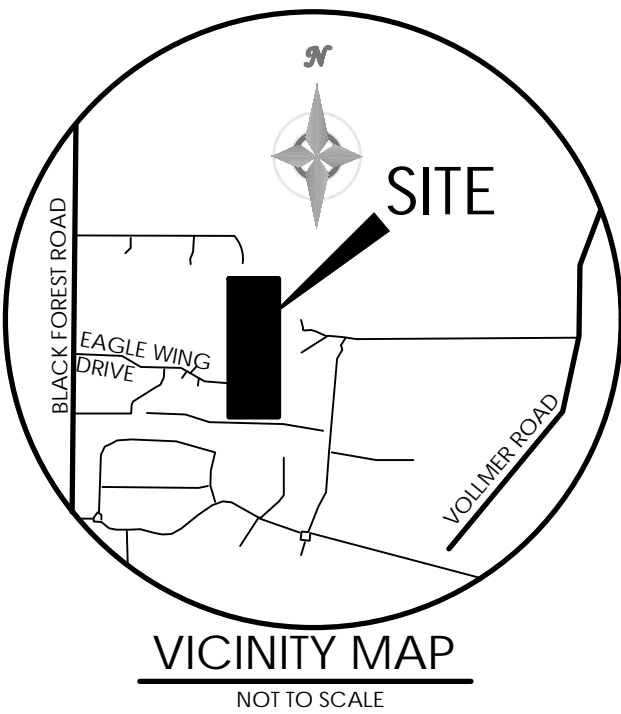
MARCH 7, 2024  
SHEET 1 OF 1



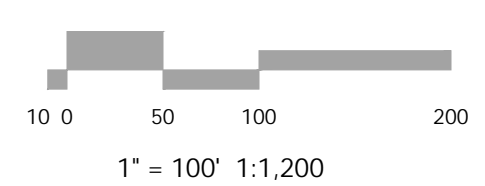
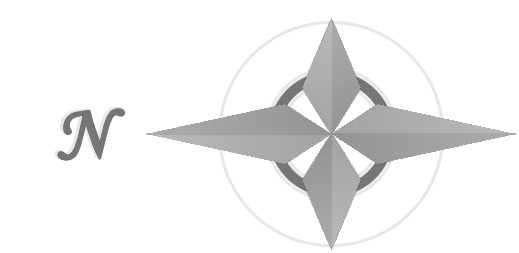


**LEGEND**

- PROPERTY LINE
- EASEMENT LINE
- LOT LINE
- EXISTING
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DBPS DESIGN POINT
- LOCAL DESIGN POINT
- DRAINAGE REPORT PHOTO NUMBER / DIRECTION



BENCHMARK



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**EAGLE RISING**  
FILING NO.1

**STREAM VEGETATION**  
PHOTO LOCATIONS

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MARCH 7, 2024  
SHEET 1 OF 1





1

Looking downstream,  
from 250 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
82.

September 27, 2022



2

Looking upstream,  
from 250 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
82.

September 27, 2022





3

Looking  
downstream, from  
Cottonwood Creek  
DBPS Design Point  
84.

September 27, 2022



4

Looking downstream,  
from 200 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
84.

September 27, 2022

see additional March 1,  
2024 photos





4

Looking downstream, from  
200 feet downstream of  
Cottonwood Creek DBPS  
Design Point 84.

March 1, 2024



4

Looking downstream, from  
200 feet downstream of  
Cottonwood Creek DBPS  
Design Point 84.

March 1, 2024





5

Looking upstream,  
from Cottonwood  
Creek DBPS Design  
Point 102.

September 27, 2022



6

Looking upstream,  
from Cottonwood  
Creek DBPS Design  
Point 102.

September 27, 2022





7

Looking upstream,  
from Cottonwood  
Creek DBPS Design  
Point 102.

September 27, 2022



8

Looking upstream  
tributary stream, from  
Cottonwood Creek  
DBPS Design Point  
102.

September 27, 2022





9

Looking downstream,  
from Cottonwood  
Creek DBPS Design  
Point 102.

September 27, 2022



10

Looking northeast,  
from 100 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
102.

September 27, 2022





11

Looking downstream,  
from 200 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
102. Emergency  
spillway on left  
corner of pond.

September 27, 2022



12

Looking upstream,  
from 200 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
102.

September 27, 2022





13

Buried and partially buried riprap at emergency overflow, from Cottonwood Creek DBPS Design Point 104.

September 27, 2022



14

Looking at heavy vegetation downstream, from Design Point 6C.

September 27, 2022





15

Looking at riprap  
upstream tributary  
flow, from Design  
Point 6B.

September 27, 2022



16

Looking southwest  
across stream, from  
450 feet downstream  
of Cottonwood Creek  
DBPS Design Point  
104.

September 27, 2022





17

Looking up stream,  
from 450 feet  
downstream of  
Cottonwood Creek  
DBPS Design Point  
104.

September 27, 2022



18

Looking upstream,  
from 300 feet  
upstream of  
Cottonwood Creek  
DBPS Design Point  
124.

September 27, 2022





19

Looking west across  
channel, from 100  
feet upstream of  
Cottonwood Creek  
DBPS Design Point  
124.

September 27, 2022



20

Looking downstream  
at the upper banks,  
from 100 feet  
upstream of  
Cottonwood Creek  
DBPS Design Point  
124.

September 27, 2022





21

Looking upstream,  
from Design Point 8.

September 27, 2022



22

Looking downstream,  
from Design Point 8.

September 27, 2022





23

On the east side of the creek looking west, from 200 feet downstream of Design Point 9.

September 27, 2022



24

Looking southwest towards pond embankment, from 400 feet downstream of Design Point 10.

September 27, 2022





25

Looking downstream  
towards offsite pond  
and riprap, from  
Cottonwood Creek  
DBPS Design Point  
126.

September 27, 2022

Location is off-site,  
south of property



26

Looking upstream,  
from Cottonwood  
Creek DBPS Design  
Point 126.

September 27, 2022





27

Looking upstream  
towards riprap of  
emergency spillway,  
from east bank 550  
feet downstream of  
Design Point 10.

September 27, 2022  
see additional March 1,  
2024 photos



28

Riprap of  
emergency spillway,  
from east bank 550  
feet downstream of  
Design Point 10.

September 27, 2022  
see additional March 1,  
2024 photo





Pond 2 Emergency  
Spillway Looking  
downstream  
(southwest)

March 1, 2024



Pond 2 Emergency  
Spillway Looking  
upstream  
(northeast)

March 1, 2024





29

Looking upstream,  
from the west bank  
500 feet downstream  
of Design Point 10.

September 27, 2022



30

Looking north at  
culverts, on the east  
side of the road from  
100 feet south of  
Design Point 8A.

September 27, 2022





31

Riprap lining  
downstream from  
DP8A, from 100 feet  
north of Design Point  
12.

September 27, 2022



32

Looking northwest up  
tributary stream, from  
100 feet northwest of  
Design Point 9.

September 27, 2022





33

Looking east, on  
west bank of creek,  
from 100 feet  
northwest of Design  
Point 9.

September 27, 2022



34

Riprap lined swale  
from barn area to  
creek, 450 feet  
downstream of  
DBPS Design Point  
104.

September 27, 2022

Riprap added

See additional March 1,  
2024 photo





35

Looking west,  
existing riprap lined  
swale in need of  
additional riprap from  
Design Point 6A.

September 27, 2022



36

Looking at riprap on  
tributary flow  
upstream of DP6B,  
from Design Point  
6A.

September 27, 2022





37

Looking northeast  
from the centerline of  
the creek at  
HECRAS Station  
1200.


December 11, 2023



38

Looking southwest  
from the centerline of  
the creek at  
HECRAS Station  
1400.

December 11, 2023

	<p>39</p>
	<p>Looking east at east property line at approximately HECRAS station 300.</p> <p>December 11, 2023</p>

## **Supplimental Photos and Key Map**

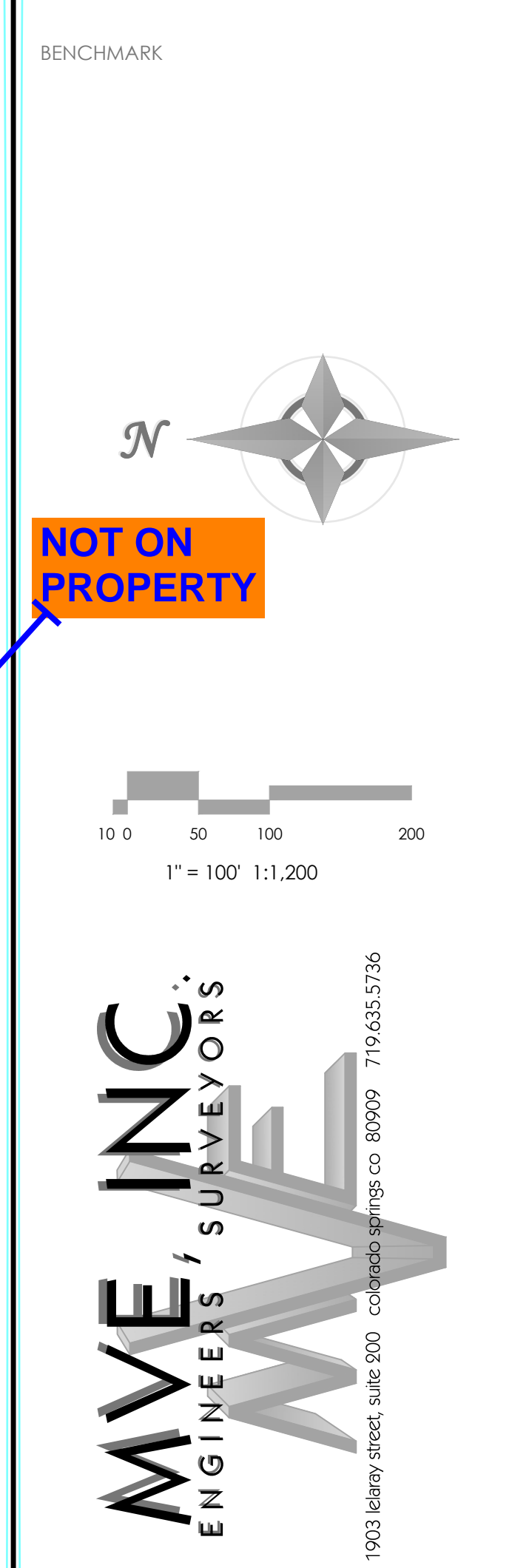
February 2024



**LEGEND**

- PROPERTY LINE
- EASEMENT LINE
- LOT LINE
- EXISTING
- 50% INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DBPS DESIGN POINT
- LOCAL DESIGN POINT
- DRAINAGE REPORT PHOTO NUMBER / DIRECTION

A circular vicinity map showing the location of the site. The map includes a north arrow pointing towards the top. A black rectangle labeled "SITE" is located in the center. To the left of the site is "EAGLE WING DRIVE". To the left of the map is "BLACK FOREST ROAD". To the right of the site is "YOUNGER ROAD". The map is titled "VICINITY MAP" and "NOT TO SCALE".



REVISIONS	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
AS-BUILTS BY	
CHECKED BY	

MVE PROJECT 61145  
MVE DRAWING DRN-MAP-HECRAS

OCTOBER 31, 2023  
SHEET 1 OF 1



**Eagle Rising SP205 & SF2225**

**Added photos requested by Jeff Rice in the EDARP 1.29.2024 Review Comments**

**To the Deviation Request submitted for EMC 3.3.3 B & C**



0024 E



0025 E



0028 SE Veg Growth vs. 2022



0030 E Boulder dam in place & stable for 40+ years

**Commercial Real Estate, Development and Construction Management**

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Telephone: 719-886-6535 Cell: 719-351-8629

[www.NLdevelopment.com](http://www.NLdevelopment.com) [wtimura@NLdevelopment.com](mailto:wtimura@NLdevelopment.com)





0138 NW Vegetation Growth vs. 2022 3.1.2024



0134 SE Vegetation Growth vs. 2022 3.1.2024



0131 SE Vegetation Growth vs. 2022 3.1.2024





0036 S



0041 E



7361 E



7362 E





7363W





0044 SE



0046 SE





0049 SE

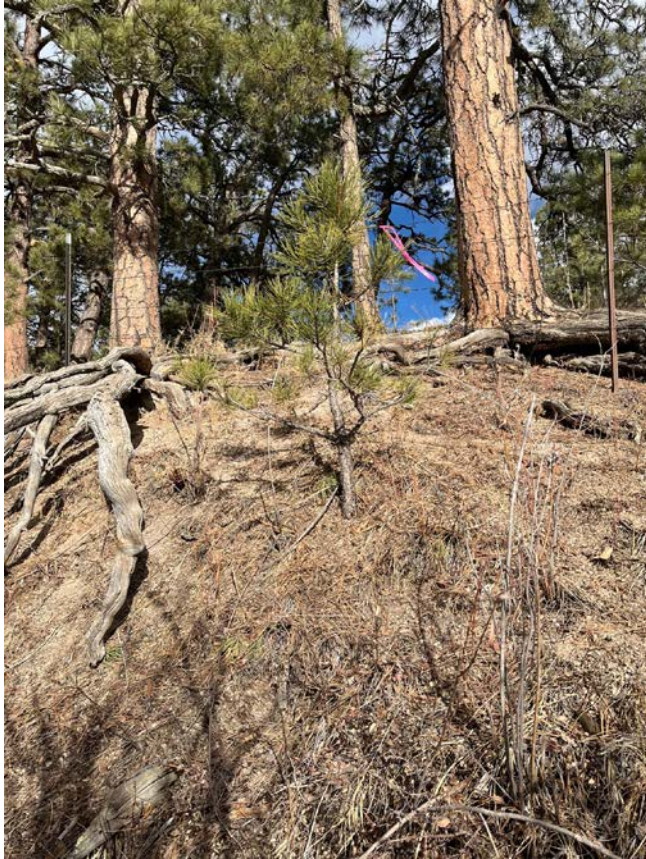


0050 SE



0118 E 3.1.2024





7365W



7366E



0060 SE





0062 SE



0065 N



0066 N





7367SE



7368SW



0068 SW





7368 E



7371 W



0070 NW





0072 NE



7370 E





7372 W



0077 SW





0080 NE



0084 SE



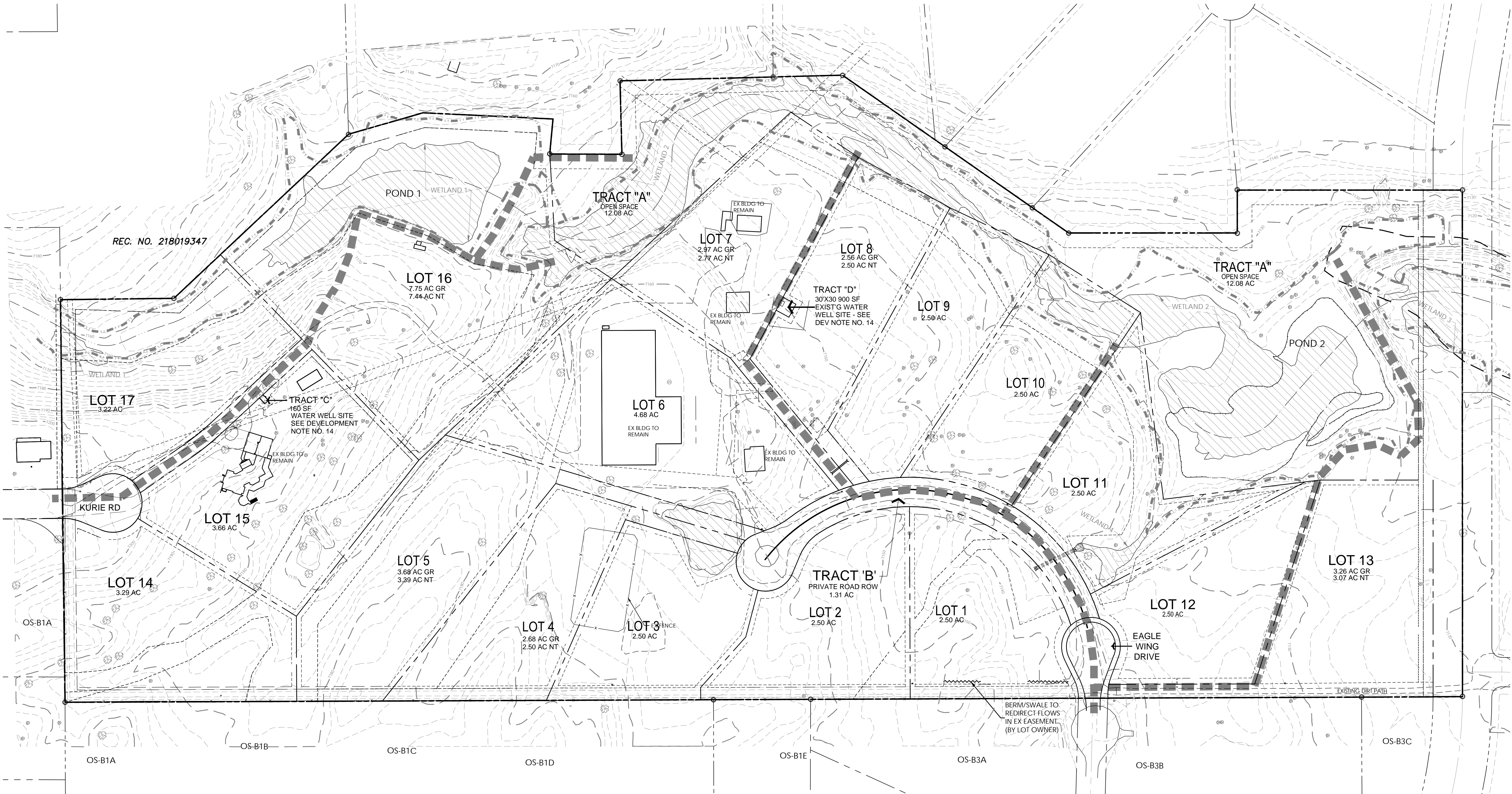


0085 S

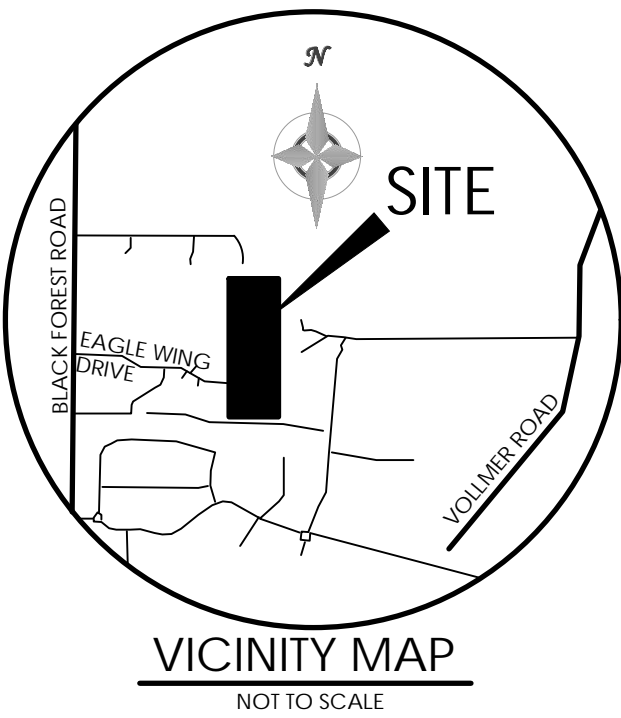


0088 NW

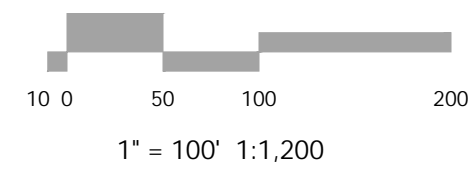
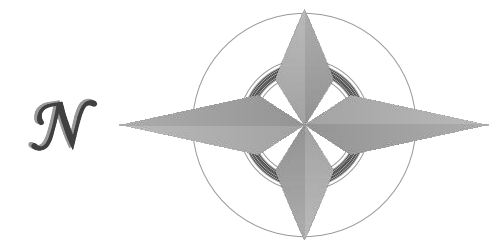




LEGEND	
	PROPERTY LINE
	EASEMENT LINE
	NBL NO BUILD LIMIT LINE
	LOT LINE
	EXISTING
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	PROPOSED INDEX CONTOUR
	PROPOSED INTERMEDIATE CONTOUR
	100 YEAR STORM WATER FLOOD LEVEL
	POSSIBLE ACCESS PATH



BENCHMARK



REVISIONS

DESIGNED BY  
DRAWN BY  
CHECKED BY  
AS-BUILTS BY  
CHECKED BY

EAGLE RISING  
PRELIMINARY PLAN

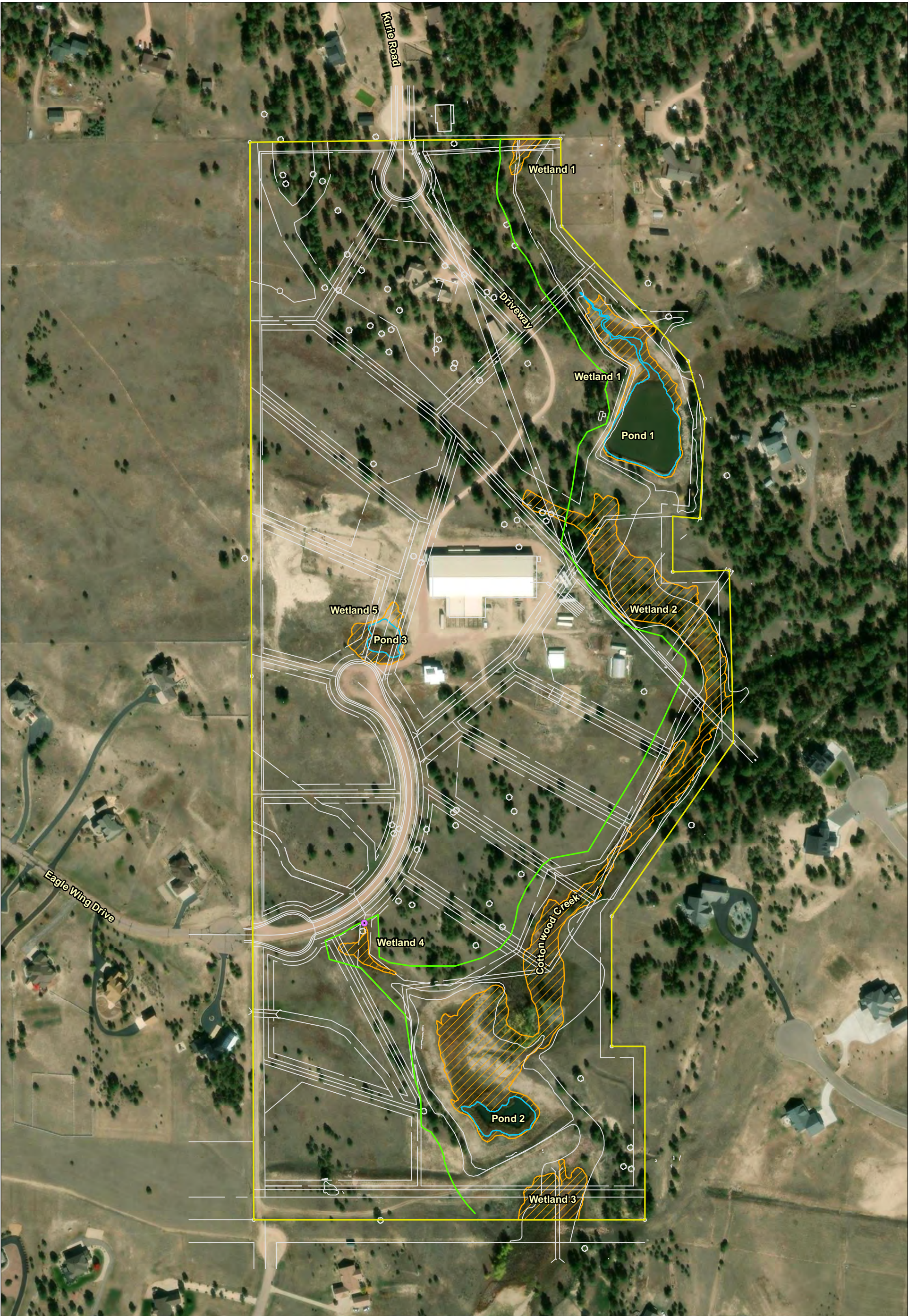
CREEK ACCESS

EXHIBIT

MVE PROJECT 61145  
MVE DRAWING DRN-MAP-DEV

MARCH 7, 2024  
SHEET 1 OF 1





Eagle Rising 2022 Natural Resources Assessment






-  Culvert
-  Construction/Disturbance Limit
-  Open Water
-  Project Area Boundary
-  Wetland

Image Source: Maxar Technologies©, October 14, 2022

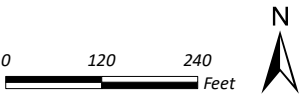


Figure 3  
Proposed Subdivision

Prepared for: Steve Jacobs  
File: 22\_113 Figure 3.mxd (GS)  
August 25, 2023





be impacted by development of the project area and to identify any significant changes in natural resources since the assessment conducted in 2012.

The project area has been continually influenced by human activities for more than 100 years. Timber was a major industry in the Black Forest in the late 1800's with numerous lumber mills scattered through the area. Grazing and agriculture dominated the land use in the early 1900's, eventually giving way to summer homes, and full-time residences (El Paso County Land Use Department 1987).

## Methods

During the 2022 site visits, ERO conducted an updated natural resources assessment of the project area. In addition to the information gathered during the 2022 site visits, natural resource information was obtained from existing databases and sources such as aerial photography, the Colorado Natural Diversity Information Source (NDIS), U.S. Fish and Wildlife Service (Service) National Wetlands Inventory database, U.S. Geological Survey (USGS) National Hydrography Dataset (NHD), and other sources ("Google, Inc." 2022; Natural Diversity Information Source 2021; U.S. Fish and Wildlife Service, n.d.; U.S. Geological Survey 2022). Based on the information gathered from existing sources and the initial site visit, ERO verified existing vegetation communities and identified important wildlife attributes of the project area.

## Project Area Description

The National Land Cover Database maps five land cover types in the project area (U.S. Geological Survey 2016). Grassland/Herbaceous is the most dominant and occurs throughout the majority of the western portion of the project area. The other land cover types in the project area include evergreen forest, scrub/shrub, open water, and barren land.

The project area is on the southern edge of the Black Forest, northeast of Colorado Springs (Figure 1). Vegetation in the project area consists of upland grasslands, patches of ponderosa pine (*Pinus ponderosa*) and upland shrubs, and wetland/riparian vegetation along drainages. Three tributaries to Cottonwood Creek converge at the eastern project area boundary. In the project area, Cottonwood Creek generally flows from north to south and primarily consists of wetlands throughout the channel (Figure 2; Photos 5a through 7a, 5b, 6b). Two ponds (Ponds 1 and 2) occur along Cottonwood Creek in the project area that are contained behind earthen dams (Photos 1a through 4a). As a result of water rights negotiations and drought, the wetlands along Cottonwood Creek and the two ponds were drier in 2022 than what was observed in 2012 (Photos 1b through 4b). A third pond (Pond 3), that was excavated in uplands occurs in the west, central portion of the project area (Figure 2; Photos 6a and 6b)). Wetlands occur in the channel and on benches and terraces along Cottonwood Creek and as small fringes along the ponds. A depressional area and swale consisting of wetland vegetation (Wetland 4) occurs downstream of a culvert in the project area northwest of Pond 2 (Figure 2). Wetlands in the project area are dominated by Nebraska sedge (*Carex nebrascensis*), Baltic rush (*Juncus balticus*), redtop (*Agrostis gigantea*), broadleaf cattail (*Typha angustifolia*), sandbar willow (*Salix exigua*), strapleaf willow



(*Salix ligulifolia*), park willow (*Salix monticola*), and shining willow (*Salix lucida* subsp. *caudata*). The riparian overstory along Cottonwood Creek is dominated by peachleaf willow (*Salix amygdaloides*) and plains cottonwood (*Populus deltoides* subsp. *monilifera*) trees. Upland shrubs in the riparian corridor include snowberry (*Symphoricarpos occidentalis*), Woods' rose (*Rosa woodsii*), golden currant (*Ribes aureum*), and chokecherry (*Padus virginiana*) (Photo 10). The soils in the project area primarily consist of Pring coarse sandy loam, 3 to 8 percent slopes (Natural Resources Conservation Service 2022).

The project area is one of the last remaining nonresidential tracts of land along Cottonwood Creek. Rural residential development (2- to 5-acre lots) surrounds the entire project area. Two existing homes are located in the northwest corner of the project area and a large barn, corral, and disturbed area occurs in the north-central portion of the project area (Photo 8a). The uplands in the project area are a mixture of native grassland and disturbed areas (Photos 9a and 9b). The project area has historically been used for cattle grazing, and some limited grazing continues in the southeast corner of the project area. The native upland areas are dominated by blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), threeawn (*Aristida* sp.), soapweed yucca (*Yucca glauca*), Canada wildrye (*Elymus canadensis*), intermediate wheatgrass (*Thinopyrum intermedium*), sideoats grama (*Bouteloua curtipendula*), muhly (*Muhlenbergia* sp.), and ponderosa pine (Photos 9a and 9b). The disturbed uplands are dominated by smooth brome (*Bromus inermis*), diffuse knapweed (*Centaurea diffusa*), Canada thistle (*Cirsium arvensis*), musk thistle (*Carduus nutans*), common mullein (*Verbascum thapsus*), common teasel (*Dipsacus fullonum*), and kochia (*Bassia scopara*).



## Conclusions

On behalf of the project proponent, ERO is requesting an approved JD for the old stock pond and upland vegetated swale in the northeastern portion of the project area, Pond 3 and associated Wetland 5, and Wetland 4. Based on the information in this report, if the Corps determines that the wetlands and waters are not jurisdictional, ERO would appreciate a written determination of this request confirming that no further consultation under Section 404 is required.

If you have any questions or need additional information, please do not hesitate to contact me at 303-830-1188 or by email at [cmarne@eroresources.com](mailto:cmarne@eroresources.com). I look forward to hearing from you.

Sincerely,



Courtney Marne  
Biologist/Associate

cc: David Jones - Land Resource Associates  
Stephen Jacobs - MyPad, Inc.

Attachments: Figures 1 and 2; Photo Log; Routine Wetland Determination Forms; JD Form

## References

- Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual." Wetlands Research Program Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station.  
<https://www.lrh.usace.army.mil/Portals/38/docs/USACE%2087%20Wetland%20Delineation%20Manual.pdf>.
- ERO Resources Corporation. 2012. "Wetland Delineation Report, Eagles Rising Subdivision, El Paso County, Colorado."
- U.S. Army Corps of Engineers. 2010. "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)." Vicksburg, Mississippi. <https://usace.contentdm.oclc.org/utis/getfile/collection/p266001coll1/id/7646>.
- U.S. Army Corps of Engineers. 2020. "National Wetland Plant List."
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2022a. "PLANTS Database." PLANTS Database. 2022. <https://plants.sc.egov.usda.gov/home>.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2022b. "Web Soil Survey." 2022. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
- U.S. Geological Survey. 2016. "National Land Cover Database." 2016.  
<https://www.usgs.gov/node/279743>.



U.S. Geological Survey. 2022. "National Hydrography Dataset." U.S. Department of the Interior, U.S. Geological Survey. <https://apps.nationalmap.gov/viewer/>.

Weber, William A., Ronald C. Wittmann, and Linna Weber Müller-Wille. 2012. *Colorado Flora: Eastern Slope, Fourth Edition. A Field Guide to the Vascular Plants*. University Press of Colorado.



EAGLE RISING SUBDIVISION  
PHOTO LOG  
MARCH 19, 2012 AND APRIL 27, 2022



**Photo 1a** - Cottonwood Creek at the southern boundary of the project area. View is to the south.



**Photo 1b** - Cottonwood Creek at the southern boundary of the project area. View is to the south.



**Photo 2a** - Wetlands along Cottonwood Creek in the project area. View is to the south.



**Photo 2b** - Wetlands along Cottonwood Creek in the project area. View is to the south.



**Photo 3a** - Pond 1 in the project area. View is to the east.



**Photo 3b** - Immediately upstream of Pond 1 in the project area. View is to the east.



EAGLE RISING SUBDIVISION  
PHOTO LOG  
MARCH 19, 2012 AND APRIL 27, 2022



**Photo 4a** - Pond 2 in the project area.  
View is to the northwest.



**Photo 4b** - Pond 2 in the project area.  
View is to the northwest.



**Photo 5a** - Vegetated swale upstream of Cottonwood Creek  
in the project area. View is to the northwest.



**Photo 5b** - Vegetated swale upstream of Cottonwood Creek  
in the project area. View is to the northwest.



**Photo 6a** - Pond 3 in the project area.  
View is to the northwest.



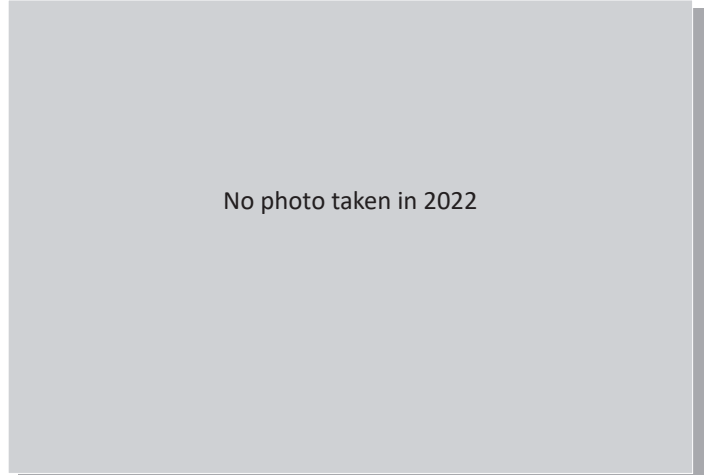
**Photo 6b** - Pond 3 and associate Wetland 5 in the project area.  
View is to the northwest.



EAGLE RISING SUBDIVISION  
PHOTO LOG  
MARCH 19, 2012 AND APRIL 27, 2022



**Photo 7a** - Wetland 9 in the project area.  
View is to the southeast.



**Photo 7b** - Wetland 9 in the project area.  
View is to the southeast.



**Photo 8a** - Disturbed uplands and barn in the project area.  
View is to the northeast.



**Photo 8b** - Disturbed uplands and barn in the project area.  
View is to the northeast.



**Photo 9a** - Native uplands in the project area.  
View is to the northeast.



**Photo 9b** - Native uplands in the project area.  
View is to the northeast.



EAGLE RISING SUBDIVISION  
PHOTO LOG  
MARCH 19, 2012 AND APRIL 27, 2022



**Photo 10a** - Riparian corridor in the project area.  
View is to the southeast.



**Photo 10b** - Riparian corridor in the project area.  
View is to the southeast.



# Publication indicating the utilization of willow for stream stabilization



## COLORADO STATE PARKS STEWARDSHIP PRESCRIPTION



Date Created: April 10, 2002

Revised: April 1, 2005

Author: Mindy Wheeler

Parks Affected: Most

## Cottonwood and Willow Management <sup>Stewardship</sup> **Rx**





# RESTORING STREAM BANKS WITH WILLOWS



Willows along a stream serve many important functions. They provide shade and cover for stream life and improve water quality by absorbing and storing chemicals. Their ability to withstand flooding, to stabilize soils, and to grow quickly in saturated areas make them ideal for revegetating stream banks.

Establishing willow cuttings, stakes, and/or wattles on a stream bank will benefit you and the stream. The most appropriate material and method to use will depend upon stream size and planting location.

Willows growing in a nearby area, with similar soil and moisture conditions as your problem area, should be used as planting stock to help increase tree survival.

If plants are purchased from a nursery, you should buy cuttings and not rooted seedlings. Also, select a native species to enhance survival and decrease competition with other plants.

Recommended species include black willow (*Salix nigra*), sand bar willow (*S. interior*), meadow willow (*S. petiolaris*), heart-leaved willow (*S. rigida*) and Ward's willow (*S. caroliniana*).

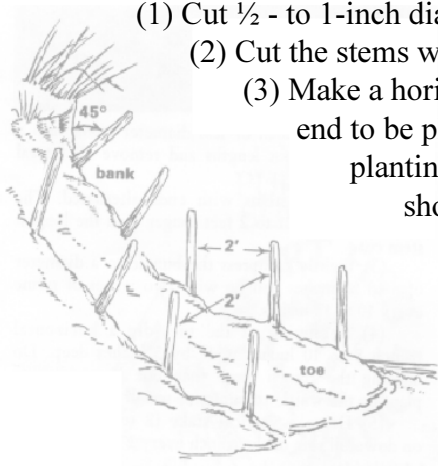
Collect and plant the willows during the dormant season. Willows planted in the spring before the buds swell seem to do the best. When storing or transporting plants, keep them cool and slightly moist.



## Willow Cuttings

Cuttings are used on small streams where flooding and erosion is minimal. This material is easy to obtain, requires few tools and little labor to plant.

- (1) Cut ½ - to 1-inch diameter plants or stems and remove all lateral branches.
- (2) Cut the stems with a knife or pruning shears into 12- to 24-inch lengths.
- (3) Make a horizontal cut on the end which will remain exposed and a 45° angle cut on the end to be planted. This will prevent you from planting them upside down. Note: Buds on plant should face up.
- (4) Push cutting directly into soil or produce a pilot hole by pounding a piece of metal rebar into the soil and then push the cutting into the hole. A planting (dibble) bar may also be used. Plant so that only a few inches remain exposed.





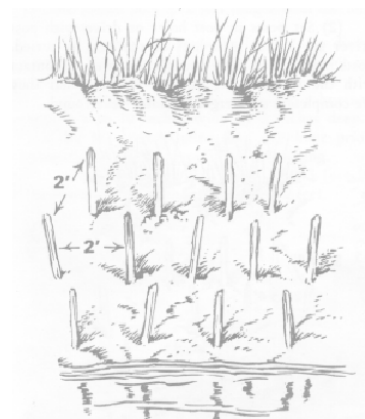


### Willow Stakes

Use stakes where materials need to be driven deeper to improve moisture supply to the stakes.

(1) Cut 1- to 3-inch diameter stems into 18- to 36-inch lengths with a hand saw or chainsaw and remove all lateral stems. (Note: Using an axe or knife to cut the stems may damage the plant.)

(2) Use dibble bar or drive stake with mallet until approximately 3 to 6 inches remain exposed or to refusal. **Do not force and split stake.**



### Willow Posts

Posts can also be used to revegetate stream banks. They are most appropriate in situations where a stable moisture supply is deep in the soil and willow materials need to be driven deeper to reach it. This is a very labor intensive method, but posts can withstand relatively high flows.

(1) Cut 3- to 6-inch diameter trees into 6- to 8-foot lengths with a chainsaw and remove all lateral branches. Sharpen bottom end to ease planting and score 12 to 14 inches.

(2) Set posts in post holes or drive with post driver so that at least half of the post is buried. Posts must be set deep enough to maintain contact with the water table, but not so deep that they are completely submerged in water year-round.

(3) The damaged top few inches of each post should be cut after planting if posts were driven.



### Wattles

Use wattles in slow-moving water areas to trap sediments and revegetate banks. This method is more labor intensive than planting cuttings or stakes.

- (1) Cut 1 1/2-inch or less diameter stems into a minimum of 3-foot lengths and remove all lateral branches.
- (2) Bundle stems with ends alternated. The bundle should be 1 to 2 feet longer than the longest stem cut.
- (3) Tightly compress bundle to a diameter of 8 to 10 inches and tie with two wraps of twine every 10 - 15 inches.
- (4) Beginning at the toe, dig a horizontal trench 8 to 10 inches wide by 5 inches deep. Do not dig the trench more than one hour prior to planting the wattle to minimize soil drying.
- (5) Drive a vertical stake (2 to 3 feet long) on done-hill side of trench every 2 feet.
- (6) Place wattles in trench and drive 2- to 3-foot long stakes through the bundle every 3 feet.
- (7) Cover with soil and tamp wattle so that no more than 20 percent of the wattle is exposed.

A combination of these methods may be needed based on the characteristics of the stream and its banks.



Proper maintenance will be needed to attain long-term success. Protect young, growing willows from livestock. Also, avoid herbicide treatment on planted areas.

Planting willows along and on stream banks provides a number of benefits to the fragile stream environment and the surrounding land. However, this technique does not replace the need for responsible stream corridor management such as maintaining a permanent corridor of trees along streams. It is merely a tool to help mend problem areas. If you have further questions,

please contact your local Missouri Department of Conservation Regional Office.

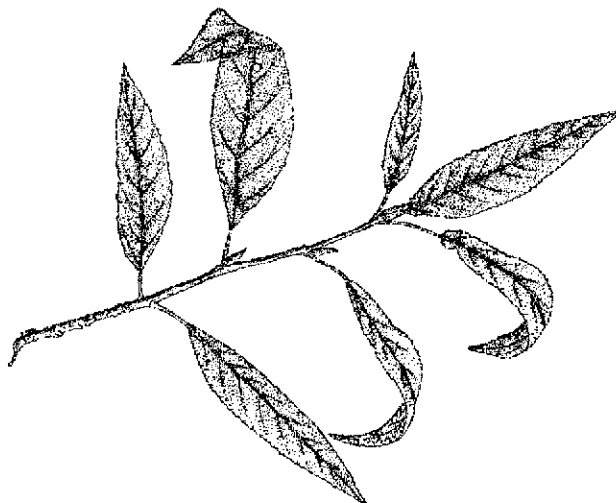


## Wetland / Riparian Plant Finder 6: Riparian – Foothills and Canyons

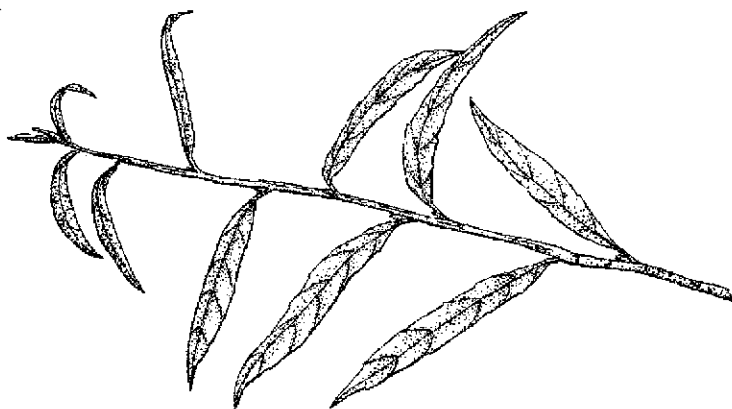
(dominant species in bold type)

### TREES AND SHRUBS (continued)

<i>Rubacer parviflorum</i>	thimbleberry
<i>Salix amygdaloides</i>	peachleaf willow
<i>Salix bebbiana</i>	Bebb willow
<i>Salix drummondiana</i>	Drummond's willow
<i>Salix geyeriana</i>	Geyer's willow
<i>Salix irrorata</i>	bluestem willow
<i>Salix lucida</i>	shining willow
<i>Salix monticola</i>	mountain willow
<i>Swida sericea</i>	red-osier dogwood



*Populus angustifolia*



*Salix exigua*



Publication on restoration of Colorado streams and rivers utilizing  
new willow plantings

April 14, 2010

## Restoration Plan and Environmental Assessment for the Upper Arkansas River Watershed

### PREPARED FOR

U.S. Department of the Interior  
U.S. Fish and Wildlife Service  
U.S. Bureau of Land Management  
U.S. Bureau of Reclamation

State of Colorado  
Department of Natural Resources  
Department of Public Health and Environment  
Department of Law

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(See original submittal for complete report)