SUMMIT COUNTY
COLORADO

PLANNING DEPARTMENT

970.668.4200
www.SummitCountyCO.gov

0037 Peak One Dr. | PO Box 5660
Frisco, CO 80443

UPPER BLUE PLANNING COMMISSION
AGENDA
MARCH 28, 2024 – 5:30 P.M.
This meeting will be conducted in person at:
Mt. Royal Room
County Commons
0037 Peak One Dr.
Frisco, CO 80443
The public is welcome to attend in person or via Zoom by using the following information:

Register in advance for this webinar:
https://summitcountyco-gov.zoom.us/meeting/register/tZUld-CqrTkpE9a2NIMT_wAcCu6bAu3-B0ti
After registering, you will receive a confirmation email containing information about joining the webinar.

I. CALL TO ORDER

II. ROLL CALL

III. APPROVAL OF SUMMARY OF MOTIONS: February 29, 2024

IV. APPROVAL OF AGENDA: Additions, Deletions, Change of Order

V. NEW BUSINESS

- No items

VI. CONSENT AGENDA

- No Items

VII. PUBLIC HEARINGS

- PLN24-014 -Class 5 Development Agreement Amendment; Red Tail Ranch PUD, A request for an Amendment to an existing Development Agreement on 488 acres; Red Tail Ranch PUD, Red Tail Ranch PUD, 805 Whatley Ranch Road (CR 945) (Upper Blue/Joel Mayo)

- PLN23-046 - Mascot Placer CUP, Milling, Class 4 Conditional Use Permit for Milling Operations Upper Blue Basin, TR 6-77, Sec 24, Qtr 2, Mascot Placer MS# 7083, 64.03 acres, Remaining 25 acres earth and stone producing land on Sch #6512349, zoned A-1. Complete legal description available from Planning, 5290 Tiger RD (CR 6), East of Swan Valley Estates, North of the Parkville sub (Upper Blue/Peak Materials C/O Joanna Hopkins)

- PLN23-072: Country Boy Mine Property Rezoning**:** Preliminary rezoning of a 20-acre parcel from A-1 to PUD for the Country Boy Mine Property to allow Community special events, museum, mine tours, bard, animal keeping (donkeys), parking, existing accessory structures, recreational events (snowshoeing, hikes, etc.), pavilion, gift shop/check-in area, Ore Bin Restoration, employee housing facilities, food truck, tubing facility, toboggan use, warming hut/outhouse, kitchen facility, improved bathroom facility, and site design elements and Operational Plans, Country Boy Mine, A Portion of Survey NO. 1285 Lois D. Placer, T6S, R77W, Sections 32 and 33 (Upper Blue Basin/Danny Teodoru)

VIII. WORK SESSION ITEMS

- No Items

IX. DISCUSSION ITEM

- No Items

X. ADJOURNMENT

* Allowance for Certain Site Plans to Be Placed on the Consent Agenda: Site plan reviews consisting of three (3) to a maximum of 12 multi- family units for the total development parcel or project may be placed on a Planning Commission's "consent agenda", which allows for expeditious review and approval of these smaller projects. Site plans may only be placed on the consent agenda if the recommendation does not include any conditions. Single-family and duplex developments that are required to have a site plan review by a Planning Commission due to a plat note, PUD requirement or other regulatory mechanism may also be placed on a Commission's consent agenda. A Planning Commission member may pull such agenda item off the consent agenda to allow staff or the applicant to address issues or questions related to the site plan review criteria for decision prior to taking action.

UPPER BLUE PLANNING COMMISSION
SUMMARY OF MOTIONS

February 29, 2024

CALL TO ORDER: Keith Gallacher, Chair, called the meeting to order at 5:31 p.m.

COMMISSIONERS PRESENT: Keith Gallacher, Richard Holcroft, Allen Frechter, Dan Cleary, Steve Holcomb, Christine Murphy, Emily Lawless and Ric Pocius

STAFF PRESENT: Susan Lee, Suzanne Pugsley and Margaret Citak

APPROVAL OF SUMMARY OF MOTIONS: The Summary of Motions of the January 25, 2024 meeting were approved as submitted.

APPROVAL OF AGENDA: Additions, Deletions, Change of Order – None

CONSENT AGENDA: No Items

NEW BUSINESS: No Items

PUBLIC HEARING: No Items

WORK SESSION ITEMS: No Items

DISCUSSION ITEMS: Applicant Interviews for Vacancies and/or Expiring Terms

Applicant Interviews for vacancies and/or expiring terms. The Commission interviewed Ben Stuckey, Rebecca Walters and Gordon Manin for the vacant seat left by Christine Murphy. The Commission preferred Rebecca Walters or Gordon Manin for the open seat and recommends that the existing commissioners who are up for reappointment be reappointed.

ADJOURNMENT: The meeting was adjourned at 6:58 p.m.

Respectfully submitted,

Suzanne Pugsley
Planner II

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STAFF REPORT

TO: Upper Blue Planning Commission ("UBPC")

FROM: Simon Corson, Senior Planner

FOR: Meeting of March 28, 2024

SUBJECT: Planning Case PLN24-014: A Class 5 Amendment to the existing Development Agreement, Red Tail Ranch PUD; 488-acre parcel, zoned Red Tail Ranch PUD

APPLICANT: Joel Mayo, Davis Graham & Stubbs LLP

OWNER: Bolthouse LLC

REQUEST: Class 5: Amendment to the existing Red Tail Ranch Development Agreement, Red Tail Ranch PUD; a 488-acres parcel, zoned Red Tail Ranch PUD

PROJECT DESCRIPTION

General Location: West of the Town of Breckenridge, surrounded by the White River National Forest
Legal Description: Red Tail Ranch PUD
Existing Zoning: Red Tail Ranch PUD
Total site area: 488 acres
Adjacent land uses:
East: White River National Forest, Town of Breckenridge
West: White River National Forest
North: White River National Forest
South: White River National Forest

BACKGROUND

The subject parcels within the Red Tail Ranch Planned Unit Development (PUD) are owned by Bolthouse LLC. The Whatley Ranch PUD was originally approved on November 9th, 1987, and most recently amended on March 22, 2004. During the PUD amendment process in 2004, the PUD was renamed to the Red Tail Ranch PUD. The PUD establishes the land uses and densities that shall be permitted within the subject parcels, a general development plan, development standards and conditions that must be adhered to by the property owner. In 2004, a Development Agreement was established between the property owner and Summit County Government, which created vested property rights for a minimum of ten years up to twenty years. The vested rights period under the 2004 Development Agreement was set to expire on March 24, 2024, which created the impetus for this application. This application was filed on February 9th, 2024, and if approved, would extend the vested rights under the 2004 Development Agreement.

PROJECT SUMMARY

This application proposes to extend the vested rights that were granted to the property owner in 2004 for an additional minimum period of two years through March 24, 2026. The applicant also

proposes to allow for up to five, two-year extensions. If all options to extend were exercised, this Development Agreement would expire on March 24, 2036. This proposed Amendment to the Red Tail Ranch Development Agreement Amendment is written in such a way that these options to extend the vested rights would be deemed exercised and effective absent the property owner's prior written notice to Summit County Government sixty days prior to the expiration of the vested rights period. The property owner is not requesting to change the general development plan, nor any development standards, uses or densities. In other words, no changes to the Red Tail Ranch PUD are proposed.

CRITERIA FOR DECISION

Section 12805.01 of the Summit County Land Use and Development Code ("Code") states that the Planning Commission shall recommend approval and the BOCC shall approve a development agreement if it meets all relevant County regulations and standards and provided the Review Authority makes the following findings:

A. Vesting of property rights is warranted in light of relevant circumstances such as the size and phasing of the development economic cycles and market conditions.
B. The agreement is consistent with public health, safety and welfare.
C. The agreement provides for the construction and financing of improvements and facilities needed to support the proposed development.
D. The standards and criteria required to be met at the step in the development process for which an agreement is being sought have been met.

A. VESTING OF PROPERTY RIGHTS

Staff finds that the vesting of property rights is warranted because they would allow for gradual phasing of development. With everchanging market conditions, the property owner's desire to hold vested property rights with the provisions to extend or extinguish these rights after a period of two years is reasonable.

B. PUBLIC HEALTH, SAFETY AND WELFARE

Staff finds that this agreement is consistent with public health, safety, and welfare because of the development plan, development standards, uses and densities established through the Red Tail Ranch PUD and reinforced through the provisions of this Development Agreement. By granting approval to amend this Development Agreement, the public is assured that the subject parcels will not be upzoned for a minimum of two years and a maximum of twelve years.

C. CONSTRUCTION, FINANCING, AND FACILITES

Staff finds that this agreement provides for the construction and financing of improvements and facilities needed to support the proposed development. Any development on the subject parcels would need to be in adherence with the underlying zoning detailed in the Red Tail Ranch PUD. Should development take place on the subject parcels, additional Summit County Government review would be required including Site Plan Review and Building Permit Review.

D. STANDARDS AND CRITERIA IN THE DEVELOPMENT PROCESS

Staff finds that standards and criteria within the Development Agreement are met, in that the applicant applied to amend the Red Tail Ranch Development Agreement prior to its expiration date of March 24, 2024.

STAFF RECOMMENDATION

Staff recommends the Upper Blue Planning Commission recommend that the Board of County Commissioners approve Planning Case PLN24-014, an Amendment to the existing Red Tail Ranch Development Agreement, Red Tail Ranch PUD; a 488-acre parcel, zoned Red Tail Ranch PUD, with the following findings:

Findings:

1. This Development Agreement is warranted considering relevant circumstances such as the size and phasing of the development economic cycles and market conditions.
2. This Development Agreement is consistent with public health, safety and welfare.
3. This Development Agreement provides for the construction and financing of improvements and facilities needed to support the proposed development.
4. This Development Agreement is in conformance with standards and criteria required to be met at this step in the development process.

ATTACHMENTS:

a. Red Tail Ranch Development Agreement Amendment
b. Red Tail Ranch PUD
c. Project Narrative

FIRST AMENDMENT TO DEVELOPMENT AGREEMENT FOR EXTENDED VESTING OF THE RED TAIL RANCH (F/K/A WHATLEY RANCH) PUD

This first amendment ("First Amendment") amends the Development Agreement for Extended Vesting of the Red Tail Ranch (f/k/a Whatley Ranch) PUD dated March 24, 2004 and recorded June 9, 2004 at Reception No. 758767 ("2004 Development Agreement") and is made as of the ___ day of _____ 2024, between the SUMMIT COUNTY BOARD OF COUNTY COMMISSIONERS ("Summit County" or the "County") and Bolthouse, LLC, a Colorado limited liability company, successor-in-interest to Bud & Dot, LLLP ("Developer").

RECITALS

WHEREAS, Summit County is authorized by Section 12800 of the Summit County Land Use and Development Code, as currently in effect or hereinafter amended ("Code") and C.R.S. 24-68-101 *et seq.,* to enter into an agreement with a landowner or developer to provide for a vested property rights period according to the terms and for the period identified in a development agreement; and

WHEREAS, Developer is the owner of certain real property located in Summit County, Colorado, legally described on Exhibit A, which exhibit excludes Lot 1 of the Whatley Reserve Subdivision ("Lot 1"), attached hereto and by this reference incorporated herein (the "Property"); and

WHEREAS, the Property contains approximately 488 acres and, together with Lot 1, is currently zoned for a Planned Unit Development ("PUD"); and

WHEREAS, the County and Developer desire to protect the ranching and natural resource values of the Property; and

WHEREAS, Summit County previously approved an application for a major PUD modification ("PUD Modification") pursuant to Section 12200 *et seq.* of the Code which included a name change for the development to the Red Tail Ranch Planned Unit Development ("The Red Tail Ranch PUD"); and

WHEREAS, the Upper Blue Planning Commission previously recommended that the Board of County Commissioners approve The Red Tail Ranch PUD subject to certain conditions, found that The Red Tail Ranch PUD constituted a site specific development plan and approved the development agreement; and

WHEREAS, By Resolution No. 2004-28 recorded June 9, 2004 at Reception No. 758767, Summit County previously approved a site specific development plan and development agreement for The Red Tail Ranch PUD in accordance with the provisions of Section 12800 of the Code wherein the owner's development rights for the Property were vested on March 24, 2004 ("2004 Development Agreement"); and

WHEREAS, Summit County has now received a completed application and all required fees and submittals for this First Amendment wherein the 2004 Development Agreement will be

amended to extend the vested rights provided thereunder for a further period of a minimum of 2 years and a maximum of 12 years; and

WHEREAS, the Summit County Board of County Commissioners has reviewed this First Amendment at a public hearing held on _____, 2024 with public notice as required by law and considered the evidence and testimony presented at that hearing; and

WHEREAS, Summit County has determined that The Red Tail Ranch PUD remains in general conformance with the Joint Upper Blue Master Plan and the Countywide Comprehensive Plan as in effect at the time of the 2004 Development Agreement; and

WHEREAS, Summit County has approved this First Amendment through a quasi-judicial process by resolution.

NOW THEREFORE, in consideration of the recitals set forth above and provisions of this First Amendment, the parties agree as follows.

AGREEMENT

The 2004 Development Agreement is hereby amended as follows. The remainder of the 2004 Development Agreement not otherwise amended herein shall remain in full force and effect.

1. Paragraph 1 is amended as follows:

   Extension of Vesting Warranted. Summit County acknowledges and agrees that it has determined that circumstances warrant another extension of the vested property rights for the Property for all of the reasons supporting the original vesting period under the 2004 Development Agreement, including assuring the public that the Property will not be able to be upzoned by a County process or a town annexation process for a minimum of an additional 2 years, with a maximum potential of 12 additional years;.

2. Paragraph 1(c) is amended as follows:

   Extension of Vesting Period. Pursuant to its authority under Section 12808 of the Code, the Board of County Commissioners, on behalf of Summit County, agrees that the vested property rights period for the Property shall be extended again from the term under the 2004 Development Agreement for an additional two (2) years from the Effective Date of this First Amendment. Thereafter and subject to this Section of the First Amendment, the vesting period shall automatically be extended for five (5) additional two-year (2-year) periods (for a total maximum of 12 additional years beyond the term in the 2004 Development Agreement). Notwithstanding the foregoing, Developer shall have the right to terminate any automatic extension of the vesting period provided hereunder by providing written notice thereof to the County on or before sixty (60) days prior to the then-existing termination date of the vesting period.

3. (3) Paragraph 10(j) is amended as follows:

Notice. Any notice required or permitted hereunder shall be in writing and shall be sufficient if personally delivered or mailed by certified mail, return receipt requested, addressed as follows:

To Summit County:	Board of Commissioners P.O Box 68 Breckenridge, CO 80424
with a copy to:	Keely Ambrose County Attorney P.O. Box 68 Breckenridge, CO 80424
To the Developer:	Bolthouse, LLC c/o William Bolthouse 4650 W Hanoverian WayLittleton, CO 80128
With a copy to:	Joel Mayo Davis Graham & Stubbs LLP 1550 17th Street, Suite 500 Denver, CO 80202

Notices mailed in accordance with the provisions of this paragraph shall be deemed to have been given three (3) days after deposit in the United States mail. Notices personally delivered shall be deemed to have been given upon delivery. Nothing herein shall prohibit the giving of notice in the manner provided for in the Colorado Rules of Civil Procedure for service of civil process. Either party may change the name or address for giving notice by providing notice of such change in the manner provided for herein.

(4) The 2004 Development Agreement remains unchanged and in effect except as specifically provided herein.

EXECUTED as of the date first above written.

BOARD OF COUNTY COMMISSIONERS OF SUMMIT COUNTY, COLORADO

By:_____

Title: _____

ATTEST:

By:_____

Title: _____

By: _____
William Bolthouse
Manager of Bolthouse, LLC

STATE OF COLORADO)
)ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me on this ____ day of _____, 2024 by_____.

Witness my hand and official seal:

_____
Notary Public

My commission Expires: _____

751909
Cheri Brunvand-Summit County Recorder 4/5/2004 13:58 DF:

RED TAIL RANCH
PLANNED UNIT DEVELOPMENT DESIGNATION

The Whatley Planned Unit Development Designation ("PUD") was originally approved the 9th day of November, 1987, and readopted on the 10th day of April 1989 and the 10th day of August, 1990 by the Board of County Commissioners of Summit County, Colorado, hereinafter referred to as the "County". The PUD is hereby modified this 22nd day of March, 2004, and is hereby renamed the Red Tail Ranch Planned Unit Development Designation, (hereinafter referred to as the "Designation"). This Designation applies to certain real property located in Summit County and described in attached Exhibit A hereinafter referred to as the "Property".

This Designation establishes the land uses and density that shall be permitted within the Property, a general development plan, development standards and conditions that must be adhered to by Bud & Dot, LLLP as successor and assign of the original owner/developer of the PUD, hereinafter referred to as the "Owner/Developer". This Designation also specifies improvements which must be made and conditions which must be fulfilled in conjunction with the development of the Property. Where this Designation does not address a specific development standard or requirement of the Summit County Land Use and Development Code, currently in effect or hereinafter amended (hereinafter referred to as the "Development Code"), the provisions of the Development Code shall apply. Where the Designation addresses a specific development standard or requirement, the provisions of this Designation shall supersede the provisions of the Development Code. Use and development of the Property shall be in accordance with the specific requirements of this Designation and in substantial compliance with the PUD Plan attached hereto as Exhibit B, and the following goals and objectives:

- The prime objective for the Red Tail Ranch is to pursue a conservation oriented approach to development which emphasizes the historic ranching or agricultural character of the Property and promotes a land stewardship approach to future development.
- Future residential development in the Property should be compatible with and respect the diversity of natural features, wildlife habitats and vegetation types that exist on the Property.
- Open meadows and wetland areas should be essentially free from development with the exception of minimal disturbance for roads, utilities, agricultural fencing, ponds, and other enhancements and structures related to the maintenance and control of natural water features designed to create and/or support wildlife habitat or necessary to serve the permitted uses.

A. Density, Permitted Uses, Accessory Uses and Caretaker Units

1. Permitted Density and Uses

The following are the permitted density and uses of the Property:

a) Existing single family unit and existing accessory uses on Lot 1 of the Whatley Reserve Subdivision. No size restrictions pertain to this single family residence.
b) 11 other single family residences. No size restrictions pertain to these single family residences so long as the development standards set forth in this PUD are otherwise met.
c) The existing single family residences may be remodeled, renovated, expanded, removed, relocated or replaced so long as no more than 12 single family residences are created on the Property.

d) Agricultural and Open Space Uses (Excludes Lot 1 of the Whatley Reserve Subdivision): All of the areas outside of the development areas shall remain open and free from development except for agricultural and open space uses. Agricultural uses of the Property shall be consistent with the historical agricultural and ranching use of the Property and are permitted and/or limited as follows:

i. Agricultural Operations: Operations associated with the growing and harvesting of crops and timber, and raising of livestock and enhancement of support for fisheries and wildlife habitat including such activities as lumbering, plowing, planting, scarifying soils, construction and cleaning of irrigation ditches, construction of roads, buildings, corrals, stock ponds, fishery improvements and other wildlife habitat within farm or ranch boundaries.
ii. Agricultural Buildings: Structures designed and constructed to house and/or control or store farm implements, equipment and recreational vehicles, hay, grain, poultry, livestock or other horticultural products. These structures shall not be places of human habitation or places of employment where agricultural products are processed, treated or packaged (except for harvesting and storage which are expressly authorized); nor shall they be places used by the public.
iii. Private open space uses include both active and passive recreation uses, including but not limited to non-commercial horseback riding, snowmobiling, ATVs, cross-country skiing, skating, hiking, fishing, shooting, hunting and other similar uses.

2. Accessory Uses (Excludes Lot 1 of the Whatley Reserve Subdivision)

Accessory uses associated with the single family residential dwellings shall be permitted within the required disturbance envelope (Please refer to Section B.1) as follows:

a) Private attached or detached garage or garages limited to no more than 1,500 square feet of floor area per single family residential dwelling or caretaker unit.
b) Home occupations in accordance with Section 3810 of the Development Code.
c) Storage buildings/shed limited to 500 square feet of floor area.
d) Residential outdoor storage, including but not limited to, storage or parking of recreational vehicles, boats, utility trailers in accordance with Section 3815 of the Development Code.
e) Other residential accessory uses permitted by the Development Code in the A-1 Zoning District.

3. Caretaker Units (Excludes Lot 1 of the Whatley Reserve Subdivision)

Caretaker units do not count towards density since such units are allowed as an accessory use to the single family residential dwellings. Thus, there is no density associated with these units that can be transferred out of the PUD, nor can such units be converted to market rate dwelling units.

Caretaker units shall be permitted as an accessory use subject to meeting the following requirements:

a) Number of caretaker units:
   i) The Homestead House and Tack House, as shown on Exhibit B, are permitted as caretaker units subject to the execution of a caretaker covenant as required by subsection A.3.i below. The Homestead House and Tack house are not required to be

titled jointly with a primary unit and may be owned in common by a homeowners association or other similar legal entity.

ii) Four additional caretaker units are permitted in accordance with the development standards and requirements of this Designation.

b) Caretaker units shall be occupied by persons related to the Owner/Developer of the property, either by blood, adoption or marriage, by guests of the Owner/Developer, or employees of the Owner/Developer who exchange security and/or caretaker services for housing. Caretaker units shall not be offered to or be used as rental units. Where a caretaker unit is established, the primary unit may be owner-occupied, rented short or long term, or vacant.

c) A caretaker unit shall be restricted by the property owner by a recorded covenant with the County that restricts the use of the unit to members of the property owner's family, or guests of the Owner/Developer or employees of the Owner/Developer in accordance with this section. The covenant shall grant enforcement power to Summit County.

d) A caretaker unit may be located in a freestanding residence separate from the property owner's residence, may be incorporated into the primary residence or a garage serving the primary residence.

e) Residences which contain caretaker units shall retain a single family character in both function and design.

f) A freestanding caretaker unit shall not exceed 2,400 square feet (excluding garage space) except that the existing Carlston residence of approximately 3,090 square feet may be converted to a caretaker unit at its current size. There are no size limits for caretaker units incorporated into the primary residence.

g) Parking for caretaker units shall be submitted in accordance with the requirements of the Development Code.

h) A well permit that allows for a caretaker unit in addition to the primary unit shall be submitted to the County during the building permit review.

i) Within three months of the Effective Date, the Homestead House and Tack House shall be restricted as caretaker units by a covenant between the Owner/Developer and the County in accordance with the requirements of this Designation.

B. Development Standards

Residential development conducted after the Effective Date shall comply with the following development standards:

1. Development Areas and Disturbance Envelopes

a) Each of the 11 single family residences permitted by Section A.1.b above and the additional four (4) related caretaker units (not including the caretaker units in the Homestead House and the Tack House) shall be located within development areas A-H as depicted on the PUD Plan (Exhibit B) and subject to site plan review and the development criteria as outlined in Section B (Development Standards) of this Designation. More than one single family dwelling unit or more than one caretaker unit is permitted within each development area provided the requirements of this PUD are met. The existing single family residence in Lot 1 of the Whatley Reserve Subdivision may be remodeled, renovated, removed, relocated or replaced; provided however, if the density unit is relocated from Lot 1 it must be relocated to a development area subject to meeting the requirements of this Designation.

b) Residential structures and residential uses must be located within a defined 2 to 3 acre disturbance envelope within one of the identified development areas as depicted on

Exhibit B. Disturbance envelopes meeting the requirements of this PUD shall be established as a part of the required site plan review process. All residential uses and associated accessory uses shall be located entirely within the disturbance envelope, including but not limited to roof driplines, decks, garages, sheds, wells and septic systems. No soil disturbance or tree removal is allowed outside of the disturbance envelope unless for buried utilities (excluding septic systems), fire mitigation, forest management, driveway or roadway construction, or other improvements expressly provided for herein. Agricultural and open space uses as outlined in Section A.1.d above can be located anywhere within the development areas shown in Exhibit B, within the disturbance envelopes or anywhere within the Property, subject to meeting the requirements of this Designation.

2. Building Height

a) Residential Structures: The maximum building heights for residential structures, including but not limited to accessory structures associated with residential uses, shall not exceed 35 feet, with such maximum height measured as a parallel plane 35 feet above the natural grade or finished grade, whichever is more restrictive. The height limitation can be visualized as an irregular plane, having the same contour as the surface of the building site, elevated to a height of 35 feet above the natural or finished grade. If the topography of the site slopes in more than one direction, the slope with the steepest grade shall be used as the natural grade by which the maximum height is calculated. Where there are minor depressions, hills or other minor irregularities of the natural grade of the building site, the average grade of the building site shall be used to determine the maximum height. Appendages may exceed the maximum height allowed by 10%, including but not limited to chimneys, vents, and antennas.
b) Agricultural Structures: Building heights for agricultural structures shall not exceed 50 feet using the methodology to calculate height listed in section B.2a above.
c) Notwithstanding the foregoing, structures shall be shorter than the height of the adjacent tree canopy in the disturbance envelope. To meet this requirement, a tree survey of the existing tree height in the disturbance envelope shall be required at the time of submitting for a site plan review.

3. Colors/Materials

a) Structures and roofs shall have non-reflective roof material and non reflective glass, and shall have natural colors so as to blend in with the surrounding landscape.
b) Exterior walls shall match the medium color values from the immediate background landscape.

4. Fencing

a) Fencing shall be permitted for agricultural, ranching and equestrian purposes.
b) Residential fencing shall be discouraged except within disturbance envelopes and along drives and roadways.
c) Fencing shall be open post and rail fencing, livestock fencing or other fencing typical of a ranching application.
d) Other types of fencing may be allowed by the County for unique situations, such as enclosed pet runs that may be required to minimize adverse impacts on wildlife, and for guardrails along roadways as required for safety.

e) Notwithstanding the foregoing fencing provisions, if Summit County approves wildlife friendly fencing standards, all fencing within the ranch shall attempt to meet the approved wildlife friendly fencing standards, so long as the application of such standards allows for the agricultural, ranching and equestrian uses of the Property to be met and the aesthetics of the development to be preserved. Fencing for dog or pet runs is excluded from this provision.

5. Environmental Standards

a) Slopes: All disturbance envelopes shall be located in areas with slopes less than 30%.
b) Wetlands: Disturbance envelopes shall be located at least 25 feet from wetland areas. No soil disturbance shall occur within 25 feet of wetland areas unless such disturbance is for agricultural operations as permitted by Section A.1.d or for existing road crossings of wetland areas as specifically provided for herein. If it is not practicable to use existing road crossings of wetlands to access a development area, then new wetland impacts for access roads are permitted provided the impact is mitigated to the satisfaction of the County. Filling of wetlands or other impacts to the wetland setback not contemplated herein shall be evaluated per the County's Wetland Regulations. The Owner/Developer may replace damaged culverts with new culverts of the same length, although the size may be bigger to accommodate higher flow rates. The existing roads in the Property may be re-graded and graveled within 25 feet of wetlands.
c) Wildlife: The land uses envisioned by this Designation have been evaluated using the provisions of the County's Wildlife Habitat Overlay District. To minimize impacts to wildlife, every dwelling unit in the PUD built after the Effective Date shall use bear-proof trash containers or dumpsters; and (ii) not allow dogs or cats to freely roam unless under direct supervision and voice control, with animal runs or other means used to ensure that they are contained when kept outside and not supervised.
d) Floodplain: No development shall occur within the 100 year floodplains that may be present on the Property.

6. Meadows, Benches, and Topography

The following design standards shall be used when siting disturbance envelopes and during the required site plan review:

a) Meadows/Open Landscapes: Wherever practicable, avoid locating residential buildings and accessory structures and uses in meadows and open landscapes. Where it is not practicable to avoid these areas, development shall be located and designed according to the following standards:
   i) Where practicable, buildings shall be located along forest edges.
   ii) When practicable, buildings shall be located behind landforms to provide maximum screening.
   iii) Buildings that must be located in open areas because it is not otherwise practicable to meet the other design standards in this Designation, shall be designed and intensely landscaped to blend into their surroundings to the maximum extent practicable.
   iv) Significant open areas shall be retained between disturbance envelopes to provide visual separation of structures to extent practicable.
b) Topographic Benches: Development within development areas A, B, and C shall meet the following standards:
   i) Buildings shall be located and designed so that the existing visual dominance of the natural landform, vegetation and topography is maintained.

ii) To the extent practicable, development shall not penetrate the skyline on the bench as viewed from any public road, trail, open space or recreation area.
iii) Buildings shall be set back from the edge of the bench slopes so they do not appear to protrude or hang over the edge of ridgelines and slopes.

c) Topography
i) Development shall minimize the need for grading, earth moving, vegetation removal and site disturbance to the maximum extent practicable.
ii) To the extent practicable, buildings shall be stepped to fit with the natural terrain.
iii) Building mass shall be broken into distinct, smaller forms including facades and rooflines. Breaking the mass into smaller forms, which may involve repeating similar forms is required over large blocks or building masses.
iv) Roads and other linear utilities that require site disturbance and removal of vegetation shall avoid crossing steeper slopes in the "mid slope" area.
v) The horizontal and vertical extent of road and driveway cuts shall be limited. Retaining walls constructed with natural materials such as timbers or rock are encouraged, and exposed concrete retaining walls are prohibited. Terraced retaining walls shall be used instead of larger retaining walls.
vi) Cut and fill slopes are strongly discouraged and shall be minimized to the extent practicable.

7. Landscaping

Landscaping for new single family development after the Effective Date shall provide for the application of topsoil and revegetation with a native grass seed mix in establishing finished grades. Any berms shall meet the applicable requirements of the Development Code. Trees within the disturbance envelope not removed for construction (including but not limited to septic systems, wells, utilities, finished grade and driveways), forest management or fire mitigation, shall be preserved to the extent practicable. Please also refer to the forest management and fire mitigation requirements in Section C.5 below. All other landscaping shall be considered under the Flexible Landscape Standards of the Development Code.

8. Historical Resources

The existing Homestead House, Tack House and barn are important historical resources of the ranch. The Owner/Developer has agreed that these historic resources shall be preserved in their current locations and that their historic character shall be preserved. These structures shall not be demolished, destroyed or moved unless the County gives its permission, subject to force majeure. Nothing herein shall prohibit Owner/Developer from remodeling the internal or external areas of these structures provided the historical character is preserved.

9. Transfer of Development Rights

In 1996, the Owner/Developer transferred eight (8) development rights into the Property by paying $68,000 to County, with such funds to be used by County to acquire land located elsewhere in the Upper Blue River area. This payment was voluntarily made by the Owner/Developer in lieu of and in satisfaction of a requirement that Developer provide for the acquisition of, and transfer to the property, the right to develop an additional eight (8) residential dwelling units to offset the traffic and other impacts of a corresponding increase in density.

10. Water Quality

All development shall comply with the County's Water Quality Control Regulations outlined in Chapter 7 of the Development Code.

11. Lighting

a) All exterior lighting shall meet the lighting requirements of the Development Code to prevent off-site glare and adverse impact to wildlife.
b) The Owner/Developer has agreed to replace the existing lights within the Property that are causing off-site glare within six months of the Effective Date.

12. Parking

At least 2 parking spaces shall be required for each single family residence. At least two parking spaces shall be required for each caretaker unit. Garage spaces shall be counted toward meeting these parking requirements.

13. Animal Keeping

Animal keeping shall meet the requirements for the A-1 zoning district outlined in the Development Code.

14. Site Plan Review

The location of all new residential homesites and associated disturbance envelope areas shall be subject to site plan review pursuant to the site plan review process outlined in the Development Code. All other new or modified structures are subject to site plan review by the County in accordance with the provisions of the Development Code.

C. UTILITIES AND IMPROVEMENTS

1. Water

Water for individual homesites will be provided by individual wells subject to approval by the State Engineer. A copy of a well permit shall be submitted concurrent with a building permit application for a new single family development.

2. Wastewater Disposal

Wastewater disposal will be provided by on site sewage disposal systems subject to approval by the Summit County Environmental Health Department through the application for an Individual Sewage Disposal Permit for new single family development.

3. Utilities

All utilities shall be placed underground in accordance with the Summit County Subdivision Regulations, except those already existing above ground as of the Effective Date.

4. Access

a) Existing ranch roads will generally be used to provide access to permitted single family and caretaker units. Notwithstanding the foregoing, some improvements and relocation of existing roads may be necessary, such as for example where existing roads cross sloped areas to achieve the road grades as provided for herein. Except for the specialized road standards provided in this subsection, or as otherwise approved by the County Engineer, where the main road or side roads serves more than four units, it shall be designed using low volume road standards as outlined in the Development Code. Except for the specialized road standards as provided in this subsection, or as otherwise approved by the County Engineer, where a road serves four units or less, it shall be designed using the driveway design standards as outlined in the Development Code.

b) To reduce the environmental impact of these road improvements, the County has approved the following unique road and driveway standards:
   i) There is no maximum length of a cul-du-sac, provided that sprinklering is provided in each residence and emergency pullouts and turnarounds are constructed as required by the County Engineer.
   ii) Specific grading plans and applicable permit applications shall be submitted to the County for review and action prior to the commencement of any road or driveway improvements.
   iii) Travel Lane widths for low volume roads shall be 9', with a total width of 18 feet.
   iv) The County Engineer may permit road grades to exceed the 8% maximum grade to minimize the amount of cut and fill and the number of switchbacks, provided: (i) the maximum length of approved grades in excess of 8%, as measured along the road, shall not exceed 500 feet; and, (ii) public safety is protected.
   v) Pull-outs for emergency vehicles shall be per the applicable requirements of the County. Notwithstanding the foregoing, emergency pullouts distance can be varied up to +/- 50 feet of the required distance to allow siting a pullout at locations which minimize grading and overall site disturbance.

c) Prior to the issuance of any building permits for a fourth single family residence, the main access road that serves more than four dwelling units shall be brought up to the standards as required by this PUD. All future development beyond this shall require that access be brought up to the standards as required by this PUD prior to the issuance of a certificate of occupancy. The main access road does not need to be realigned with County Road 3 provided the road is upgraded to meet the requirements of this Designation, if necessary.

d) Prior to the issuance of any building permits for new residential units after the Effective Date, the Owner/Developer shall grant to the County a mutually agreeable, 40 foot wide limited public access easement for the low volume roadway(s) up to the point where the roadway(s) would serve four or less units, except through the homestead area, where the easement may be less if it would encroach on existing, historic structures.

e) Prior to the issuance of any building permits for new residential units after the Effective Date, the Owner/Developer shall: (i) create a homeowner's association or other legal entity for the maintenance of the roads and driveways; and, (ii) create a private road maintenance agreement that is mutually agreeable to the Owner/Developer and the County that provides for the maintenance of the roads and driveways by the HOA or other legal entity.

f) Paving of the roads and driveways shall be minimized to the extent practicable. Paving around residences shall be permitted.

5. Forest Stewardship Plan and Fire Mitigation

a) A forest stewardship plan which emphasizes long-term health and sustainability of the forest resource on the property has been prepared for the property (Copy of the Original can be found in Planning Case file #04-001). The forest stewardship plan has been implemented by the Owner/Developer. The Owner/Developer of the Property will continue to implement the forest stewardship plan on the ranch, including but not limited to: removal of diseased trees (pine beetle, dwarf mistletoe, etc.), and thinning as necessary. Trees within the Property shall be preserved to the extent practicable unless tree removal is for development permitted by this PUD, forest management or fire mitigation, subject to force majeure.

b) All future residential development in the Property shall comply with the County's wildfire hazard mitigation requirements concurrent with the building permit process.

6. Fire Protection

The Property is located within the Red, White and Blue Fire Protection District ("District"). Except as otherwise specifically provided for herein, all development on the property shall meet all fire protection requirements of the District or its successors. The Owner/Developer agrees to install approved fire sprinkler systems in each new single family residence built after the Effective Date.

D. IMPLEMENTATION

1. Subdivision Requirements

a) Prior to submitting for the required site plan review for new residential dwellings permitted by this Designation, the Owner/Developer must either: (i) create a 35 acre parcel, or such greater acreage as desired by the Owner/Developer, for each single family residence permitted by this Designation; or, (ii) plat a property that is not less than 20 acres in size. If a parcel less than 35 acres in size is desired, the Owner/Developer shall submit preliminary and final plats and such plats shall be approved by the County prior to any development.

b) Densities of development indicated in this Designation represent <u>maximum</u> permitted densities and levels of use and each proposed development phase must meet all applicable standards and requirements as contained in the Development Code unless such standards and requirements are specifically waived or modified by the terms of this Designation.

2. Formation of Homeowner's Association

Prior to the issuance of any building permits for new residential units after the Effective Date, the Owner/Developer shall create a homeowner's association or other legal entity for the maintenance of the roads, driveways and other common areas of the Property. Such homeowner's association or other legal entity shall exclude Lot 1, Whatley Reserve Subdivision.

E. GENERAL PROVISIONS

1. Enforcement

The provisions of this Designation and its development plan relating to the use of land and the location of private open space shall run in favor of the County and shall be

enforceable at law or in equity by the County without limitation on any power or regulation otherwise granted by law. Other provisions of this Designation and the development plan shall run in favor of the residents, occupants, and owners of the planned unit development but only to the extent expressly provided in, and in accordance with the terms of this Designation and the development plan. Provisions not expressly stated as running in favor of the residents, occupants, or owners of the planned unit development shall run in favor of the County.

2. Breach of Provisions

If at any time any provision or requirement stated in this Designation has been breached by the Owner/Developer, the County may withhold approval of any or all site plans or plat maps, or the issuance of any or all grading or building permits or occupancy permits applied for on the Property, until such breach has been remedied; provided, however that the County shall not take affirmative action on account of such breach until it shall have first notified the Owner/Developer in writing and afforded the Owner/Developer a reasonable opportunity to remedy the same.

3. Binding Effect

This Designation shall run with the land and be binding upon the Owner/Developer, its respective successors, representatives and assigns, and all persons who may hereafter acquire an interest in the Property or any part thereof, with the exception that provisions of this designation may be modified through a PUD amendment in accordance with the procedure stated in the Development Code. This Designation shall be recorded in order to put prospective purchasers or other interested persons on notice as to the terms contained herein.

4. Amendments

Amendments to the provisions of this Designation shall be reviewed and acted upon as a rezoning application, subject to the County's procedures for zoning amendments and to the requirement for findings under the Planned Unit Development Act of 1972 at CRS 24-67-106(3)(b), unless such amendment is determined to be minor in nature in accordance with the provisions outlined in the Development Code.

5. Notices

All notices required by this designation shall be in writing and shall be either hand delivered or sent by certified mail, return receipt requested, postage prepaid, as follows:

Notice to County:

Board of County Commissioners
PO Box 68
Breckenridge, CO 80424

Notice to Owner/Developer:

Bud and Dot, LLLP
c/o Gary and Nancy Carlston
515 Arapahoe
Boulder, CO 80302

With a copy to:

Richard A. Johnson, Esq.
Johnson & Repucci LLP
2521 Broadway, Suite A
Boulder, CO 80304

All notices so given shall be considered delivered three days after the mailing thereof. Either party, by notice so given, may change the name or address to which future notices shall be sent.

6. Entire Designation

This Designation contains all provisions and requirements incumbent upon the Owner/Developer relative to the Red Tail Ranch Planned Unit Development, except as modified by subsequent action of the Board of County Commissioners in accordance with the procedures set forth in the Development Code and the Colorado Planned Unit Development Act (CRS 24-67-106) for amending planned unit developments, and except that nothing contained herein shall be construed as waiving any requirements of the Development Code or other regulations otherwise applicable to the development of the Property.

7. Relationship to Original PUD Designation and Previous Amendments

This PUD Designation supersedes all previous PUD designations covering the Property included within this PUD. To the extent the provisions of this revised PUD Designation are the same in substance to the provisions of earlier approved versions of this PUD Designation, they shall be considered as continuations thereof and not new enactments.

8. Effective Date

To be legally effective and binding, this PUD Designation must be recorded by the Summit County Clerk and Recorder. The date of such recording is referred to herein as the "Effective Date."

9. PUD Review Requirements

Chapter 12 of the Development Code includes procedures and requirements for review of all Planned Unit Developments. The Owner/Developer shall be on notice of these requirements. If the County and the Owner/Developer enter into a development agreement to vest property rights pursuant to CRS 24-68-101 and Section 12800 et seq of the Development Code, then the PUD review requirements shall apply as outlined in any development agreement.

10. Legality of Provisions

In the case one or more of the provisions contained in this Designation, or any application hereof, shall be invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained in this Designation and the application thereof shall not in any way be affected or impaired thereby.

IN WITNESS WHEREOF, the County and the Owner/Developer have executed this Designation as of the date first above written.

Original signatories to the PUD, and all amendments thereto, are on file with the Summit County Planning Department, as well as recorded and filed in the Office of the Clerk and Recorder.

APPROVAL OF AMENDMENTS

The foregoing planned unit development designation amends and supercedes the Whatley Planned Unit Development Designation, which was originally approved by the Summit County Board of County Commissioners on 9th day of November 1987 (Recorded at Reception Number 347180), and was reapproved on the 10th day of April 1989 (recorded at Reception Number 416209) and the 10th day of August, 1990 (recorded at Reception Number 391582), and the 22nd day of March, 2004 (recorded at Reception Number 751908).

This Designation is hereby revised to incorporate the approved amendments as noted above, and shall remain in force as revised. Copies of the original Designation and all reapprovals and modifications are available from the Summit County Clerk and Recorder.

ADOPTED THIS 22ND DAY OF MARCH, 2004.

COUNTY OF SUMMIT
STATE OF COLORADO
BY AND THROUGH ITS
BOARD OF COUNTY COMMISSIONERS

William C. Wallace, Chairman

ATTEST:

SUMMIT COUNTY COLORADO

Cheri Brunvand, Clerk & Recorder

LEGAL DESCRIPTION OF RED TAIL RANCH PUD

(Exhibit A to Red Tail Ranch Planned Unit Development Designation)

PARCEL A:

THE NORTHWEST QUARTER AND THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 24, TOWNSHIP 6 SOUTH, RANGE 78 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF SUMMIT, STATE OF COLORADO.

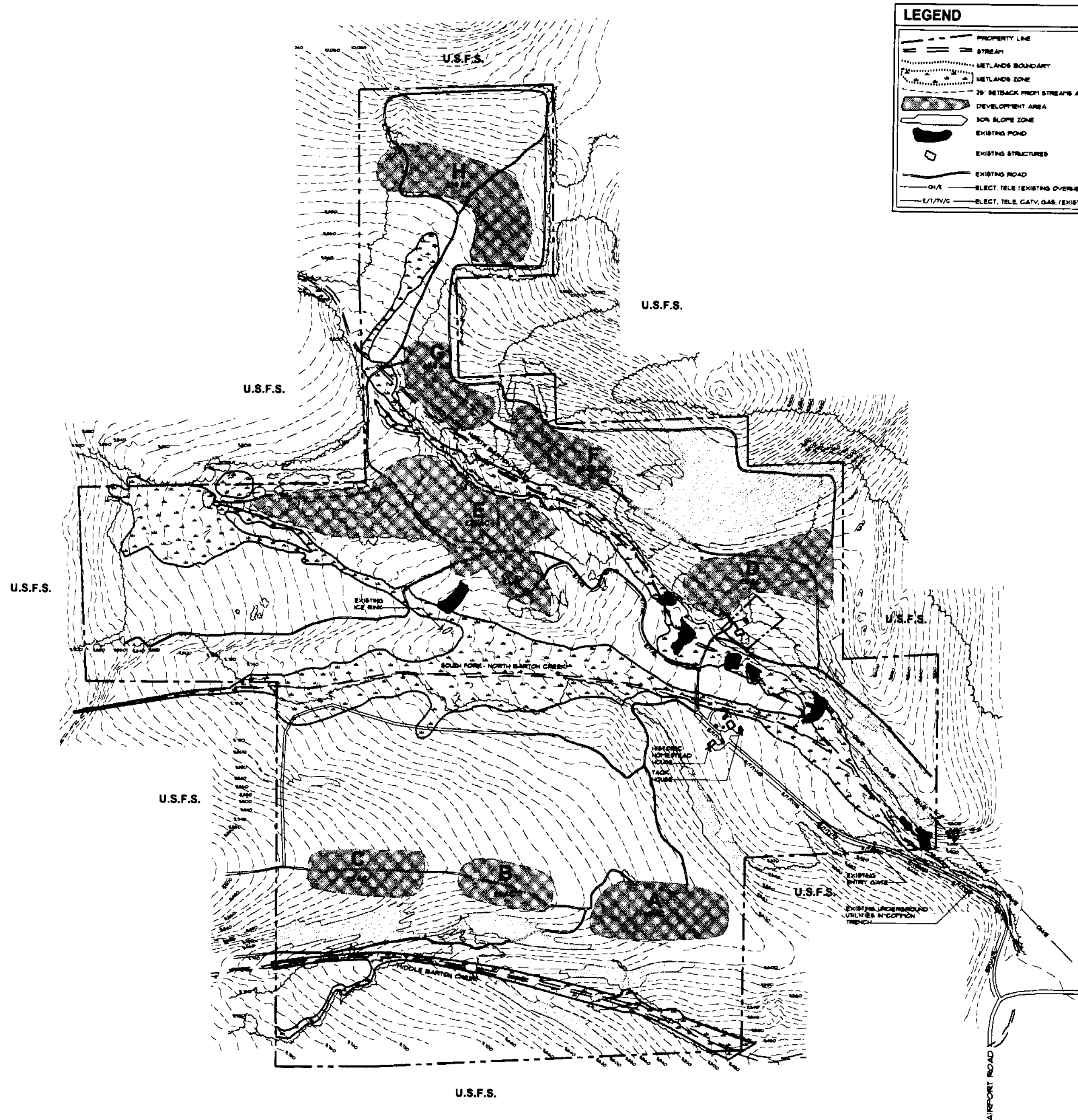
THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER, THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER, THE SOUTH HALF OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER, THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER, THE SOUTH HALF OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER, THE EAST HALF OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER, THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER, THE WEST HALF OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER AND THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 13, TOWNSHIP 6 SOUTH, RANGE 78 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF SUMMIT, STATE OF COLORADO.

THE EAST HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER, THE WEST HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER AND THE EAST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 14, TOWNSHIP 6 SOUTH, RANGE 78 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF SUMMIT, STATE OF COLORADO.

THE EAST HALF OF THE EAST HALF OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 6 SOUTH, RANGE 78 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF SUMMIT, STATE OF COLORADO.

PARCEL B:

LOTS 1 AND 2, WHATLEY RESERVE, ACCORDING TO THE PLAT THEREOF RECORDED AUGUST 24, 1990 UNDER RECEPTION NO. 391333, COUNTY OF SUMMIT, STATE OF COLORADO.



LEGEND

- PROPERTY LINE
- STREAM
- WETLANDS BOUNDARY
- WETLANDS ZONE
- 25' SETBACK FROM STREAMS AND WETLANDS
- DEVELOPMENT AREA
- 30% SLOPE ZONE
- EXISTING POND
- EXISTING STRUCTURES
- EXISTING ROAD
- OH/E — ELECT. TELE (EXISTING OVERHEAD)
- E/T/TV/G — ELECT. TELE. CATV, GAS (EXISTING UNDERGROUND)

CONCEPTUAL DEVELOPMENT PLAN / EXHIBIT B TO THE RED TAIL RANCH PUD DESIGNATION

SCALE: 1" = 300'

NORTH

BAKER • HOGAN • HOUX
ARCHITECTURE & PLANNING / A.I.A / P.C.
P.O BOX 931, 160 EAST ADAMS, BRECKENRIDGE, COLORADO 80424 (970) 453-6880

STEPHEN SPARN & ASSOCIATES, PC
ARCHITECTURE AND PLANNING
1731 15th Street, Suite 250 Boulder, CO 80302
tel: 303.442.4422 fax: 303.442.4471 www.sparn.com

RED TAIL RANCH MAJOR P.U.D. MODIFICATION

REVISIONS:

JOB NO: 15161.1
DATE: 03/11/04
DRAWN BY: EPR
CHECKED BY: AJ/ELB

SHEET NUMBER:
EXHIBIT B
OF: 1

Project Narrative

The Property, together with Lot 1, is currently zoned for a Planned Unit Development ("PUD"). The Property is also subject to a Development Agreement for Extended Vesting of the Red Tail Ranch (f/k/a Whatley Ranch) PUD dated March 24, 2004 ("2004 Development Agreement"). The 2004 Development Agreement created vested property rights for a minimum of 10 years up to 20 years. The vested rights period under the 2004 Development Agreement is set to expire on March 24, 2024.

Property owner now desires to extend its vested rights under the 2004 Development Agreement. Property owner does not seek to change any of the site-specific development plan that was already approved. This Amended Development Agreement will continue the vested rights already granted to Property owner for an additional minimum period of two (2) years through March 24, 2026, and allow for up to five (5) additional options to extend the vested rights for 2 year periods. The options to extend shall be deemed exercised and effective absent owner's prior written notice to Summit County sixty (60) days before the expiration of the then-current vested rights period.

SUMMIT COUNTY
COLORADO

PLANNING DEPARTMENT

970.668.4200
www.SummitCountyCO.gov

0037 Peak One Dr. PO Box 5660
Frisco, CO 80443

STAFF REPORT

TO: Upper Blue Planning Commission

FROM: Lili Girodie, Planner II

FOR: Meeting of March 28, 2024

SUBJECT: Planning Case PLN23-046; A request for a Class 4 Conditional Use Permit for Milling activities associated with Colorado Division of Reclamation Mining and Safety permit M1998-052 at TR 6-77, Sec 24, Qtr 2, Mascot Placer MS# 7083, 64.03 acres, Remaining 25 acres earth and stone producing land on Sch #6512349, zoned A-1. Complete legal description available from Planning.

APPLICANT: Joanna Hopkins on behalf of Peak Materials

OWNER: Rock Island Land Company LLC

REQUEST: A request for a Class 4 Conditional Use Permit for Milling activities associated with Colorado Division of Reclamation Mining and Safety permit M1998-052 at TR 6-77, Sec 24, Qtr 2, Mascot Placer MS# 7083, 64.03 acres, Remaining 25 acres earth and stone producing land on Sch #6512349, zoned A-1. Complete legal description available from Planning.

PROJECT DESCRIPTION

Location: 5290 Tiger RD (CR 6)

Legal Description: TR 6-77 Sec 24 Qtr 2 Mining Claim(s) cont 64.0310 acres MASCOT PLACER MS# 7083 Acres 64.0310 REMAINING 25 ACRES EARTH & STONE PRODUING LAND ON SCH 6512349

Existing Zoning: A-1

Proposed Use: Milling

Existing Use: Gravel mining operations

Total site area: Approximately 64.0310 acres

Adjacent land uses:

East: NR-2 (USFS) property east of Tiger Rd, 6061 Tiger RD (single-family residence)

West: Undivided 50% Interest TR 6-77 Sec 23 Qtr 1 Mining Claim(s) cont 516.9840 acres WILLIAMS PLACER MS# 1118 Acres 136.4000 EARTH/STONE PROD LAND Acres 10.0000 POINT PLACER MS# 19719 Acres 9.0200 IXL MILL SITE MS# 3178B Acres 4.4300 EUREKA MS# 3202 Acres 4.3900 GOLDEN BANK NO 3 MS# 19796 Acres 4.0900 ROYAL TIGER MS# 3200 Acres 5.1600 HIGHLAND MARY MS# 3201 Acres 5.1600 BRITISH BOY MS# 3071 Acres 5.1600 BROWN PLACER MS# 2166 Acres 120.8700 GOLDEN BANK MS# 19716 Acres 4.0900 GOLDEN BANK #2 MS# 19796 Acres 8.2600 IXL PLACER MS# 1479 Acres 22.4620 IXL MS# 3178A Acres 5.1600 LONGFELLOW MS# 3088 Acres 5.1600 MAMMOTH MS# 5926 Acres 5.9250 MINERAL CHIEF MS# 3051 Acres 4.8100 MORNING STAR MS# 5926 Acres

	3.1300 OJ LEWIS MS# 3047 Acres 5.1600 PRIMROSE LODE MS# 19720 Acres 1.7220 PRIMROSE PLACER MS# 19720 Acres 122.5900 SILVER EEL MS# 3232 Acres 4.8340 SWALLOW MS# 3177 Acres 5.1600 TEDDY MS# 19717 Acres 4.1140 CASHIER/SMUGGLER MS# 5926 Acres 8.2700 PT WILLIAMS PLACER Acres 1.4540, zoned BC
North:	NR-2 (USFS) property
South:	NR-2 (USFS) property

BACKGROUND

Peak Materials, LLC has submitted a Conditional Use Permit (CUP) application to add a rock crushing (milling) facility on the Mascot Placer for the purpose of creating saleable materials using existing dredge rock found on the site. The requested CUP term is for 5 years. After the milling and material removal associated with this CUP, the applicant will oversee and complete the river restoration work as outlined in the Swan River Restoration Preliminary Design Plan Report prepared for the Blue River Watershed Group (BRWG) by Ecological Resources Consultants, Inc. (ERC) in March 2013. The applicant will grant construction access to the site for the restoration work and will dedicate permanent public access to the future restored river system.

Peak Materials has operated a screening plant with material sales in the Swan River valley since 2003. Peak Materials has been a stakeholder in the Swan River restoration efforts, assisting with planning on the privately-owned portions of the river, including the Mascot Placer. The existing condition at the subject parcel consists of a highly disturbed aquatic and riparian upland environment heavily impacted by historic mining activities that dredged the valley bottom and obliterated the Swan River channel.

In 1999, the Planning Department received a CUP application for commercial gravel crushing on an adjacent, privately owned, 124-acre parcel to the east of the project site. This application (PLN99-049) was denied by the Upper Blue Planning Commission on July 21, 2001. The applicant subsequently appealed the Planning Commission's denial to the Board of County Commissioners. A public meeting before the Board of County Commissioners was scheduled for October 8, 2001. However, the applicant withdrew the application on September 12, 2001. The main concerns pertaining to this application involved the industrial nature of the request, and the increase in vehicle traffic and dust on Tiger Road. The reclamation plan at that time would have left the site as a smoothly graded upland in preparation for subdivision and development of residences on the property. Restoration of the river corridor to a natural condition was not a component of that proposed reclamation plan.

The applicant applied for a similar request in 2017, via PLN17-130, to allow for crushing and milling on the Mascot Placer. This went through the development review process as a Class 4 CUP, and the Upper Blue Planning Commission (UBPC) reviewed the case as a public hearing at the April 26, 2018, UBPC meeting. At the time, the UBPC denied the application by a vote of 5-2 against. The applicant appealed this denial to the BOCC on May 3, 2018. On July 24, 2018, the BOCC upheld the decision of the UBPC denying the CUP for milling on the Mascot Placer. On August 20, 2018, Plaintiff filed a Rule 106 Complaint alleging that the Summit County Board of County Commissioners abused its discretion and acted in an arbitrary and capricious manner by denying Planning Case PLN#17-130. The Court upheld the UBPC and BOCC ruling.

In 2018, the denial was made with the finding that the use was not in harmony with surrounding uses or the neighborhood – the primary issue was not the milling/crushing activity on site but

compounding existing truck traffic in the area. At the time, the County was engaged in it's own milling/crushing and restoration project on the immediate downstream reach of the Swan River on the Williams Placer. When both projects were taken into consideration, the truck traffic and associated noise and dust produced would have been far greater than when taken separately. Now that the County project is complete, the Mascot Placer work would be the only trucking traffic associated with milling and crushing on Tiger Road.

The CUP for milling on the Williams Placer was reviewed via PLN16-017 and approved by the UBPC on March 24, 2016, via resolution 16-03. This approval was then appealed to the BOCC by members of the public in the area, and the BOCC reviewed on May 3, 2016; the UBPC's approval was upheld on May 3, 2016. The purpose of this request for milling was to ultimately restore the stretch of the Swan River where it passed through publicly owned property.

The current request for milling also has a restoration component. Working with stakeholders – mainly the Blue River Watershed Group (BRWG) – the applicant is proposing that in conjunction with milling and crushing activities, the property will be staged for the restoration of the stretch of the river that crosses the Mascot Placer property. This restoration work is an important component of the application as it ensures that the work completed on the lower, County-owned Williams Placer stretch will be continued onto upper stretches, as was desired when the County project was being completed. Public access to the river will be restored and ecological function will be greatly improved, providing public benefits to the community in perpetuity.

The applicant has offered to provide annual reports to the BOCC with information regarding progress and timeframes for the milling operation. The first check in will occur at the end of the first working season, ideally around November 2024. The first annual report will occur in spring of 2025 (one year after the Conditional Use Permit's approval) and subsequent check-ins will occur annually around this time frame.

The first stage of the restoration of this site includes processing and removal of the remaining dredge tailings to create a more natural, meandering stream channel. The applicant desires to crush onsite the dredge tailings to create materials required for the restoration work (e.g. fines for channel substrate), as well as for offsite sales. Having the ability to crush and process material onsite eliminates the need to import large volumes of construction materials and creates more options for offsite saleable uses. This processing of rock material is considered milling. The Summit County Land Use & Development Code (Code) defines milling as:

> *An operation, as distinguished from mining, in which minerals, rock and gravel are processed or extracted through methods including but not limited to the grinding, crushing, screening, of such materials, or potential reagents for processing.*

Milling activity in the A-1 zone district requires the approval of a CUP along with an approved Department of Reclamation and Mining (DRMS) permit. Crushing is an integral part of the restoration approach, as fine materials are required to line the new channel. Milling of these materials onsite will decrease the amount of material taken off-site and will reduce the need to import material for restoration.

The removal of dredge materials in conjunction with the access and construction easement will provide the opportunity for restoration activities to proceed on the privately held portions of the Swan River corridor as envisioned by the ERC 2013 plan. Overall, this project will be a benefit to the property owner, operator, and Swan Valley River environment. For this reason, the property

owner has been supportive of this project and has offered an easement for construction and public access.

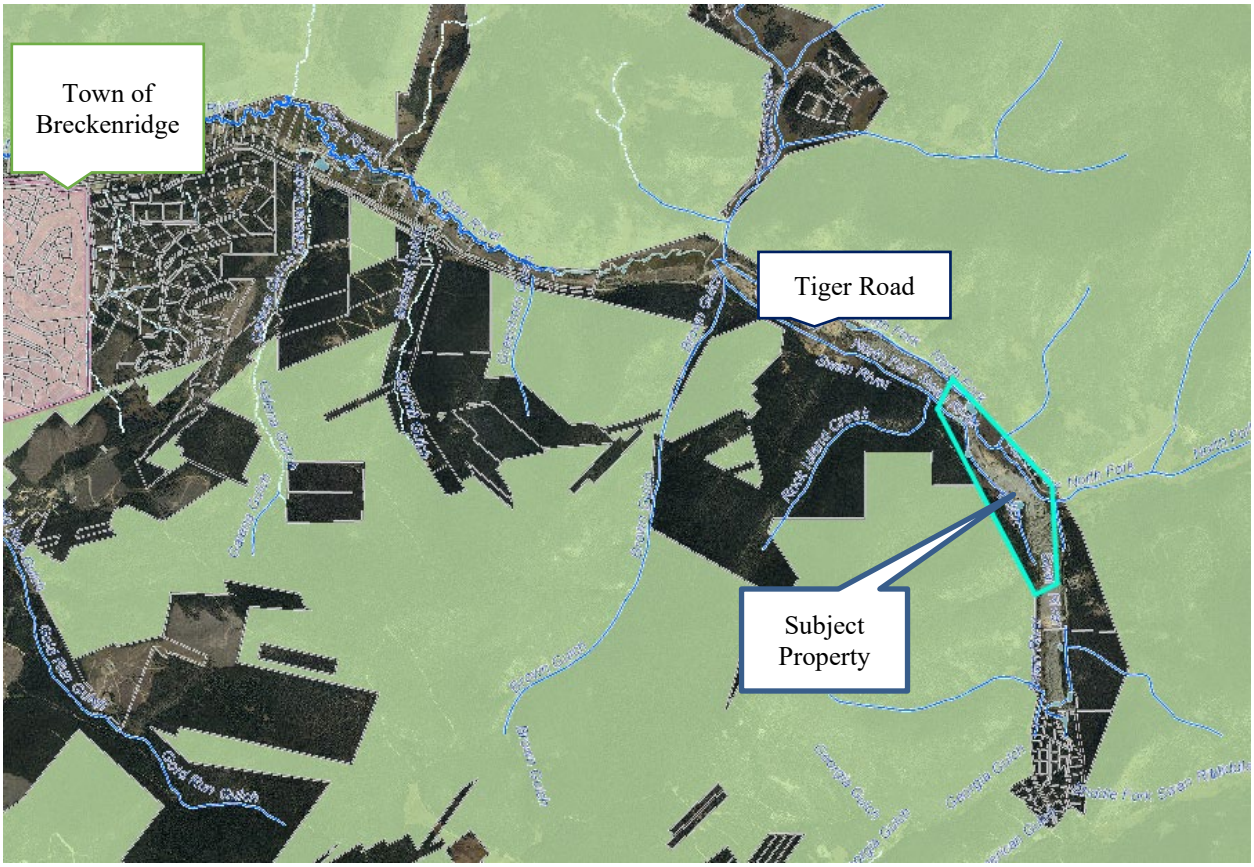
As part of this application, Peak Materials will partially fund and provide management and oversight of the restoration project. Per their application materials they are proposing the following enhanced reclamation standards and in-kind material and service contributions valued at over $500,000 to further the restoration efforts:

- Per the Swan River Restoration Master Plan & Mascot Reclamation Plan, Peak will provide gravels and crusher fines for use in the stream channel construction.
- The riparian corridor will be graded to the alignment, grade and depth as shown on the grading plan and in details 1 and 3 on sheet L-03, still maintaining two feet of material above the groundwater table. The remaining 2,250 (approx.) lineal feet, noted in the ERC plan as the reference reach, will be graded, stabilized and revegetated, as shown in detail 2 on sheet L-03
- As shown on the grading plan (sheet L-03, Exhibit C to the CUP), Peak is proposing a section of plating material, a finer material which fills the voids between the dredge rock, and topsoil over the entire mining area to allow for full revegetation of the site. Topsoil, and topsoil amendments if needed, will be clean, debris-free and suitable as a growth medium for revegetation.

Based on the proposed mitigation measures, the applicant will file a technical revision to amend their Department of Reclamation and Mine Safety (DRMS) permit (M1998-052) to reflect the commitments described above. The applicant acknowledges that this amended permit will remain in full force and effect until the enhanced reclamation standards have been achieved. The applicant has further agreed to hold the amended permit open, without revisions unless changes are mutually agreed upon with Summit County, until the completion of the restoration project. To ensure this agreement is met staff is recommending a condition of approval that the applicant shall provide proof of acceptance by the state of the amended DRMS permit, in substantial compliance with the ERC 2013 plan, prior to the commencement of milling and crushing activities in the year 2025.

During peak season, traffic volumes are estimated at 90 loads daily, but the applicant anticipates an average traffic volume at 60 loads per day. The applicant has eliminated hauling on Saturdays from their request to only haul Monday through Friday. Therefore, the applicant is proposing trucking of materials to/from the site limited to the hours of 7:00 am to 5:30 pm, Monday through Friday. Milling/crushing operations of existing onsite dredge spoils may occur six (6) days a week and only between the hours of 7 a.m. and 7 p.m., Monday through Saturday.

A vicinity map showing the location of the property is below:



CRITERIA FOR DECISION

The Planning Commission may approve a conditional use permit only if the application meets all relevant County regulations and standards and provided the Planning Commission makes the following findings from §12302.04:

A. The proposal is in general conformance with the goals, policies/actions and provisions of the Summit County Countywide Comprehensive Plan and any applicable basin or sub basin master plans.
B. The proposed conditional use is in compliance with the County's Zoning Regulations.
C. The use is in harmony and compatible with surrounding land uses and the neighborhood and will not create a substantial adverse impact on adjacent properties or on services and infrastructure.
D. Adequate services and infrastructure are available to serve the use or the applicant has obligated himself to provide services and infrastructure in sufficient time to serve the proposed use.

DISCUSSION

12302.04: Findings for Approval of Conditional Use Permit:

A. General Conformance with the Countywide Comprehensive Plan, the Upper Blue Master Plan, and Joint Upper Blue Master Plan.

The three applicable master plans contain several goals and policy/actions that are applicable to the proposal. The applicable goals and policies/actions are primarily related to neighborhood impacts, economic development, and uses appropriate for rural areas. Many of these items pertain to the restoration efforts that will occur once the milling operations are completed for stretches of the river. As a result, staff has proposed a condition to the CUP that the applicant shall provide routine, annual check-ins with the BOCC to confirm that their mitigation efforts are following their milling operations in a timely manner. Staff has also proposed a condition that the applicant revise their DRMS permit to reflect the river restoration design as shown in the 2013 ERC plan no later than the commencement of operations in the year 2025. This is an important element, as the applicant's narrative relied heavily on the restoration elements to speak to how master plan compliance could be met. Without clear guarantees and timelines in place to ensure that the restoration work would be completed, staff would be unable to recommend that the project is in compliance with master plan policies and goals. Staff finds the new restoration plan (included as Exhibit C to the CUP), as proposed by the applicant, to be suitable and it is included as a proposed condition of approval.

The following are the applicable portions of the three master plans, followed by a discussion of these items:

Countywide Comprehensive Plan

Environmental Element
Goal A. Protect and preserve environmentally sensitive areas.

Once restoration occurs on the Swan River, the restored reach will provide enhanced aesthetics and recreational opportunities, more reliable and consistent water flow control, and riverbank stability. The restoration element will ensure that environmentally sensitive areas are restored from a degraded environment with substantial mining debris to an ecologically functional river.

Goal H. Protect and enhance the quality and quantity of water resources in the County.

As stated above, the restoration work will enhance the quality of the Swan River.

Policy/Action 2: Development and other land use activities (e.g., highway operations and industrial activities) should avoid water quality impacts from erosion and sedimentation and should not result in degradation of water quality as measured by Colorado's Antidegradation Policy.

Milling activities are not anticipated to have impacts on water quality that would cause degradation to resources. Peak Materials has operated on the Mascot Placer for fourteen seasons with CDPHE water quality monitoring with no reported water quality impacts. Additionally, the future

restoration that will occur once milled materials are removed from the site will improve water quality on this stretch of the river.

Policy/Action 5. Allow low impact dispersed recreation uses (e.g., hiking trails, and benches) within riparian corridors to facilitate public access, when consistent with protection of water resources.

Low impact dispersed recreation uses will be granted as part of the restoration process, as the applicant has agreed to provide a public access and construction easement to the river corridor to allow for the restoration work to occur and also allow public access to that stretch of the river for recreational purposes. The easement in question is not yet executed, but is proposed as a condition of approval and is included in the timeline that the applicant has proposed that is included in Attachment A.

Goal J. Work cooperatively with appropriate agencies to provide interpretive environmental opportunities and other educational programs.

Peak Materials has participated in the Swan stakeholder group for seven years with agencies such as the USFS, Summit County, Colorado Parks & Wildlife to establish interpretive and educational programs on the restored Swan River. The Mascot Placer landowner intends to grant a public access easement to Summit County over the graded future stream channel alignment.

Goal M. Support the County's Weed Control Program.

The applicant is proposing an aggressive noxious weed management plan to maintain Mascot Placer as a weed free area and to prevent the spread of weed infestation.

Upper Blue Master Plan

Goal E. Maintain and improve recreational and trail access throughout the Basin.

The public access and construction easement, discussed above, will provide enhanced public recreational access to the Swan River once restoration activities occur. Staff is proposing conditions of approval to ensure that guarantees are provided to ensure this restoration work occurs as part of the ongoing maintenance and oversight of the CUP and on-site activities. This restoration project will improve the functionality of the Swan River and the recreational access opportunities within the watershed.

Joint Upper Blue Master Plan

Water Resources/Watershed Protection Element:

Goal K. Provide opportunities to enable the County and towns to protect and enhance the quality of the Basin's waters, while facilitating the responsible use of those resources.

The Swan River restoration element of the project is an opportunity for the County to work with stakeholders and private property owners to enhance the Swan River watershed now and into the future.

Based on the above analysis, staff finds that the application is in general conformance with the Countywide Comprehensive Plan, the Upper Blue Master Plan, and Joint Upper Blue Master Plan

with the condition that the applicant secure approval from the state for revisions to their existing DRMS permit that substantially reflect the 2013 ERC Swan River Restoration Preliminary Design Plan Report Reclamation plan, as attached to the CUP as Exhibit D, prior to the commencement of milling operations and/or material removal from the site (whichever happens first) commencing in 2025.

B. Compliance with the County's Zoning Regulations

The zoning designation for the subject property is A-1. Milling activities are a conditional use in this zone district. Section 3812.04C.1 of the Code sets the criteria for approval for milling within the County. The criteria applicable to this CUP application are:

- The proposed operation shall be compatible with adjacent residential, commercial, industrial, agricultural, public, or recreational land uses.
- The proposed operation will have no significant adverse impact on the environment, including any areas containing significant environmental resources or attributes, with specific emphasis on the following:
    a) Air quality
    b) Surface and ground water quality
    c) Visual and scenic quality
    d) Noise
    e) Terrestrial and aquatic animal life or plant life
    f) Wetlands and riparian areas
    g) Areas of paleontological, historic, or archaeological importance
- The proposed operation will not degrade any substantial sector of the local economy in the vicinity of the operation, including any recreational opportunities or experience.
- The proposed operation is not subject to or will not subject others to significant risk from natural hazards including soil stability, geologic hazards, or wildfires.

This CUP for milling will be compatible with land uses adjacent to the Mascot Placer on Tiger Road. The only adjacent uses include permitted mining activity, which include gravel extraction, commercial storage, as well as the existing single-family home on the property. Adjacent to the subject property is Good Times Adventures, a dog sled and snowmobile tour company. The proposed CUP will be compatible with the on-site residential, mining, and commercial recreation land uses in the immediate vicinity.

Approval of this CUP will not result in any significant adverse impact on the environment. The environmental considerations of a) air quality and d) noise, as listed above, may be addressed with the proposed conditions of approval for this CUP. Conditions include necessitating that the applicant have dust control and monitoring in place that conforms with all state, federal, and local stormwater management and erosion and sediment control requirements including, but not limited to, controlling onsite fugitive dust (dust that is not emitted from one single point source, typically generated during commercial or business activities such as sand, gravel and rock-mining operations, paving operations, parking lot and roadway cleaning, and earthmoving operations) with water, or similar comparable measures, and tarping loaded trucks leaving the project site. Hauling materials will be limited to 10.5 hours daily, Monday through Friday, reducing the existing hauling time by 1.5 hours and eliminating Saturdays from their current screening operation. This time limit matches the hours permitted for construction noise in Summit County as well as restrictions that were in place on the adjacent Williams Placer.

This CUP will not result in any adverse impacts to surface and ground water quality, visual and scenic quality, terrestrial and aquatic animal life or plant life, wetlands and riparian areas, or areas of paleontological, historic, or archaeological importance because this CUP will facilitate the end goal of restoration activities to take place that will repair and enhance all of the above-mentioned environmental resources and attributes. Additionally, this CUP will not result in the degradation of any sector of the local economy, including recreation, as the completed restoration work on the Swan River will result in expanded recreational opportunities for those who enjoy activities along the river, such as anglers and birdwatchers. This CUP will not affect the commercial recreation offered at Good Times Adventures, because their snowmobiling and dog sledding operations are currently operated off-site, North of Tiger Road. There are no known natural hazards on the subject parcels.

Staff finds that the application is in general conformance the County's zoning regulations with the condition that construction phase dust control and monitoring shall conform to all state, federal, and local stormwater management and erosion and sediment control requirements including, but not limited to, controlling onsite fugitive dust with water, or similar comparable measures, and tarping loaded trucks leaving the project site.

C. <u>Harmony and Compatibility with the Surrounding Land Uses and will not create a Substantial Adverse Impact on the Surrounding Area</u>

This CUP proposal will be compatible with the adjacent land uses in the vicinity of Mascot Placer. The only adjacent uses include permitted mining activity including gravel extraction, commercial snowmobile tours, and the existing single-family home on the property.

This CUP does not require any services to be provided to the subject site; nor are any services, permanent mining/milling structures planned to be located on the subject property. The only infrastructure in the vicinity is Tiger Road. Access to the site is from Tiger Road, approximately 2.5 miles from the end of the paved portion of Tiger Road.

PLN17-130 was denied in part due to concerns about harmony and compatibility with surrounding uses and the potential substantial adverse impacts from the use. That determination was based in large part on the cumulative impacts with the County's Williams Placer project and the requested milling operation on Mascot Placer acting in concert. Now that the Williams Placer project is completed, the concerns about cumulative impacts are more or less eliminated. The project proposes fewer days than the Williams Placer project proposed (Williams Placer allowed hauling Monday through Saturday from 7am to 7pm). The applicant proposes a trucking volume from the Mascot Placer up to a maximum of 90 loads per day, with average traffic anticipated to be 60 loads per day. The Engineering and Road and Bridge Departments have stated that this Tiger Road is sufficient for the proposed volume. The proposed hauling schedules stated in the application narrative are included as proposed conditions of approval. Furthermore, the Road & Bridge Department is anticipating that they will repave Tiger Road in spring of 2024, which will aid in the reduction of dust and other impacts of increased vehicle trips on Tiger Road. Dust mitigation is also included as part of the proposal to ensure that neighboring properties and those adjacent to Tiger Road are not impacted by dust.

Staff finds that the proposal is in harmony and compatibility with the surrounding land uses and will not create a substantial adverse impact on the surrounding area with the conditions that:

- The applicant shall be responsible for the coordination of materials moving to/from the site and shall ensure all operators are made aware of and adhere to applicable traffic laws and the Travel Management Plan; and

- Milling/crushing operations of existing onsite dredge spoils and the schedule for trucking of materials to/from the site shall adhere to the Travel Management Plan, attached to the CUP as Exhibit B.

D. Availability of Adequate Services and Infrastructure

All the dredge materials to be milled will come from the subject site. Large volumes of the crushed material will be used on site to complete the restoration of the Swan River stream bed, channel, and associated attributes. This milling CUP will not require any additional services or infrastructure to be provided. There are no services on the subject site that will be affected by the proposed conditional use. Should the applicant need to store any fuel on site, the Red, White, and Blue Fire District will require that all fuel storage tanks have the necessary permits from the Fire District. The applicant is aware of this comment, and no fuel storage is proposed at this time. Therefore, adequate services are available to serve the proposed milling use on the site.

The Engineering Department submitted comments in support of this application, stating that Engineering and Road and Bridge support the request in the interest of the infrastructure needs of the community and the proposed, ongoing cooperative efforts to restore the Swan River Valley. They proposed that required traffic mitigation and restoration efforts be included as conditions of approval. The Engineering Department believes that traffic volumes are sufficiently low to meet requirements.

Staff finds that the application meets this requirement.

STAFF RECOMMENDATION

Staff recommends the Upper Blue Planning Commission approve PLN23-046, a request for a Class 4 Conditional Use Permit for Milling activities associated with Colorado Division of Reclamation Mining and Safety permit M1998-052 at TR 6-77, Sec 24, Qtr 2, Mascot Placer MS# 7083, 64.03 acres, Remaining 25 acres earth and stone producing land on Sch #6512349, zoned A-1 with the following findings and conditions.

Findings:

1. With compliance with the listed conditions, the proposal is in general conformance with the goals, policies/actions and provisions of the Summit County Countywide Comprehensive Plan, the Upper Blue Master Plan, and the Joint Upper Blue Master Plan.
2. With compliance with the listed conditions, the proposed conditional use is in compliance with the County's Zoning Regulations.
3. With compliance with the listed conditions, the use is in harmony and compatible with surrounding land uses and the neighborhood and will not create a substantial adverse impact on adjacent properties or on services and infrastructure.
4. Adequate services and infrastructure are available to serve the use.

Conditions:

1. The applicant shall secure approval from the state for revisions to their existing DRMS permit that substantially reflect the 2013 ERC Swan River Restoration Preliminary Design Plan Report Reclamation plan, attached to the CUP as Exhibit D, and any relevant updates to this plan as approved by Summit County prior to the commencement of milling operations and/or material removal from the site (whichever occurs first) in 2025.
2. The applicant shall hold the amended permit open, without revisions unless changes are mutually agreed upon with Summit County, until the completion of the restoration project.
3. A 175' public access and construction easement for the purpose furthering the goals, actions, and policies of the ERC Swan River Restoration Preliminary Design Plan Report

2013 as described in the project narrative, attached the CUP as Exhibit A, and the 2013 ERC Swan River Restoration Preliminary Design Plan Report shall be finalized and granted to Summit County prior to the commencement of milling/crushing operations on the site in the year 2025.

4. Construction phase dust control and monitoring shall conform to all state, federal, and local stormwater management and erosion and sediment control requirements including, but not limited to, controlling onsite fugitive dust with water, or similar comparable measures, and tarping loaded trucks leaving the project site.
5. The applicant shall be responsible for the coordination of materials moving to/from the site and shall ensure all operators are made aware of and adhere to applicable traffic laws and the Travel Management Plan, attached to the CUP as Exhibit B. Signage shall be posted at the site providing information about the Traffic Management Plan, as well as contact information for questions and comments. Signage meeting the requirements for Construction Project Identification in Chapter 9 of the Code will require a permit.
6. Milling/crushing operations of existing onsite dredge spoils and the schedule for trucking of materials from and to the site shall adhere to the Travel Management Plan. The Summit County Planning Department shall be notified at least seven (7) calendar days in advance of commencing milling operations, as well as periodic breaks and/or termination of milling operations, pursuant to the Travel Management Plan.
7. Applicant shall provide the Board of County Commissioners with an annual project update prior to commencement of milling operations for the year. The report shall include: the types and quantities of materials exported, types and quantities of stockpiled materials, percent of total crushing completed, number and frequency of loads, any trucking issues or violations, updates on the restoration design and implementation, status of the DRMS permit revision, and other operational concerns throughout the term of this CUP.
8. This permit shall expire five years from the date of approval.
9. Failure to maintain compliance with any of the above conditions may result in the revocation of the CUP approval.

ATTACHMENTS:

1. Resolution 2024-
    a. Exhibit A - Applicant’s Project Narrative
    b. Exhibit B – Mascot Travel Management Plan (TMP)
    c. Exhibit C – Site Plan
    d. Exhibit D – 2013 ERC Swan River Restoration Preliminary Design Plan Report

Peak Materials
Conditional Use Permit
Mascot Placer

Submittal Date:

05/09/2023

REV 10/12/2023

REV 1/30/2024

Project Description

Peak Materials (formerly Everist Materials) has operated in Summit County since 1963 and in the Swan River valley since 2003. Peak's experience working on the Mascot Placer has spanned twenty seasons operating a screening plant and selling aggregates to support construction projects in Summit County. In 2010, Peak became a key stakeholder in the Swan River restoration efforts, along with the USFS, Summit County Open Space & Trails, Town of Breckenridge, Colorado Parks & Wildlife, Blue River Watershed Group, Trout Unlimited and the private landowners, assisting with planning on the privately-owned portions of the river, including Mascot Placer. The downstream reaches of the Swan River, known as the Williams Placer, were restored and completed in 2022 by the collective efforts of Summit County and the Town of Breckenridge and countless stakeholder partners. This project also involved crushing dredge spoils to clear the dredge piles as well as to fund the restoration efforts. The addition of a crushing plant on Mascot Placer has been contemplated for several years as a means of advancing the removal of dredge material on the private property sections along the Swan River to eventually allow for the continuation of restoration efforts upstream. Mass excavation of this material is cost prohibitive and would extend the restoration of the Swan River several years into the future. To that end, Peak Materials is applying for a crushing permit to add milling as an allowed use to their existing mining operation to continue the Swan River restoration efforts upstream and to re-establish the confluence of the North, Middle and South forks of the Swan. Reconnecting the North, Middle and South forks of the Swan carry a significant benefit to the native fish species and allows for broader movement within the Swan River valley.

In 2018, Peak Materials applied for a conditional use permit to allow crushing activities which was denied due to the effects of cumulative truck traffic combined with the existing county operation on the Williams Placer. Now that the dredge spoils have been removed and crushing activities on the Williams Placer have been completed, Peak Materials, along with the Blue River Watershed Group and other key stakeholders, are re-applying for a conditional use permit to continue the Swan River restoration efforts upstream.

The total project area is consistent with the property boundary of Mascot Placer (89 acres). The affected area is limited to the dredge piles which cover approximately half of the subject property. The processing equipment is currently and will continue to be located within the existing affected area footprint so no additional lands will be disturbed outside of existing dredge piles.

Mining and milling will continue to move upstream across the full extent of the dredge piles and to a depth not to exceed two feet above groundwater which fluctuates throughout the valley. Stockpiles and equipment will move upstream in conjunction with the mining

operations. All hauling will enter and exit the site from the current access on Tiger Road.

Peak currently operates between the hours of 7am and 7pm, Monday through Saturday. Restricted truck travel and modified hauling hours, as detailed in the Travel Management Plan, will be imposed upon commencement of milling activities. A conditional use permit term of five years is being requested.

Background

Gravel mining and screening operations at Mascot Placer are currently a legal, nonconforming use on the subject property. Per Summit County development code, the addition of milling activities requires approval of a conditional use permit (CUP). Peak performs mining and reclamation activities under a Colorado Division of Reclamation, Mining and Safety (DRMS) permit (M1998-052) as Kilgore Companies, LLC dba Peak Materials. The property is leased from Rock Island Land Company. Further, the DRMS holds a reclamation bond to ensure that the reclamation standards described in the permit are achieved. Peak will file the necessary revisions and amendments required to bring the DRMS reclamation plan and bond to match the final river design.

Commitment to Preserving Natural Features and Open Space

To restore the natural topography of the property, the dredge material will be cleared, crushed and hauled away, and a functional stream channel and reseeded uplands will be constructed by Peak Materials. Another key partner in the project, the Blue River Watershed Group (BRWG), recently applied for a $900,000 grant from the USFS and is applying for an additional $80,000 from the Colorado Basin Roundtable Water Supply Reserve Fund for use toward planning and final design efforts for the Swan River restoration of Reach C (Mascot Placer). Peak Materials will continue their excavation upstream and upon receipt of a final plan from the BRWG and ERC, Peak will construct the final river channel and grade upland areas with topsoil and seeding. In addition to construction of the channel, Peak will also provide in-kind materials for channel construction and topsoil. BRWG will be responsible for contracting the design work and construction oversight as well as preparing and finalizing the final public access and construction easements. A public access and construction easement over the future stream and riparian corridor alignment will be granted by the landowner to perpetually ensure that the corridor remains undeveloped in its restored condition.

BRWG and ERC are conducting ongoing groundwater monitoring in the area for the next year to determine the best elevation for the future river channel. To that end, Peak Materials is requesting approval of the included reclamation plan based on the 2013 Swan River Master Plan with the intention of updating the plan with the final design and grading plans in 2025.

Criteria for Decision Statement

This conditional use permit application meets the following criteria for decision:

Master Plan Conformance Statement

The proposed milling activities associated with this CUP application meet several environmental goals of the Countywide Comprehensive Plan, Upper Blue Master Plan and the Joint Upper Blue Master Plan.

Countywide Comprehensive Plan – Environmental Element:

Goal A. Protect and preserve environmentally sensitive areas. The Swan River Restoration will provide enhanced aesthetics and recreational opportunities, more reliable and consistent water flow control and river bank stability.

Goal H. Protect and enhance the quality and quantity of water resources in the County.

Policy/Action 2 states that industrial activities should avoid water quality impacts. Peak Materials has been operating in the valley for fourteen seasons under CDPHE water quality monitoring and has maintained an excellent environmental track record.

The Swan River restoration will allow for low impact dispersed recreation uses within riparian corridors as stated in Policy/Action 5.

Policy/Action 14 provides for support of projects that restore stream channels and natural conditions which is the primary goal of the Swan River Restoration.

Goal J. Work cooperatively with appropriate agencies to provide interpretive environmental opportunities and other educational programs. Peak has participated in the Swan stakeholder group for seven years with agencies such as the USFS, Summit County, Colorado Parks & Wildlife to establish interpretive and educational programs on the restored Swan River. The Mascot landowner intends to grant a public access easement to Summit County over the graded future stream channel alignment.

Goal M. Support the County's weed control program. Peak is proposing an aggressive noxious weed management plan (attached) to maintain Mascot Placer as a weed-free area and prevent further spread of weed infestation downstream.

Upper Blue Master Plan – Recreation and Trails Element

Goal E. Maintain and improve recreational and trail access throughout the Basin. The public access and construction easement granted by the landowner will provide enhanced, public recreational access to the Swan River.

Joint Upper Blue Master Plan – Water Resources/Watershed Protection

Goal K. Provide opportunities to enable the County and towns to protect and

enhance the quality of the Basin's waters, while facilitating the responsible use of those resources. The Swan River restoration is an excellent example of an opportunity for the County to enhance the Swan River watershed through responsible management of the processing and sale of natural resources by private stakeholders.

Compliance with County Zoning Regulations

The proposed operation is consistent with existing uses on the subject property. Peak has operated for the past nineteen years with no air, noise or water quality concerns or impact on other sectors of the local economy.

Market Considerations

Peak has well documented sales and hauling statistics covering the past nineteen construction seasons which average out to 30 loads per day based on 7 months per year and 5 days per week. The introduction of a milling operation will increase sales, and therefore traffic, by an estimated factor of 2, or up to an average of 60 loads per day (refer to the Travel Management Plan for additional details). The peak historic maximum load count is 22 and, by an estimated factor of 2 to account for crushed products, the peak average is estimated to be 44 loads per day. Peak is proposing a daily, not-to-exceed load count of 90 loads which will be managed using scale tickets and order tracking.

Utilizing LIDAR survey data, it is estimated that approximately 250,000 tons of dredge spoils remain on Mascot Placer not including any additional grading to intercept the groundwater to create to river channel. Over the requested five-year permit period, that material will be crushed and stockpiled. Sales are entirely market dependent and hauling will be limited to demand for material. There is a significant planned highway project on I-70 scheduled to begin in 2024 which would require 150,000 tons of crushed material products ideally provided by a local source to reduce impacts of trucking material from out of area.

Compatibility with Surrounding Land Uses and Neighborhood

As stated above, the proposed milling activities are consistent and compatible with the existing and adjacent land uses and will not substantially increase off-site impacts, such as traffic. Environmental considerations, such as air and water quality, will be complied with through the required permitting, testing and reporting for equipment through the Colorado Department of Public Health & Environment (CDPHE). Additionally, Peak will work with Summit County on additional, off-site dust mitigation efforts along Tiger Road utilizing water trucks and other surface treatments as needed and permitted by the Summit County Road & Bridge department.

Infrastructure Needs

The existing mining operation screens wet material from the face of the dredge piles. Sewage disposal for employee use is provided by portable toilet. An office trailer and scale are already on-site. The addition of a crushing operation will not require additional services or infrastructure. Summit County Road & Bridge is responsible for ongoing maintenance of the roadways to and from Mascot Placer as well as speed limit signage.

The unpaved section of Tiger Road to the Mascot property will receive magnesium chloride applications to mitigate dust and is monitored by Summit County Road & Bridge.

Traffic mitigation is a key component to managing the secondary impacts of the crushing operation, namely transportation of the crushed material.

Traffic Impact Mitigation Measures

In an effort to mitigate the additional truck traffic generated by milling operations associated with the Swan River Restoration Project, Peak will utilize the following standards for truck travel:

Import, Export Hauling Coordination

The applicant/operator is responsible for coordinating the import and export of the materials to and from the project site. The current screening operation has no limitation on the volume or type of import/export of materials or when the materials are hauled to the site via Tiger Road. With the original CUP application, Peak committed to imposing the following restrictions:

- 90 load (180 trip) daily maximum, average traffic anticipated to be 60 loads per day;
- reduction in hauling days, eliminating Saturday;
- reduction in hauling hours (10.5 hour days from 12 hour days)

- Eliminate hauling of import materials not directly associated with the reclamation project and include import of reclamation materials in the proposed 90 load daily maximum;
- Truck loads and sales volume tracking will be achieved through the use of scale tickets.

Water Supply

The addition of a crushing operation will require a source of water for equipment dust mitigation. Peak is pursuing two alternatives to meet this need and is in the process of a lease/purchase of water or alternatively, Peak can haul water tanks to the site from other locations as needed. Water trucks will also be employed for dust mitigation along the travel routes within the property and on Tiger Road as needed.

Truck Safety

All trucks owned and operated by Peak Materials feature two, on-board systems which track real-time speed, location and traffic movements. Any enforcement incident can be cross referenced to the driver utilizing these systems and disciplinary measures will be taken.

Reclamation Standards

Mascot Placer currently has a basic reclamation plan which was developed in conjunction with the State Division of Reclamation Mining & Safety (DRMS) permit. The biggest limiting factor in the DRMS permit for excavation of dredge material is the requirement to maintain at least two feet of material above the groundwater table. Recent legislation has provided the ability for restoration projects to expose groundwater in the channel which is invaluable to advancing this project.

Over the past several years, Peak has been in discussions with Swan River restoration stakeholders to determine increased reclamation standards and other contributions that Peak may be able to make toward the restoration efforts.

To that end, Peak Materials is proposing the following enhanced reclamation standards and in-kind material and service contributions to further the restoration efforts. Please reference the attached Swan River Master Plan 2013 between stations 67+50 – 121+00 (approximately) for the Mascot concept design plan.

Based on these proposed enhanced reclamation standards, Peak will file a technical revision to amend DRMS permit M-1998-052 to reflect the plan updates described above. The DRMS will hold an increased reclamation bond based on the cost of these enhanced reclamation standards to ensure that the reclamation plan is completed per the revised plan. This permit will be in full force and effect until the enhanced reclamation standards listed above have been achieved and cannot be modified without prior written consent of Summit County.

Summary

Peak Materials has been operating harmoniously and in compliance with all environmental regulations for the past 20 seasons. This CUP request will allow for additional equipment to operate in the disturbed dredge footprint with minimal additional off-site impacts and furthers the ongoing efforts of the Swan River restoration in a relatively short timeframe. In summary, Peak is a proud participant and stakeholder in the Swan River restoration and looks forward to being part of the ongoing progress.

Travel Management Plan
Gravel Crushing Operations
Mascot Placer 5290 Tiger Road/County Road 6
Breckenridge, Colorado

Submittal Date: May 9, 2023

Submitted By: Peak Materials, LLC
28755 Highway 9
Silverthorne, CO 80498

PLAN OVERVIEW

This Traffic Management Plan (TMP) is specific to the ongoing gravel screening operations as well as to provide for the addition of a crushing plant at the Mascot site for a five-year duration.

As with operation on the adjacent Williams Placer, a key element to the success of this project from both an aesthetic and economic standpoint is the ability to process and mill material for the project and remove excess material from the project site. Excess material hinders the goals of the restoration project and can be beneficially reused by other projects in Summit County.

Screening activities commenced at Mascot Placer in 2003 under a 112c State Mining Permit with the Colorado Division of Mining, Reclamation and Safety (DRMS) Mine ID# M-1998-052. During this time, Peak Materials (formerly Everist Materials) has managed operations within the pit and hauling has been provided by a combination of Peak Materials (Peak) trucking as well as independent trucking companies. The addition of a crushing operation is projected to increase the sales volume of material and therefore, increase the number of truck round trips during regular business hours.

Milling/crushing operations may occur on the project site Monday – Saturday (6 days a week), from 7:00 a.m. – 7:00 p.m., Trucking of materials is limited to Monday – Friday (5 days a week) from 7:00a.m.- 5:30 p.m. to limit impacts on cyclist and other recreational users along Tiger Road. Operations typically run from June through November.

MATERIAL EXPORT AND HAULING COORDINATION

Operator: Peak Materials
Address: 28755 Highway 9
City, State, Zip: Silverthorne, Colorado 80498
Phone Number: 970.468.2521

The operator is responsible for the coordination of materials moving to/from the site and shall ensure all operators are made aware of this traffic management plan as well as all applicable safety measures and traffic laws.

Safe and considerate use of Tiger Road by the applicant/operators utilizing materials produced on the project site shall be in accordance with applicable traffic laws. The applicant/operator shall ensure that all trucking or hauling to/from the project site, including any contractor, subcontractor, or employee shall be completed in accordance with this Traffic Management Plan and all applicable traffic laws. The

applicant/operator shall educate any contractor, subcontractor, or employee of all relevant provisions of this Traffic Management Plan and shall include onsite signage outlining the key provisions of this plan.

Typical educational signage shall be the same or similar to the following:

NOISE CONTROL:

All motor vehicles using Tiger Road for hauling shall conform to Section 5-8-10 of the Breckenridge Town Code: Motor Vehicle Noise: “Maximum Permissible Noise Levels – vehicles weighing less than 10,000 pounds, manufacturer’s gross vehicle weight may not exceed 80 decibels measured at a distance of 25 ft.; vehicles weighing 10,000 pounds or more, manufacturer’s gross vehicle weight may not exceed 90 decibels measured at a distance of 25 ft.”

TRUCK ROUTE:

Material exported from /imported to the project site will be trucked to/from its destination/source via Tiger Road (SCR 6) and shall not use Revett Drive unless delivering product to a jobsite located on Revett Drive. Although the daily truck counts will be highly variable due to seasonal market demand, the estimated average load count associated with the export of crushed material will be approximately 60 loads per day (6 loads per hour) and the daily maximum count to be 90 loads (9 loads per hour) for short durations during the operation of activities on the site. Truck trips will be monitored utilizing scale tickets and sales order tracking.

Trucks hauling milled materials shall access the project via the existing site entrance near the North Fork of the Swan River intersection with Tiger Road (SCR 6). Refer to the attached Truck Travel Route map.

Trucks shall at a minimum adhere to the following conditions:

- Follow all applicable traffic rules and laws
- Strictly adhere to all posted speed limits
- Use of compression release engine brakes ('Jake' brakes) shall be prohibited
- Yield to bicycle, equestrian and pedestrian traffic sharing the roadway
- Through traffic hauling milled product on Revett Drive is prohibited

TRAFFIC IMPACT MITIGATION MEASURES

In an effort to mitigate the additional truck traffic generated by milling operations associated with the Swan River Restoration Project, Peak will utilize the following standards for truck travel:

IMPORT, EXPORT AND HAULING COORDINATION:

The applicant/operator is responsible for coordinating the import and export of the materials to and from the project site.

PARKING:

Peak currently has one full time seasonal staff member on-site and may increase staffing to two full time seasonal staff members. Staff members will be on the subject site during the construction season (June-November) and shall park on the subject site.

ENVIRONMENTAL CONTROLS:

Construction phase dust control and monitoring shall conform to all state, federal, and local stormwater management, erosion and sediment control, and hauling requirements including, but not limited to controlling on-site fugitive dust, and tarping trucks leaving the project site. Additionally, Peak is working with Summit County to overlay an additional 3,000 lineal feet of Tiger Road with recycled asphalt to further mitigate dust in the residential areas. The remaining section of Tiger Road to the Mascot access will receive magnesium chloride applications to mitigate dust and is monitored by Summit County Road & Bridge.

SELF REPORTING:

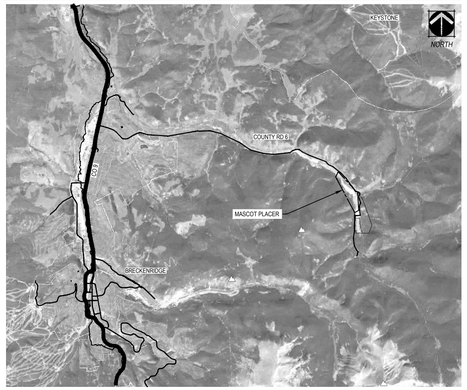
Peak will report any citations, traffic violations or violations of this TMP at an annual meeting with the BOCC throughout the term of the crushing permit.

TRUCK SAFETY:

All trucks owned and operated by Peak Materials feature two, on-board systems which track real-time speed, location and traffic movements. Any enforcement incident can be cross referenced to the driver utilizing these systems and disciplinary measures will be taken.

INDEX MAP

SCALE: NTS



GENERAL NOTES

1. THESE PLANS SHALL NOT BE UTILIZED FOR CONSTRUCTION OR PERMITTING UNLESS STATED FOR SUCH USE IN THE TITLE BLOCK.
2. DRAWINGS ARE INTENDED TO BE PRINTED ON 24" X 36" PAPER. PRINTING THESE DRAWINGS AT A DIFFERENT SIZE WILL IMPACT THE SCALE. VERIFY THE GRAPHIC SCALE BEFORE REFERENCING ANY MEASUREMENTS ON THESE SHEETS. THE RECIPIENT OF THESE DRAWINGS SHALL BE RESPONSIBLE FOR ANY ERRORS RESULTING FROM INCORRECT PRINTING, COPYING, OR ANY OTHER CHANGES THAT ALTER THE SCALE OF THE DRAWINGS.
3. VERIFY ALL PLAN DIMENSIONS PRIOR TO START OF CONSTRUCTION. NOTIFY THE OWNER'S REPRESENTATIVE TO ADDRESS ANY QUESTIONS OR CLARIFY ANY DISCREPANCIES.
4. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.
5. CONTRACTOR / APPLICANT SHALL CONFIRM THAT SITE CONDITIONS ARE SIMILAR TO THE PLANS, WITHIN TOLERANCES STATED IN THE CONTRACT DOCUMENTS, AND SATISFACTORY TO THE CONTRACTOR / APPLICANT PRIOR TO START OF WORK. SHOULD SITE CONDITIONS BE DIFFERENT THAN REPRESENTED ON THE PLANS OR UNSATISFACTORY TO THE CONTRACTOR / APPLICANT, THE CONTRACTOR / APPLICANT SHALL CONTACT THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND FURTHER DIRECTION.
6. CONTRACTOR / APPLICANT IS RESPONSIBLE TO PAY FOR, AND OBTAIN, ANY REQUIRED APPLICATIONS, PERMITTING, LICENSES, INSPECTIONS AND METERS ASSOCIATED WITH WORK.
7. THE CONTRACTOR / APPLICANT SHALL BE RESPONSIBLE FOR ANY FINES OR PENALTIES ASSESSED TO THE OWNER RELATING TO ANY VIOLATIONS OR NON-CONFORMANCE WITH THE PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS, JURISDICTIONAL CODES, AND REGULATORY AGENCIES.
8. THE CONTRACTOR / APPLICANT SHALL KNOW, UNDERSTAND AND ABIDE BY ANY STORM WATER POLLUTION PREVENTION PLAN (SWPPP) ASSOCIATED WITH THE SITE. IF A STORM WATER POLLUTION PREVENTION PLAN IS NOT PROVIDED BY THE OWNER'S REPRESENTATIVE, REQUEST A COPY BEFORE PERFORMANCE OF ANY SITE WORK.
9. MAINTAIN ANY STORM WATER MANAGEMENT FACILITIES THAT EXIST ON SITE FOR FULL FUNCTIONALITY. THE CONTRACTOR / APPLICANT SHALL INSTALL AND MAINTAIN ANY NEW STORM WATER MANAGEMENT FACILITIES THAT ARE IDENTIFIED IN THE SCOPE OF WORK TO FULL FUNCTIONALITY. THE CONTRACTOR / APPLICANT SHALL BE RESPONSIBLE FOR ANY FINES OR PENALTIES ASSESSED TO THE OWNER FOR FAILURE TO MAINTAIN STORM WATER MANAGEMENT FACILITIES DURING THE CONTRACT PERIOD.
10. THE CONTRACTOR / APPLICANT SHALL BE RESPONSIBLE TO PREVENT ANY IMPACTS TO ADJACENT WATERWAYS, WETLANDS, OR OTHER ENVIRONMENTALLY SENSITIVE AREAS RESULTING FROM WORK DONE AS PART OF THIS PROJECT. THE CONTRACTOR / APPLICANT SHALL BE RESPONSIBLE FOR ANY FINES OR PENALTIES ASSESSED TO THE OWNER RELATING TO THESE STANDARDS DURING THEIR CONTRACTED COURSE OF WORK.
11. OPEN SPACE SWALES: IF SWALES ARE EXISTING ON SITE AND ARE NOT INTENDED TO BE MODIFIED AS PART OF THE PLANS, THE CONTRACTOR / APPLICANT SHALL BE RESPONSIBLE TO MAINTAIN THE CONVEYANCE OF WATER WITHIN THE SWALES DURING THE CONTRACT PERIOD. THE CONTRACTOR / APPLICANT SHALL BE RESPONSIBLE FOR ANY DIVERSION OR PUMPING OF WATER IF REQUIRED TO COMPLETE WORK. ANY SWALES DISTURBED BY THE CONTRACTOR / APPLICANT SHALL BE EPAIRED/RESTORED TO THEIR ORIGINAL CONDITION. IF THE SWALE NEEDS TO BE DISTURBED OR MODIFIED FOR ANY REASON, THE CONTRACTOR / APPLICANT SHALL NOTIFY THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO DISTURBANCE.
12. LOCAL, STATE AND FEDERAL JURISDICTIONAL REQUIREMENTS, RESTRICTIONS OR PROCEDURES SHALL SUPERSEDE THESE PLANS, NOTES AND SPECIFICATIONS WHEN MORE STRINGENT. NOTIFY THE OWNER'S REPRESENTATIVE IF CONFLICTS OCCUR.

WEED CONTROL & MANAGEMENT PLAN

1. ADHERE TO THE SUMMIT COUNTY WEED MANAGEMENT PLAN PURSUANT TO §35-5.5-101, ET SEQ., C.R.S., THE COLORADO NOXIOUS WEED ACT. THE COMPLETE MANAGEMENT PLAN CAN BE FOUND ON THE SUMMIT COUNTY WEB SITE.
2. IF NOXIOUS WEEDS ARE PRESENT/ OR BECOME ESTABLISHED IN THE SITE, A LICENSED WEED CONTROL SPECIALIST SHALL BE HIRED TO REMOVE PRESENT NOXIOUS WEEDS. A LIST OF CONTRACTORS CAN BE FOUND ON THE SUMMIT COUNTY WEB SITE.

REVEGETATION PLAN

SCREENED TOPSOIL

1. REFERENCE GRANDING PLAN, L-03, FOR RESTORATION DETAILS.
2. INSTALL SCREENED TOPSOIL AS THE PLANTING MEDIUM. COMPOSITION SHALL BE OF FERTILE, FRIABLE, WELL-DRAINED SOIL, OF UNIFORM QUALITY, FREE OF STONES OVER 1 IN. DIAMETER, STICKS, OILS, CHEMICALS, PLASTER, CONCRETE, AND OTHER DELETERIOUS MATERIALS, WITH AN ACIDITY RANGE BETWEEN PH 5.5 AND 7.0. IT SHALL CONTAIN SAND AND CLAY IN APPROXIMATELY EQUAL PROPORTIONS, AND SHALL HAVE SOME ORGANIC CONTENT BY WEIGHT.
3. RECOMMEND AN INDEPENDENT SOIL TEST TO DETERMINE COMPOSITION OF SCREENED TOPSOIL.
4. RECOMMEND AMENDING TOPSOIL TO MEET ABOVE SPECIFIED COMPOSITION.

HIGH COUNTRY NATIVE SEED MIXTURE

COMMON NAME	BOTANICAL NAME	% MIX
SLENDER WHEATGRASS	ELYMUS TRACHYCAULUS	15 %
BLUEBUNCH WHEATGRASS	PSEUDOROEGNERIA SPICATA	15 %
SANDBERG BLUEGRASS	POA SECUNDA	10 %
INDIAN RICEGRASS	ORYZOPSIS HYMENOIDES	10 %
IDAHO FESCUE	FESTUCA IDAHOENSIS	10 %
WESTERN WHEATGRASS	PASCOPYRUM SMITHII	10 %
BLUE WILDRYE	ELYMUS GLAUCUS	10 %
ROCKY MOUNTAIN FESCUE	FESTUCA SAXIMONTANA	10 %
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	5 %
CANBY BLUEGRASS	POA SECUNDA 'CANBAR'	5 %
		100%

NOTES

1. SEED APPLICATION RATES
   - 1.1. BROADCAST: 20-25 LBS/ACRE
   - 1.2. DRILLED: 15-20 LBS/ARCE
2. APPLY EROSION CONTROL NETTING TO ANY AREA WHICH IS VULNERABLE TO SOIL EROSION SUCH AS SWALES OR STEEP SLOPES (3:1 OR STEEPER)
3. UTILIZE HYDROMULCH AND TACKIFIER OF 2,000 POUNDS PER ACRE WITH 3% TACKIFIER.

SHEET LIST

SURVEYOR

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WETLANDS

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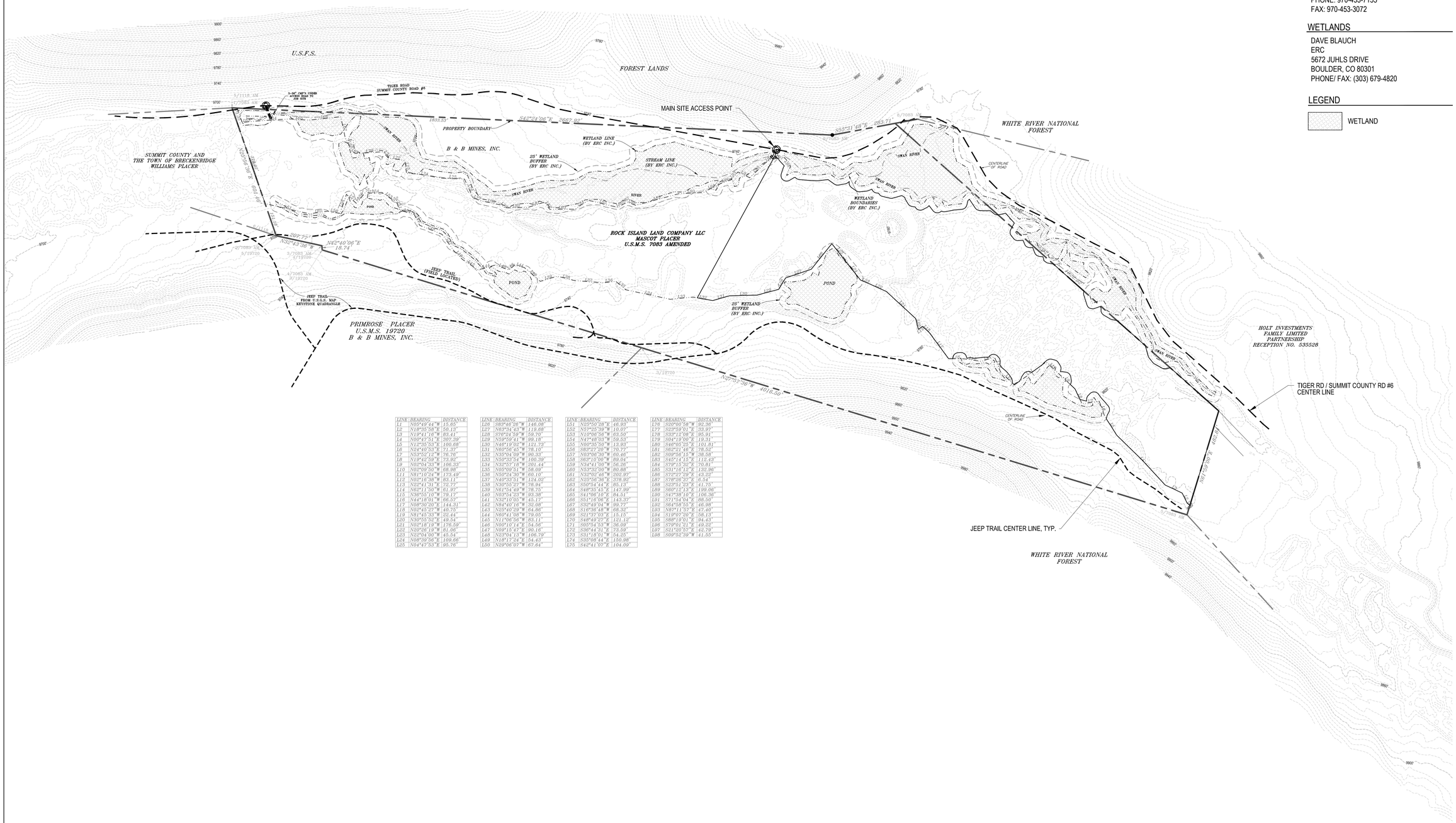
INDEX MAP AND NOTES

L-00



LINE	BEARING	DISTANCE
L1	N05°49'44"W	15.65'
L2	N18°35'59"E	50.13'
L3	N19°41'16"W	83.41'
L4	N00°47'51"E	307.39'
L5	N13°35'53"E	100.68'
L6	N24°40'53"E	71.37'
L7	N53°52'12"W	76.76'
L8	N19°42'59"E	73.92'
L9	N02°04'33"W	106.33'
L10	N02°09'50"W	68.98'
L11	N81°10'34"W	173.49'
L12	N52°16'38"W	85.11'
L13	N22°41'31"E	72.77'
L14	N62°11'50"W	61.97'
L15	N38°55'10"W	179.17'
L16	N44°18'01"W	66.57'
L17	N08°50'20"E	144.31'
L18	N02°45'32"W	40.75'
L19	N81°45'38"W	22.44'
L20	N30°55'52"E	49.54'
L21	N02°18'19"W	176.59'
L22	N35°26'19"W	81.06'
L23	N22°04'00"W	45.54'
L24	N08°39'56"E	169.66'
L25	N04°47'53"E	95.76'

LINE	BEARING	DISTANCE
L26	S83°46'26"W	146.08'
L27	N63°34'43"W	119.68'
L28	S76°24'59"W	59.70'
L29	N59°59'41"W	99.16'
L30	N46°19'02"W	121.73'
L31	N60°56'45"W	78.10'
L32	N35°04'09"W	90.33'
L33	N50°33'54"W	100.39'
L34	N32°57'16"W	201.44'
L35	N05°09'51"W	58.09'
L36	N50°24'39"W	60.10'
L37	N40°33'51"W	124.02'
L38	N30°55'37"W	78.94'
L39	N61°54'49"W	78.75'
L40	N03°54'23"W	93.38'
L41	N32°10'05"W	43.17'
L42	N84°40'16"W	32.08'
L43	N25°40'29"W	64.86'
L44	N80°41'08"W	79.05'
L45	N11°08'56"W	83.11'
L46	N00°10'14"E	54.56'
L47	N09°15'47"E	90.16'
L48	N23°04'13"W	106.79'
L49	N18°17'24"E	54.43'
L50	N29°06'02"W	67.64'

LINE	BEARING	DISTANCE
L51	N35°50'28"E	46.93'
L52	N57°25'39"W	110.07'
L53	N10°06'56"W	63.50'
L54	N47°48'03"W	59.53'
L55	N00°35'50"W	13.93'
L56	S83°27'29"W	70.77'
L57	N03°06'30"W	60.46'
L58	S83°10'00"W	89.04'
L59	N34°41'00"W	56.26'
L60	N53°32'00"W	80.88'
L61	N38°06'46"W	202.97'
L62	N35°56'36"E	378.92'
L63	N50°54'44"E	85.13'
L64	S48°35'45"E	147.99'
L65	S41°06'16"E	84.51'
L66	S51°16'06"E	143.37'
L67	S52°49'04"W	99.77'
L68	S16°36'48"W	68.32'
L69	S21°37'05"E	15.15'
L70	S48°49'23"E	121.12'
L71	S05°54'53"W	36.09'
L72	S36°44'31"E	73.59'
L73	S31°18'01"W	54.25'
L74	S35°08'44"E	150.98'
L75	S42°41'07"E	104.09'

LINE	BEARING	DISTANCE
L76	S20°00'58"W	92.36'
L77	S25°59'01"E	33.97'
L78	S83°12'08"E	95.91'
L79	S04°19'00"E	19.31'
L80	S46°05'25"E	101.81'
L81	S62°21'46"E	78.52'
L82	S09°56'15"W	38.58'
L83	S45°14'15"E	112.43'
L84	S79°15'32"E	70.81'
L85	S31°16'12"E	132.96'
L86	S72°27'29"E	43.22'
L87	S78°56'37"E	8.54'
L88	S25°51'23"E	41.75'
L89	S60°12'13"E	199.06'
L90	S47°38'10"E	106.36'
L91	S71°54'04"E	88.50'
L92	S64°58'53"E	46.98'
L93	N87°11'57"E	47.49'
L94	S19°07'09"E	58.13'
L95	S88°19'01"E	94.43'
L96	S79°01'21"E	49.22'
L97	S21°20'57"E	42.79'
L98	S09°52'39"W	41.55'

NORTH

0 100' 200' 400'

SCALE: 1" = 200'

SURVEYOR

DENNIS E. O'NEIL P.L.S.
BASELINE SURVEY'S LLC.
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PHONE: 970-453-7155
FAX: 970-453-3072

WETLANDS

DAVE BLAUCH
ERC
5672 JUHLS DRIVE
BOULDER, CO 80301
PHONE/ FAX: (303) 679-4820

LEGEND

WETLAND

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P 970.368.7068

www.norris-design.com

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SUMMIT COUNTY, CO

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LAND COMPANY, LLC.

APPLICANT:
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SILVERTHORNE, CO

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EXISTING CONDITIONS

L-01

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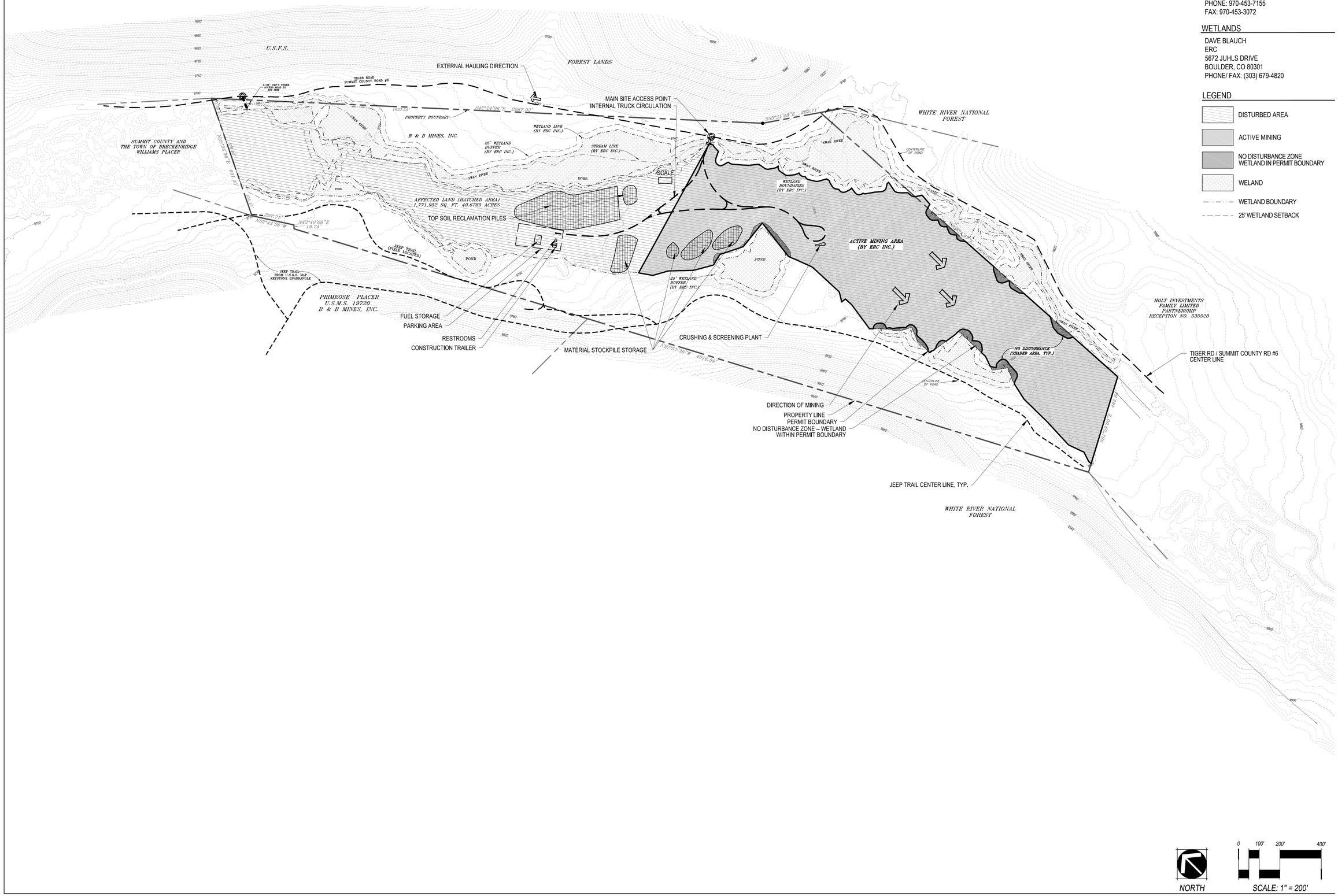
DRAWN BY: AR



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LEGEND

- DISTURBED AREA
- ACTIVE MINING
- NO DISTURBANCE ZONE WETLAND IN PERMIT BOUNDARY
- WELAND
- WETLAND BOUNDARY
- 25' WETLAND SETBACK

NORTH

0 100' 200' 400'
SCALE: 1" = 200'

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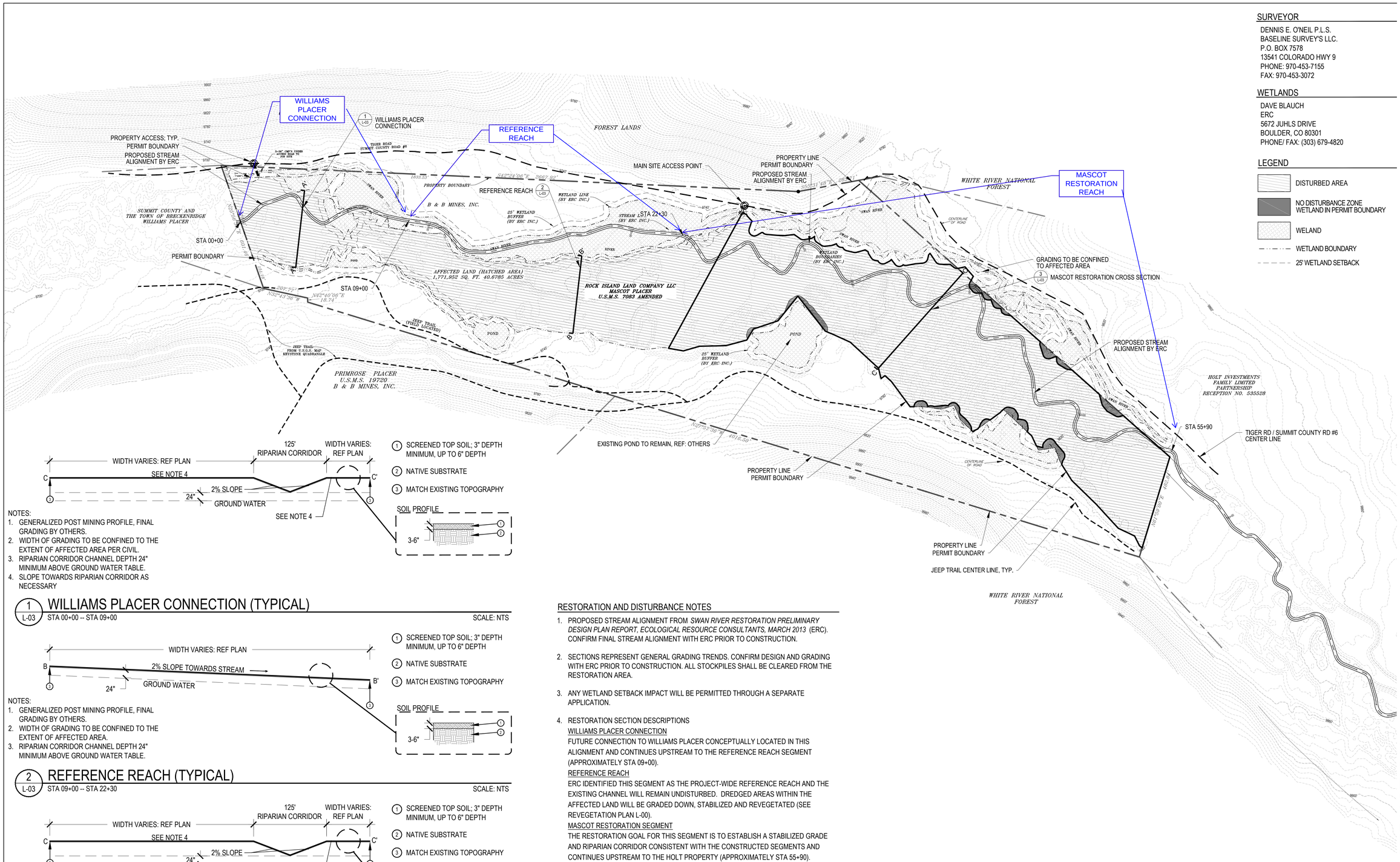
MINING PLAN

L-02

CHECKED BY: MT
DRAWN BY: AR



NOTES:
1. GENERALIZED POST MINING PROFILE, FINAL GRADING BY OTHERS.
2. WIDTH OF GRADING TO BE CONFINED TO THE EXTENT OF AFFECTED AREA PER CIVIL.
3. RIPARIAN CORRIDOR CHANNEL DEPTH 24" MINIMUM ABOVE GROUND WATER TABLE.
4. SLOPE TOWARDS RIPARIAN CORRIDOR AS NECESSARY

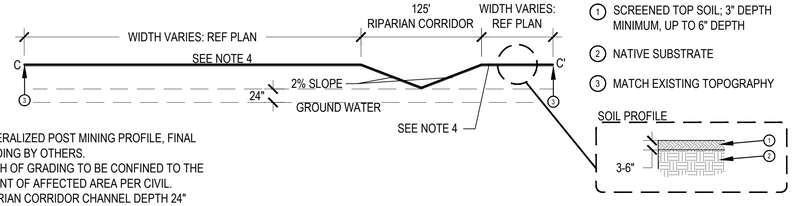
1 L-03 WILLIAMS PLACER CONNECTION (TYPICAL)

STA 00+00 -- STA 09+00 SCALE: NTS

NOTES:
1. GENERALIZED POST MINING PROFILE, FINAL GRADING BY OTHERS.
2. WIDTH OF GRADING TO BE CONFINED TO THE EXTENT OF AFFECTED AREA.
3. RIPARIAN CORRIDOR CHANNEL DEPTH 24" MINIMUM ABOVE GROUND WATER TABLE.

2 L-03 REFERENCE REACH (TYPICAL)

STA 09+00 -- STA 22+30 SCALE: NTS



NOTES:
1. GENERALIZED POST MINING PROFILE, FINAL GRADING BY OTHERS.
2. WIDTH OF GRADING TO BE CONFINED TO THE EXTENT OF AFFECTED AREA PER CIVIL.
3. RIPARIAN CORRIDOR CHANNEL DEPTH 24" MINIMUM ABOVE GROUND WATER TABLE.
4. SLOPE TOWARDS RIPARIAN CORRIDOR AS NECESSARY

3 L-03 MASCOT RESTORATION CROSS SECTION (TYPICAL)

STA 22+30 -- STA 55+90 SCALE: NTS

RESTORATION AND DISTURBANCE NOTES

1. PROPOSED STREAM ALIGNMENT FROM *SWAN RIVER RESTORATION PRELIMINARY DESIGN PLAN REPORT, ECOLOGICAL RESOURCE CONSULTANTS, MARCH 2013* (ERC). CONFIRM FINAL STREAM ALIGNMENT WITH ERC PRIOR TO CONSTRUCTION.
2. SECTIONS REPRESENT GENERAL GRADING TRENDS. CONFIRM DESIGN AND GRADING WITH ERC PRIOR TO CONSTRUCTION. ALL STOCKPILES SHALL BE CLEARED FROM THE RESTORATION AREA.
3. ANY WETLAND SETBACK IMPACT WILL BE PERMITTED THROUGH A SEPARATE APPLICATION.
4. RESTORATION SECTION DESCRIPTIONS

   WILLIAMS PLACER CONNECTION

   FUTURE CONNECTION TO WILLIAMS PLACER CONCEPTUALLY LOCATED IN THIS ALIGNMENT AND CONTINUES UPSTREAM TO THE REFERENCE REACH SEGMENT (APPROXIMATELY STA 09+00).

   REFERENCE REACH

   ERC IDENTIFIED THIS SEGMENT AS THE PROJECT-WIDE REFERENCE REACH AND THE EXISTING CHANNEL WILL REMAIN UNDISTURBED. DREDGED AREAS WITHIN THE AFFECTED LAND WILL BE GRADED DOWN, STABILIZED AND REVEGETATED (SEE REVEGETATION PLAN L-00).

   MASCOT RESTORATION SEGMENT

   THE RESTORATION GOAL FOR THIS SEGMENT IS TO ESTABLISH A STABILIZED GRADE AND RIPARIAN CORRIDOR CONSISTENT WITH THE CONSTRUCTED SEGMENTS AND CONTINUES UPSTREAM TO THE HOLT PROPERTY (APPROXIMATELY STA 55+90).

SURVEYOR

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LEGEND

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- WETLAND BOUNDARY
- 25' WETLAND SETBACK

NORTH

SCALE: 1" = 200'

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GRADING PLAN

L-03

CHECKED BY: MT
DRAWN BY: AR

Ecological Resource Consultants, Inc.
35715 US Hwy. 40, Suite D204 ~ Evergreen, CO ~ 80439 ~ (303) 679-4820

SWAN RIVER RESTORATION
PRELIMINARY DESIGN PLAN REPORT

March 22, 2013

Prepared for:

BRWG
Blue River Watershed Group

Prepared in corporation with:

ERC

FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

TOWN OF
BRECKENRIDGE
OPEN SPACE & TRAILS

Summit County
Open Space and Trails

SWAN RIVER RESTORATION
PRELIMINARY DESIGN PLAN REPORT

March 22, 2013

Prepared for:

Blue River Watershed Group

PO Box 1626
Frisco, Colorado 80443

Prepared in corporation with:

Ecological Resource Consultants, Inc.
35715 US Hwy 40, Suite D204
Evergreen, Colorado 80439

US Forest Service
White River National Forest

Summit County – Open Space and Trails
County Commons, SCR 1005
0037 Peak One Drive (PO Box 5660)
Frisco, Colorado 80442

Town of Breckenridge – Open Space and Trails
150 Ski Hill Road (PO Box 168)
Breckenridge, Colorado 80424

ERC Project # 860-1201

Swan River Restoration
Preliminary Design Plan Report
Prepared for the Blue River Watershed Group
March 22, 2013

CONTENTS

TABLES

FIGURES

APPENDIX A – Ground Water Level Monitoring Data

APPENDIX B – Swan River Bankfull Flow Estimates

APPENDIX C – Swan River Base Flow Calculations

APPENDIX D – Preliminary Restoration Plan Drawings

1.0 INTRODUCTION

1.1 Project Background

The Blue River Watershed Group (BRWG) desired to complete a Preliminary Design Plan (Design Plan Plan) for restoration of the Swan River from the downstream limits approximately at the Tiger Road crossing of Muggins Gulch extending upstream approximately 12,200 feet (2.3 miles) along the center of the valley bottom (herein referred to as "Project Area"). Ecological Resource Consultants, Inc. (ERC) was contracted to develop a Preliminary Design Plan for the Project Area that combined two previously completed concept plans: 1) the Swan River Restoration Plan (October 27, 2009) (herein referred to as "2009 Plan") prepared by Summit County and 2) the Upper Swan River Restoration Plan prepared by the Blue River Watershed Group (ERC, 2012) (herein referred to as "2012 BRWG Concept Plan"). The Project Area is located both on private and public lands. This Preliminary Design Plan has been developed in close coordination with private land owners, Summit County Open Space, the Town of Breckenridge and the US Forest Service.

The total distance of the Project Area as measured along the center of Swan River valley is approximately 12,200 feet located in the Swan River drainage, a major tributary of the Blue River, in Summit County, Colorado. The entire approximately 100-acre Project Area has been extensively disturbed from historic placer mining activities. The stream corridor and valley bottom are relatively devoid of ecological function and the Swan River is highly degraded and channelized. As a result of the dredge material, the Swan River flows subsurface through portions of stream corridor. The project goal is to restore the channel and adjacent areas within the Project Area, returning them to a natural and functional state. Objectives for the Concept Plan included the following:

- Create a natural, stable channel based on existing and anticipated flows and sediment loads,
- Establish instream aquatic habitat including pools, riffles, glides, spawning and rearing areas and promote aquatic macroinvertebrate populations,
- Protect and enhance existing wetlands,
- Restore riparian and floodplain function and habitat by removing dredge piles within the riparian corridor, recontouring banks and establishing vegetation,
- Maintain groundwater return flows seeping into the stream,
- Improve the aesthetics of the area by creating a natural system with sufficient capacity to transport flood flows,
- Remove, regrade and cap remaining dredge piles to reduce erosion and promote upland revegetation,
- Demonstrate stream restoration techniques as a model for on-going efforts to reclaim other stream reaches degraded by historic dredge mining,

- Create a fish barrier structure to eliminate upstream migration of resident non-native brook trout populations and facilitate isolation of the upper Swan River Basin for native cutthroat trout habitat, and

- Account for revised and appropriate road/stream crossings which provide appropriate fish habitat and movement.

This report is similar in nature to the report prepared by ERC as part of the 2012 BRWG Concept Plan. Much of the information presented in the 2012 report is repeated herein with additional, more detailed data and design information.

1.2 2009 Summit County Plan

The 2009 Summit County Plan provided a conceptual plan for restoration for over approximately one mile of stream through 50 acres of land owned by Summit County and the Town of Breckenridge. Similar to this Preliminary Design Plan and the 2012 BRWG Concept Plan, the 2009 Summit County Plan was based on the concept of creating a natural stream corridor; however design elements presented in the 2009 Summit County Plan only provide general restoration properties and do not include the level of detail in either analysis of geomorphologic characteristics or appropriate channel geometry. The 2009 Summit County Plan presents typical templates for proposed stream geometry, but lacks specific design elements including channel widths and design elevations necessary to achieve sustainable restoration.

This Preliminary Design Plan takes basic information presented in the 2009 Summit County Plan to a level that is compatible with the 2012 BRWG Concept Plan including providing preliminary level elevations and appropriate channel widths and geometry for both earlier projects.

1.3 2012 BRWG Concept Plan

The 2012 BRWG Concept Plan was developed by ERC. The 2012 BRWG Concept Plan included restoration of the upper Swan River from the Summit County property line extending approximately 6,900 feet upstream along the valley bottom. The 2012 BRWG Concept Plan called for dredge material to be removed and a meandering stream channel to be created within the confines of the valley. Channel alignment was generally defined to match stream planform observed in natural stream settings. Provisions were made to allow continued use of a majority of the valley across private property by confining channel alignment near the edge of the valley as it crosses this property. The proposed alignment also follows an existing stream segment near the confluence of the North Fork of the Swan River to utilize the stream and riparian area that appear to be properly functioning.

The project also includes plans for creation of a riparian zone generally parallel and extending a minimum of 50 feet on either side of the stream. Uplands would be created from the exterior of the riparian zone and extend outward to match existing vegetation on both sides of the riparian corridor.

2.0 PROJECT AREA

2.1 Location

The Project Area is located in the upper Swan River drainage in Summit County Colorado. It includes approximately 2.3 miles and 100-acres of the surrounding valley bottom. The downstream end of the Project Area is located at Latitude: 39.525735° North, Longitude -105.971660° West and the upstream extent is located at Latitude 39.501191° North, Longitude -105.946749° West. Project Area location maps are provided in **Figure 2.1** and **2.2**.

Figure 2.1. Project Area Location Map.

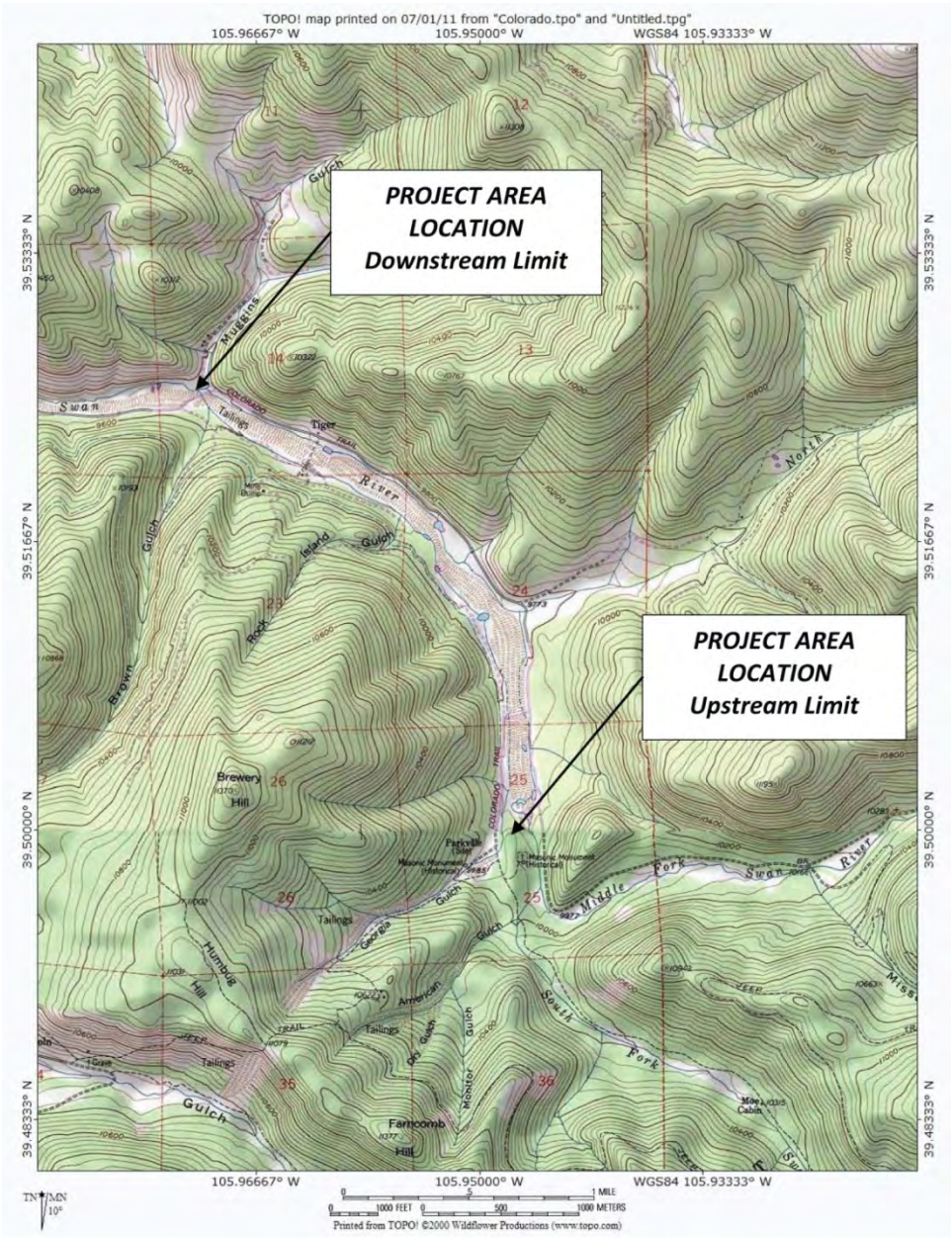
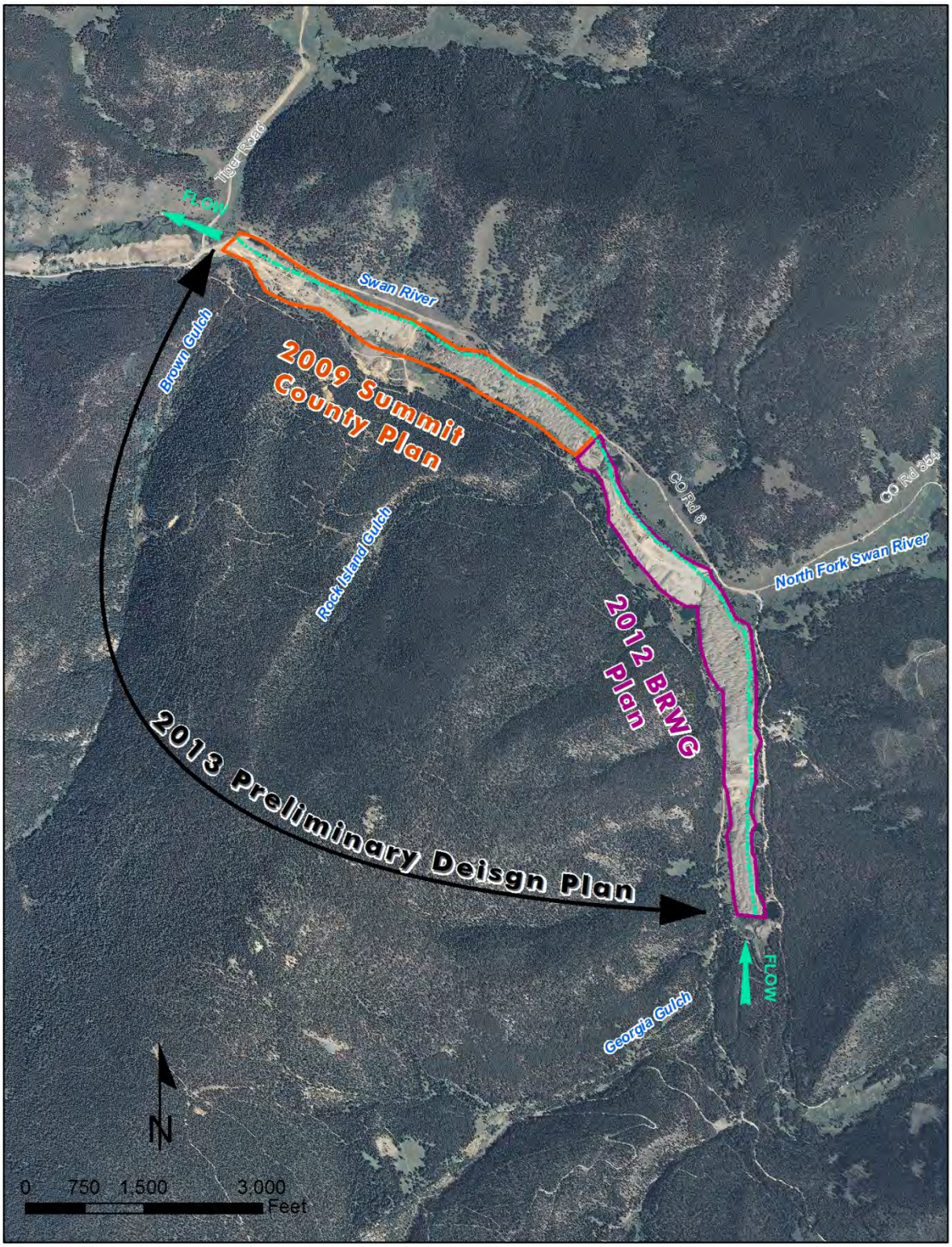


Figure 2.2. Preliminary Design Plan in Relation to the 2009 Summit County Plan and 2012 BRWG Concept Plan.



The Project Area has been historically mined using placer mining techniques. Dredging was completed to an unknown depth throughout the Swan River Valley as well as the nearby Blue River Valley. Dredge spoils remain on the Project Area and typically consist of sand to cobble sized materials left in piles that extend approximately 25 feet above the surrounding valley floor. The entire Project Area is generally devoid of natural vegetation and ecological function as a result of past mining activities. Sporadic pockets of shrubs or young trees may exist near the existing Swan River channel or where groundwater surfaces. In portions of the Project Area, dredge material has been removed or is currently being removed and sold commercially. A majority of the dredge material that has been removed from the valley for commercial purposes was located in the lower portion of the Project Area within the 2009 County Plan area. The stream has been channelized in large part by the mining process and natural riparian areas are minimal to nonexistent throughout the Project Area. Removal of the dredge material and restoration of a natural stream and riparian system are the primary focus of this Preliminary Design Plan. **Figure 2.3** and **Figure 2.4** show historic and present conditions in the project area.

Figure 2.3. Dredges used in the Swan River Valley in the early 1900s.

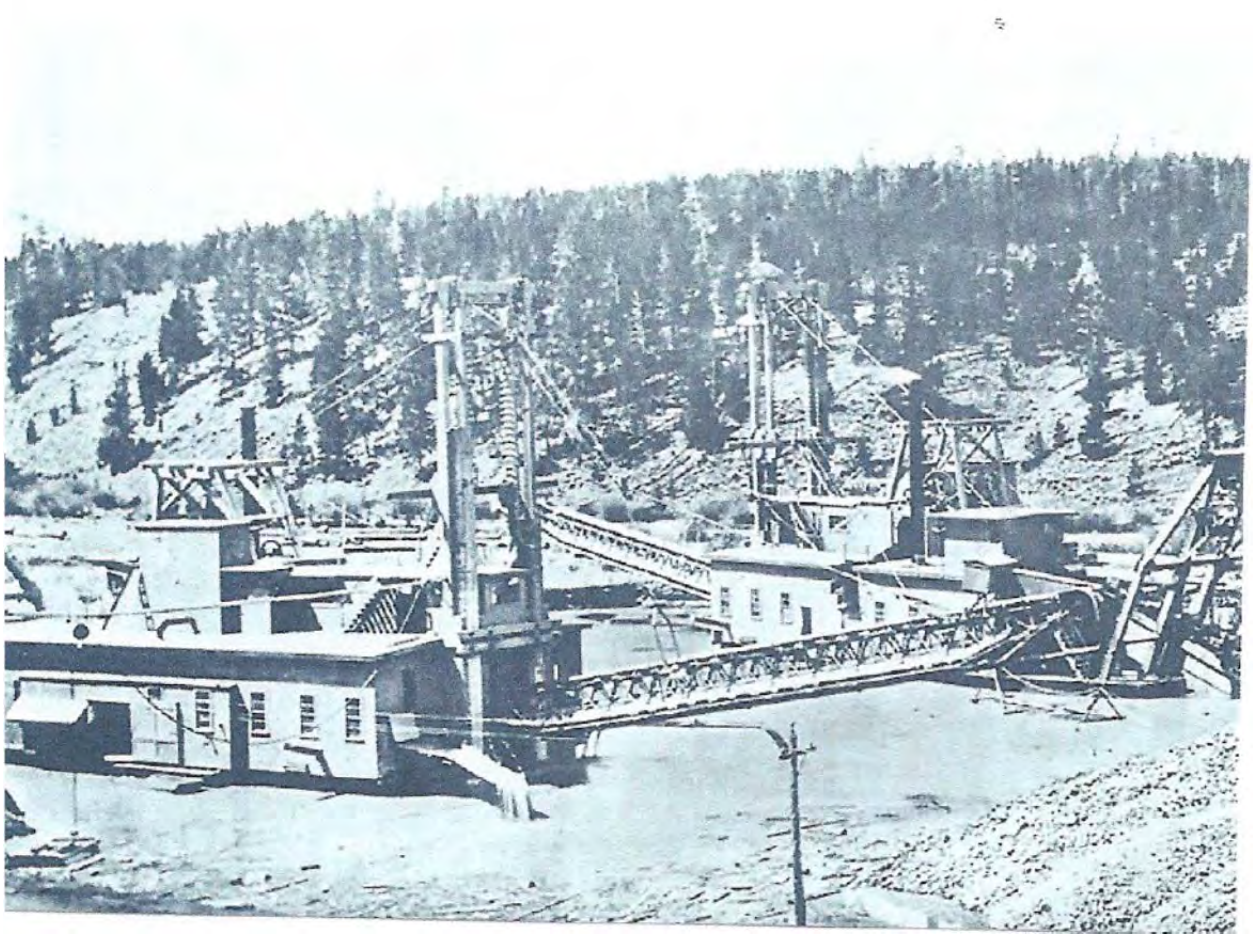


Figure 2.4. Existing Dredge Piles and General Site Characteristics of the Project Area.

3.0 HYDROLOGY

3.1 Surface Water Hydrology

Estimates of flow through the Project Area were completed in order to obtain and understand the magnitude and variability of flows that can be expected. Flow data were then used to estimate appropriate channel properties and define key hydrological design parameters.

No stream gage exists on the Swan River, therefore an evaluation was performed of regional gages and results were used as one method to estimate flows through the Project Area. Regional streamflow gages were evaluated for completeness, proximity to the Project Area and tributary drainage areas. Gages with relatively long, continuous records that are not impacted by diversions in close proximity to the Swan River basin and having tributary areas similar to the Swan River were preferred.

Four local gages were identified and evaluated. They included Keystone Gulch near Dillon (USGS Station 09047700), Snake River near Montezuma (USGS Station 09047500), Rock Creek near Dillon (USGS Station 0905200) and Turkey Creek near Red Cliff (USGS Station 09063400). Data on the four drainages are summarized in **Table 3.1**.

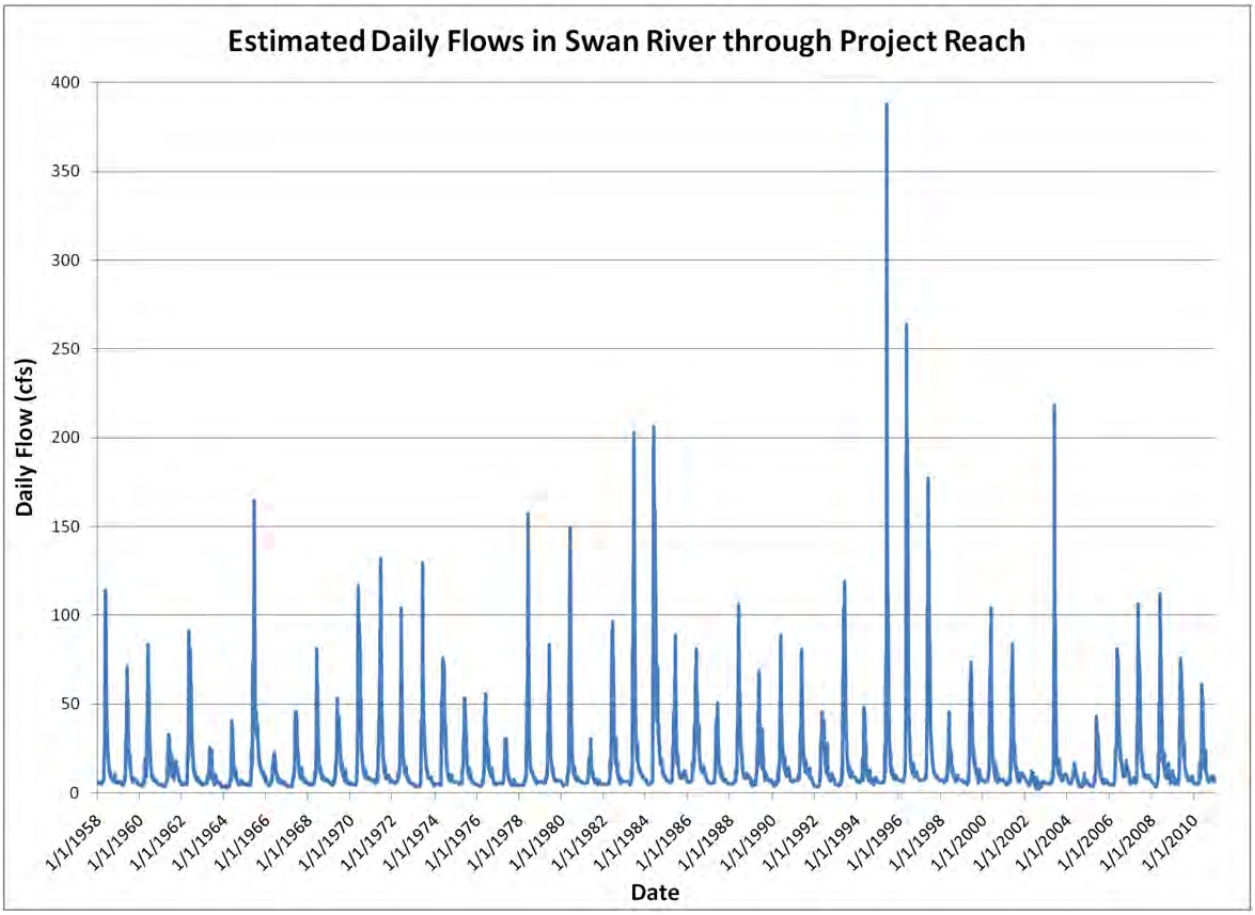
Table 3.1. Local Streamflow Gages.

Gage	Location	Period of Record	Drainage Area	Comments
Keystone Gulch	39° 35’ 40” 105° 58’ 19” (6.0 miles away)	October 1957 to present	9.10 mi^2	No upstream diversions
Snake River	39° 36’ 20” 105° 56’ 33” (6.6 miles away)	July 1942 to September 1946, October 1951 to present	57.7 mi^2	Small upstream diversions
Rock Creek	39° 43’ 23” 106° 07’ 41” (17 miles away)	October 1942 to September 1994	15.8 mi^2	No upstream diversions
Turkey Creek	39° 31’ 22” 106° 20’ 08” (21.0 miles away)	October 1963 to September 2008	23.8 mi^2	No upstream diversions

Keystone Gulch was selected as likely to be the most representative of the Swan River due to the similar drainage basin sizes, proximity to the site and the orientation of their drainages. Estimates of daily flows at the site were derived using the Keystone Gulch data; bankfull flow estimates were derived using estimates from all four stations for comparison.

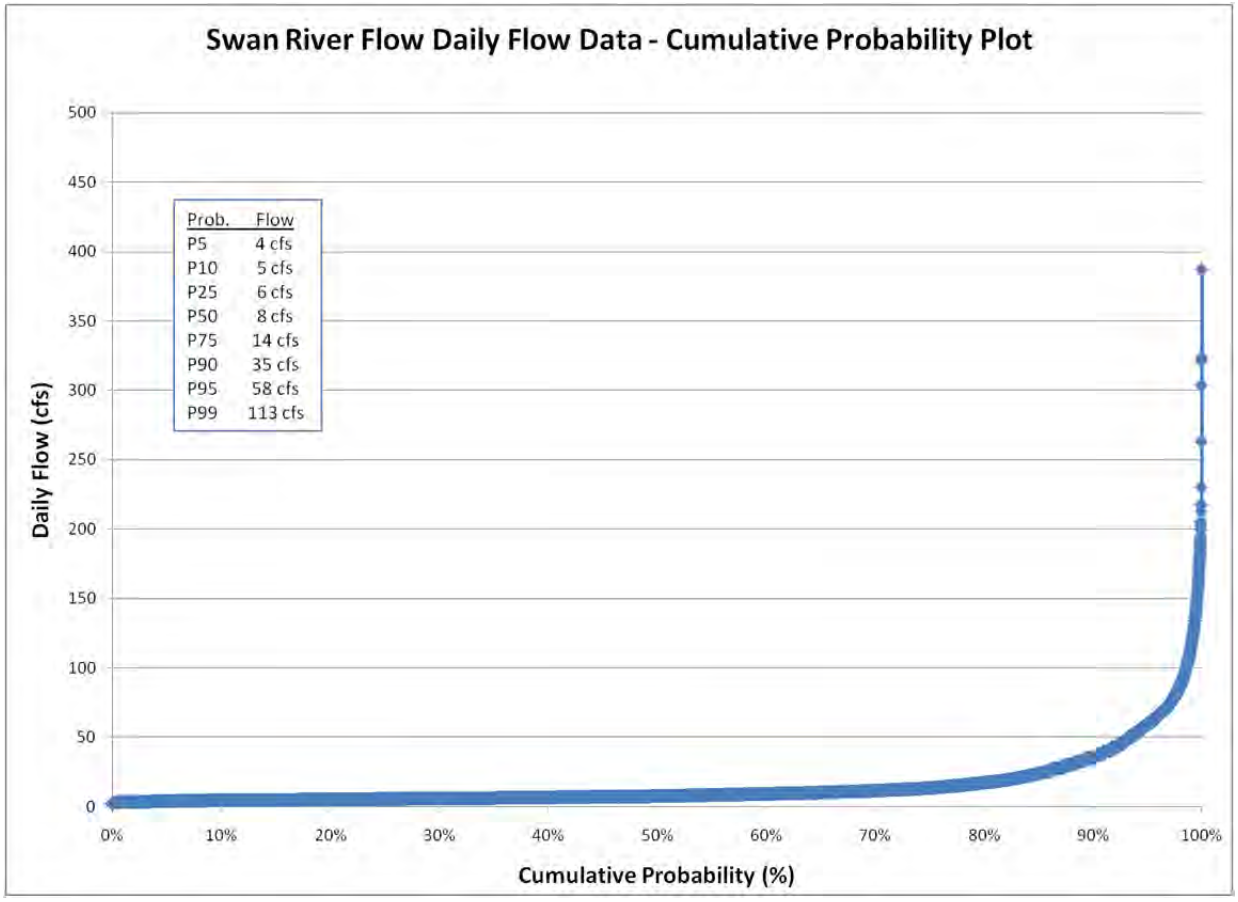
Flow estimates for the Swan River were then made based on available data from Keystone Gulch from 1958 through 2010. Daily flows measured at Keystone Gulch were multiplied by 2.53 to adjust flows from this 9.10 square mile basin to estimate daily flows at the Project Area. Estimated daily flows through the Project Area over this 53 year period of record are shown on **Figure 3.1.** Note that a straight basin adjustment was used for these daily flows. Unlike flood flows where additional adjustment is often used, a straight basin ratio was taken when looking at daily data following the idea that the unit runoff from both basins would be similar.

Figure 3.1. Estimated Daily Swan River Flows.



As would be expected, flows show a definite seasonal trend with peak flows occurring as the result of spring runoff. Flows through the late fall and winter are typically the lowest. A cumulative probability plot of estimated daily flows was developed to quantify the percentage of times flows are less than a given flow magnitude. Results of the flow frequency analysis are shown on **Figure 3.2.**

Figure 3.2. Cumulative Probability Plot – Daily Flows.



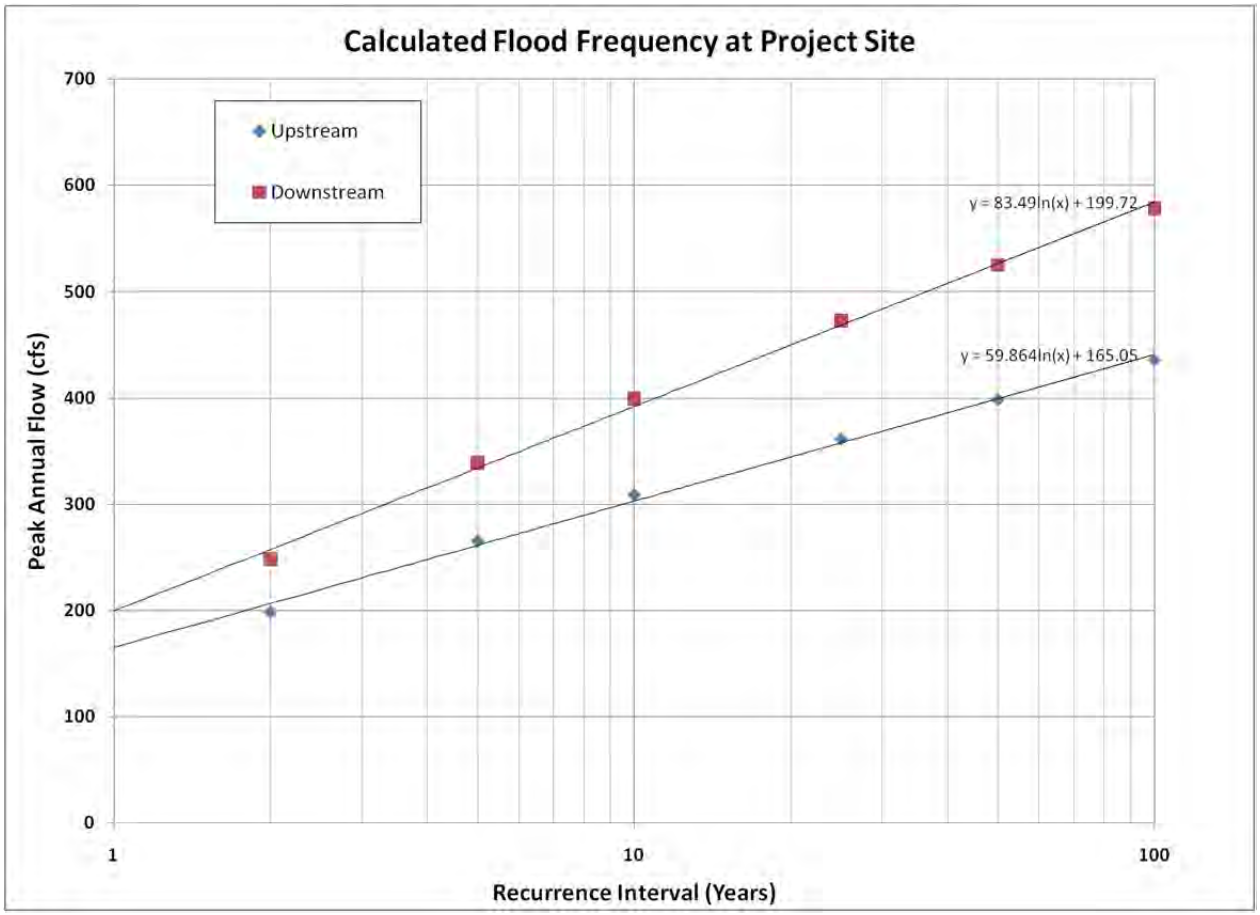
Results indicate that 5% of the time, flows are predicted to be at or below 4 cubic feet per second (cfs) based on extrapolation from the Keystone Gulch gage. Flows are expected to be at or below 8 cfs 50% of the time and at or below 58 cfs 95% of the time. Over the 53 years flows are estimated to range from a low of approximately 2.2 cfs to a high of 390 cfs.

Peak flow estimates for the project site were then made using the regional flood-frequency equations for ungaged stream reaches established by Vaill (2000). Estimates were made at the upstream and downstream project extents for the 2- through 100-year floods using the equations for mountain regions. An estimate of the 1.5-year event was obtained by extrapolation.

Flood flow estimates were used to develop conceptual channel geometries, specifically to estimate bankfull flow. Bankfull flow was assumed to have a recurrence interval of approximately 1.5 years. For

the restoration design, the bankfull flow is intended to be the point where bank vegetation will be established. **Figure 3.3** shows the flood flow values calculated by the Vaill method for both the upstream and downstream project reaches, extrapolated to include the 1.5-year flood event. Based on this information, the bankfull flow is assumed to be on the order of 190 cfs – 230 cfs.

Figure 3.3. Estimated Flood Flow Frequencies at the Project Site.



There is an inherent uncertainty in the estimate of bankfull flows at an ungaged location. Errors are greater for the more frequent flood events and range from 59.6% for the 2-year event to 43.4% for the 100-year event (Vaill 2000). A number of checks on this important design input were therefore performed as part of the preliminary design. One check included review of available references to check estimates of larger flows against flow estimates at the other gages. A second check involved field surveys and hydraulic modeling to estimate bankfull flow further downstream on the Swan River.

As a first check on the numbers presented above, peak flows were estimated based on data from Keystone Gulch, the Snake River, Rock Creek and the Turkey Creek gage sites. At each of these locations peak flow estimates contained in the Vaill 2000 report were compiled. The 1.5-year event at each location was extrapolated using probability plotting based on estimated flows. A graph showing plotted

flood frequency data for each of the four sites is provided in **Figure 3.4**. Results using these various locations are summarized in **Table 3.2.**

Figure 3.4. Estimated Flood Flow Frequencies at Regional Station.

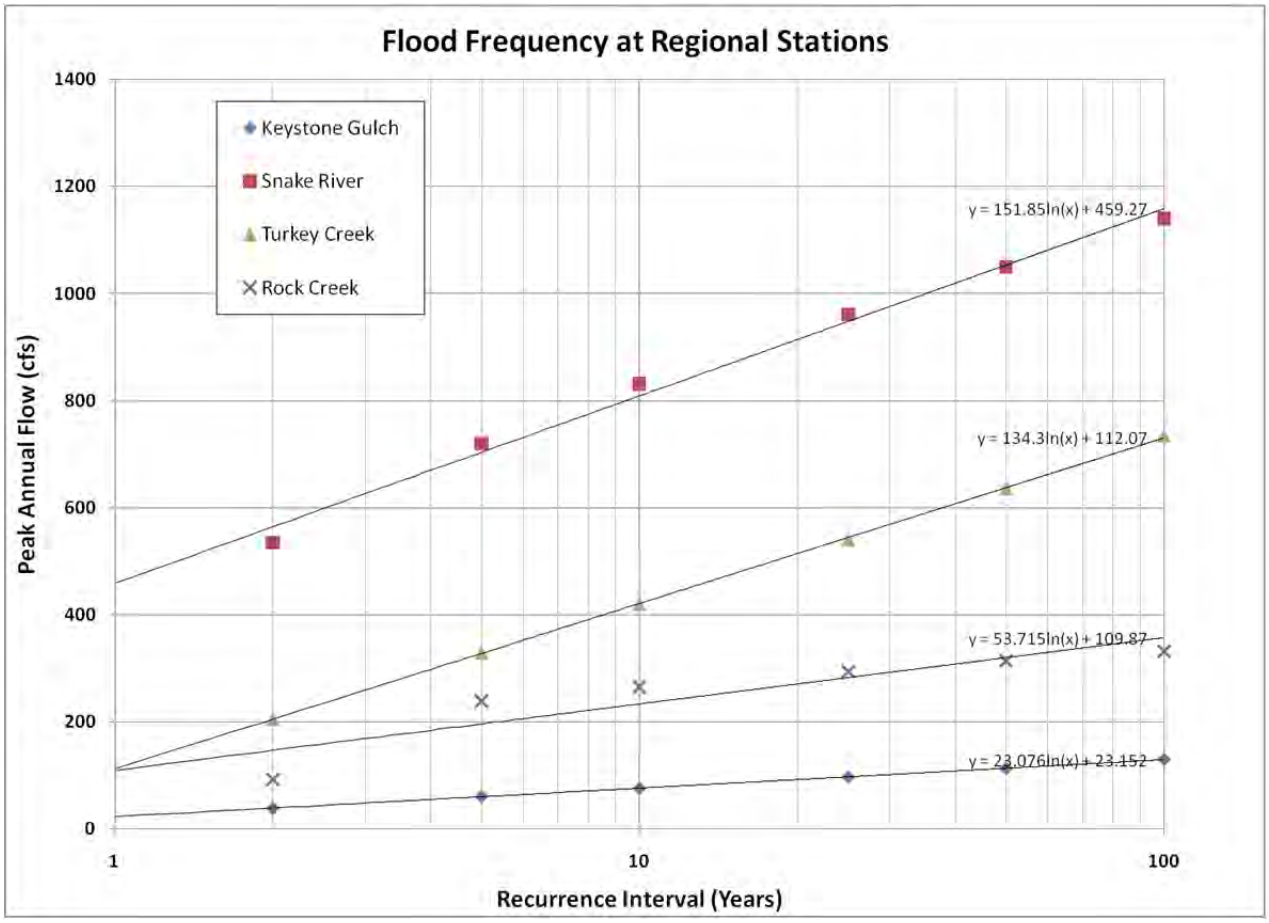


Table 3.2. Comparison of 1.5-Year Flow Estimates at Different Locations.

Site	Area (mi^2)	1.5-Year Flow Estimate (cfs)	Unit 1.5-Year Flow (cfs/mi^2)
Keystone Gulch	9.10	33	3.63
Rock Creek	15.8	132	8.35
Snake River	57.7	521	9.03
Turkey Creek	23.8	167	7.02
Mean	NA	NA	7.01
Median	NA	NA	7.69

Results show a range of unit flows from 3.63 cfs per square mile to 9.03 cfs per square mile with a mean and median of 7.01 cfs per square mile and 7.69 cfs per square mile, respectively. Graphical results suggest that all data except Rock Creek tend to plot well on trend lines. Utilizing the mean and median unit flows presented in the table result in a 1.5-year flow of 102 cfs and 112 cfs, respectively at the upstream end of the project. Unit flow values produce a 1.5-year flow of 160 cfs for the mean value and 176 cfs for the median value at the downstream end of the project.

Estimates of bankfull flow were then made based on physical conditions in a downstream section of the Swan River in an attempt to add certainty to the bankfull flow estimate used in design. This is believed to provide the most accurate estimate of bankfull flow as it is based on physical observations rather than empirical, regional estimates. The Forest Service completed a survey on May 31, 2012 to aid in the evaluation of bankfull flow. The survey was completed on a section of the Swan River near the dredge boat on Summit County Open Space land. The river at this location has a tributary drainage area of 28.9 square miles. Calculations by the Forest Service indicate a bankfull flow of 101 cfs at the dredge boat site. Details of the Forest Service's bankfull flow estimates including a sensitivity analysis is presented in **Appendix B**.

ERC and the Forest Service discussed the field methods employed and results and concluded that given the condition of the site investigated it is likely that there is significant subsurface flow at the dredge boat site that should be considered when estimating actual bankfull flow. The actual quantity of flow that may be conveyed in the subsurface is not practical to quantify from physical measurements. Given the stream size and location, however, it is reasonable to assume that the Swan River would be a perennial stream. As the stream is observed to be dry or nearly dry conditions at different times, it is likely that flows on the order of average baseflows may be occurring subsurface. Adding average baseflows to the bankfull estimate calculated by the Forest Service likely improves the accuracy of the bankfull flow estimate that should be used in the design.

ERC therefore estimate baseflows at the dredge boat site for inclusion with the bankfull flow estimate by the Forest Service. Four different procedures were evaluated. ERC selected a flow of 17 cfs as the baseflow based on the results of this analysis. Details of the baseflow calculations are provided in **Appendix C**. Adding 17 cfs of baseflow to the calculated (surface) bankfull flow of 101 from the Forest Service results in a total bankfull flow estimate of 118 cfs at the dredge boat site.

Estimates of bankfull flow were then made at the project site based on drainage areas following methods suggested by Vaill (2000). The drainage area at the upstream end of the project site and downstream from the North Fork of the Swan, which is the largest tributary along the project length are 14.6 and 22.9 square miles. Using these aerial adjustments results in an estimated bankfull flow of 80 cfs and 103 cfs, respectively for this method.

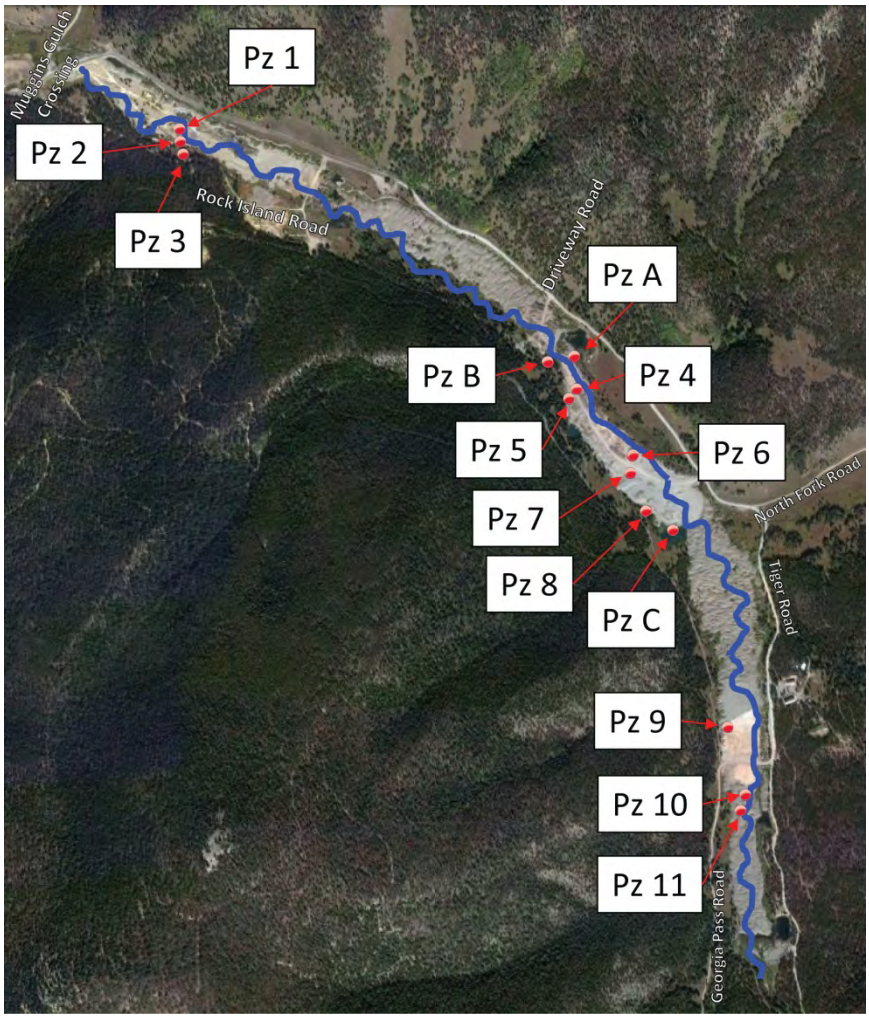
3.1.1 Bankfull Flow Estimates

Estimates of bankfull flow values derived from physical measurements plus baseflows are believed to be the most accurate method available. For this reason bankfull flow estimates at the upstream and downstream ends of the Project Area were assumed to be 80 cfs and 103 cfs, respectively. A bankfull flow value of 80 cfs was used for areas upstream of the North Fork tributary confluence and a value of 103 cfs was used downstream of the North Fork tributary confluence.

3.2 Groundwater Hydrology

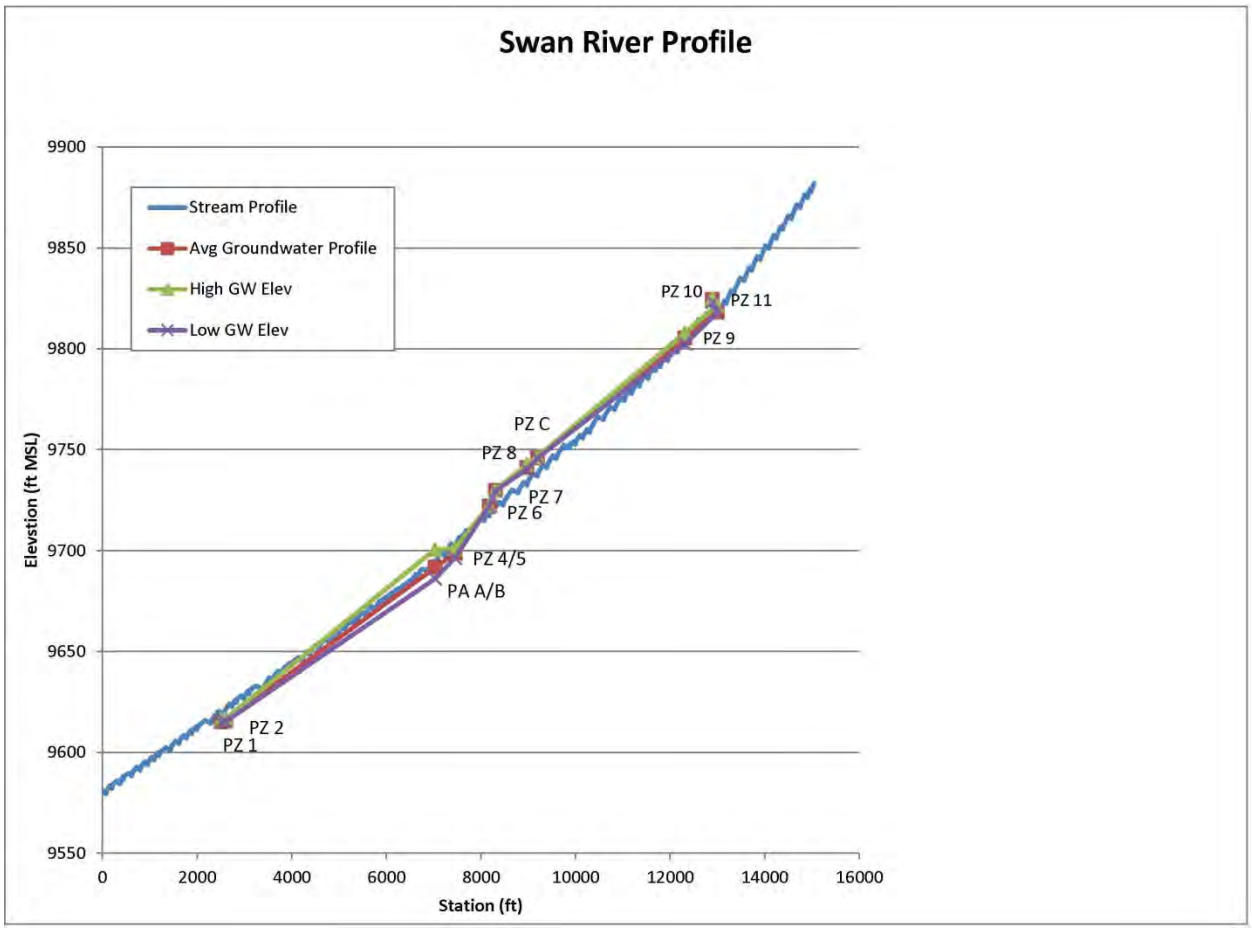
Given that the existing stream runs subsurface through the Project Area, obtaining a better understanding of groundwater levels was an important aspect of the preliminary design process. A series of 14 piezometers were installed by the Everist Materials, LLC and monitored by the Forest Service at locations intended to provide spatial coverage of the Project Area while considering access and current topography created by the dredge piles. The locations where groundwater was measured from piezometers are shown on **Figure 3.5.**

Figure 3.5. Locations of Ground Water Piezometers.



Readings were taken by the Forest Service and consisted of 18 water depth measurements from each of 14 separate piezometers. Measurements were taken approximately weekly between June and November 2012. Raw data were compiled into highest, lowest, and average groundwater elevations in each piezometer over the sample period. These elevations were plotted in profile with the proposed stream elevation by matching piezometers to the closest stream station. This plot is shown in **Figure 3.6**. It should be noted that ERC projected groundwater elevations to the stream location, so some variability is inherent in this figure. Graphs displaying the temporal variation in water levels at the different piezometers are included in **Appendix A**.

Figure 3.6. Groundwater and Stream Profiles.



A comparison of the proposed steam profile with the groundwater levels indicated that in general the two surfaces are quite similar but at certain locations and times the groundwater levels appear to be below the proposed stream bed. This is particularly true in the downstream section of the project in the vicinity of PZ 1 and 2 (near STA 25+00), and PZ 4 and 5 (near STA 74+00). In these locations stream bed elevations are generally 1-4 feet higher than the highest groundwater elevations. In general, groundwater levels appear to be lower than the proposed streambed in the vicinity of piezometers

downstream of Driveway Road. Groundwater levels in these piezometers generally showed very minimal variation during the period when data was collected and suggest that average groundwater levels may be approximately 2-6 feet below the proposed streambed at these locations.

Data were compiled to compare the proposed streambed elevation with the range of groundwater elevations observed from the nearest piezometers. High, average and low groundwater levels are compared with stream elevations with differences provided. Results are given in **Table 3.3** and include the difference in completed groundwater and streambed elevation. In this table positive values indicate areas where the streambed is above apparent groundwater while negative values indicate areas where the stream is below the apparent groundwater level. PZ 3 was not included in the analysis because it is approximately 200 feet from the stream and may not accurately reflect groundwater levels in the vicinity of the stream bed.

Table 3.3. Comparison of Stream and Ground Water Elevations.

PZ	STA	Stream El. (ft)	Groundwater El. (ft)			Distance between Stream and Groundwater El. (ft)		
			High	Average	Low	High	Average	Low
1	25+18	9,619.8	9,616.5	9,615.3	9,614.9	3.2	4.5	4.9
2	26+00	9,624.1	9,616.7	9,615.6	9,615.3	7.4	8.5	8.8
A/B	70+35	9,693.2	9,700.6	9,691.7	9686.2	-7.4	1.5	7.0
4/5	74+55	9,702.1	9,701.1	9,698.7	9,696.5	1.0	3.4	5.6
6	81+75	9,717.1	9,722.3	9,722.1	9,722.1	-5.2	-5.0	-5.0
7	83+10	9,722.6	9,730.2	9,729.9	9,729.7	-7.6	-7.3	-7.1
8	89+75	9,732.4	9,742.7	9,741.2	9,740.4	-10.3	-8.8	-8.0
C	91+95	9,736.9	9,746.5	9,746.0	9,745.9	-9.6	-9.1	-9.0
9	12+315	9,801.5	9,807.9	9,805.4	9,802.6	-6.4	-3.9	-1.1
10	12+995	9,816.4	9,821.7	9,818.2	9,817.7	-5.3	-1.8	-1.3
11	12+900	9,822.6	9,825.1	9,824.5	9,823.3	-2.5	-1.9	-0.7

Overall data suggests that groundwater and proposed streambed elevations are generally very similar in the upper portions of the Project Area and groundwater is believed to be below the proposed streambed in the lower reaches. Given that the current plan is to complete restoration of the upper most section first, it is anticipated that the proposed streambed will be very near the groundwater levels for the Reach D work. ERC believes that continued monitoring of groundwater is warranted as it will allow the group to better understand the relationship of these parameters and potentially guide minor design revisions moving forward with future work.

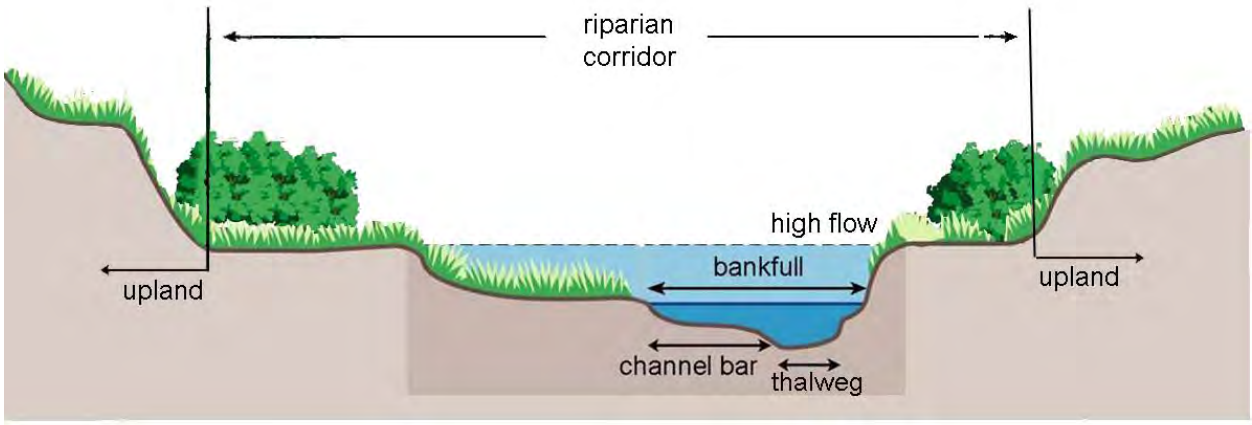
4.0 PRELIMINARY DESIGN PLAN CONCEPTS

4.1 Natural Restoration Concept

A natural based restoration approach was taken for all proposed improvements, whenever possible. The guiding principle of ERC's natural restoration approach is that a restored stream system should mimic a natural channel in appearance and function. Restoring the natural form and function within the stream system will allow lost balance and ecologic benefits to be restored. Like a natural channel, restoration was approached with a design that will allow the stream to migrate in response to flow and sediment loads, but is intended to maintain its basic form without significant aggradation or degradation. This approach, rather than a structural approach to restoration, is of the utmost importance to this project so that the restored resources function holistically and restore the desired natural characteristics throughout the Project Area.

As part of this approach, design concepts considered improvements to the channel and the connection between the stream and adjacent lands. Improvements recommended as part of this Preliminary Design Plan include an appropriately sized channel to convey typical and bankfull flow events, a riparian corridor and transitions into upland areas. A schematic showing the relationship between the stream and adjacent lands considered in this Preliminary Design Plan is presented in **Figure 4.1.**

Figure 4.1. Schematic of Stream and Adjacent Lands in a Natural System.



Natural stream improvements are sustainable, provide natural resource benefits, promote active recreation such as angling and passive recreation such as bird watching and relaxing, and result in a stream corridor that is aesthetically pleasing. ERC's restoration approach incorporates features that would be found in an undisturbed ecosystem and is based on fundamental geomorphologic and reference reach principles. For the project setting, natural restoration includes features such as riffles, bend pools, glides, instream habitat, stable vegetated banks and riparian and upland vegetation.

Structural stream control features such as rock weirs, arches, jetties and vanes that are common to many stream projects, yet are not natural features, were not considered as part of this natural design approach.

4.2 Aquatic Environment

The aquatic environment will be the life-blood of the restored Swan River local ecosystem providing forage, protection, spawning and rearing habitat for fish and other aquatic species as well as the hydrological regime to maintain a riparian community. Many factors contribute to the quality of an aquatic ecosystem. Water quality is probably the single most influential component. Water quality elements such as temperature, pH, dissolved oxygen and suspended solids can determine the productivity of a stream system. From an aquatic standpoint, historic mining activities through the Project Area have left the Swan River relatively devoid of natural features. Slow moving deep pool habitat, steeper, oxygenated riffle sections, slack backwater areas and gravel spawning beds are all important habitat typical of western streams. Instream cover (rocks, undercut banks, logs and debris) and overhead vegetation are imperative to support healthy macroinvertebrate and fish populations. These characteristics are not present through the Project Area and are the focus of the instream habitat features of the Preliminary Design Plan.

Specifically of concern is preservation of a known nearly pure genetic strain of the native cutthroat trout located upstream on the North Fork tributary. The Forest Service has expressed a desire to restore the entire Project Area, through eradication of existing non-native brook trout (*Salvelinus fontinalis*) and creation of fish movement barriers. Today, remaining native cutthroat populations are primarily limited to small headwater streams and lakes within their historic range. The US Department of Agriculture Forest Service 2005 Range-Wide Status of Colorado River Cutthroat (CRCT) states that approximately 21,386miles of stream habitat were identified as having the potential of being historically occupied by CRCT, of which about 13,615 are in Colorado. Currently CRCT occupy only about 1,359 miles of stream in Colorado, of which 46-miles is located in the Blue River Hydrologic Unit Code (HUC) 14010002. Of the total existing CRCT habitat the study further states that only 12.4% is considered excellent in Colorado.

The Preliminary Design Plan focuses on creating a healthy, diverse and self-sustaining aquatic environment which includes specific habitat requirements for native cutthroat trout. As defined by the US Fish and Wildlife Service's Habitat Suitability Indexes (HSI, February 1982), optimal cutthroat trout riverine habitat can be characterized by clear, cold water; a silt-free rocky substrate in riffle-run areas; an approximately 1:1 pool-to-riffle ratio, with areas of slow, deep water; well-vegetated stream banks; abundant instream cover; and relatively stable water flow, temperature regimes, and stream banks.

Cover and overwintering habitat are recognized as essential components of trout streams. Cover for adult trout consists of areas of obscure stream bottom in areas of water greater than 15 centimeters deep with a low velocity of less than 15 centimeters per second. These basic principles serve as the fundamental guidelines for instream aquatic environment developed as part of the Preliminary Design Plan.

One of the initial objectives of this project was to provide a fish barrier structure intended to eliminate upstream migration of resident non-native brook trout populations and facilitate isolation of the upper Swan River Basin for native cutthroat trout habitat. Through discussions with the Forest Service and project proponents throughout the development of this Preliminary Design Plan it was decided that the fish barrier would ideally be located at the existing Tiger Road Crossing of Muggins Gulch.

The barrier will be a drop barrier, taking advantage of the existing grade break from the upstream to the downstream side of the existing Tiger Road crossing. Site surveys indicate that the elevation difference from the invert on the upstream (east) side of the road to the channel invert on the downstream (west) side of the road is currently 7.9 feet (2.4 meters).

The existing grade break across the road was compared with literature values on brook trout jump heights. The highest recorded jump height for brook trout in research reviewed was 73.5 cm (2.41 feet) by brook trout in the 15 – 20+ cm size range in a laboratory setting (Kondratieff 2006). The jump heights recorded in this study were 2.9 – 4.0 times the fish body length, and maximum jump heights were only achieved when downstream plunge pools were at least 40 cm deep (1.6 times their body lengths). Another study indicates the field observation of brook trout passing a 1.2 m waterfall complex (Adams 2000). This 1.2-m-high falls complex was comprised of a 0.5 m high upper step and a 0.7 m high lower step separated by a plunge pool less than 0.2 m deep. It is our opinion that this report is not indicative of a brook trout being able to effectively clear a 1.2 m vertical drop as there was an intermediate step. In addition, no consideration appears to have been given for the downstream tailwater condition. Other reports indicate that other species including brown trout and rainbow trout have maximum jump heights of 2.5 feet, and 2.8 feet, respectively (Saila 2005). Discussions with Matt Kondratieff (2013) from Colorado Parks and Wildlife indicate that the State of Colorado uses a minimum four foot drop height from tailwater depth to crest of the upstream surface. ERC recommends that a vertical depth of at least four feet above the tailwater should be maintained. Maintaining this minimum height and a quality barrier are paramount to the success of the native cutthroat trout restoration goal. The nearly eight (8) feet of vertical separation provided by the Tiger Road crossing therefore is believed to be more than adequate to prevent upstream fish migration into the upper Swan River section even when accounting for a significant tailwater depth.

5.0 CHANNEL MORPHOLOGY

One of the key components of the restoration design was establishing the appropriate geometry for the restored stream. Appropriate channel widths were estimated for the 2012 BRWG Concept Plan based on standard geomorphologic principles and verified by review of "representative conditions" identified within the Project Area. Appropriate channel planform was estimated based on typical properties for the anticipated stable stream type following the Rosgen Classification system (Rosgen 1996).

In addition, ERC completed a HEC-RAS model of the proposed channel configuration to refine initial channel geometry estimates. Channel geometry derived from standard geomorphologic principles as well as information resulting from the more detailed hydraulic modeling are presented in this section.

5.1 Bankfull Channel Width

The approximate width for the restored channel was estimated based on observed relationships relating basin area to bankfull width (Leopold 1994), (Rosgen 1996). For the Project Area, bankfull width is the width of the channel where it first starts to overflow into its floodplain. As indicated above, the Swan River through the Project Area has a total tributary area of approximately 22 square miles. Standard regional geomorphologic curves suggest that for this sized basin the active channel should be on the order of 25 - 30 feet wide with a mean depth of approximately 1.5 feet at riffle sections.

Observations of sections of the stream that are currently properly functioning were used as a check against the values estimated using the basin area/width geomorphologic relationships. For this assessment the stretch of the Swan River downstream from the confluence with the North Fork of the Swan River was evaluated. The location of this "representative reach" is shown on **Figure 5.1.**

While this section of stream may or may not have been impacted in the past, it is currently functioning well with stable channel cross sections and profile and a healthy riparian area. As discussed in more detail below, the stream through the representative reach is generally straighter than typical for this type of a valley, which generally relates to narrower cross sections.

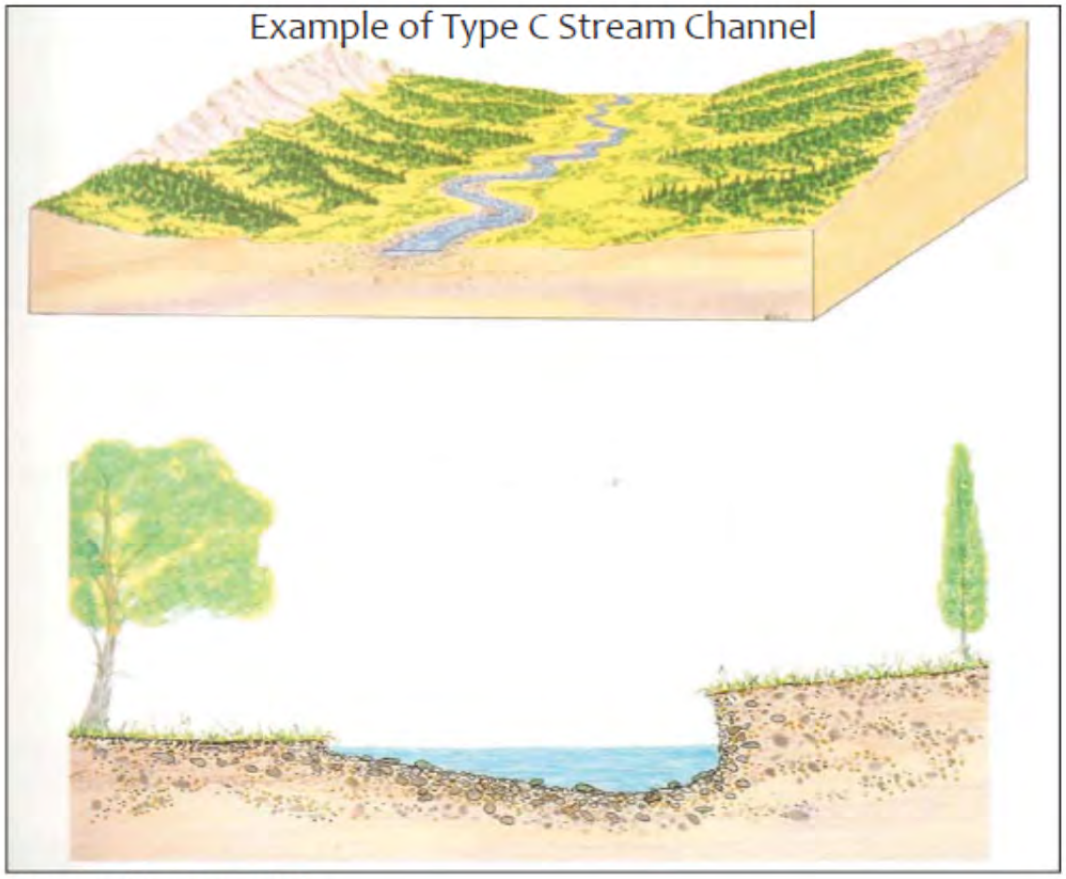
Existing bankfull channel widths were measured at five locations within this representative reach by ERC as part of a site investigation in September of 2011. All bankfull measurements ranged from 20 – 25 feet. Measured bankfull widths are within the general range of the widths estimated based on standard geomorphologic data indicating a good relationship between widths estimated from standard geomorphologic principles and those measured in the field. Results lead to the design geometry of 25 foot bankfull width in riffle sections. Bankfull stream widths for the riffles sections and in pool and glide sections (areas between riffles) were then further refined through the use of hydraulic modeling.

Figure 5.1. "Representative Reach" within Project Area.

5.2 Channel Planform

Channel planform, or shape as observed from above, was estimated based on the stream type that is assumed to be appropriate through the Project Area. As part of this assessment other regional streams were evaluated and it was found, as would be expected, that a majority of healthy streams in this area are single thread systems. Given this and the broad, terraced valleys observed in other segments of the Swan River, ERC believes that a Rosgen Cb Stream Type is an appropriate target for the restored channel segment. A Type Cb stream is a single thread channel alluvial stream, as shown in **Figure 5.2.** It typically includes a meandering planform with point bars and riffle/pool sequences and has a broad, defined floodplain.

Figure 5.2. Schematic of Typical Type C Stream.



Source: Rosgen 1996

Typical published values for stream sinuosity, slope, meander wavelength and entrenchment for Type Cb3 and Cb4 streams are given on **Table 5.1** where "3" and "4" indicate the dominate substrate are cobbles and gravels, respectively.

Table 5.1. Typical Type Cb Stream Properties.

Category	Criteria
Channel Slope	2 % - 3.99%
Pool Spacing	5-7 Times Bankfull Width
Width/Depth Ratio	> 12
Entrenchment Ratio	>2.2
Sinuosity	>1.2

Meander lengths and mean radii of curvature can be approximated from channel width. A mean channel width of 25 feet relates to a meander length of approximately 280 feet and a radius of curvature of approximately 60 feet (Leopold 1992).

The conceptual planform view for the restored stream section was developed based on these general guidelines. By design, not all sections of the proposed stream exactly fit within the criteria of a typical Type Cb stream due to the desire to provide variability in the stream geometry, as one finds in natural stream systems. The proposed stream planform can be seen on **Sheets 1-8** in **Appendix D**. A summary of the average properties measured from the proposed Concept Plan is given on **Table 5.2.**

Table 5.2. Characteristics of Conceptual Level Restoration.

Category	Value
Valley Length (ft)	11,760
Stream Length (ft)	15,055
Stream Sinuosity	1.28
Number of Bend Pools	91
Average Pool Spacing (ft)	165 (6.6 bankfull widths)
Riffle Bankfull Width (ft)	25
Riffle Bankfull Depth (ft)	1.5
Width/Depth Ratio	16.7
Average Channel Slope	2.0%
Floodprone Depth (ft)	3
Floodprone Width (ft)	175
Entrenchment Ratio	7

5.3 Stream Profile

Typically a proposed stream profile would include information on existing and proposed elevations. This effort was limited by the fact that detailed topographic mapping of the full Project Area is not available. ERC completed a limited site survey which included selected point locations along the existing stream channel, at all existing stream crossings, at select locations where groundwater intercepts the surface and at the upstream and downstream ends of the Project Area. This information was supplemented by detailed survey data provided by the Forest Service at the extreme upstream and downstream ends of the Project Area well as two foot contour interval mapping available over the downstream Summit County/Town of Breckenridge property.

The proposed channel profile was developed to match key elevations along the length of the Project Area while establishing new proposed elevations for a majority of the Project Area. Key elevations that were generally matched in the stream profile included the following:

- Upstream culvert invert under Tiger Road at the downstream Project Area limit,
- Road crossing at Rock Island Road,
- Road crossing at the Driveway Road and
- Upstream extent of the Project Area,

Elevations at internal road crossings Rock Island Road and the Driveway Road were maintained in the design not because they provided critical vertical controls for the project but rather because they represent logical breakpoints for the construction reach phasing of the project. In order to construct the project following a phased approach, it will be important to have vertical continuity from one stream reach to another. Establishing these internal crossings as vertical control provides the opportunity to start and end a restoration reach at any of these road crossings.

Through conversations with project sponsors it was decided that the existing elevation at the Georgia Pass Road does not need to be maintained. This elevation was not maintained because the logical breakpoint between reaches in the upstream end of the project is further downstream from the road and lowering the channel in this location makes it feasible to intercept groundwater. For this reason the current culvert elevation at Georgia Pass Road was not maintained in the Preliminary Design Plan.

Proposed channel slopes are illustrated on the plan and profile design drawings in **Appendix D**.

5.4 Hydraulic Modeling

Detailed hydraulic modeling was performed using the proposed plan and profile. Hydraulic modeling was performed for several reasons. First hydraulic model results allowed ERC to evaluate the physical stream geometries that were estimated based on fundamental geomorphologic principles and measures of bankfull channel properties in the reference section. Secondly the hydraulic model results provide insight on anticipated flow characteristics which are helpful for evaluating likely flow velocities and shear stresses. For these reasons, HEC-RAS modeling software was used.

In order to properly model the proposed improvements, the Project Area was divided into two reaches with the first being the portion of the project upstream of the confluence with North Fork tributary and the second being the segment downstream of this point. The differentiation between these two subreaches being that the bankfull flow is greater in the downstream reach than in the upstream reach. The entire Project Area was stationed from 0+00 feet beginning at the downstream end, which corresponds to the crossing of the Swan River by Tiger Run Road. Each individual proposed riffle, pool and glide was incorporated into the model. Pools were located at major river bends with riffles located upstream of bend pools. Glides were located halfway between pools and riffle beginnings. Elevations were assigned to each feature based on the stationing distance from the downstream end. The base of each pool is 2 feet lower than the riffle leading into it and 1.5 feet lower than the elevation at the start of the next riffle beginning downstream. This results in a residual pool depth of 0.5 feet. Glide elevations were set halfway between the elevations of upstream pool and start of the downstream riffle beginning.

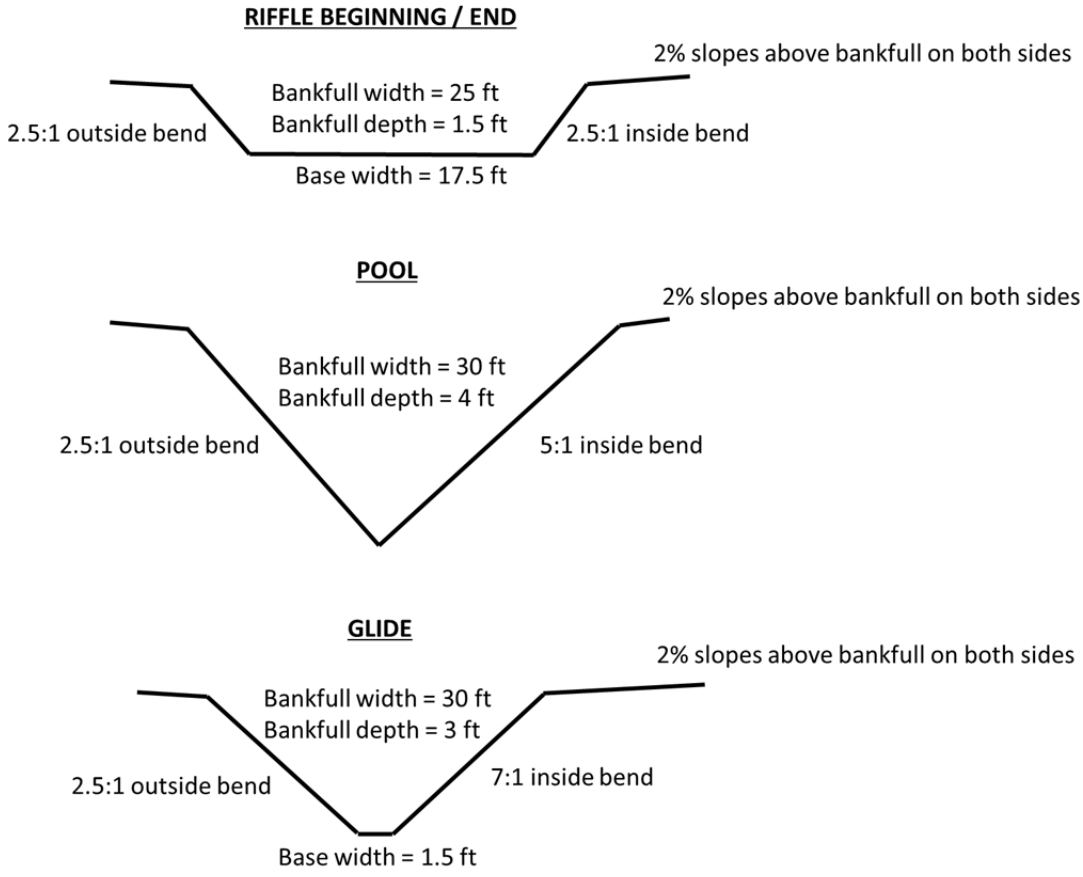
A sensitivity analysis was performed for the Manning's n roughness within the channel. Standard literature suggests a value of 0.04 for the channel (Chow 1959). The survey and calculation of bankfull flow performed by the Forest Service at the dredge boat sites, however, suggest a higher Manning's n value in the range of 0.056 for this stream system. ERC modeled the system assuming Manning's n values ranging from a low of 0.04 to a high of 0.067 (20% greater than the value calculated by the Forest

Service). Average flow depths in riffle sections were found to be more sensitive to roughness values near the lower end of this range than the higher end. Calculated flow depths were generally found to be within 0.2 foot using Manning's n values of 0.056 and 0.067. A value of 0.056 was utilized in the final hydraulic modeling performed for the project.

A total of 371 individual cross-sections were input into the HEC-RAS model. Each cross-section had a uniform geometry based on the type of feature represented. The model was run using the mixed flow regime option; upstream and downstream boundary conditions were set assuming normal flow depth based on the average reach slope. Mixed flow was selected as opposed to subcritical flow as it allowed the resultant flow regime to go supercritical. This was desired as it allowed ERC to identify locations where supercritical flow may occur. Iterative model runs were made and results inspected to determine the appropriate bankfull geometries that would cause the stream banks to approach an overtopping condition at bankfull flow.

Results obtained by the model suggest that the flow depth in the riffles in the upstream and downstream reaches will be in the range of 1.4 – 1.6 feet. Flows were calculated to be subcritical. The cross-sections for each of the features are depicted in **Figure 5.3.**

Figure 5.3. Channel Cross-Section Geometry by Feature.



5.5 Rock Sizing

Channel geometry and flow information allowed ERC to determine rock sizes that are appropriate for different stream components. Given that the intent of the stream is to act as a natural system rather than an engineered channel, rock sizing criteria were set to promote stability in normal flow conditions yet allow for some mobilization in extreme flow conditions. To achieve this goal rocks were sized to provide general stability for flows up to the bankfull conditions. For flows above bankfull conditions it is expected that portions of the bed may mobilize, which is similar to conditions measured in Colorado where bed mobilization typically occurs as flows approach bankfull conditions (Ryan 2002).

RipWin software was used to determine the appropriate design rock size to minimize scour and erosion for each type of stream feature for the bankfull flow. Inputs to RipWin included flow rate, meander radius, cross-section geometry, Manning's n and average slope. The two different bankfull flow rates were used upstream of the confluence with the North Fork and downstream of that point. For meander radii, the smallest radius in each reach was used. Model inputs are shown in **Table 5.3.** Rounded rock was assumed for all calculations given that the available rock consists of rounded river cobble.

Table 5.3. Parameters for RipWin Rock Sizing Software.

Feature Type	Location	Flow rate (cfs)	Smallest Meander Radius (ft)	Cross-Section Geometry			Average Bed Slope
				Left Bank Slope	Bottom Width (ft)	Right Bank Slope	
Riffle (straight)	upstream	80	n/a	2.5:1	17.5	2.5:1	0.0426
	downstream	103	n/a	2.5:1	17.5	2.5:1	0.0299
Riffle (bending)	upstream	80	100	2.5:1	17.5	2.5:1	0.0426
	downstream	103	120	2.5:1	17.5	2.5:1	0.0299
Pool	upstream	80	21	5:1	0	2.5:1	0.0071
	downstream	103	15	5:1	0	2.5:1	0.0065
Glide	upstream	80	21	7:1	1.5	2.5:1	0.0071
	downstream	103	15	7:1	1.5	2.5:1	0.0065

The results of the RipWin analysis are displayed in **Table 5.4.** Rock sizes were rounded to the nearest inch. D_{50} is the rock diameter that is greater than that of 50% of the rocks. With the possible exception of the rock sizes calculated for the outside bends, all material sizes appear to be readily available based on observation of the dredge piles. Larger material for the outside bend appears to be available, but in lesser quantities.

Table 5.4. D50 Rock Size by Feature Type.

UPSTREAM (Q=80 cfs)				
	Riffle Bed	**Riffle Side Slope (straight riffle)**	**Outside Bend Downstream of Riffle (outside bend)**	**All other sections**
D_{50} (in)	2	2	6	1
DOWNSTREAM (Q=103 cfs)				
	Riffle Bed	**Riffle Side Slope (straight riffle)**	**Outside Bend Downstream of Riffle (outside bed)**	**All other sections**
D_{50} (in)	2	2	5	1

Flow velocities produced by the HEC-RAS were also evaluated. As HEC-RAS is a 1-D program, velocities represent average velocities across a given cross section. In one location model results suggested a flow velocity significantly greater than the remainder of the riffles. To account for the high velocity anticipated at this location, the design calls for the use of a modified "step pool". This step pool will utilize larger (D_{50} = 12 inch) rock and a steeper 6:1 slope in place of the standard lower gradient riffle. This single step pool is located at Riffle 21, which is located at approximately Station 34+30.

6.0 CONCEPTUAL DESIGN COMPONENTS

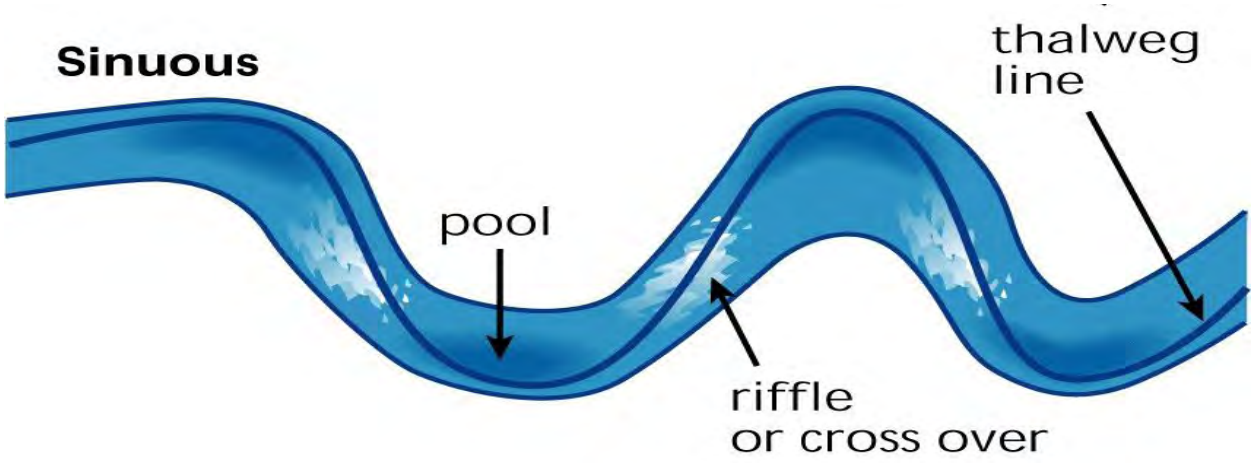
The main elements of the Preliminary Design Plan include creating a natural, meandering channel, providing quality instream habitat, stabilizing banks utilizing bioengineering techniques, creating a native riparian terrace and reclaiming upland areas. Methods used to achieve these improvements are discussed in this section of the report.

6.1 Channel Form

A plan view of the proposed channel is presented on **Sheets 2-8** in **Appendix D**. A key element of the proposed channel design is creating a meandering pattern that is in balance with the natural hydrograph. The proposed channel takes on an alignment that is generally meandering through the valley, as shown in **Figure 6.1.** It has an overall sinuosity of 1.28 and follows a non-uniform route to achieve the type of diversity that is observed in natural streams. The straightest section of the planned stream is downstream of the confluence with the North Fork of the Swan River. This section of the stream is proposed to remain in its current alignment. While straighter than a typical Type Cb stream this section of the stream was found to be functioning well with stable banks and established riparian vegetation along the stream corridor. Another section from approximately station 120+00 to 129+00 on the Preliminary Design Plan has been designed straighter than a typical Type Cb stream in order to maximize available usable land at the request of the current landowner. The exact sinuosity may evolve

with progressive stages of construction as more is learned and final grading accommodates existing vegetation.

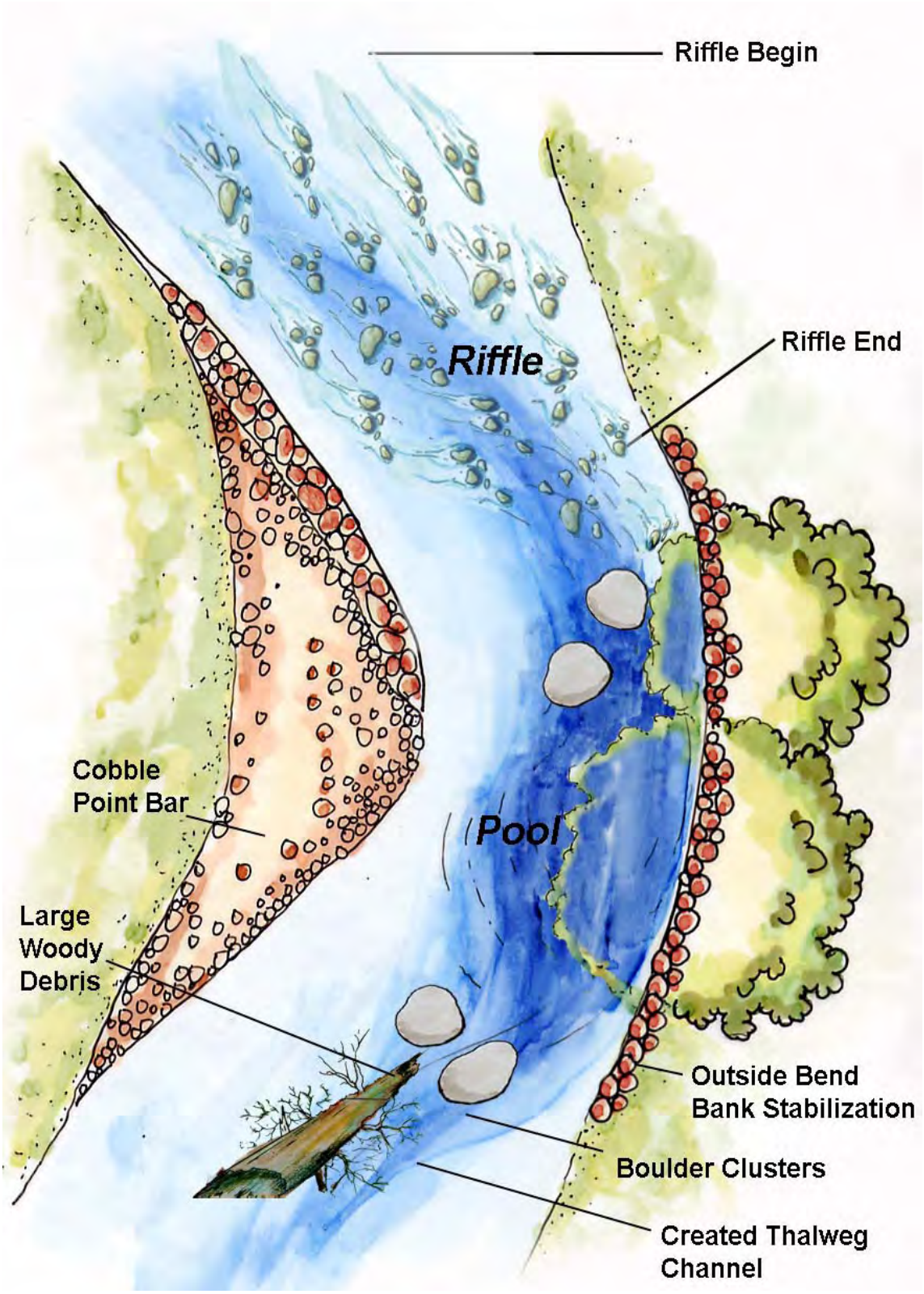
Figure 6.1. Schematic of Meandering Channel with Riffle/Bend Pools.



Type Cb streams are dominated by repeating riffle/bend pool complexes and point bars, as shown in **Figure 6.2.** Riffles are the steeper sections of the stream and generally located upstream from larger channel bends. Riffles are characterized by larger substrate material and swift flows. Pools are located downstream of riffles and are typically at or near the more pronounced bends in the stream. The higher flow velocity of the riffle sections provide energy required to continually scour the pools maintaining quality pool habitat. Glides are located between pools and riffles and generally have a mild adverse slope leading from the end of a pool up to the start of the next riffle. Glides have a well-defined thalweg that contain flow to a defined channel during low flow periods. Schematic templates depicting typical geometries of riffle, pool and glide cross sections are presented on **Sheet 9** of the Preliminary Design Plan.

The Preliminary Design Plan shows the proposed channel meandering through the valley and intercepting and/or impacting some of the limited open water and mature vegetation that exists at some locations. It is anticipated that during further design development and field staking prior to construction the precise alignment may be modified slightly in some locations to preserve existing resources. Final grading will need to be understood and considered when determining which resources can and cannot be protected in the field, but all efforts should be made to preserve vegetation where practical. Vegetation that will be impacted should be salvaged and utilized as part of the revegetation plan whenever possible.

Figure 6.2. Schematic of Riffle/Pool Complex.



6.2 Bank Stabilization

Stabilizing the newly constructed channel banks will be important in maintaining water quality and sustaining the constructed channel. The long-term goal of the restoration work is to create a condition where bank stability is achieved through vegetation. During initial vegetation establishment, however, additional stabilization measures are needed. Restoration concepts are therefore to provide adequate native vegetation along the stream corridor yet supplement this with additional, temporary stabilization measures.

Different levels of stabilization are expected to be required for different shear stresses. In straight sections of the channel and along inside bends, stresses will be relatively low and stabilization requirements will be less. Along outside bends stresses will be highest and additional stabilization measures will be warranted. Two different stabilization concepts were developed to meet these different requirements.

For both conditions, the key to relieving stresses on the banks is allowing flood flows to access its floodplain where flows can then spread out over a larger area. For this reason all banks should be constructed to the bankfull elevation and riparian corridor immediately adjacent to the stream should be gently sloped towards the uplands. This general configuration will allow for the dissipation of energy and activation of the floodplain.

As was observed in the representative reach, existing stream banks consist of a combination of cobbles, gravels and fine material with healthy stands of riparian vegetation were stable at all locations observed. This natural condition should be replicated in the constructed banks.

Bank stabilization and riparian corridor development for straight sections and inside bends will include a cobble mix toe with a riparian corridor sloping outward towards the uplands at a maximum 2% grade. Soil growth medium should be placed along these banks, extending 50 feet outward into the riparian corridor, at a minimum six inch depth and seeded using native riparian grasses. A temporary erosion control fabric should be used to cover the soil and protect it during vegetation establishment. This soil growth medium, seed and erosion control fabric is designed to extend for 50 feet on both sides of the channel. Biolog check structures will be installed along the banks perpendicular to flow to help minimize flow velocities that could be encountered during vegetation establishment when the banks are the most susceptible to erosion. The biolog is biodegradable and intended to provide protection only during the initial establishment period.

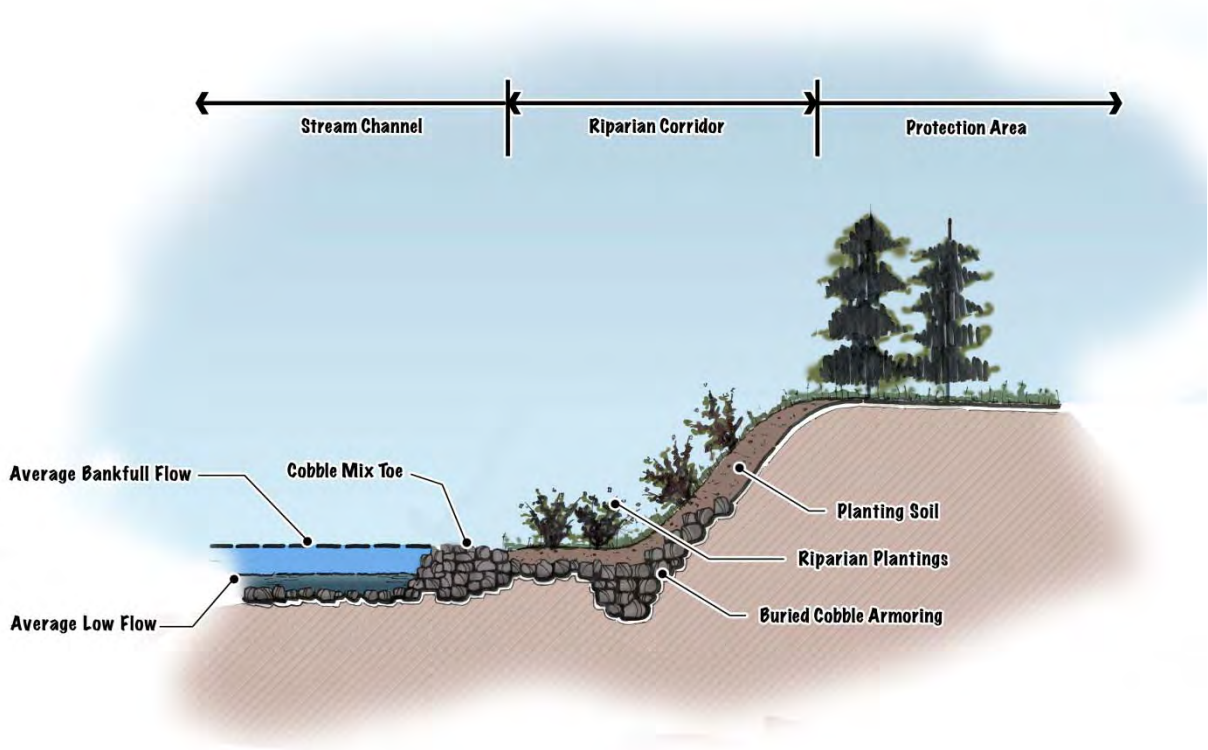
Bank stabilization and riparian corridor development for outside bends will experience higher stresses and therefore additional protection will be required utilizing native plants rootmass. Outside bends will include two (2) feet of soil growth medium along the bank stabilization bench, extending 4 feet outward from the stream channel edge in order to provide greater rooting depth. Brush layering using native willows (Salix spp.) is planned immediately behind the cobble mix toe. Willow stakes should be harvested locally, properly prepared and layered with a density of six stakes per linear foot of bank. Two staggered rows of #5 native willow shrubs (with fully developed rootballs) will also be planted

behind the brush layering to provide additional root mass. This larger sized potted material is recommended to provide more immediate rootmass reinforcement as well as increased survival rate. Combined the brush layering, rooted willows and deeper available rooting depth will promote a more structurally stable and biological diverse outside bend. Typical details of the two proposed bank stabilization techniques are provided on **Sheet 10** of the Preliminary Design Plan. Recommended species list is provided on **Sheet 10** -Table 1.

The Preliminary Design Plan anticipates approximately 8,100 linear feet of outside bend bank stabilization and 22,008 linear feet of straight section and inside bend bank stabilization.

Specific locations may be defined where lateral channel migration should not be allowed. In critical locations the bank can be armored below the surface yet restored to resemble a natural channel. An example of a more structured bank armoring approach that can be utilized if needed is provided on **Figure 6.3.**

Figure 6.3. Schematic of Bank Armoring.



6.3 Riparian Corridor

Riparian corridors refer to the entire ecosystem connected to the stream consisting of the physical channel, banks, wetlands and transitional vegetation communities The Preliminary Design Plan has developed a riparian corridor that is approximately 4-6 times the stream bankfull width, inclusive of the channel itself. This width provides a flood prone area that is consistent with the intended channel type.

Evaluation of aerial photographs, literature review and professional judgment of regional wetland/riparian habitats indicated that prior to significant land disturbance (i.e., dredge operations), the Project Area likely contained suitable elevation, geomorphic setting and climate for montane willow riparian shrubland.

These riparian systems, which are found throughout the region, are located along streams and drainages and typically occur as mosaic of vegetative communities that may be tree or herb dominated in areas but contain diverse shrub components throughout. The hydroperiod for these habitats is highly dependent on snowmelt and geomorphology which largely control the frequency, timing, duration and depth of flooding (Laubhan 2004). The systems consist of temporarily, seasonally and intermittently flooded shrublands comprised of broad-leaved deciduous willow dominated species in the midstory canopy (Lemly and Joe Rocchio 2009) and an understory of herbaceous species including a mix of grasses, forbs, sedges and rushes. These corridors are some of the most biologically diverse habitats having a consistent source of water and providing structural habitat diversity utilized by a wide variety of wildlife. **Figure 6.4** depicts typical reference condition riparian characteristics incorporated into the Preliminary Design Plan. Variability should be expected in hydrologic composition of the final riparian conditions. Some riparian areas are expected to be wetter or drier than others based on surface and groundwater interaction.

Figure 6.4. Photo Examples of Typical Riparian Corridor Reference Condition in Summit County.

This Preliminary Design Plan focuses first on establishing a deeply rooted and dense groundcover dominated by native riparian herbaceous species that are typical to the region such as Nebraska sedge (*Carex nebrascensis),* beaked sedge (*Carex utriculata*), rushes (*Juncus spp*.), common spikerush (*Eleocharis palustris*), fowl managrass *(Glyceria striata),* bluejoint (*Calamagrostis canadensis*), mountain brome (*Bromus marginatus*), streambank wheatgrass (*Elymus laceolatus*), western wheatgrass (*Pascopyrum smithii*) and/or alpine timothy (*Phleum alpinum*). The intent is to quickly establish a groundcover to stabilize soil, minimize establishment of invasive species and promote long-term successional development. To facilitate complete ground coverage and seed bank development the entire riparian corridor would be seeded with specialized riparian seed mix that promotes species diversity, contains locally native species that germinate rapidly and provides complete groundcover over a wide variety of hydrologic conditions.

Second, strategically placed riparian plantings are proposed along the length of the new channel to provide not only bank stability but also increased biomass and structural habitat for the fishery and terrestrial wildlife. Additionally, riparian vegetation provides biomass to the stream (leaf-litter), overhead cover (shading) and increases bug life (terrestrial and aquatic, such as caddis).

Typically, this type of riparian system includes a dense midstory of native shrubs including a variety of tall willows such as Geyer's willow (Salix geyeriana), Drummond willow (*Salix drummondiana*) or park willow (*Salix monticola*), intermixed with serviceberry (*Amelanchier alnifolia*), shrubby cinquefoil (*Pentafloides floribunda*) or bog birch (*Betual glandulosa*). Overstory tree species are not dominant in these riparian shrub communities but may include canopy stands of blue spruce (*Picea pungens*) or quaking aspen (*Populus tremuloides*). Recommended species lists are provided on **Sheet 10** (Table 1 and 2).

Riparian plantings are proposed in two general forms, (1) those associated with outside bend bank stabilization (described in **Section 6.2**) and (2) riparian planting pockets. The Preliminary Design Plan presents the creation of 81 outside bend bank stabilization areas and 105 distinct riparian planting pockets. Preliminary riparian planting pocket locations are shown schematically on **Sheets 2-8** of the Preliminary Design Plan and typical details of the pockets are shown on **Sheet 10**. These details and layouts were used to determine material quantities and estimate costs. It is intended, however, that exact location, size and shape of the pockets will be determined as part of further design development and field conditions during construction.

Riparian planting pockets are intended to create an island effect or a diverse plant community in a relatively small space, as compared to spacing individual species at greater distances. In ecological literature, this type of island habitat has a much higher functional value resulting from increased structural complexity. Significantly more bird species will utilize this type of habitat when compared to an isolated shrub or tree. In addition, the islands typically look more visually natural as compared to an isolated planting. The riparian planting pockets are also typically more successful because they act as a natural windbreak, preventing drying out from wind/sun exposure and are significantly easier to protect and maintain during the critical establishment period.

Each riparian planting pocket should consist of an approximately 25 foot diameter (approximately 500 square foot) randomly and irregularly shaped circle or oval formed along the general contour of the stream channel edge. The pocket will be excavated to a depth of 2 feet, approximately 13 #5 native shrubs installed at 6 foot on-center spacing and one ball-and burlap tree or aspen clump, backfilled with soil growth medium and covered with a 3 inch mulch layer. During the establishment period (2-3 years), the pocket should also be surrounded by wooden snow fencing (or similar) to increase protection of the pocket from wind, wildlife predation and providing minor shading. Routine watering of the entire riparian planting pocket may also be required during the establishment period. A typical detail of a riparian planting pocket is provided on **Sheet 10**.

All proposed plantings and seeding associated with bank stabilization, planting pockets, riparian corridor as well as uplands will need to consider regional availability. While commercial native plant nurseries and seed companies can provide specific species, local plant genetics should be considered. The Project Area provides an ideal opportunity to collect, harvest, salvage, transplant and/or propagate plant materials. Reuse of salvaged on site materials is always preferred over purchasing commercial materials. Many commercial nurseries under a contract-grow agreement can harvest plant materials at a site specific location and complete full propagation and grow-out in a controlled environment until project implementation. Seed stock can be harvested and stored from site specific locations. The timing of project implementation and use of locally native plant material must be strongly considered as part of project planning.

6.4 Aquatic Micro-Habitat

The Preliminary Design Plan incorporates approximately 91 aquatic micro-habitat features, assuming a minimum of one within each glide section of the proposed channel. Because the proposed channel will be constructed through barren land, many instream habitat features that commonly exist in established channels will not be present. While the Preliminary Design Plan focuses primarily on creating instream habitat diversity in the form of riffles-pools-glides and vegetated banks, additional non-structural micro-habitat features have been included to further increase aquatic habitat complexity, diversity and instream biomass. The Preliminary Design Plan incorporates two types of aquatic micro-habitats; (1) boulder clusters and (2) log spurs (large woody debris). These features will be placed in pool and/or glide sections where velocities are low and water is slightly deeper and are intended for habitat cover only and not intended for bank stability or grade control.

(1) Boulder clusters would consist of two to four larger irregularly shaped boulders placed in close proximity creating localized scour holes. Boulders are placed in configuration at differing elevations and spacing to create a diversity of water depths and velocities across the spectrum of typical stream flows.

(2) Log spurs, or what is commonly referred to as large woody debris (LWD), is common in many established rocky mountain streams creating fish habitat and biological diversity. Water flowing over and under LWD during high flow events can result in localized scour pockets or holes for cover habitats for fish. Such features can also trap smaller wood, branches leaves and organic matter that add to the complexity and diversity of aquatic life. These features would generally consist of one or more logs with

a minimum diameter of 1 foot (with or without the rootwad intact) buried into stream channel bank protruding downstream, resting on the bottom of the channel, below the bankfull elevation. The incorporation of these log spurs or LWD are not intended as a structural component of the channel or bank stability but rather as ways to increase instream habitat. Typical details of aquatic micro-habitat are provided on **Sheet 9**.

6.5 Soil Growth Medium

Re-establishing a more natural ecosystem over more than 95-acres in what currently is now barren waste cobble requires extensive amounts of soil growth medium. Detailed analysis of the particle size and or quantity has not been completed within the dredge on the Project Area. The Preliminary Design Plan currently calls for upwards of 35,600 cubic yards of soil growth medium for uplands and over another 33,645 cubic yards associated with the riparian corridor. This is assumed as an minimum and deeper depths of soil growth medium would only result in more ecological benefit. The purchase and import of this quantity of soil growth media has been estimated at approximately $2.07 million dollars or almost 24% of the total project cost based on an assumed unit cost of $30 per cubic yard. While a high quality topsoil or growth medium is essential for the successful long-term establishment of natural vegetation, many options may exist to produce or amend lesser quality materials and obtain the required benefits at a lower cost. The composition of topsoil generally consists of upwards of 45% fine grain mineral particles with less than 5% organic material/nutrients and the remaining 50% comprised of water and air. Substantial cost savings can be incurred by simply amending salvaged fine grained mineral soils during processing of the dredge. Fine grained mineral soils can be amended with wood chips, biosolids and manufactured fertilizers, humates and mycorrhizal inoculations. Large volumes of compost are potentially available locally through the Summit County Resource Allocation Park (Summit County Landfill) (http://www.co.summit.co.us/index.aspx?NID=232). This compost source could serve as an ideal soil amendment for a soil growth medium. Once a project phase has identified potential sources of fine grained materials, either through onsite materials or import, special consideration must be made to the overall characteristics of such materials. In particular, soil texture, pH, salts, percent organic matter and nutrients as well as the presences of potential contaminants are all critical to the performance of the soil mixture and ultimately the success of the restoration. More detailed analysis and consideration beyond the scope of this report will be required when considering the soil growth medium required for restoration implementation.

As part of the Preliminary Design Plan, the costs provided assume the purchase and import of a fine grained soil growth medium and a single application of manufactured fertilizer/humates and mycorrhizal. Future design efforts will need to evaluate more thoroughly the availability and suitability of onsite and offsite materials in order to develop a more cost effective growth media solution.

6.6 Upland Planting

The Preliminary Design Plan depicts upwards of 44.1-acres of upland area that will be reclaimed. These areas will consist of temporary storage areas of dredge material or spoil areas. These areas should be graded to varying and undulating landforms based on material quantities. Generally upland areas

should be graded to form naturally appearing varying landforms with stable slopes and capped with a minimum of six inches of unconsolidated soil growth media. All grading should create a smooth transition into both the riparian corridor and the existing natural uplands. The initial focus of the Preliminary Design Plan is to re-vegetate the upland areas with an appropriate native mountain big sagebrush community. These vegetation communities in the area are dominated by a midstory of species such as big sagebrush (*Artemisia tridentate),* rabbitbrush (*Chrysothamnus sp.*) and buffaloberry (*Shepherdia canadensis*). Understory vegetation can include Rocky Mountain fescue (*Festuca saximontana*), Indian ricegrass (*Oryzopsis hymenoides*), mountain brome (*Bromus marginatus),* western wheatgrass (*Pascopyrum smithii) or* Canada wildrye (*Elymus Canadensis).* Initial re-vegetation will need to quickly stabilize soils, increase soil biomass and prevent invasive weed establishment. Once the understory grassland community is well established future restoration efforts can focus on developing a more diverse vegetation community which includes shrubland and forest species based on final topography and landforms. The cost estimate provided associated with upland planting zones includes grading, placement, amendments seeding and mulching of the initial grassland community and does not include establishment of shrubland or forest. A recommended species lists is provided on **Sheet 10** (Table 3).

6.7 Stream and Groundwater Interface

Currently through the Project Area the Swan River is both a gaining and losing stream over individual sections. At some locations surface flows are evident even during times of low flow while the stream is dry with all flows going subsurface at other locations. One of the most important aspects of the planned stream restoration will be to ensure that flow is maintained at the surface and not allowed to go subsurface in the dredge material.

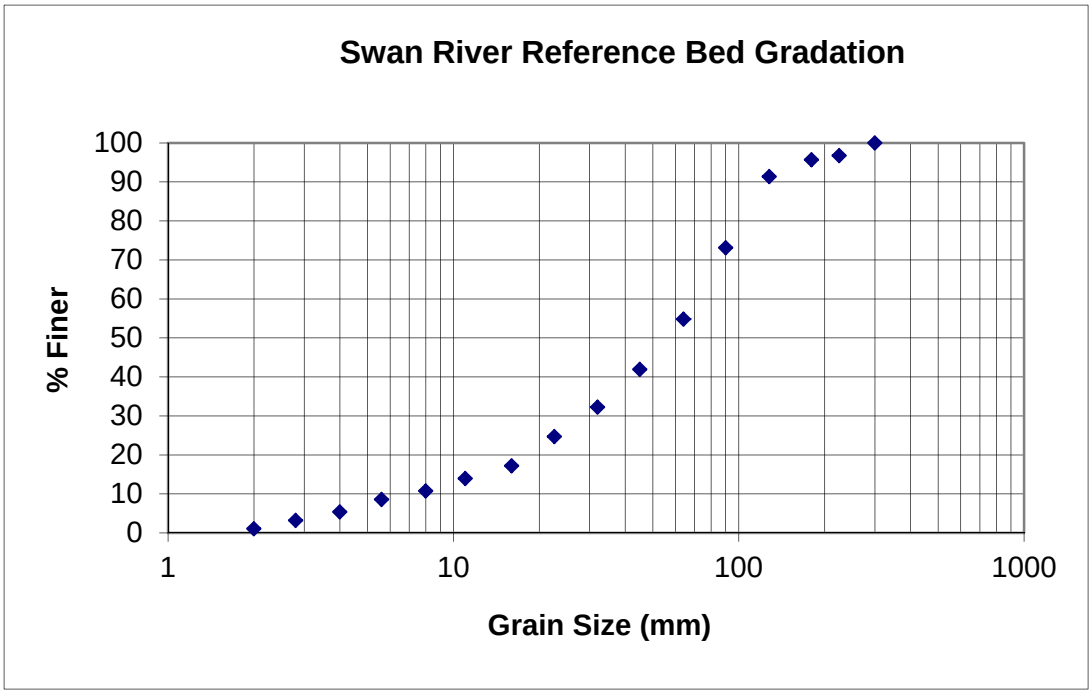
A first step towards this was gaining a better understanding of groundwater levels as they relate to the proposed stream elevation. As discussed in the groundwater section above there are areas where current groundwater is believed to be both above and below the proposed streambed. In areas where the streambed is below the groundwater level, water will tend to stay at the surface and groundwater inflows will make the river a gaining stream. In areas where groundwater is below the proposed streambed, there will be a tendency for the stream to lose water.

In areas where the groundwater is below the proposed streambed it is desired to create a barrier that minimizes surface water loss to the groundwater system. The technique that will be utilized to maintain surface flows is to create a layer below the channel bed that has relatively low permeability. This will be accomplished using natural materials. The low permeability zone is designed to be constructed using a combination of finer material mixed with the smaller portion of dredge material to create a substrate with lower vertical permeability than the surrounding dredge rock. This finer material will help to inhibit vertical migration of the water, maintaining flows at the surface. If the channel is set at an elevation that intercepts the groundwater and fine material underlies the stream, water will remain at the surface. The lower permeability material layer is designed to extend below the active channel and under a portion of the riparian area for a total width of 75 feet. A 1.5 foot thick layer, consisting of a compacted mixture of

3 inch minus material with 20% of the material passing the #200 sieve (fines) is included for this conceptual level design. A typical stream cross section including this low permeability layer is shown on **Sheet 10**.

This material specification was compared with an existing gradation measured by ERC in the stream reach downstream from the Project Area. Results of ERC's stream gradation analysis are shown on **Figure 6.5**.

Figure 6.5. Reference Stream Bed Gradation.



Based on ERC's sampling, the D_{50} of the existing bed material is on the order of 55 mm (2.2 inches). Observations indicated some level of armoring. Following the method of Fuller and Thompson (1907), suggest that soils should have a fines content of between 5% and 15% based on the recommended range of n values in the procedure. Considering that the bed gradation measured by ERC likely overestimates the D_{50} due to armoring, the recommended fines content would be greater than the 5% - 15% range from the Fuller-Thompson method presented above. Use of 20% fines in the low permeability material is therefore believed to be appropriate.

6.8 Road Crossings

Five road crossings were included as part of this Preliminary Design Plan. Crossings included three internal to the project along the Swan River (Rock Island Road, the Driveway Road and Georgia Pass Road) and the crossing of the Swan River at Tiger Road at the downstream end of the Project Area. An

additional culvert was also sized for as one will be required for the proposed relocated Muggins Gulch Road crossing.

Road crossings are intended to serve multiple functions. First, they need to be capable of passing peak flow events and second, given the overall project goal of native cutthroat habitat they need to meet fish migration needs. The one exception is the culvert planned for the Tiger Road crossing. As this road crossing is intended to eliminate the upstream migration of brook trout there was no need to size this crossing for passage.

Input from the Forest Service dictated that all crossings where fish passage is required should target a minimum crossing width of 1.5 times the bankfull width. Given the approximately 25 foot calculated bankfull width, a stream crossing width of 40 feet was selected. This would typically necessitate a bridge span crossing rather than a culvert crossing. Bridge spans were therefore assumed for the three crossings of the Swan River internal to the Project Area. A box culvert crossing as assumed for both the Tiger Road and Muggins Gulch crossings. The proposed box culvert at Tiger Road was designed to be 25 feet wide.

The results in **Table 6.1** show recommended crossing sizes determined for Swan River and Muggins Gulch.

Table 6.1. Recommended Culvert Sizing.

Crossing Name	Crossing Type	Crossing Size
Swan River Rock Island Road Driveway Road Georgia Pass Road	Precast Bridge Span	40’ span
Swan River Tiger Road	Box Culvert	4’ rise x 25 foot span
Muggins Gulch	Box Culvert	3’ rise x 6’ span

6.9 Existing Open Water Features

Several existing open water features exist throughout the Project Area. These areas were non-naturally formed from dredge operations consisting of excavated pits now filled with exposed groundwater or impoundments of the existing Swan River. These open water areas vary in depth from a few feet to upwards of possibly 20 feet. Vegetation of these open water features is generally limited to a narrow fringe along the ordinary high water mark. Preservation, enhancement or creation of additional such areas are subject to Colorado water law and US Army Corps of Engineers (USACE) jurisdiction and will require additional consideration during further design development.

On the Preliminary Design Plans these existing open water areas and larger areas of existing vegetation are shown as part of the riparian corridor. In such instances the preservation, incorporation or

salvage/transplanting will need to be determined based on more detailed evaluation and construction conditions.

In other instances existing open water features are shown as "reclamation areas". In these areas the design parameters require open water features to be modified and recontoured. More detailed design will be required in such areas however the areas will likely be converted to uplands or may provide opportunity for wetland/riparian development.

6.10 Muggins Gulch Road Crossing

Project proponents have expressed interested as part of the 2009 Summit County Plan and in recent conversations to reconfigure the Tiger Road and Muggins Gulch Road crossings of the Swan River. The intent of this would be to alter the road configurations in order to consolidate what is currently two crossings of the Swan River near Muggins Gulch into a single crossing. As part of this Preliminary Design Plan ERC developed a road alignment that allows for the removal of the western most of these two roads. With the proposed road consolidation eastbound traffic headed to Muggins Gulch would cross the Swan River on Tiger Road before turning left onto a new spur road. The new spur road would cross Muggins Gulch and reconnect with the existing Muggins Gulch Road north of the Swan River. The proposed new road alignment is illustrated on **Sheet 2** of the Preliminary Design Plans.

Construction of this spur road would allow for removal and reclamation of the southern portions of the existing Muggins Gulch Road, which would improve both the Swan River and its riparian habitat.

ERC designed the Muggins Gulch Road to be a 20-foot wide, single lane, low-volume road with a 2-4° outslope. To handle seasonal truck traffic, the minimum curve radius should be 60 feet. The road bed should be made of 6-inch deep crushed rock (1-inch diameter maximum). Cut and fill slopes should not exceed 1:1 and 2:1, respectively. The stream crossing at Muggins Gulch should be sized to for 1.5 times the bankfull width. Topographical analysis revealed that Muggins Gulch is no wider than 4 feet across. This means a 3 feet x 6 feet box culvert will allow passage of 1.5 times bankfull width. The design criteria for the Muggins Gulch road are based on the assumptions and recommendations described in Keller (2003) and Edwards (2011). The location of the proposed new road segment along with the sections of road that can be abandoned and areas reclaimed as well as typical road cross sections are provided on **Sheets 2 and 11** of the Preliminary Design Plans.

6.11 Public Access Easement

Summit County and the Forest Service have been working with private landowners within the Project Area to develop a public access easement along the proposed stream channel. At this point the easement is only preliminary and will need to be finalized in the future. For the purposes of the Preliminary Design Plan the easement has been depicted as 175 feet wide established from the proposed channel centerline extending approximately extending 87.5 feet on either side. The easement will encompass the stream channel as well as portions of the riparian corridor and uplands.

7.0 PROJECT COST ESTIMATES

Cost estimates were developed for the individual elements of the overall Preliminary Design Plan. Costs contained in this Preliminary Design Plan are based on 2013 prices. Estimates were generated from material costs, discussions with contractors, costs for completed stream improvement projects and engineering judgment. These quantities and costs are not all inclusive however should be considered adequate for planning purposes.

Unit construction costs were prepared for each specific Preliminary Design Plan improvement. **Tables 7.2 through 7.5** provide itemized costs for each improvement type by Construction Reach and **Table 7.6** provides overall project quantities and costs.

Major assumptions included in the cost estimates are provided below:

1. Mining activities will include excavation of the dredge material to the approximate subgrade elevation.

2. Restoration costs include final excavation of the stream channel and fine grading at all areas.

3. An 18 inch thick low permeability underliner consisting of a compacted mixture of fine graded materials will be applied for a 75 foot wide area under the stream and riparian areas.

4. Appropriate sized gravel and cobble will be used to create channel beds and banks. It is assumed that this material will be available on site and provided at no cost to the project.

5. Two feet of unconsolidated soil growth medium will be utilized in the riparian corridor adjacent to outside bends. Six inches of unconsolidated soil growth medium will be utilized in the remainder of the riparian corridor within 50 feet on each side of the stream.

6. Six inches of unconsolidated soil growth medium will be utilized within the all upland areas.

7. Road crossings are sized for 1.5 times the bankfull width. Costs for the Tiger Road crossing include monies for protection of the slope below the culvert outlet and additional costs assumed to prevent brook trout migration.

8. Straight sections of the restored channel and inside channel bends will include appropriately sized cobble mix toes with 50 foot wide riparian areas. These riparian areas will have six inches of soil growth medium and will be covered with a biodegradable erosion control fabric. Biologs will be placed along the banks perpendicular to flow to help dissipate overbank flow that may occur during vegetation development.

9. Bank stabilization on outside bends of the restored channel have been designed to promote more robust vegetation development. Appropriately sized cobble mix toes will form the foundation. Two feet of soil will be included on the bank stabilization bench immediately behind the cobble toe extending four feet. Brush layering will be added along the outside banks and two rows of #5 shrubs planted at 6 foot centers will be included along the outside bends.

10. There will be 105 riparian planting pockets dispersed throughout the riparian corridor. Riparian plating pockets will include approximately 37 cubic yards of soil growth medium placed at a minimum unconsolidated depth of two feet, 13 #5 shrubs and one balled and burlapped tree per pocket.

11. Upland area reclamation includes seeding, soil amendments and mulched and crimped.

12. Some existing open water areas will be reclaimed via grading and planting. Details of the specific work required in these areas will be determined in the field. An average per acre cost of $40,000 was assumed for the Reclamation Areas and is intended to include grading, soil and planting.

13. Temporary irrigation and weed control including minor maintenance will be required and is included in the project costs. Temporary irrigation of the bank stabilization areas, riparian planting pockets, riparian corridor and uplands is highly recommended during the establishment period.

14. Monitoring and maintenance will likely be required by the US Army Corps of Engineers and is included in the costs. An adapted management program approach is highly recommended.

15. Water Control identified in the cost estimate will need further evaluation and is highly dependent on restoration sequencing and unknown groundwater elevations. Since dredge removal operations are assumed to leave the surface at Preliminary Design Plan subgrade elevations, groundwater may be exposed for final restoration work in some areas. The cost estimate has assumed a lump sum cost to adequately manage water during restoration construction of the entire project. This cost will need to be further refined based on specific restoration items and groundwater elevations.

16. Costs for mobilization and demobilization were assumed at 5% of construction.

17. Costs for survey and construction management were assumed at 5% of construction.

18. A contingency of 10% of construction costs was included in the estimate.

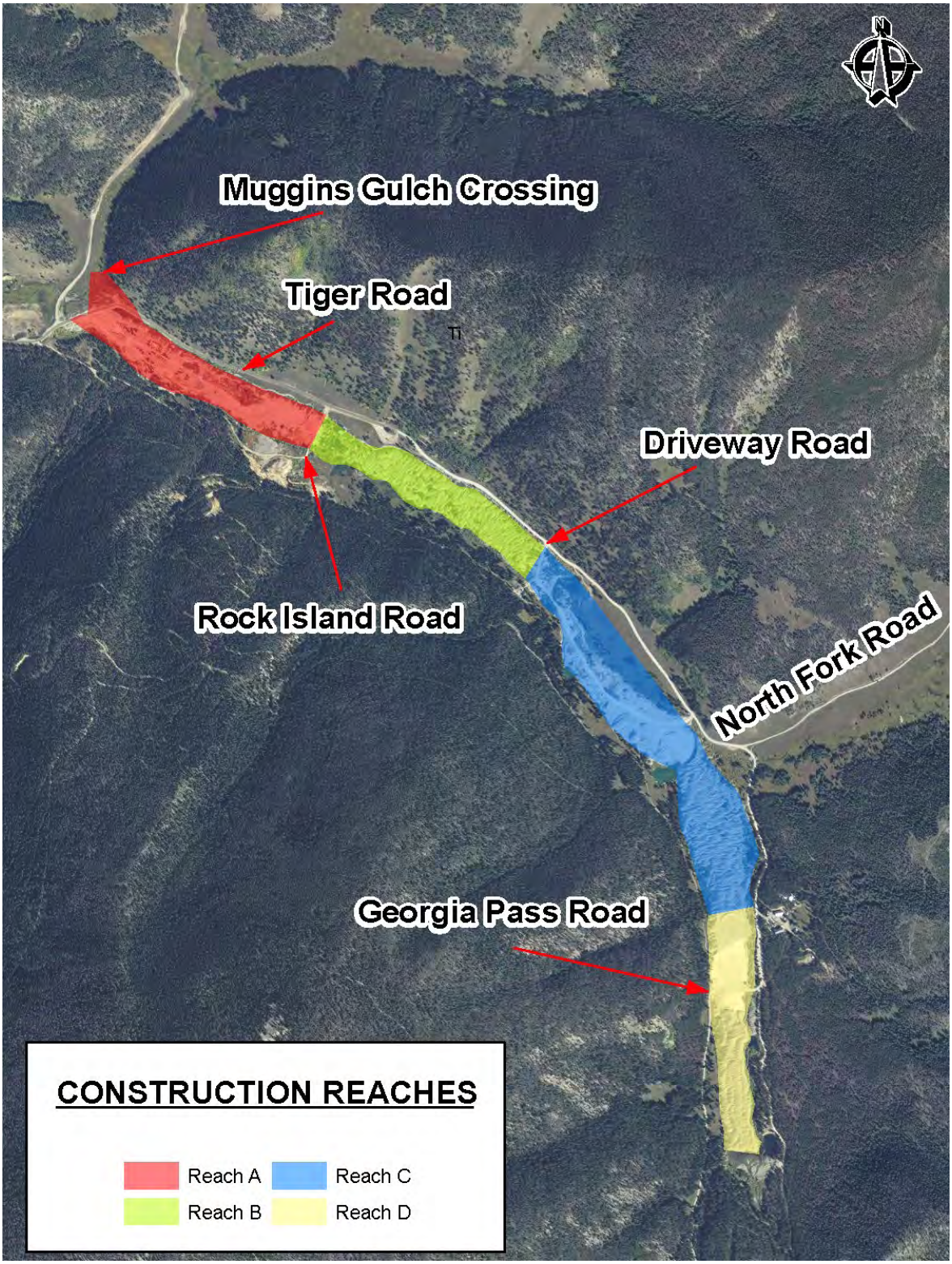
Due to financial, logistical and other constraints the improvements will not be completed at one time. In order to break the project into smaller segments, four different Construction Reaches were defined. Four reaches were assumed, with major road crossings used to delineate three of the reaches. The downstream extent of the upstream most reach was not defined by an existing road but rather by a

logical break point based on current dredge material removal. As discussed earlier, constructing different reaches at different times creates a project constraint in that it dictates that the elevation of the upstream and downstream end of each reach must generally match existing conditions in order to avoid a vertical disconnect during construction. The benefit of matching existing grade, however, is that the reaches can be designed to occur in any order. For this report reaches were identified as A through D starting at the downstream end of the project. Different reaches can be implemented in different order desired as financing is available and different lands are ready to be reclaimed. Table 7.1**Table 7.1** shows the approximate stationing and road crossings included when defining each phase**.** A map of the approximate phase locations is shown in **Figure 7.1.**

Table 7.1. Construction Reaches.

Reach	Approximate Stationing	Included Road Crossing
A	0+00 to 32+50	Tiger Rd Muggins Gulch
B	32+50 to 67+50	Rock Island Rd
C	67+50 to 120+00	Driveway Rd
D	120+00 to 150+55	Georgia Pass Rd

Figure 7.1. Approximate Locations of Recommended Construction Reaches



Itemized project costs have been defined for each reach of the work and for the project as a whole. Costs for the individual phases are presented on **Table 7.2**, **Table 7.3**, **Table 7.4** and **Table 7.5.** Based on this budgetary level estimate and the assumptions presented above, it is anticipated that the total cost to complete the full restoration of this area is approximately $8.48 million, as presented on **Table 7.6.**

Table 7.2. Budgetary Level Project Cost Estimates for Reach A.

Item	Unit	Quantity	Unit Cost	Sub-Total
STREAM IMPROVEMENTS				**$718,260.00**
Excavation - 125 Foot Stream and Riparian Zone	Cubic Yard	11900	$6.00	$71,400.00
Material Sorting & Placement - Fine Material Mixture for Subgrade	Cubic Yard	8900	$8.00	$71,200.00
Fine Grading for Riparian Zone	Acre	13.0	$4,000.00	$52,000.00
Fine Grading - Active Channel	Linear Foot	3200	$12.00	$38,400.00
Material Supply, Sorting and Placement - Material Sizes for Channel Bed and Banks	Cubic Yard	5930	$8.00	$47,440.00
Instream Habitat - Construct Riffle/Bend Pool Sequences	Each	20	$1,000.00	$20,000.00
Instream Micro Habitat Rock Features per Each Sequence	Each	20	$500.00	$10,000.00
Instream Micro Habitat Woody Debris Features per Each Sequence	Each	20	$500.00	$10,000.00
Riparian Planting Soils along 100 foot Riparian Corridor	Cubic Yard	5930	$30.00	$177,900.00
Erosion Control Fabric along 100 foot Riparian Corridor	Square Foot	352000	$0.35	$123,200.00
Bank Stabilization - Outside Bend Extra Mineral Soil	Cubic Yard	510	$30.00	$15,300.00
Bank Stabilization - Outside Bend Vegetation (Brush Layering and Shrubs)	Linear Foot	2300	$31.00	$71,300.00
Temporary Fencing - Outside Bends	Linear Foot	2530	$4.00	$10,120.00
RIPARIAN AND UPLAND PLANTING ZONES				**$409,990.00**
Riparian Area Seeding	Acre	12.9	$2,500.00	$32,250.00
Riparian Planting Pockets	Each	28	$2,630.00	$73,640.00
Temporary Fencing - Riparian Planting Zone	Linear Foot	2200	$4.00	$8,800.00
Upland Area Fine Grading	Acre	6.6	$2,000.00	$13,200.00
Upland Planting Soil	Cubic Yard	5300	$30.00	$159,000.00
Upland Seeding	Acre	6.6	$3,500.00	$23,100.00
Weed Control, Irrigation and Minor Maintenance	Lump Sum	1	$100,000.00	$100,000.00
MISCELLANEOUS ITEMS				**$720,750.00**
6' x 3' box culvert (Muggins Gulch proposed road alignment)	Each	1	$21,000.00	$21,000.00
25' x 4' box culvert with downstream armoring for fish migration barrier	Each	1	$141,900.00	$141,900.00
Spoils Piles Grading and Reclamation	Cubic Yard	11900	$3.00	$35,700.00
Road Construction	Lump Sum	1	$13,000.00	$13,000.00
Road Demolition	Lump Sum	1	$25,000.00	$25,000.00
Reclaimed Area	Acre	0	$40,000.00	$0.00
Water Control	Lump Sum	1	$125,000.00	$125,000.00
Construction BMPs	Lump Sum	1	$12,500.00	$12,500.00
Monitoring	Lump Sum	1	$40,000.00	$40,000.00
Project Permitting	Lump Sum	1	$6,250.00	$6,250.00
Construction Mobilization/Demobilization (5% of Construction Subtotal)	Lump Sum	1	$75,100.00	$75,100.00
Construction Survey & Management (5% of Construction Subtotal)	Lump Sum	1	$75,100.00	$75,100.00
Contingency (10% of Construction Subtotal)	Lump Sum	1	$150,200.00	$150,200.00
CONSTRUCTION SUBTOTAL				**$1,502,350.00**
Total				**$1,849,000.00**

Table 7.3. Budgetary Level Project Cost Estimates for Reach B.

Item	Unit	Quantity	Unit Cost	Sub-Total
STREAM IMPROVEMENTS				**$777,640.00**
Excavation - 125 Foot Stream and Riparian Zone	Cubic Yard	12300	$6.00	$73,800.00
Material Sorting & Placement - Fine Material Mixture for Subgrade	Cubic Yard	10000	$8.00	$80,000.00
Fine Grading for Riparian Zone	Acre	12.0	$4,000.00	$48,000.00
Fine Grading - Active Channel	Linear Foot	3600	$12.00	$43,200.00
Material Supply, Sorting and Placement - Material Sizes for Channel Bed and Banks	Cubic Yard	6670	$8.00	$53,360.00
Instream Habitat - Construct Riffle/Bend Pool Sequences	Each	24	$1,000.00	$24,000.00
Instream Micro Habitat Rock Features per Each Sequence	Each	24	$500.00	$12,000.00
Instream Micro Habitat Woody Debris Features per Each Sequence	Each	24	$500.00	$12,000.00
Riparian Planting Soils along 100 foot Riparian Corridor	Cubic Yard	6670	$30.00	$200,100.00
Erosion Control Fabric along 100 foot Riparian Corridor	Square Foot	396000	$0.35	$138,600.00
Bank Stabilization - Outside Bend Extra Mineral Soil	Cubic Yard	490	$30.00	$14,700.00
Bank Stabilization - Outside Bend Vegetation (Brush Layering and Shrubs)	Linear Foot	2200	$31.00	$68,200.00
Temporary Fencing - Outside Bends	Linear Foot	2420	$4.00	$9,680.00
RIPARIAN AND UPLAND PLANTING ZONES				**$395,790.00**
Riparian Area Seeding	Acre	11.7	$2,500.00	$29,250.00
Riparian Planting Pockets	Each	28	$2,630.00	$73,640.00
Temporary Fencing - Riparian Planting Zone	Linear Foot	2200	$4.00	$8,800.00
Upland Area Fine Grading	Acre	6.2	$2,000.00	$12,400.00
Upland Planting Soil	Cubic Yard	5000	$30.00	$150,000.00
Upland Seeding	Acre	6.2	$3,500.00	$21,700.00
Weed Control, Irrigation and Minor Maintenance	Lump Sum	1	$100,000.00	$100,000.00
MISCELLANEOUS ITEMS				**$738,950.00**
40-ft precast bridge span	Each	1	$207,200.00	$207,200.00
Spoils Piles Grading and Reclamation	Cubic Yard	12300	$3.00	$36,900.00
Reclaimed Area	Acre	0	$40,000.00	$0.00
Water Control	Lump Sum	1	$125,000.00	$125,000.00
Construction BMPs	Lump Sum	1	$12,500.00	$12,500.00
Monitoring	Lump Sum	1	$40,000.00	$40,000.00
Project Permitting	Lump Sum	1	$6,250.00	$6,250.00
Construction Mobilization/Demobilization (5% of Construction Subtotal)	Lump Sum	1	$77,800.00	$77,800.00
Construction Survey & Management (5% of Construction Subtotal)	Lump Sum	1	$77,800.00	$77,800.00
Contingency (10% of Construction Subtotal)	Lump Sum	1	$155,500.00	$155,500.00
CONSTRUCTION SUBTOTAL				**$1,555,030.00**
Total				**$1,912,380.00**

Table 7.4. Budgetary Level Project Cost Estimates for Reach C.

Item	Unit	Quantity	Unit Cost	Sub-Total
STREAM IMPROVEMENTS				**$1,065,660.00**
Excavation - 125 Foot Stream and Riparian Zone	Cubic Yard	22700	$6.00	$136,200.00
Material Sorting & Placement - Fine Material Mixture for Subgrade	Cubic Yard	14400	$8.00	$115,200.00
Fine Grading for Riparian Zone	Acre	13.0	$4,000.00	$52,000.00
Fine Grading - Active Channel	Linear Foot	5200	$12.00	$62,400.00
Material Supply, Sorting and Placement - Material Sizes for Channel Bed and Banks	Cubic Yard	9630	$8.00	$77,040.00
Instream Habitat - Construct Riffle/Bend Pool Sequences	Each	29	$1,000.00	$29,000.00
Instream Micro Habitat Rock Features per Each Sequence	Each	29	$500.00	$14,500.00
Instream Micro Habitat Woody Debris Features per Each Sequence	Each	29	$500.00	$14,500.00
Riparian Planting Soils along 100 foot Riparian Corridor	Cubic Yard	9630	$30.00	$288,900.00
Erosion Control Fabric along 100 foot Riparian Corridor	Square Foot	572000	$0.35	$200,200.00
Bank Stabilization - Outside Bend Extra Mineral Soil	Cubic Yard	400	$30.00	$12,000.00
Bank Stabilization - Outside Bend Vegetation (Brush Layering and Shrubs)	Linear Foot	1800	$31.00	$55,800.00
Temporary Fencing - Outside Bends	Linear Foot	1980	$4.00	$7,920.00
RIPARIAN AND UPLAND PLANTING ZONES				**$869,090.00**
Riparian Area Seeding	Acre	12.9	$2,500.00	$32,250.00
Riparian Planting Pockets	Each	29	$2,630.00	$76,270.00
Temporary Fencing - Riparian Planting Zone	Linear Foot	2280	$4.00	$9,120.00
Upland Area Fine Grading	Acre	21.9	$2,000.00	$43,800.00
Upland Planting Soil	Cubic Yard	17700	$30.00	$531,000.00
Upland Seeding	Acre	21.9	$3,500.00	$76,650.00
Weed Control, Irrigation and Minor Maintenance	Lump Sum	1	$100,000.00	$100,000.00
MISCELLANEOUS ITEMS				**$928,650.00**
40-ft precast bridge span	Each	1	$207,200.00	$207,200.00
Spoils Piles Grading and Reclamation	Cubic Yard	22700	$3.00	$68,100.00
Reclaimed Area	Acre	0	$40,000.00	$0.00
Water Control	Lump Sum	1	$125,000.00	$125,000.00
Construction BMPs	Lump Sum	1	$12,500.00	$12,500.00
Monitoring	Lump Sum	1	$40,000.00	$40,000.00
Project Permitting	Lump Sum	1	$6,250.00	$6,250.00
Construction Mobilization/Demobilization (5% of Construction Subtotal)	Lump Sum	1	$117,400.00	$117,400.00
Construction Survey & Management (5% of Construction Subtotal)	Lump Sum	1	$117,400.00	$117,400.00
Contingency (10% of Construction Subtotal)	Lump Sum	1	$234,800.00	$234,800.00
CONSTRUCTION SUBTOTAL				**$2,347,550.00**
Total				**$2,863,400.00**

Table 7.5. Budgetary Level Project Cost Estimates for Reach D.

Item	Unit	Quantity	Unit Cost	Sub-Total
STREAM IMPROVEMENTS				**$626,045.00**
Excavation - 125 Foot Stream and Riparian Zone	Cubic Yard	7600	$6.00	$45,600.00
Material Sorting & Placement - Fine Material Mixture for Subgrade	Cubic Yard	8500	$8.00	$68,000.00
Fine Grading for Riparian Zone	Acre	8.0	$4,000.00	$32,000.00
Fine Grading - Active Channel	Linear Foot	3050	$12.00	$36,600.00
Material Supply, Sorting and Placement - Material Sizes for Channel Bed and Banks	Cubic Yard	5650	$8.00	$45,200.00
Instream Habitat - Construct Riffle/Bend Pool Sequences	Each	18	$1,000.00	$18,000.00
Instream Micro Habitat Rock Features per Each Sequence	Each	18	$500.00	$9,000.00
Instream Micro Habitat Woody Debris Features per Each Sequence	Each	18	$500.00	$9,000.00
Riparian Planting Soils along 100 foot Riparian Corridor	Cubic Yard	5650	$30.00	$169,500.00
Erosion Control Fabric along 100 foot Riparian Corridor	Square Foot	335500	$0.35	$117,425.00
Bank Stabilization - Outside Bend Extra Mineral Soil	Cubic Yard	400	$30.00	$12,000.00
Bank Stabilization - Outside Bend Vegetation (Brush Layering and Shrubs)	Linear Foot	1800	$31.00	$55,800.00
Temporary Fencing - Outside Bends	Linear Foot	1980	$4.00	$7,920.00
RIPARIAN AND UPLAND PLANTING ZONES				**$459,580.00**
Riparian Area Seeding	Acre	8.4	$2,500.00	$21,000.00
Riparian Planting Pockets	Each	20	$2,630.00	$52,600.00
Temporary Fencing - Riparian Planting Zone	Linear Foot	1570	$4.00	$6,280.00
Upland Area Fine Grading	Acre	9.4	$2,000.00	$18,800.00
Upland Planting Soil	Cubic Yard	7600	$30.00	$228,000.00
Upland Seeding	Acre	9.4	$3,500.00	$32,900.00
Weed Control, Irrigation and Minor Maintenance	Lump Sum	1	$100,000.00	$100,000.00
MISCELLANEOUS ITEMS				**$771,650.00**
40-ft precast bridge span	Each	1	$207,200.00	$207,200.00
Spoils Piles Grading and Reclamation	Cubic Yard	7600	$3.00	$22,800.00
Reclaimed Area	Acre	1.4	$40,000.00	$56,000.00
Water Control	Lump Sum	1	$125,000.00	$125,000.00
Construction BMPs	Lump Sum	1	$12,500.00	$12,500.00
Monitoring	Lump Sum	1	$40,000.00	$40,000.00
Project Permitting	Lump Sum	1	$6,250.00	$6,250.00
Construction Mobilization/Demobilization (5% of Construction Subtotal)	Lump Sum	1	$75,500.00	$75,500.00
Construction Survey & Management (5% of Construction Subtotal)	Lump Sum	1	$75,500.00	$75,500.00
Contingency (10% of Construction Subtotal)	Lump Sum	1	$150,900.00	$150,900.00
CONSTRUCTION SUBTOTAL				**$1,453,125.00**
Total				**$1,857,275.00**

Table 7.6. Budgetary Level Project Cost Estimates for Entire Project.

Item	Unit	Quantity	Unit Cost	Sub-Total
STREAM IMPROVEMENTS				**$3,187,605.00**
Excavation - 125 Foot Stream and Riparian Zone	Cubic Yard	54500	$6.00	$327,000.00
Material Sorting & Placement - Fine Material Mixture for Subgrade	Cubic Yard	41800	$8.00	$334,400.00
Fine Grading for Riparian Zone	Acre	46.0	$4,000.00	$184,000.00
Fine Grading - Active Channel	Linear Foot	15050	$12.00	$180,600.00
Material Supply, Sorting and Placement - Material Sizes for Channel Bed and Banks	Cubic Yard	27880	$8.00	$223,040.00
Instream Habitat - Construct Riffle/Bend Pool Sequences	Each	91	$1,000.00	$91,000.00
Instream Micro Habitat Rock Features per Each Sequence	Each	91	$500.00	$45,500.00
Instream Micro Habitat Woody Debris Features per Each Sequence	Each	91	$500.00	$45,500.00
Riparian Planting Soils along 100 foot Riparian Corridor	Cubic Yard	27880	$30.00	$836,400.00
Erosion Control Fabric along 100 foot Riparian Corridor	Square Foot	1655500	$0.35	$579,425.00
Bank Stabilization - Outside Bend Extra Mineral Soil	Cubic Yard	1800	$30.00	$54,000.00
Bank Stabilization - Outside Bend Vegetation (Brush Layering and Shrubs)	Linear Foot	8100	$31.00	$251,100.00
Temporary Fencing - Outside Bends	Linear Foot	8910	$4.00	$35,640.00
RIPARIAN AND UPLAND PLANTING ZONES				**$2,134,450.00**
Riparian Area Seeding	Acre	45.9	$2,500.00	$114,750.00
Riparian Planting Pockets	Each	105	$2,630.00	$276,150.00
Temporary Fencing - Riparian Planting Zone	Linear Foot	8250	$4.00	$33,000.00
Upland Area Fine Grading	Acre	44.1	$2,000.00	$88,200.00
Upland Planting Soil	Cubic Yard	35600	$30.00	$1,068,000.00
Upland Seeding	Acre	44.1	$3,500.00	$154,350.00
Weed Control, Irrigation and Minor Maintenance	Lump Sum	1	$400,000.00	$400,000.00
MISCELLANEOUS ITEMS				**$3,159,800.00**
25' x 4' box culvert with downstream armoring for fish migration barrier	Each	1	$141,900.00	$141,900.00
6' x 3' box culvert (Muggins Gulch proposed road alignment)	Each	1	$21,000.00	$21,000.00
40-ft precast bridge span	Each	3	$207,200.00	$621,600.00
Spoils Piles Grading and Reclamation	Cubic Yard	54500	$3.00	$163,500.00
Road Construction	Lump Sum	1	$13,000.00	$13,000.00
Road Demolition	Lump Sum	1	$25,000.00	$25,000.00
Reclaimed Area	Acre	1.4	$40,000.00	$56,000.00
Water Control	Lump Sum	1	$500,000.00	$500,000.00
Construction BMPs	Lump Sum	1	$50,000.00	$50,000.00
Monitoring	Lump Sum	1	$160,000.00	$160,000.00
Project Permitting	Lump Sum	1	$25,000.00	$25,000.00
Construction Mobilization/Demobilization (5% of Construction Subtotal)	Lump Sum	1	$345,700.00	$345,700.00
Construction Survey & Management (5% of Construction Subtotal)	Lump Sum	1	$345,700.00	$345,700.00
Contingency (10% of Construction Subtotal)	Lump Sum	1	$691,400.00	$691,400.00
CONSTRUCTION SUBTOTAL				**$6,914,055.00**
Total				**$8,481,855.00**

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APPENDIX A

Ground Water Level Monitoring Data

Table A-1: Piezometer measurements, depth to ground water in feet.

Type	Elevation of Pipe top (ft AMSL)	6/11/ 2012	6/21/ 2012	6/25/ 2012	Added/Cut Pipe (ft)[1]	7/9/ 2012	7/17/ 2012	7/25/ 2012	8/1/ 2012	8/8/ 2012
PZ 1	9620.92	4.40	5.10	5.20	5.55	10.89	11.02	11.21	10.91	11.28
PZ 2	9619.70	3.05	3.50	3.63	5.48	9.23	9.31	9.46	9.27	9.53
PZ 3	9625.25	13.00	13.10	13.10	1.95	14.11	15.01	15.06	14.94	15.12
PZ 4	9711.12	13.20	13.10	13.70	-3.59	10.11	10.11	10.99	10.99	11.01
PZ 5	9713.24	12.10	12.26	12.30	0.00	12.30	12.44	12.51	12.47	12.62
PZ 6	9734.94	12.75	12.73	12.74	-2.94	9.80	9.82	9.85	9.81	9.84
PZ 7	9739.75	9.60	9.67	9.70	1.20	10.90	10.94	11.01	10.99	11.03
PZ 8	9751.76	9.69	9.84	9.11	0.00	10.10	10.19	10.34	10.24	10.45
PZ 9	9822.62	14.74	15.21	15.31	2.10	17.53	17.63	17.96	17.58	18.24
PZ 10	9838.15	16.46	17.73	8.34	0.50	20.33	20.84		20.84	20.88
PZ 11	9845.48	20.64	20.69	20.71	0.00	20.35	20.87	20.80	20.64	
PZ A	9700.62						4.42	4.49	4.51	4.53
PZ B	9695.70							7.13	7.36	7.47
PZ C	9755.29						8.79	9.10	8.85	9.26

1. Pipe length was changed in late June or early July 2012. Subsequent measurements reflect this change.

Table A-1: Piezometer measurements, depth to ground water in feet (con't).

8/14/ 2012	8/28/ 2012	9/6/ 2012	9/10/ 2012	9/17/ 2012	9/27/ 2012	10/3/ 2012	10/9/ 2012	10/18/ 2012	10/22/ 2012	11/26/ 2012
11.31	11.51	11.61	11.49	11.49	11.51	11.54	11.51	11.55	11.55	11.50
9.38	9.72	9.81	9.84	9.80	9.82	9.83	9.88	9.86	9.89	9.85
15.00	15.42	15.53	15.56	15.53	15.53	15.57	15.58	15.56	15.64	15.70
11.02	11.02	11.02	11.03	11.06	11.07	11.05	11.07	11.05	11.06	10.88
12.56	12.98	12.69	12.71	12.70	12.73	12.69	12.77	12.74	12.79	12.73
9.87	9.88	9.88	9.91	9.92	9.93	9.89	9.93	9.91	9.94	9.75
11.03	11.13	11.18	11.19	11.21	11.02	11.19	11.22	11.19	11.24	11.10
10.31	10.81	10.98	11.03	10.99	11.01	11.05	11.06	11.03	11.11	11.38
18.01	21.11	21.98	22.01	21.90	21.89	22.09				
20.94	20.83	20.82	20.87	20.91	20.87	20.91	20.89	20.81	20.89	20.75
21.04	21.04	21.16	21.16	21.13	21.11	21.21	21.12	21.19	21.24	22.18
4.33	4.56	4.62	4.74	4.81	4.87		4.94	5.01	5.03	4.88
7.44	8.96	6.39	9.46	9.50	9.51	9.43	9.55	9.45	9.52	9.32
9.14	9.41	9.33	9.37	9.38	9.38	9.39	9.38	9.41	9.39	9.25

Table A-2: Piezometer measurements, converted to ground water elevation in feet AMSL.

Type	Elevation of Pipe top (ft AMSL)	6/11/ 2012	6/21/ 2012	6/25/ 2012	Added/ Cut Pipe (ft)[1]	7/9/ 2012	7/17/ 2012	7/25/ 2012	8/1/ 2012	8/8/ 2012
PZ 1	9620.92	9616.52	9615.82	9615.72	5.55	9615.58	9615.45	9615.26	9615.56	9615.19
PZ 2	9619.70	9616.65	9616.20	9616.07	5.48	9615.95	9615.87	9615.72	9615.91	9615.65
PZ 3	9625.25	9612.25	9612.15	9612.15	1.95	9613.09	9612.19	9612.14	9612.26	9612.08
PZ 4	9711.12	9697.92	9698.02	9697.42	-3.59	9697.42	9697.42	9696.54	9696.54	9696.52
PZ 5	9713.24	9701.14	9700.98	9700.94	0.00	9700.94	9700.80	9700.73	9700.77	9700.62
PZ 6	9734.94	9722.19	9722.21	9722.20	-2.94	9722.20	9722.18	9722.15	9722.19	9722.16
PZ 7	9739.75	9730.15	9730.08	9730.05	1.20	9730.05	9730.01	9729.94	9729.96	9729.92
PZ 8	9751.76	9742.07	9741.92	9742.65	0.00	9741.66	9741.57	9741.42	9741.52	9741.31
PZ 9	9822.62	9807.88	9807.41	9807.31	2.10	9807.19	9807.09	9806.76	9807.14	9806.48
PZ 10	9838.15	9821.69	9820.42		0.50	9818.32	9817.81		9817.81	9817.77
PZ 11	9845.48	9824.84	9824.79	9824.77	0.00	9825.13	9824.61	9824.68	9824.84	
PZ A	9700.62						9696.20	9696.13	9696.11	9696.09
PZ B	9695.70							9688.57	9688.34	9688.23
PZ C	9755.29						9746.50	9746.19	9746.44	9746.03

1. Pipe length was changed in late June or early July 2012. Subsequent measurements reflect this change.

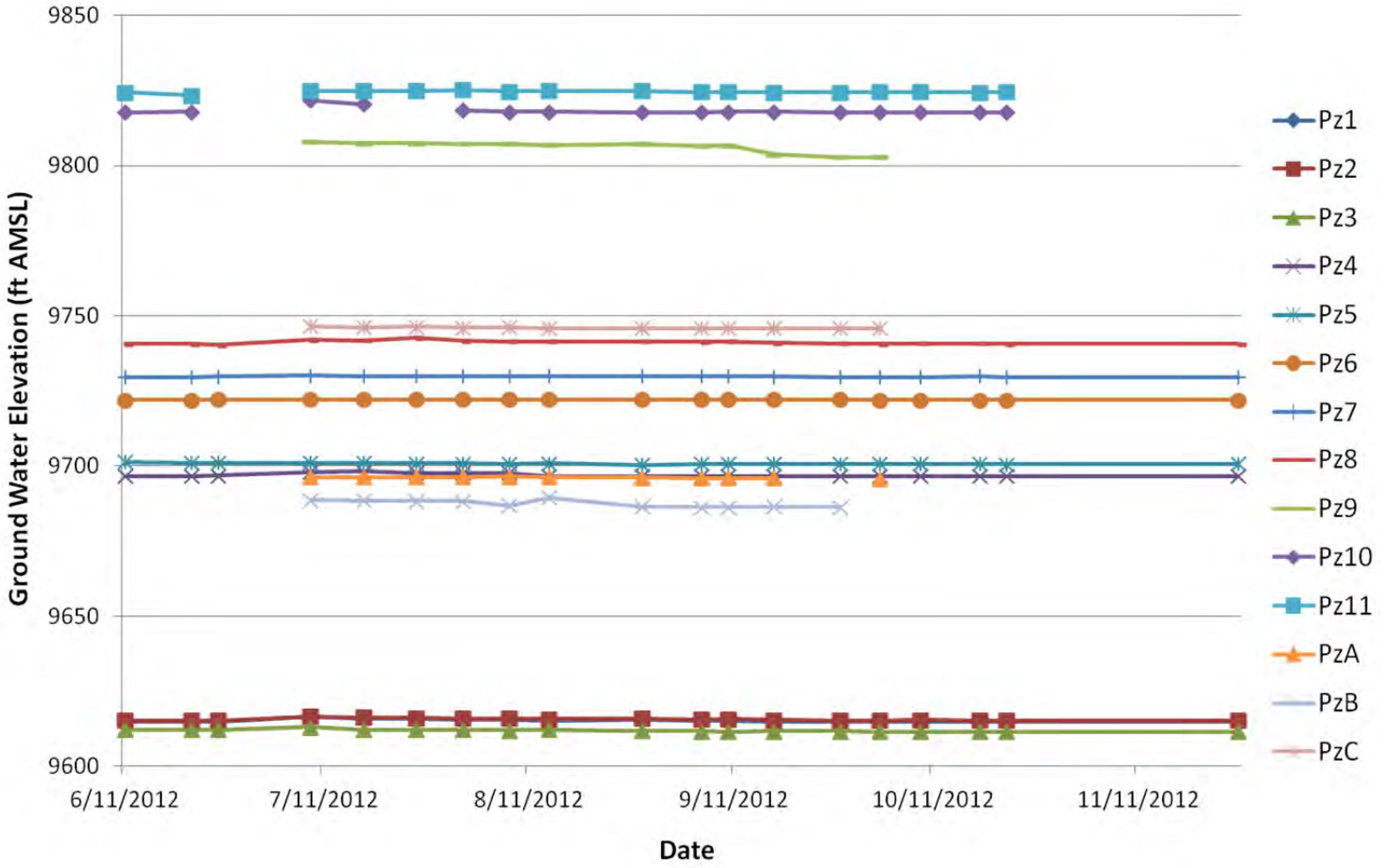
Table A-2: Piezometer measurements, converted to ground water elevation in feet AMSL (con't).

8/14/ 2012	8/28/ 2012	9/6/ 2012	9/10/ 2012	9/17/ 2012	9/27/ 2012	10/3/ 2012	10/9/ 2012	10/18/ 2012	10/22/ 2012	11/26/ 2012
9615.16	9614.96	9614.86	9614.98	9614.98	9614.96	9614.93	9614.96	9614.92	9614.92	9614.97
9615.80	9615.46	9615.37	9615.34	9615.38	9615.36	9615.35	9615.30	9615.32	9615.29	9615.33
9612.20	9611.78	9611.67	9611.64	9611.67	9611.67	9611.63	9611.62	9611.64	9611.56	9611.50
9696.51	9696.51	9696.51	9696.50	9696.47	9696.46	9696.48	9696.46	9696.48	9696.47	9696.65
9700.68	9700.26	9700.55	9700.53	9700.54	9700.51	9700.55	9700.47	9700.50	9700.45	9700.52
9722.13	9722.12	9722.12	9722.09	9722.08	9722.07	9722.11	9722.07	9722.09	9722.06	9722.25
9729.92	9729.82	9729.77	9729.76	9729.74	9729.93	9729.76	9729.73	9729.76	9729.71	9729.85
9741.45	9740.95	9740.78	9740.73	9740.77	9740.75	9740.71	9740.70	9740.73	9740.65	9740.39
9806.71	9803.61	9802.74	9802.71	9802.82	9802.83	9802.63				
9817.71	9817.82	9817.83	9817.78	9817.74	9817.78	9817.74	9817.76	9817.84	9817.76	9817.90
9824.44	9824.44	9824.32	9824.32	9824.35	9824.37	9824.27	9824.36	9824.29	9824.24	9823.31
9696.29	9696.06	9696.00	9695.88	9695.81	9695.75		9695.68	9695.61	9695.59	9695.74
9688.26	9686.74	9689.31	9686.24	9686.20	9686.19	9686.27	9686.15	9686.25	9686.18	9686.38
9746.15	9745.88	9745.96	9745.92	9745.91	9745.91	9745.90	9745.91	9745.88	9745.90	9746.04

Table A-3: Summary of Piezometer measurements.

Name	High GW Elev (ft AMSL)	Low GW Elev (ft AMSL)	Avg GW Elev (ft AMSL)	Standard Deviation (ft)	Range (ft)	Deepest Depth to Water (ft)	Shallowest Depth to Water (ft)	Avg Depth to Water (ft)
PZ 1	9616.52	9614.86	9615.25	0.43	1.66	-0.67	-2.33	-1.06
PZ 2	9616.65	9615.29	9615.65	0.38	1.36	-2.06	-3.43	-2.42
PZ 3	9613.09	9611.50	9611.94	0.39	1.59	8.00	6.41	7.56
PZ 4	9698.02	9696.46	9696.80	0.53	1.56	8.46	6.90	8.11
PZ 5	9701.14	9700.26	9700.66	0.22	0.88	7.08	6.20	6.68
PZ 6	9722.25	9722.06	9722.14	0.06	0.19	7.18	6.99	7.10
PZ 7	9730.15	9729.71	9729.89	0.14	0.44	4.24	3.80	4.06
PZ 8	9742.65	9740.39	9741.20	0.06	2.26	5.98	3.71	5.16
PZ 9	9807.88	9802.63	9805.42	2.17	5.25	13.54	8.29	10.75
PZ 10	9821.69	9817.71	9818.20	1.10	3.98	14.74	10.76	14.25
PZ 11	9825.13	9823.31	9824.47	0.39	1.82	13.77	11.95	12.62
PZ A	9696.29	9695.59	9695.92	0.23	0.70	2.78	2.08	2.45
PZ B	9689.31	9686.15	9687.10	1.16	3.16	7.20	4.04	6.26
PZ C	9746.50	9745.88	9746.04	0.20	0.62	4.66	4.04	4.51

Figure A-1: Time series plot of ground water elevation in feet AMSL.



APPENDIX B

Swan River Bankfull Flow Estimates

Mark Weinhold White River National Forest 19 December 2012

Swan River Bankfull Flow Estimates

The intent of this summary is to document the procedure used to estimate bankfull discharge at the bottom end of the project reach for the Swan River restoration project. Since there is considerable divergence between estimates based on local gauges, this analysis is intended to help choose a value within that range.

The general process involved taking a discharge measurement during high flow in order to back calculate a starting roughness value for the stream reach. This starting roughness value was then adjusted, based on stage and relative submergence of bed material, to give a roughness value at bankfull stage. The measured cross section, field-identified bankfull indicators, and measured slope were then used to estimate the discharge at bankfull stage using WinXSPRO, a one-dimensional hydraulic model (Hardy et al. 2005).

On May 31, 2012 we collected a discharge measurement and cross section in the Summit County Open Space land on the Swan River, immediately behind the dredge boat. The discharge at the time was only 13.4 cfs, a very low value for that time of year. The gradient, hydraulic variables from the cross section, along with the discharge value, were fed backwards into Manning's equation to determine the effective flow resistance in the reach (n = 0.080) at that low stage.

This roughness value is expected to decrease as roughness elements become submerged at stages near bankfull, so two empirical equations were used to estimate the decline. Thorne and Zevenbergen (1985), which gave the best prediction of the measured low flow roughness (based partly on D_{84} particle size), suggest a decrease in roughness of approximately 30 percent between low flow stage and bankfull. This resulted in a roughness value of n = 0.056. Both the back-calculated and estimated roughness values are consistent with published data by Hicks and Mason (1998) as well as other measurements we have made in similar gravel-bed streams.

With a 'known' roughness value at bankfull stage, a measured cross section, and a measured slope between bankfull indicators, we calculated the discharge in the Open Space reach as 101 cfs. This measurement was translated upstream to the project reach using the methods suggested by Vaill (1999):

$$Q_P = Q_{OS} (A_P/A_{OS})^{0.69}$$

Where the subscripts OS and P refer to the Open Space reach and Project reach, respectively. Based on drainage areas (estimated from StreamStats) of 28.9 square miles at the Open Space and 23.1 square miles at the bottom of the project reach, the estimated bankfull discharge was about 86 cfs.

There is obvious uncertainty in this estimate, primarily in the measured gradient (mainly due to the short length between identifiable bankfull indicators) and the Manning's roughness. In order to account for this uncertainty, the discharge at the Open Space was recalculated by sampling from probability distributions for both the gradient and roughness within a Monte Carlo simulation.

We assumed normal probability distributions to describe the slope and roughness at bankfull discharge. The measured values were used as the means of the distributions. Since those values could easily be off by 20 percent, the standard deviation of the distribution was assumed to be 20 percent of the mean. While the selection of these standard deviation values could be considered somewhat arbitrary, they appear reasonable and provide some starting point for determining sensitivity and uncertainty in the discharge estimate.

The Monte Carlo simulation was performed with an EXCEL add-on called @Risk. The bankfull discharge was repeatedly calculated with Manning's equation by sampling from the previously described probability distributions. The summary results for 1000 iterations are shown below in Figure 1 and Table 1. The median value at the bottom end of the project reach is approximately 86 cfs, as previously calculated. However, a 90 percent confidence interval could be interpreted as 70.3 to 109.0 cfs. The interquartile range (25th to 75th percentile) could range from 79.1 to 94.8 cfs.

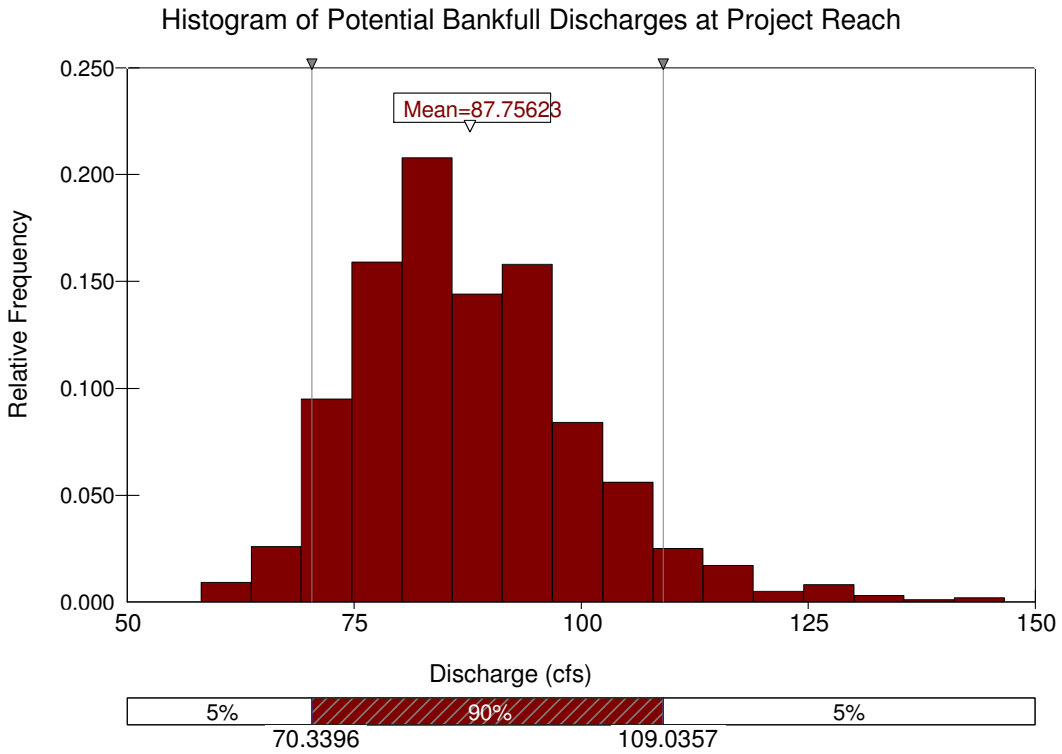


Figure 1. Histogram of 1000 iterations of Manning's equation, generated by sampling from probability distributions for slope and roughness.

Table 1. Summary statistics for 1000 iterations of Manning's equation, generated by sampling from probability distributions for slope and roughness.

Summary Statistics			
Statistic	**Value**	**Percentile**	**Value**
Minimum	58.1	5%	70.3
Maximum	146.6	10%	73.4
Mean	87.8	15%	75.6
Std Dev	12.5	20%	77.1
Variance	157.3	25%	79.1
Skewness	0.8	30%	80.5
Kurtosis	4.4	35%	82.0
Median	86.0	40%	83.0
Mode	82.1	45%	84.4
Left X	70.3	50%	86.0
Left P	5%	55%	87.4
Right X	109.0	60%	89.5
Right P	95%	65%	91.7
Diff X	38.7	70%	93.3
Diff P	90%	75%	94.8
#Errors	0	80%	96.9
Filter Min		85%	100.1
Filter Max		90%	103.4
#Filtered	0	95%	109.0

Hopefully these estimates, along with discussions about subsurface and base flow, will beneficially inform our choice of a design discharges for the Swan River project.

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APPENDIX C

Swan River Base Flow Calculations

Ecological Resource Consultants, Inc.
35715 US Hwy. 40, Suite D204 ~ Evergreen, CO ~ 80439 ~ (303) 679-4820

Technical Memorandum

Date: December 10, 2012

To: Troy Thompson

From: James Koehler

Re: Swan River Base Flow Calculations

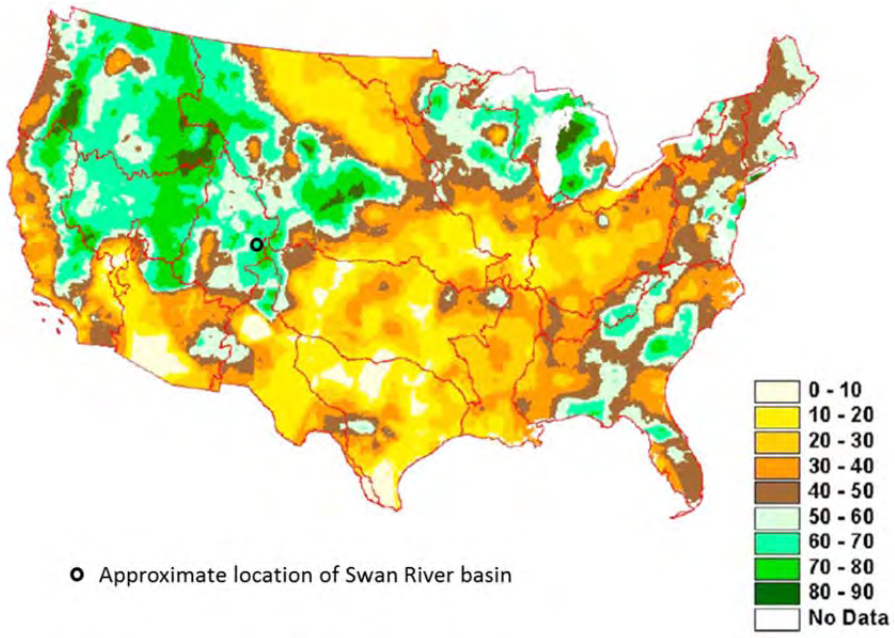
Introduction

The process for determining base flow for the Swan River watershed area involved four techniques: 1) interpolation from a base flow index (BFI) map produced by the USGS, 2) interpolation from a base flow index map produced by Santhi, et al, 3) analytically calculating base flow index and 4) analytically calculating base flow volume. Techniques 3) and 4) used closed-form equations developed by Santhi, et al to describe the relationship between basin characteristics and base flow. These techniques were selected based on their availability, simplicity, and relevance to the problem at hand. Multiple techniques were used to increase the confidence in results if similar values were produced.

USGS Base Flow Index Map

Figure 1 shows a BFI map created by the USGS from a 1-km raster dataset (Wolock). Base flow index is defined as the percentage of total streamflow that can be attributed to ground water discharge, or base flow. The BFI is calculated by dividing base flow by total flow. The map in Figure 1 was developed by interpolating BFI values obtained using a smoothed minima technique to separate base flow from total flow for 8,249 streamflow records. These records spanned an average of 33 years of daily observations. The average observed basin size was 528 km2. Using the map in Figure 1, the BFI in the Swan River watershed can be approximated as 60-70%.

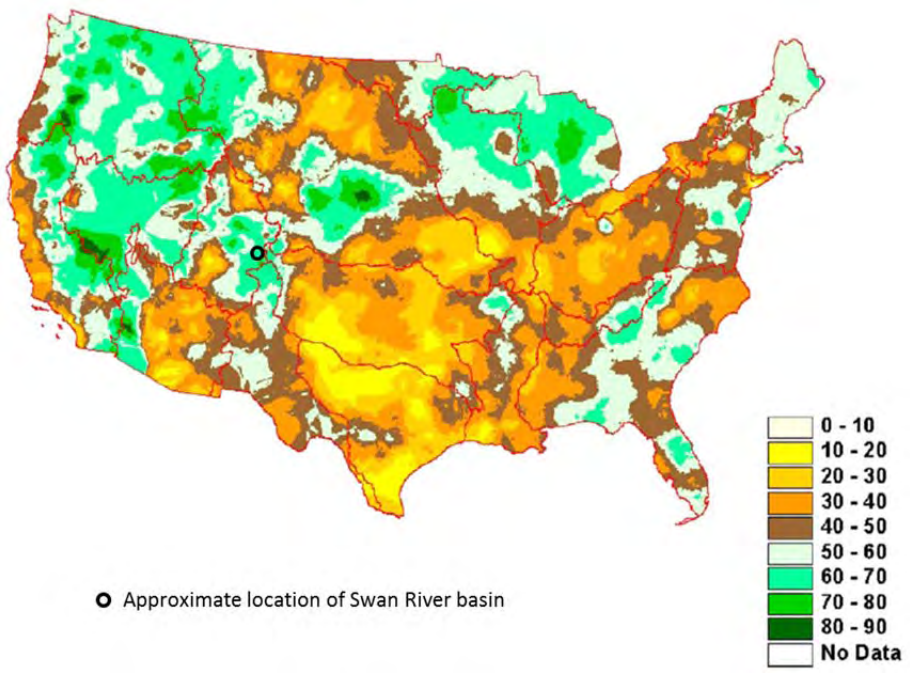
Figure 1: USGS Base Flow Index Map



Santhi, *et* al. (2008) Base Flow Index Map

Figure 2 shows a BFI map created by Santhi, et al. (2008). This map was developed by interpolating BFI values using a digital filtering technique to separate base flow from total flow for nearly 8,600 streamflow records. These gauges were selected from basins of drainage areas of 50-1,000 km2 and consisted of at least 10 years of daily records from low ET months. Using the map in Figure 2, the BFI in the Swan River watershed can be approximated as 60-70%.

Figure 2: Santhi, et al (2008), Base Flow Index Map



Base Flow Equations

Santhi, et al. (2008) used multiple regression techniques to find the most significant relationships between basin characteristics (terrain, geology and climate variables) and base flow (Santhi et a. 2008). These relationships are described by Equations 1 and 2: [1]

$$BFI = 33.5435 + 0.0091*Relief + 0.3034*Sand \quad (1)$$

where,

BFI = base flow index, in percent
Relief = maximum basin elevation minus minimum basin elevation, in meters
Sand = percentage of sand in soil

$$BF = 60.43 + 0.2145*Relief + 0.4283*(P - PET) \quad (2)$$

where,

[1] In the article by Santhi, *et al*, the equation for base flow contains a typographical error. ERC confirmed from the lead author, Dr. Santhi Chinnasamy, that the base flow equation presented here as Eqn (2) is correct.

BF = base flow volume, in millimeters
Relief = maximum basin elevation minus minimum basin elevation, in meters
P = annual precipitation, in millimeters
PET = annual potential evaporation, in millimeters

The values used for the parameters in Equations 1 and 2 came from various sources. "Relief" and "Precipitation" were estimated using the USGS Stream Stats program. "Sand" was estimated using the USDA Natural Resources Conservation Service Web Soil Survey. "PET" was estimated by taking an average of estimated lake and pan evaporation values from multiple sources including: Colorado State University, the National Agroforestry Center, the National Oceanic and Atmospheric Administration, and the Western Regional Climate Center. Because the estimates of PET from these sources ranged from 889 mm (35 in) to 1295 mm (51 in), a simple average was taken. The estimated parameters are presented in Table 1.

Table 1: Parameter Values Used in Equations 1 and 2

Parameter	Relief	Sand	P	PET
Value	1037 m	51%	646 mm	1143 mm

Results

The results of the analyses are presented in Table 2. Three of the four methods produced BFI, the percentage of total flow attributed to base flow. BFI is converted to base flow volume by multiplying by the mean annual streamflow. The mean annual streamflow in the Swan River basin is estimated from the USGS Stream Stats program as 29 cubic feet per second (cfs). The estimated base flow shown in Table 2 is the product of estimated BFI and 29 cfs.

Table 2: Results from Four Techniques used to Calculate Base Flow

Technique	**Estimated BFI (%)**	**Estimated Base Flow (cfs)**
Interpolation from USGS Map	65	19
Interpolation from Santhi, *et al* Map	65	19
Calculating BFI from Eqn (1)	58	17
Calculating Base Flow from Eqn (2)	n/a	7

Discussion

The results presented in Table 2 are in general agreement with each other. The base flow calculated using Technique 4 is the outlier based on the sensitivity of Equation 2 to PET, a parameter that is very difficult to accurately determine. However, using the low end of estimates for PET (889 mm), instead of a simple average, yields a base flow of 19 cfs. This provides a high degree of confidence that the base flow in Swan River is in the vicinity of 17 cfs.

References

Colorado State University, Colorado Climate Data for Waste Management System Design, http://www.extsoilcrop.colostate.edu/Soils/cnmp/table8a.html (2000).

National Agroforestry Center (NAC), USDA, "Mean Annual Lake Evaporation, 1946-1955." http://nac.unl.edu/atlas/Map_Html/Climate/National/Mean_Annual_Lake_Evaporation/ET.htm (from Dunne and Lepld (1978) modified from Kohler et al. (1959)).

National Oceanic and Atmospheric Administration (NOAA), Evaporation Atlas for Contiguous 48 United States" Technical Report 33 (1982). http://www.nws.noaa.gov/oh/hdsc/PMP_related_studies/TR33.pdf.

Santhi, C., *et* al., "Regional Estimates of Base Flow for the Conterminous United States be Hydrologic Landscape Regions," Journal of Hydrology (2008) v 351, pgs. 139-153.

U.S. Geological Survey (USGS), Stream Stats Colorado. http://water.usgs.gov/osw/streamstats/colorado.html (2012).

Web Soil Survey, Natural Resources Conservation Service (NCRS), USDA (2012).

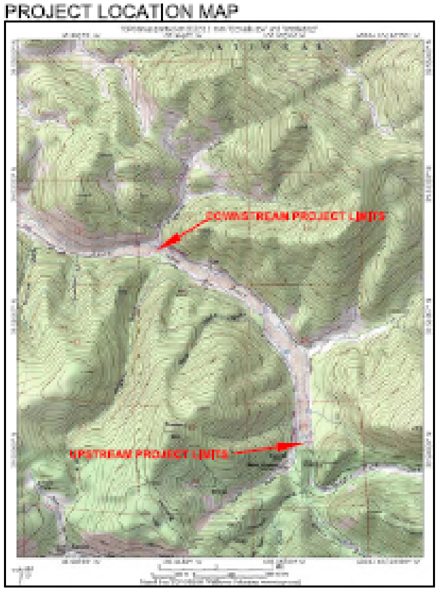
Western Regional Climate Center (WRCC), "Pan Evaporation Map of US from Climate Atlas of United States" (1983). http://www.wrcc.dri.edu/climmaps/panevap.gif.

Wolock, David, M. "Base Flow Index Grid for Conterminous United States." USGS Open File Report 03-263. USGS: Reston, VA (2003). http://water.usgs.gov/GIS/metadata/usgswrd/XML/bfi48grd.xml.

APPENDIX D

Preliminary Design Plan

PROJECT LOCATION MAP



PROJECT VICINITY MAP

PLAN SET CONTENTS

PREPARED FOR:

Blue River Watershed Group
PO Box 1626
Frisco, CO 80443

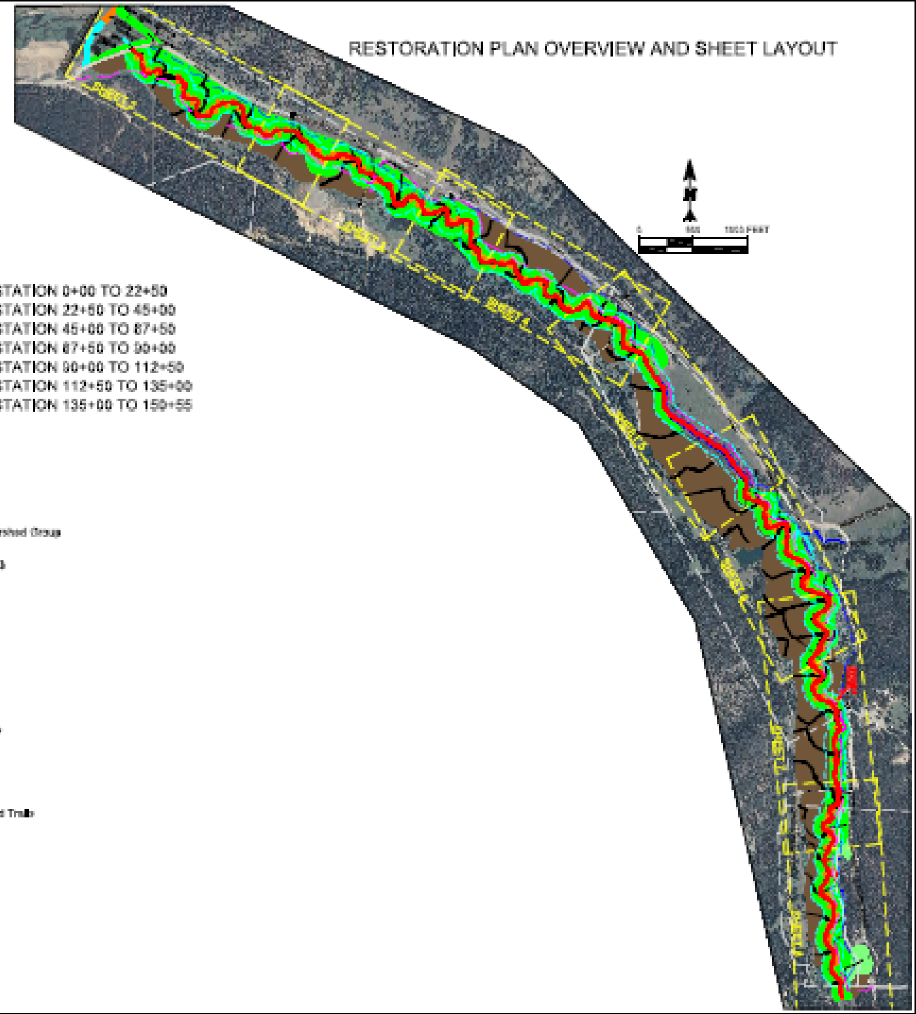
PREPARED IN COOPERATION WITH:

US Forest Service
White River National Forest

Summit County-Open Space and Trails
County Commons
SCR 1005
0037 Peak One Drive (PO Box 5660)
Frisco, CO 80443

Town of Breckenridge-Open Space and Trails
150 Ski Hill Road (PO Box 168)
Breckenridge, CO 80424

RESTORATION PLAN OVERVIEW AND SHEET LAYOUT



A	3-22-13	FINAL		

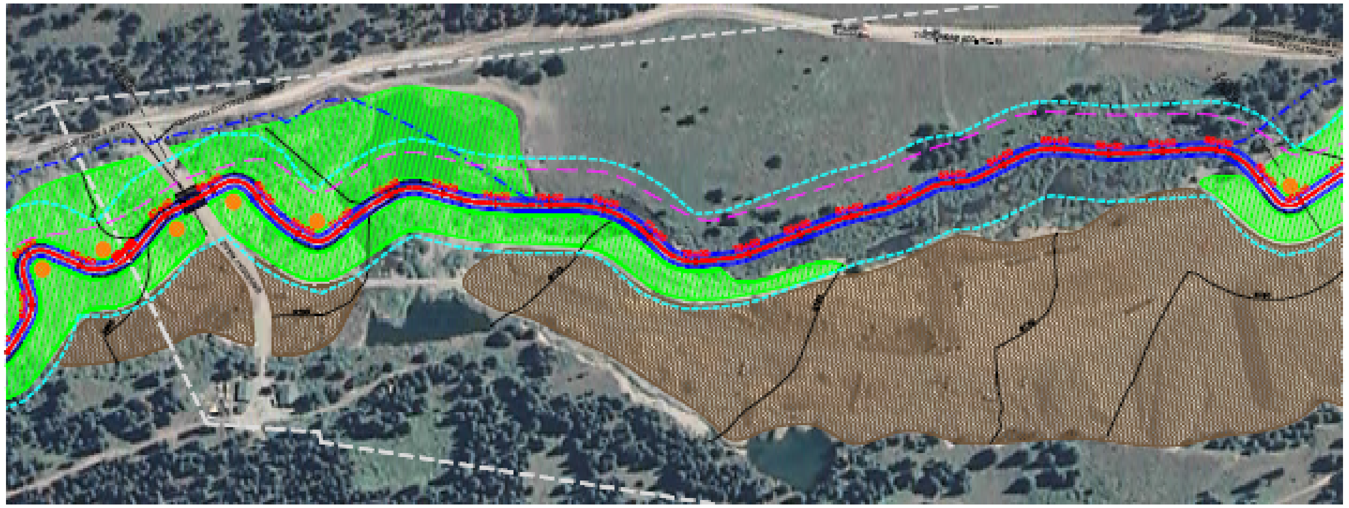
APPROVED BY: DRC
CHECKED BY: DRC
DESIGNED BY: DRC
DRAWN BY: DRC

CLIENT: Blue River Watershed Group

PROJECT: 2013 Swan River Restoration Preliminary Design Plan

TITLE: Cover Sheet

1 of 11 | A



LEGEND

(PROPOSED DESIGN FEATURES)

Channel Bank (Bankfull)

Channel Centerline and Stationing

Bank Stabilization (Outside Bends)

Ground Contour (10' Intervals)

Riparian Corridor Restoration

Riparian Planting Focus

Upland Restoration

Public Access Easement

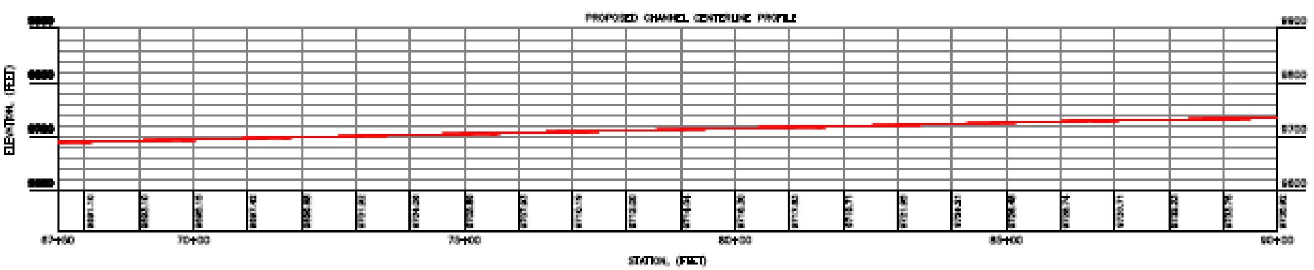
Public Trail

Public Parking Area

(EXISTING FEATURES)

Swan River Channel

Property Boundary



INSTREAM FEATURE DATA

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[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

NOTES:

1. The 2013 Swan River Restoration Plan (2013 Plan) has been prepared by the Blue River Watershed Group in close coordination with:
   - U.S. Forest Service White River National Forest
   - Summit County and
   - Town of Breckenridge.
2. Property boundaries as depicted were obtained from Summit County GIS and are approximate. Discrepancies from actual field survey do exist.
3. Proposed ground contours have been generated based on limited available existing topography. Proposed ground contours and tie-ins to existing topography will need adjustment upon more detailed topographic field survey.
4. Existing native vegetation and water features should be preserved when feasible and incorporated into final design planning.
5. Proposed Channel Centerline Profile depicts the average profile along the proposed channel centerline and does not depict instream habitat features as presented in the Instream Feature Data Tables 1-3.
6. The 2013 Plan has been developed as a preliminary design plan containing information for planning purposes only. Specifications shall be provided for final implementation.
7. The 2013 Plan has been developed based on and incorporating previous restoration planning as part of the Swan River Restoration Conceptual Design Plan (Summit County, 10-27-09) and the Upper Swan River Restoration Concept Plan (Blue River Watershed Group, 3-25-12).
8. Public Access Easement, Trail and Parking Areas are preliminary and for planning purposes only. Public Trail is intended as non-motorized and a soft surface.

A	3-22-13	FINAL

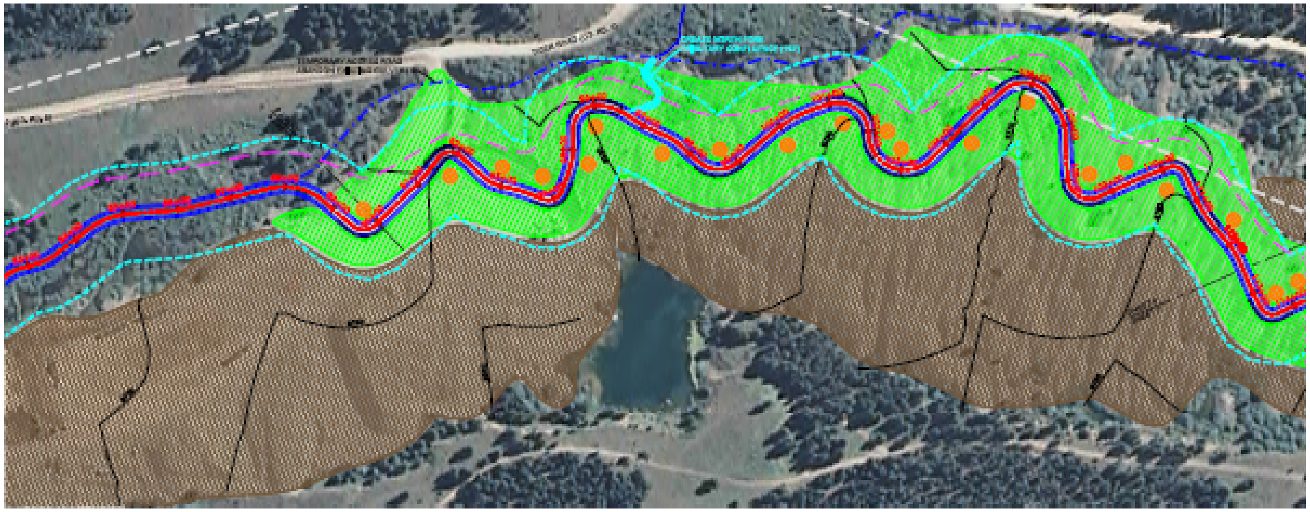
APPROVED BY: ERC
CHECKED BY: ERC
DESIGNED BY: ERC
DRAWN BY: ERC

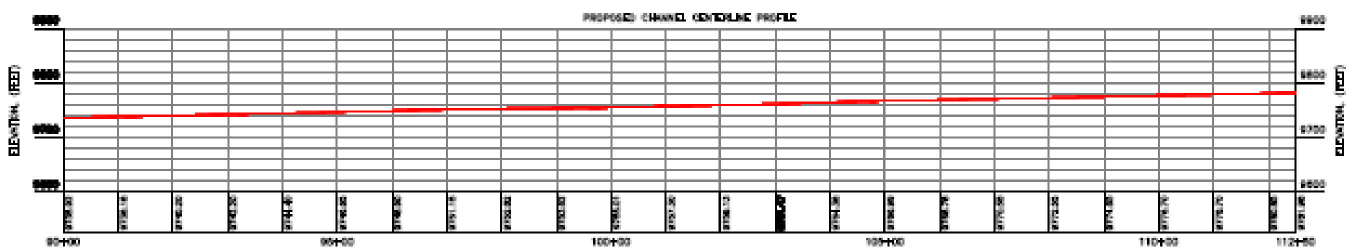
Ecological Resource Consultants, Inc.
35715 US Hwy. 40, Suite D204
Evergreen, CO 80439
303.679.4820
www.ecoresource.net

CLIENT: Blue River Watershed Group

PROJECT: 2013 Swan River Restoration Preliminary Design Plan

TITLE: Plan and Profile





INSTREAM FEATURE DATA

[illegible]

NOTES:

1. The 2013 Swan River Restoration Plan (2013 Plan) has been prepared by the Blue River Watershed Group in close coordination with: [illegible]
2. Property boundaries [illegible]
3. Proposed ground contours [illegible]
4. [illegible]
5. Proposed Channel Centerline Profile [illegible]
6. The 2013 Plan has been developed as a preliminary design [illegible]
7. The 2013 Plan [illegible]
8. Public Access Easement, Trail and Parking Areas [illegible]

A	3-22-13	FINAL	APPROVED BY:	ERC
			CHECKED BY:	ERC
			DESIGNED BY:	ERC
			DRAWN BY:	ERC

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CLIENT: Blue River Watershed Group

PROJECT: 2013 Swan River Restoration Preliminary Design Plan

TITLE: Plan and Profile

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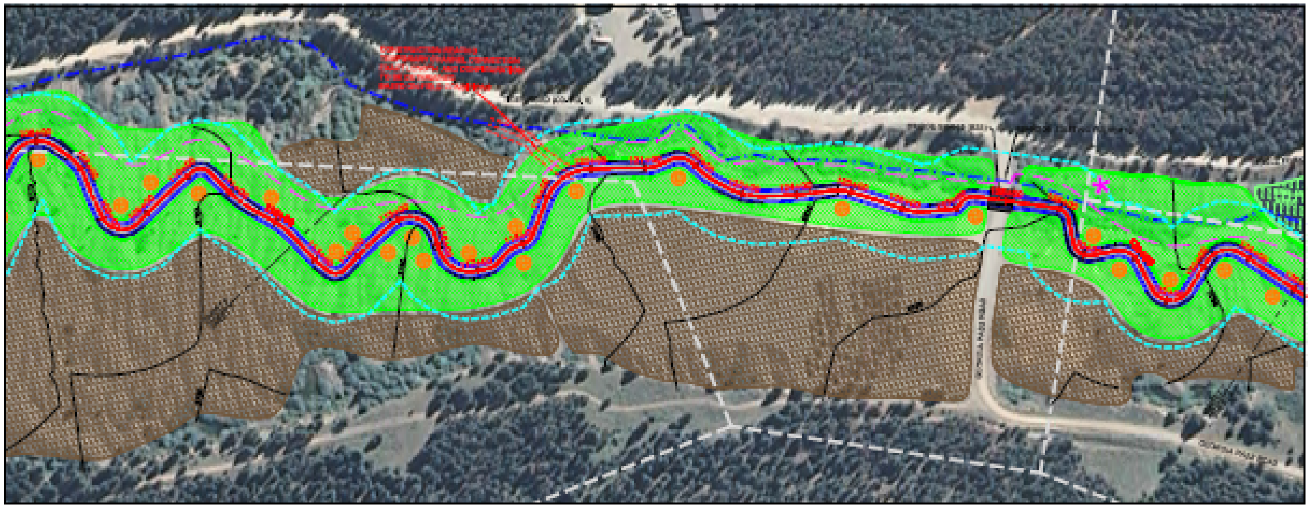

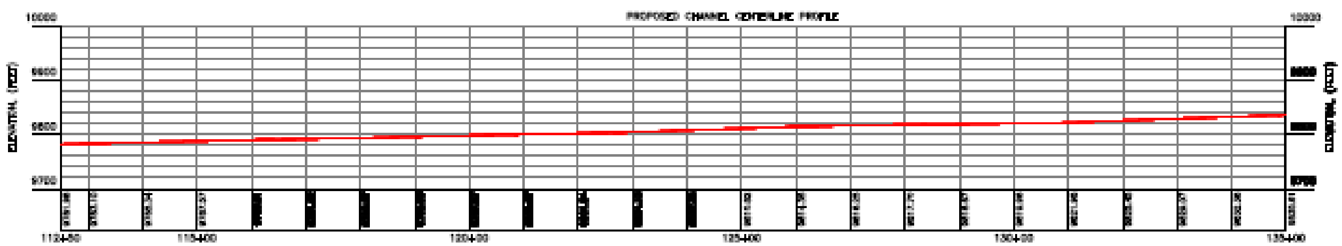

LEGEND

(PROPOSED DESIGN FEATURES)

(EXISTING FEATURES)

INSTREAM FEATURE DATA

[illegible]	[illegible]	[illegible]	[illegible]

NOTES:

1. The 2015 Swan River Restoration Plan (2015 Plan) has been prepared by the Blue River Watershed Group in close coordination with:
   - U.S. Forest Service White River National Forest;
   - Summit County and
   - Town of Breckenridge.
2. Property boundaries as depicted were obtained from Summit County GIS and are approximate. Discrepancies from actual field survey do exist.
3. Proposed ground contours have been generated based on limited available existing topography. Proposed ground contours and features relating to existing topography will need adjustment upon more detailed topographic field survey.
4. Existing native vegetation and water features should be preserved when feasible and incorporated into final design planning.
5. Proposed Channel Centerline Profile depicts the average profile along the proposed channel centerline and does not depict instream feature features as presented in the Instream Feature Data Tables 1-4.
6. The 2015 Plan has been developed as a preliminary design plan containing information for planning purposes only. Modifications should be provided for the final implementation.
7. The 2015 Plan has been developed based on and incorporating previous restoration planning as part of the Swan River Restoration Conceptual Design Plan (Summit County, 10-07-05) and the Upper Swan River Restoration Concept Plan (Blue River Watershed Group, 4-24-12).
8. Public Access Easement, Trail and Parking Areas are preliminary and for planning purposes only. Public Trail is intended as non-motorized and a soft surface.

A	3-22-15	FINAL

APPROVED BY: ERC
CHECKED BY: ERC
DESIGNED BY: ERC
DRAWN BY: ERC

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CLIENT: Blue River Watershed Group

PROJECT: 2015 Swan River Restoration Preliminary Design Plan

TITLE: Plan and Profile

7 of 11

A

RESOLUTION NO. 2024-12

UPPER BLUE PLANNING COMMISSION
OF THE COUNTY OF SUMMIT
STATE OF COLORADO

A RESOLUTION APPROVING PLN23-046, A Conditional Use Permit (CUP) for milling activities (gravel crushing) associated with Colorado Division of Reclamation Mining and Safety permit M1998-052, on the Mascot Placer MS# 7083, containing approximately 64 acres located in Section 24, Township 6 South, Range 77 West of the 6th Principal Meridian in Summit County, CO and zoned A-1; (Applicant – Peak Materials, LLC

WHEREAS, Peak Materials, LLC has submitted an application for a Conditional Use Permit (CUP) for milling activities (gravel crushing) associated with Colorado Division of Reclamation Mining and Safety permit M1998-052, on the Mascot Placer MS# 7083, containing approximately 64 acres located in Section 24, Township 6 South, Range 77 West of the 6th Principal Meridian in Summit County, CO and zoned A-1 to the Upper Blue Planning Commission; and,

WHEREAS, the Upper Blue Planning Commission has held a public hearing, with public notice as required by law on March 28, 2024, and has considered all relevant testimony and evidence presented at that hearing; and,

WHEREAS, in light of such considerations, the Upper Blue Planning Commission of Summit County, Colorado finds that:

1. The proposal is in general conformance with the Goals, Policies/Actions and provisions of the Summit County Countywide Comprehensive Plan, the Upper Blue Master Plan, and the Joint Upper Blue Master Plan, as this CUP will promote the economic use of the property as well as the restoration, protection, and enhancement of the Swan River Valley and public access. The temporary adverse impacts associated with any additional truck traffic, dust, and noise along the Tiger Road corridor are fully offset and acceptable given the significant long term public and environmental benefits resulting from the Swan River Restoration, of which gravel crushing under this Conditional Use Permit is a critical component.
2. With the conditions of approval, the proposed conditional use is in compliance with the County's Zoning Regulations for the A-1 zone district and §3812 Mining/Milling of the Summit County Land Use & Development Code.
3. With the conditions listed below, the use is in harmony and compatible with surrounding land uses and the neighborhood and will not create a substantial adverse impact on adjacent properties or on services and infrastructure. No services are available on site, and the application does not require any additional services or infrastructure.
4. Adequate services and infrastructure are available to serve the use. This CUP approval does not require the additional of any services or infrastructure to the Williams Placer site.

NOW, THEREFORE, BE IT RESOLVED BY THE UPPER BLUE PLANNING COMMISSION OF THE COUNTY OF SUMMIT, STATE OF COLORADO THAT a Conditional Use Permit (CUP) for milling activities (gravel crushing) associated with Colorado Division of Reclamation Mining and Safety permit M1998-052, on the Mascot Placer MS# 7083, containing approximately 64 acres located in Section 24, Township 6 South, Range 77 West of the 6th Principal Meridian in Summit County, CO and zoned A-1; is hereby approved subject to the following conditions:

1. The applicant shall secure approval from the state for revisions to their existing DRMS permit that substantially reflect the 2013 ERC Swan River Restoration Preliminary Design Plan Report Reclamation plan, attached to the CUP as Exhibit D, and any relevant updates to this plan as approved by Summit County prior to the commencement of milling operations and/or material removal from the site (whichever happens first) commencing in 2025.
2. The applicant shall hold the amended permit open, without revisions unless changes are mutually agreed upon with Summit County, until the completion of the restoration project.
3. A 175' public access and construction easement for the purpose furthering the goals, actions, and

policies of the ERC Swan River Restoration Preliminary Design Plan Report 2013 as described in the project narrative, attached the CUP as Exhibit A, and the 2013 ERC Swan River Restoration Preliminary Design Plan Report shall be finalized and granted to Summit County prior to the commencement of milling/crushing operations on the site in the year 2025.

4. Construction phase dust control and monitoring shall conform to all state, federal, and local stormwater management and erosion and sediment control requirements including, but not limited to, controlling onsite fugitive dust with water, or similar comparable measures, and tarping loaded trucks leaving the project site.
5. The applicant shall be responsible for the coordination of materials moving to/from the site and shall ensure all operators are made aware of and adhere to applicable traffic laws and the Travel Management Plan, attached to the CUP as Exhibit B. Signage shall be posted at the site providing information about the Traffic Management Plan, as well as contact information for questions and comments. Signage meeting the requirements for Construction Project Identification in Chapter 9 of the Code will require a permit.
6. Milling/crushing operations of existing onsite dredge spoils and the schedule for trucking of materials from and to the site shall adhere to the Travel Management Plan. The Summit County Planning Department shall be notified at least seven (7) calendar days in advance of commencing milling operations, as well as periodic breaks and/or termination of milling operations, pursuant to the Travel Management Plan.
7. Applicant shall provide the Board of County Commissioners with an annual project update prior to commencement of milling operations for the year. The report shall include: the types and quantities of materials exported, types and quantities of stockpiled materials, percent of total crushing completed, number and frequency of loads, any trucking issues or violations, updates on the restoration design and implementation, status of the DRMS permit revision, and other operational concerns throughout the term of this CUP.
8. This permit shall expire five years from the date of approval.
9. Failure to maintain compliance with any of the above conditions may result in the revocation of the CUP approval.

ADOPTED THIS 28th DAY OF MARCH, 2024.

UPPER BLUE PLANNING COMMISSION
OF THE COUNTY OF SUMMIT
STATE OF COLORADO

_____
Keith Gallacher, Chair

ATTEST:

_____
Lili Girodie, Planner II

SUMMIT COUNTY
COLORADO

PLANNING DEPARTMENT

970.668.4200
www.SummitCountyCO.gov

0037 Peak One Dr. PO Box 5660
Frisco, CO 80443

MEMORANDUM

TO: Upper Blue Planning Commission (UBPC)

FROM: Susan Lee, Planning Director

FOR: Meeting of March 28, 2024 (Continued from the December 28, 2023, January 25, 2024, and February 29, 2024, meetings)

SUBJECT: PLN23-072: Country Boy Mine Property Preliminary Rezoning

APPLICANT: Danny Teodoru, Timberline Law, LLC
OWNER: Dragons and Explosions, LLC
REQUEST: Class 5: Preliminary rezoning of a 20 acre parcel from A-1 to PUD for the Country Boy Mine Property to allow Community special events, museum, mine tours, bard, animal keeping (donkeys), parking, existing accessory structures, recreational events (snowshoeing, hikes, etc.), pavilion, gift shop/check in area, Ore Bin Restoration, employee housing facilities, food truck, tubing facility, toboggan use, warming hut/outhouse, kitchen facility, improved bathroom facility, and site design elements and Operational Plans, Country Boy Mine, A Portion of Survey NO. 1285 Lois D. Placer, T6S, R77W, Sections 32 and 33.

ISSUES:
The subject application PLN23-072, Country Boy Preliminary Rezoning Request from A-1 to PUD was scheduled for a public hearing at the December 28, 2023, UBPC Meeting. At this meeting the applicant requested a one (1) month continuance. The Planning Commission approved the continuance request and continued the hearing to the January 25, 2024, meeting. On January 22, 2024, the applicant requested that the hearing again be continued to a special meeting date of February 29, 2024, at which time the applicant again asked for a continuance to March 28, 2024.

On March 12, 2024, the applicant submitted a letter requesting a continuance to the April 25, 2024 meeting. Staff finds that rather than continuing the hearing for the fourth time, the applicant should continue to work with staff, complete their application, and schedule a hearing with the Upper Blue Planning Commission when they are ready. Public notice for the hearing will be required.