

**Lower St. Croix Comprehensive Watershed Management Plan (CWMP)
Implementation Policy Committee**

Policy Committee

Meeting #4

**July 26, 2021
4:00-6:00 PM**

Chisago County Gov. Center
Room 159 B (Old Room 131)
313 N Main St, Center City

To participate remotely:

Microsoft Teams meeting
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Vision

The St. Croix River, groundwater, lakes, streams, rivers, wetlands, and upland habitat in the Lower St. Croix watershed sustain healthy ecosystems, recreation, public health, tourism, agriculture, the economy, and quality of life in our communities.

Mission

Guide protection and restoration of priority natural resources in the Lower St. Croix watershed over the next ten years through implementation of the Lower St. Croix Comprehensive Watershed Management Plan.

Facilitator: Angie Hong

Note taker:

Invited:

Anoka SWCD: Sharon LeMay
Brown's Creek WD: Klayton Eckles
Carnelian Marine St Croix WD: Wade Johnson
Chisago County: Chris DuBose (Vice Chair), Lance Petersen, and Mike Mergens
Chisago SWCD: Jim Birkholz
Comfort Lake Forest Lake WD: Jackie Anderson
Isanti County: Susan Morris (Secretary)
Isanti SWCD: Jerry Schaubach
Middle St. Croix WMO: John Fellegly
Pine County: Steve Hallan
Pine SWCD: Doug Odegard
South Washington WD: Kevin ChapdeLaine
Sunrise River JP WMO: Janet Hegland
Washington County: Fran Miron (Chair)
Washington SWCD: Diane Blake
Valley Branch WD: Ed Marchan

Copied:
Policy Committee alternates; Advisory Committee members

Meeting packet:

- 5-24-21 Policy Committee meeting minutes
- July 2021 Financial Update
- Agronomist – draft position announcement and MN Extension memo
- SWWD McQuade project information
- 7-19-21 e-newsletter update

Agenda Items

Topic	Purpose	Lead	Time
Introductions; Approve agenda	DECIDE	Policy Committee	5 min
Approval of May 24 Meeting Minutes	DECIDE	Policy Committee	5 min
Financial Update	INFO	Craig Mell	5 min.
Subcommittee Updates <ol style="list-style-type: none"> 1. <u>Agronomy Outreach</u> – Jay Riggs <ul style="list-style-type: none"> ○ Position announcement & partnership with Minnesota Extension 2. <u>Urban and Agricultural Projects</u> – Craig Mell and Mike Isensee <ul style="list-style-type: none"> ○ SWWD McQuade Project 3. <u>Watershed Education</u> – Angie Hong <ul style="list-style-type: none"> ○ Local partner interviews ○ Project tour on September 27 ○ Possible logos for outreach 4. <u>Wetland Restoration</u> – Becky Wozney 5. <u>Internal Analyses</u> – Susanna Wilson-Witkowski 6. <u>Targeting Analyses</u> – Jay Riggs 	INFO	Planning Team	30 min.
Progress Update: Cumulative progress toward water quality goals	INFO	Emily Heinz	5 min.
Discussion: Meeting location and topics for future meetings	DISCUSSION	Policy Committee	10 min.
Adjourn	DECIDE	Policy Committee	5 min.

**Lower St. Croix Comprehensive Watershed Management Plan (CWMP)
Implementation Policy Committee**

Policy Committee

Meeting #3

May 24, 2021

4:00-6:00 PM

Facilitator: Angie Hong

Note taker: Angie Hong

Attending:

Anoka SWCD: Sharon LeMay
 Chisago County: Chris DuBose, Lance Petersen, and Mike Mergens
 Chisago SWCD: Jim Birkholz
 Comfort Lake Forest Lake WD: Jackie Anderson
 Isanti County: Susan Morris
 Isanti SWCD: Jerry Schaubach
 Middle St. Croix WMO: John Fellegly
 Pine County: Steve Hallan
 Pine SWCD: Doug Odegard
 South Washington WD: Kevin ChapdeLaine
 Sunrise River JP WMO: Janet Hegland
 Washington County: Fran Miron
 Washington SWCD: Diane Blake

Absent:

Brown's Creek WD: Craig Leiser
 Carnelian Marine St Croix WD: Wade Johnson
 Valley Branch WD: Ed Marchan

MINUTES

1. Introductions; Approve agenda
 - The meeting was called to order by Chair Fran Miron at 4:03pm.
 - Motion to approve agenda by Jim Birkholz. Second by Susan Morris. Roll call vote. All members voted yes.

2. Approval of March 22 Meeting Minutes
 - Motion to approve minutes by Jackie Anderson. Second by Mike Mergens. Roll call vote. All members voted yes.

3. Update on BWSR approved work plan for 2021-22 - Craig Mell
 - The work plan was submitted to BWSR on March 22
 - On March 31 we received a signed agreement from BWSR
 - The steering committee attended a grant compliance meeting on March 30
 - On April 13, Chisago SWCD approved contracts with CLFLWD and WCD for admin services and activities 1 and 3 in the work plan

4. Financial Update - Craig Mell
 - No additional updates

5. Subcommittee Updates

- Agronomy Outreach – Jay Riggs
 - The subcommittee would like to have one full-time person and is still considering whether it will be more cost-effective to hire a staff person or contract with University of MN Extension. Jay will be meeting with MN Extension tomorrow to discuss.
 - Matt Moore - Lance Petersen from Policy Committee has provided a lot of great insight for the subcommittee conversations

- Urban and Agricultural Projects – Craig Mell and Mike Isensee
 - Combined subcommittee for activities 2, 4, 5, and 9
 - \$360k is available for structural projects in the first round of funding - \$160K for ag and \$200k for urban. The subcommittee is recommending that the steering committee allocate 50% of the available funding for projects this year.
 - The group sent out a request for shovel-ready projects that require funding from Lower St. Croix WBIF and got proposals from South Washington WD and Carnelian-Marine-St. Croix WD
 - i. \$150-175K from LSC WBIF for a SWWD ravine project with direct drainage to St. Croix River in Afton (Total project cost = \$243K)
 - ii. \$20K from LSC WBIF for a CMSCWD Goose Lake project in Scandia (Total project cost = \$58k)
 - The total load reduction goal for the full plan for 2021-23 is 500lb P. These two projects will get us halfway there
 - There is lots of prioritization work happening during these first two years and it is hard to get projects ready to construct this early in the process
 - There is also \$200k available for nonstructural projects
 - i. Will likely create an RFP to contract with someone to conduct street sweeping analyses for communities that are willing
 - ii. Ag non-structural BMPs will be a big priority but pursuing those is contingent on getting an agronomist on board, finalizing policy for cost-share, and completing targeted analyses in rural portions of the watershed.

- Watershed Education – Angie Hong
 - Barbara Heitkamp, the new educator, introduced herself to the group. She lives in Bayport and has worked at SAFL for the past 10 years. Trained hydrologist-geologist and has been doing communications since 2015. Excited to begin the new position.
 - Jay Riggs: There were 63 applicants and the group conducted 8 interviews. Jackie Anderson and Janet Hegland were on the hiring committee along with staff
 - Jackie Anderson: We had very qualified candidates and people were very complimentary of EMWREP, our existing education program.

- Wetland Restoration – Becky Wozney

- The subcommittee will be meeting next week and discussing the prioritization process
- Internal Analyses – Susanna Wilson-Witkowski
 - The subcommittee met on April 26 and developed criteria for prioritizing lakes for internal analyses. They are considering if lakes are part of a WRAPS study, if they have large external loads coming in, and other factors
 - Will develop a 1-2 pg form for the next subcommittee meeting on June 3 and will prepare a request for quotes to be sent out this fall
- Targeting Analyses – Jay Riggs
 - Subcommittee will be meeting this week and will have a report for the policy committee soon

Policy Committee Discussion:

- Jackie Anderson: WBIF can't be used for monitoring work so we'll be using modeling estimates?
- Jay Riggs: Yes
- Jackie Anderson: CLFLWD would like to ensure we have accurate numbers on pollutant loading and reduction and not just modeling estimates
- Mike Isensee: The loading to Goose Lake was determined through monitoring. The ravine project in SWWD will only be modeled for nutrient loading estimates.
- Jackie Anderson: Mike Kinney wants to make sure that farmers are working toward a goal if they are getting 100% funding for a project
- Matt Moore: Asked Jim Birkholz if farmers should be asked to be meeting T?
- Jim - This is a good partial goal but many farmers and landowners could do more than just that. T is a goal that is applicable to all soils in all fields and worthy of attaining. But often, there are water quality impacts and improvements to be achieved in other ways.
- Lance Petersen: "T" is the soil loss part of equation. Most acres in the watershed meet T but not phosphorus loss goals. It is unfortunate we can't measure or monitor with the funds. Need to work on reducing P and N in addition to sediment.
- Matt Moore: The SWWD project will reduce 295 tons sediment + 250lb P – directly entering the St. Croix every year

6. Progress Update – Angie Hong

- Emily Heinz will provide an update on cumulative progress toward water quality goals at future Policy Committee meetings. So far, we have not completed any projects.

7. Overview of additional, locally-led projects – Angie Hong

- Angie showed a map of the Lower St. Croix watershed with proposed projects to be funded with WBIF and local funds:
https://www.google.com/maps/d/u/0/edit?mid=1U_E43ZHR9CkXKN52iDZkekNmmxC8Hz7O&usp=sharing
- Steve Hallan: Snake River and Kettle River are just north of us and discharging to the St. Croix. Opportunity for collaboration between LSC and partners in those watersheds

- Barb Peichel: The Snake River Watershed is working on their Comprehensive Watershed Management Plan right now. There will also be Clean Water Fund Competitive Grants open statewide this summer.
- Matt Moore: Snake and Kettle are significant contributors to the St. Croix and in the TMDL
- Jay Riggs: Snake River is currently developing its 1w1p. There will eventually be similar plans statewide. Wisconsin has lost many of the lead staff we used to partner with.
- Fran Miron – Perhaps the Policy Committee could get reports from local partners such as the Snake, Kettle, and Wisconsin at future meetings to know what neighboring watersheds are doing
- Barb Peichel: Deanna Pomije (Kanabec SWCD) is the lead LGU staffer for the Snake River Watershed One Watershed One Plan process so could possibly give a short update. Or I could too.

8. Meeting format and topics for future meetings

- In person vs virtual meetings
 - Chris Dubose – in person
 - Steve Hallan – at least hybrid. Totally in person is hard to make
 - Janet Hegland – in person or hybrid
 - Susan Morris – prefers in person but having the virtual option is good
 - Kevin ChapdeLaine – hybrid at minimum would be a good compromise
 - Jackie Anderson – would like hybrid
 - Jim Birkholz – hybrid would be a good way. Encourage in person meetings.
 - Jerry Schaubach – also likes idea of hybrid. It allows people to attend when out of town or traveling
 - John Fellego – only challenge is logistics of hybrid meetings. What technology would be needed and what level of staffing?
 - Jay Riggs – WCD purchased a wide angle, double USB camera for hybrid board meetings
 - Jackie Anderson– check with City of Forest Lake to see what tech they will have set up. We could have meetings there
 - Angie Hong – City of Scandia is also set up to have hybrid meetings now
 - Chris Dubose – Chisago County will have the technology also
 - Matt Moore – SWWD is watching executive orders. If they expire, the watershed district is no longer legally able to meet virtually.
 - Steve Hallan – under open meeting law, we have to notice meetings but can meet virtually
 - Fran Miron – staff should research that aspect as well
- Meeting schedule?
 - Chris Dubose – every other month
 - Jim Birkholz – quarterly would be good. Likes the idea of keeping monthly meeting on the calendar with the expectation that we will likely cancel at least half of the meetings
 - Jackie Anderson – agrees with Jim. Would like to keep it on the calendar monthly and be sure we can meet if we have to, especially in the first year.
 - Susan Morris – maybe wait until end of Aug. to meet again

- Sharon LeMay – less is better
- Lance Petersen – every other month
- Mike Mergens – open to quarterly or every other month
- Jerry Schaubach – every other month
- John Fellego – every other month
- Steve Hallan – quarterly
- Doug Odegard – every other month but transition to quarterly
- Kevin ChapdeLaine– quarterly
- Janet Hegland – quarterly. Would prefer not to keep meetings on the calendar if they'll likely get canceled
- Fran Miron – monthly is too often. Every other would be good. Quarterly is fine. Policy Committee sets the budget and approves the annual plan but doesn't need to be involved in day to day decision making
- Diane Blake – every other month until fall

What level of involvement do PC members want?

- Jim Birkholz – let staff get going and see how it goes
- Fran Miron – I agree

Topics for future meetings

- Let Angie Hong know if you have things you'd like added to future agendas

9. Adjourn

- Chris Dubose motion to schedule next two meetings for July 26 and Sept. 27, 4-6pm in person at a location to be determined and adjourn the May 24 meeting. Second by Steve Hallan. Meeting adjourned at 5:23pm

FY21 WBIF - Lower St. Croix Watershed Partners Grant

	ACTIVITY	BEGINNING WBIF BALANCE	BEGINNING MATCH BALANCE	AMOUNT WBIF's SPENT	PERCENT WBIF's SPENT	AMOUNT OF MATCH FUNDS SPENT	PERCENT OF MATCH FUNDS SPENT	WBIF BALANCE REMAINING	TOTAL MATCH REMAINING	TOTAL WBIF & MATCH REMAINING
A1	Basin Ag Outreach Program	\$ 200,000.00	\$ -	\$ -	0.0%	\$ -	NA	\$ 200,000.00	\$ -	\$ 200,000.00
A2	Structural Ag BMP Implementation	\$ 160,000.00	\$ 55,000.00	\$ -	0.0%	\$ -	0.0%	\$ 160,000.00	\$ 55,000.00	\$ 215,000.00
A3	Shared Services Educator	\$ 125,000.00	\$ 4,800.00	\$ 7,192.90	5.8%	\$ 6,368.00	132.7%	\$ 117,807.10	\$ (1,568.00)	\$ 116,239.10
A4	Non-Structural Ag/Urban BMP Implementatio	\$ 200,000.00	\$ -	\$ -	0.0%	\$ -	NA	\$ 200,000.00	\$ -	\$ 200,000.00
A5	Structural Urban BMP Implementation	\$ 200,000.00	\$ 70,000.00	\$ -	0.0%	\$ -	0.0%	\$ 200,000.00	\$ 70,000.00	\$ 270,000.00
A6	Wetland Restoration Implementation	\$ 39,531.00	\$ -	\$ -	0.0%	\$ -	NA	\$ 39,531.00	\$ -	\$ 39,531.00
A7	Internal Analyses	\$ 50,000.00	\$ -	\$ -	0.0%	\$ -	NA	\$ 50,000.00	\$ -	\$ 50,000.00
A8	Targeting Analyses	\$ 150,000.00	\$ -	\$ -	0.0%	\$ -	NA	\$ 150,000.00	\$ -	\$ 150,000.00
A9	Technical/Engineering	\$ 40,000.00	\$ -	\$ -	0.0%	\$ -	NA	\$ 40,000.00	\$ -	\$ 40,000.00
A10	Administration/Coordination	\$ 100,000.00	\$ -	\$ 9,339.85	9.3%	\$ 712.17	NA	\$ 90,660.15	\$ (712.17)	\$ 89,947.98
PROJECT BALANCE:		\$ 1,264,531.00	\$ 129,800.00	\$ 16,532.75	1.3%	\$ 7,080.17	5.5%	\$ 1,247,998.25	\$ 122,719.83	\$ 1,370,718.08

As of July 1, 2021

Position Description and Announcement – Lower St. Croix Extension Educator, Agronomy and Water Resources

Title: Extension Educator, Agronomy and Water Resources
Classification: Assistant Extension Educator, Job Code 9625ST
Appointment: Full-time, Academic Professional, annually renewable
Program Area: Agriculture, Food and Natural Resources (AFNR)
Office Location: Washington Conservation District, Oakdale, MN
Application Deadline: TBD (four weeks after posting)

ABOUT THIS POSITION:

The goal of this position is to work with agricultural landowners and occupiers within the Lower St. Croix Basin to adopt innovative farming and land management practices to improve water quality, enhance groundwater, expand habitat, and conserve soil resources to achieve the goals of the Lower St. Croix Comprehensive Watershed Management Plan. This position is an Extension educator with the University of Minnesota, in partnership with organizations that are collectively implementing the Lower Saint Croix Comprehensive Watershed Management Plan.

PRIMARY RESPONSIBILITIES:

- Support and guide implementation of agricultural-related priorities in the Lower St. Croix Comprehensive Watershed Management Plan.
- Promote practices that focus on water quality and improve natural systems to achieve these priorities.
- Develop and promote approaches to incentivize regenerative agriculture throughout the basin.
- Provides technical leadership and assistance in agronomic, regenerative agriculture, and soil health to individual land users or groups of land users.
- Provide guidance on economic implications of conservation practices and alternative crops. Incorporates economic data into assessments and management plans to determine most cost-effective practices and impacts on production.
- Coordinate and facilitate Farmer-Led initiatives and similar activities. Provide long-term guidance and support through transition to regenerative agricultural practices. Strive to “make conservation cool.”
- Evaluates effectiveness of agronomic practices, identify technical problems and/or deficiencies, recommend improvements, and motivate landowners to implement and maintain sound conservation management systems.
- Facilitate implementation of science-based, effective, economically viable soil health management systems on diverse agricultural lands. Support development and promotion of demonstration plots.
- Write grant applications and pursue supplemental funding opportunities that enhance implementation and partnerships.
- Prioritizes data from completed resource inventories and assessments to promote and implement best management practices (BMPs) and water quality.
- Develops comprehensive natural resource management plans with agricultural landowners.
- Facilitate positive landowner relationships with local partners for implementation of conservation planning, technical assistance, and cost share/incentive programs.
- Work with Basin Educator(s) to develop and implement outreach in close collaboration with partners to ensure seamless implementation of technical assistance and cost share delivery.

To be eligible for hiring, candidates must meet all of the following **REQUIRED QUALIFICATIONS**:

REQUIRED QUALIFICATIONS:

- Bachelor's degree in agricultural engineering, agricultural economics, agronomy, or related degree and five (5) years of directly related experience.
- Documented experience providing technical guidance and direct assistance to personnel and producers to carry out agronomic practices to improve water quality; solve complex agronomic problems on individual farms or group projects; and assist with vegetative and management practices to support regenerative agriculture, soil health, and innovative conservation practices.
- Understanding of federal, state, and local rules and regulations governing water resources. Proven leadership skills, successful project management experience, and attention to detail are critical.
- A proven ability to develop and maintain effective working relationships and collaborations with colleagues, stakeholders, and communities, including those that may have diverse missions, goals, cultures, and backgrounds.
- Effective communication and presentation skills, as demonstrated by experience, materials submitted as part of the application, and the interview process.

PREFERRED QUALIFICATIONS:

- More than five years of professional experience.
- An advanced degree in a directly related field.
- Agronomist Certifications.
- Experience with NRCS FOTG and SCS programs.
- Current or past farming experience in the Midwest.

WORK ENVIRONMENT: Work involves 60-70% indoor work and frequent travel within Anoka, Chisago, Isanti, Pine, and Washington Counties. Office work includes frequent interruptions and diverse daily activities. Office equipment used includes telephone, computers, copier, LCD projector and fax machine. The general work schedule will be Monday – Friday during normal business hours, although some responsibilities may require evening and weekend meetings. Flex time and compressed work schedule are available.

BENEFITS/APPOINTMENT

- This is a full-time, Extension Educator position with an annual University Academic Professional appointment at the level of Assistant Extension Educator, Job Code 9625ST.
- The appointment will be annually renewable with continuation dependent on performance, results, availability of funds, and program needs.
- University of Minnesota appointment and benefits, including health and life insurance, <https://humanresources.umn.edu/new-employees/benefits-summaries>
- Reimbursement for travel and subsistence is available in accordance with University policy.
- Salary commensurate with education and experience.

TO APPLY

Please apply online at, <https://extension.umn.edu/about-extension/careers> **Job Opening ID: TBD**

To be considered for this position, please click the Apply button and follow the instructions. You will be given the opportunity to complete an online application for the position. Please include the following attachments with your online application:

- Resume that includes your qualifications based upon the job requirements
- Cover letter expressing how your experience and skills match the required and preferred qualifications

Three professional references and transcripts for all college work (unofficial transcripts are acceptable) will be required during interview process.

Additional documents may be attached after the application by accessing your "[My Job Applications](#)" page and uploading documents in the "My Cover Letters and Attachments" section.

To request an accommodation during the application process, email employ@umn.edu or call 612-624- UOHR (8647).

For questions about this position, contact:

Joel Larson, University of Minnesota Water Resources Center, jplarson@umn.edu.

For questions about applying online, contact:

TBD, Extension Human Resources.

Any offer of employment is contingent upon the successful completion of a background check.

The University of Minnesota Extension shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.

University of Minnesota Extension – Lower St. Croix Comprehensive Watershed Management Plan - Agricultural and Water Outreach Position Information
 DRAFT – 6/1/21

1. Organizational Responsibilities

- a. The University will hire an Extension educator who will leverage the expertise of the University and Lower St. Croix partners to implement the education and outreach components of the Lower St. Croix Comprehensive Watershed Management Plan.
- b. University will be responsible for providing salary & fringe benefits for the positions, enhanced programming from regional extension educator staff, program supervision, travel (mileage, meals, and lodging), in-service training within program area, payroll, and accounting services.
- c. The University will complete an annual performance evaluation of the educator, based on programmatic and individual work plans. The funder will have the option to provide input to University on such evaluation. The University in accordance with University personnel guidelines will determine salary adjustment of each University Extension employee.
- d. For the initial hire and as vacancies occur (e.g. retirement, resignation), the University will hire new personnel with involvement and concurrence of the funder.
- e. The funder agrees to provide local support in the form of support staff, office space, office furnishings, telephone, computer, software, internet service, storage space, and general office supplies. The University will recommend support staff responsibilities, technology needs and other office standards. Nevertheless, the level of availability and type of local support will be determined by the funder as established in the annual budget.

2. Estimated University Costs per Year

Cost category	Amount	Notes
Salary	\$55,000 - \$65,000	Will vary depending on qualifications of the individual who is hired
Fringe Benefits	\$20,075 - \$23,725	Current UMN fringe rate of 36.5%
Travel	\$6,000	Estimated based on similar positions across the state, charged at the GSA per diem and mileage rate
Professional Development	\$2,000	To allow the educator to attend professional development activities
Equipment	\$1,000	Will vary depending on the specifics of the position and responsibilities

Supervisory Time	\$5,000	Pays a portion of the supervisor's salary to account for time spent working with the educator
Total	\$89,075 - \$102,725	

3. Notes

- a. Responsibilities and funding serve as a starting point for discussion.
- b. The specific contract or agreement vehicle will be established based on mutual agreement by both parties and will include modification and termination clauses.

Prepared by: Joel Larson, Associate Director and Program Leader, Extension Water Team
(jplarson@umn.edu)

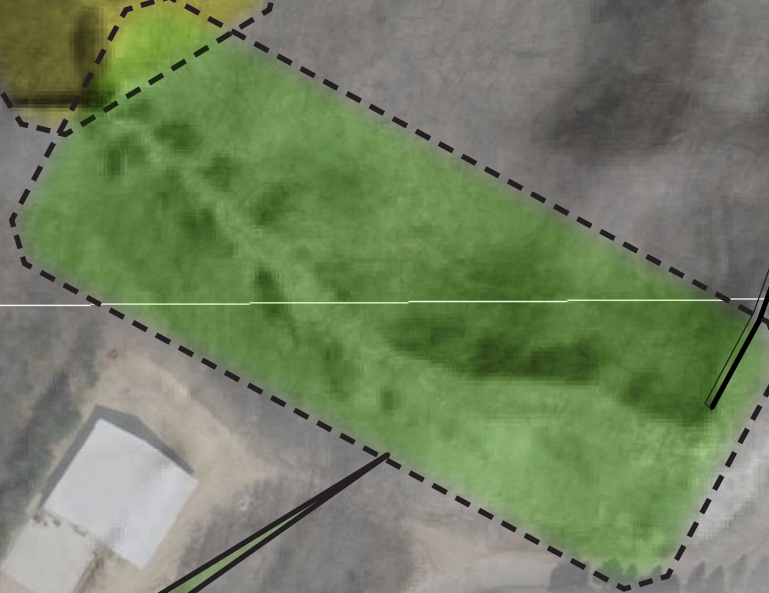
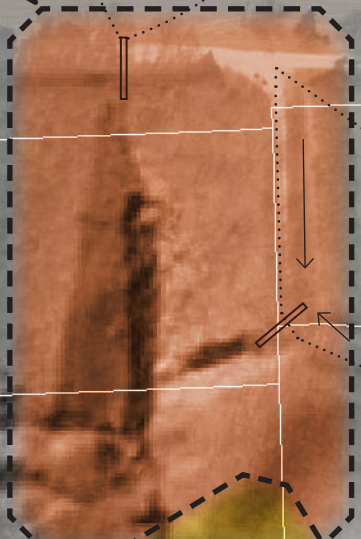
DRAFT

Project Name	McQuade Ravine Stabilization
Proposing Organization	South Washington Watershed District
Project Description (include summary of issue addressed, proposed solution, current status of the project)	Stabilize a ravine directly tributary to Lake St. Croix delivering an estimated 250 tons per year of sediment to Lake St. Croix.
Total Estimated Construction Cost	\$243,000.00
Total Lower St. Croix Partnership Funding Request	\$175,000.00

RAVINE UPPER REACH:
 Location of active head-cutting with slopes ranging from 2:1 to vertical slopes and up to 30 foot depth, highly erodible sandy soils, very little rooted vegetation, yard waste fallen trees in the bottom; Several acres of field runoff is conveyed through a road culvert and into the northern edge of the ravine contributing to the head-cutting. Less than an acre of rural ditch drainage is conveyed to an east culvert forming an active side-ravine. The side ravine is close to affecting the stability of the road base.

RAVINE MIDDLE REACH:
 1-3' vertical cutbanks at toe of slope, 10-12' depth with 2:1 to 3:1 side slopes, superceded by more stable slopes. Slight meanders to the ravine bottom. Moderate groundcover on all but the vertical slopes.

RAVINE LOWER REACH:
 2:1-3:1 side slopes with a shallower ravine profile, 20'+ wide ravine bottom with a narrow, 4-6' wide incised channel with 1-3' vertical slopes.



CULVERTS TO ST. CROIX RIVER
 Conveyance under former rail bed

STORMWATER PIPE - PRIVATE
 Existing 36" (?) diameter RCP



SITE CONDITIONS

RAVINE STABILIZATION PROJECT

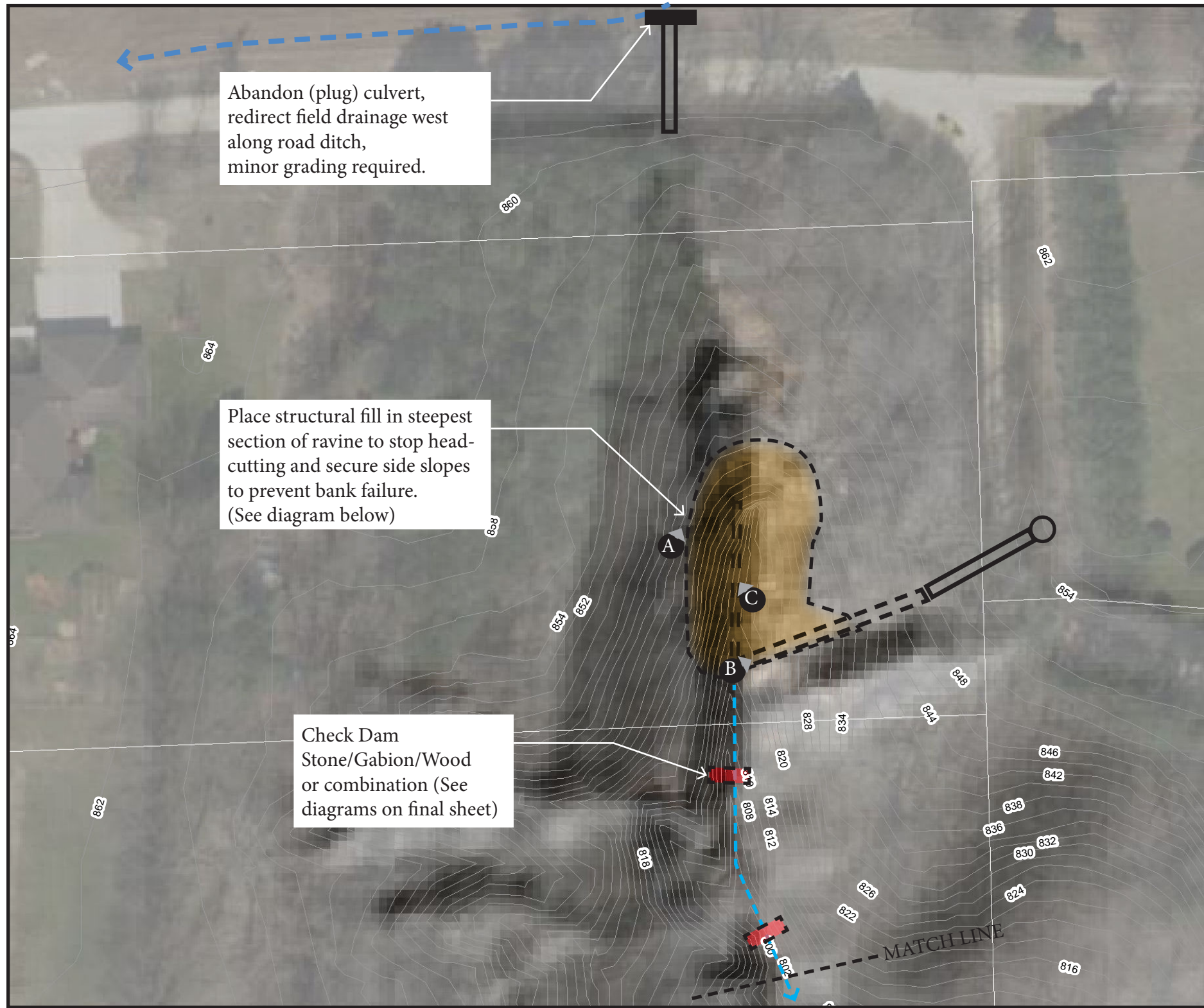
PRELIMINARY ISSUES AND STABILIZATION DESIGN

date: 2 / 2019

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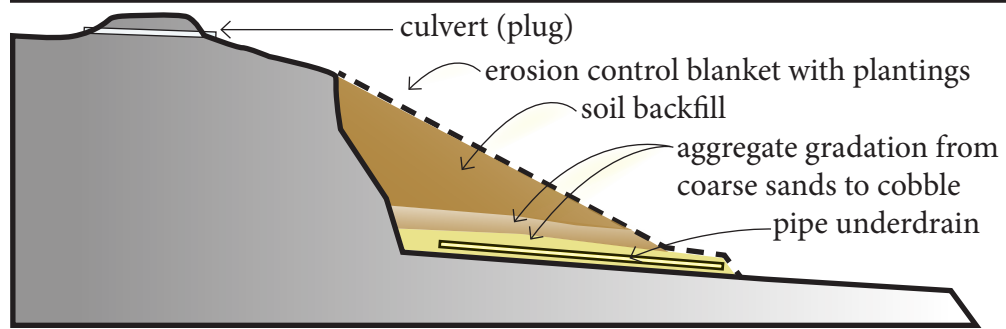
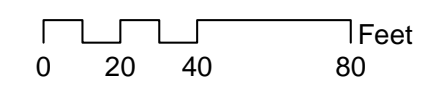
RAVINE - UPPER REACH



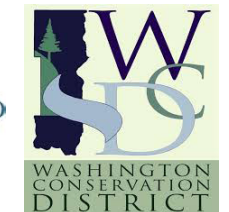
SITE CONDITIONS

RAVINE STABILIZATION PROJECT
 PRELIMINARY ISSUES AND STABILIZATION DESIGN

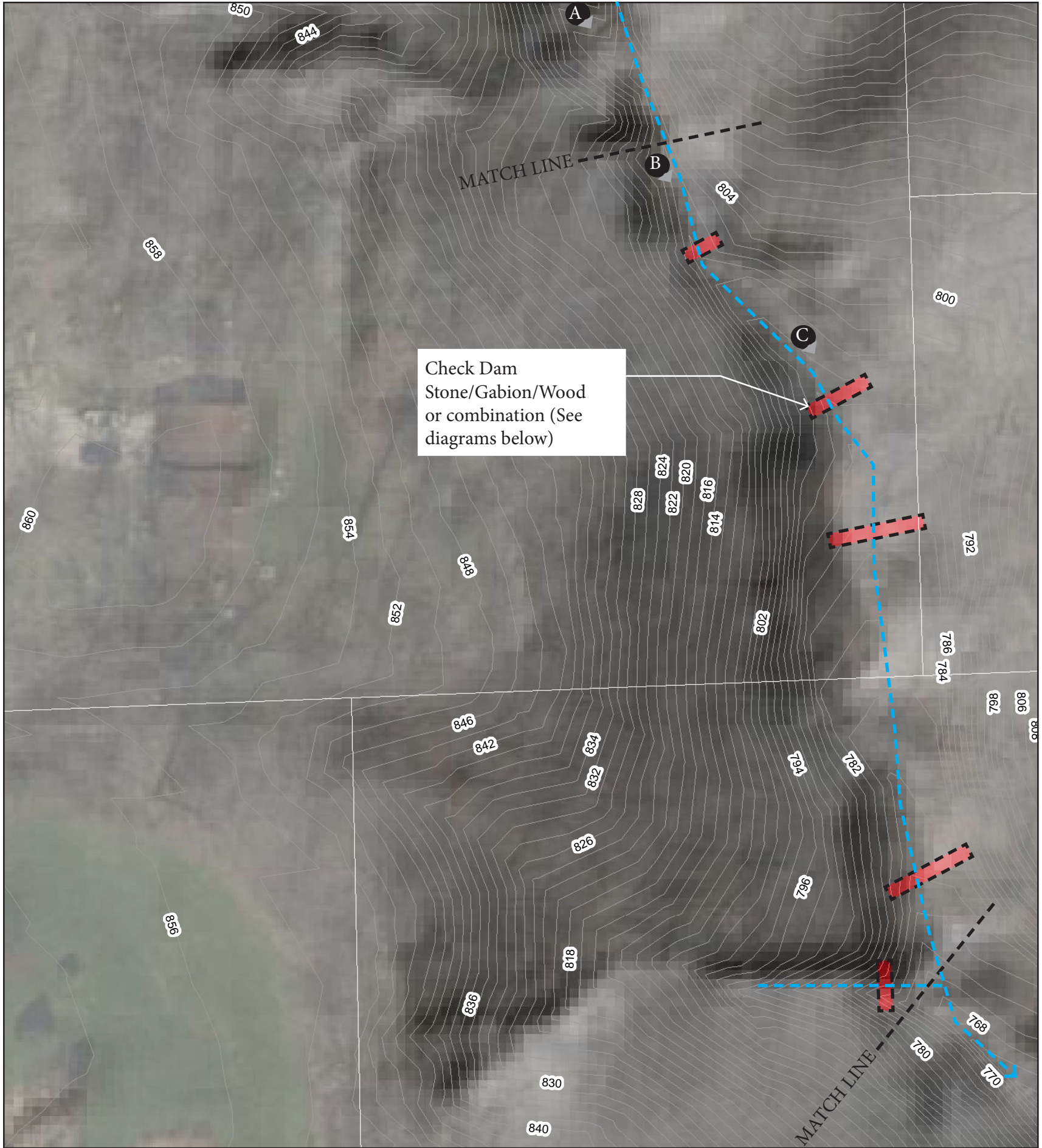
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Ravine Structural Fill Diagram - Not to Scale



RAVINE - MIDDLE REACH



SITE CONDITIONS

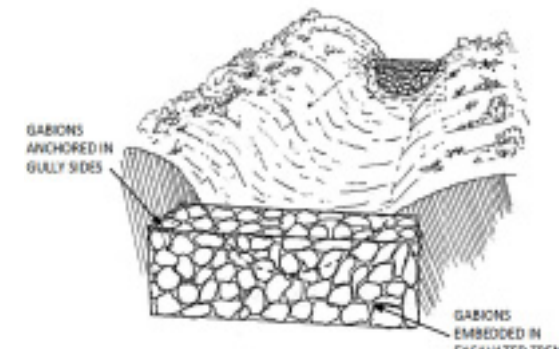
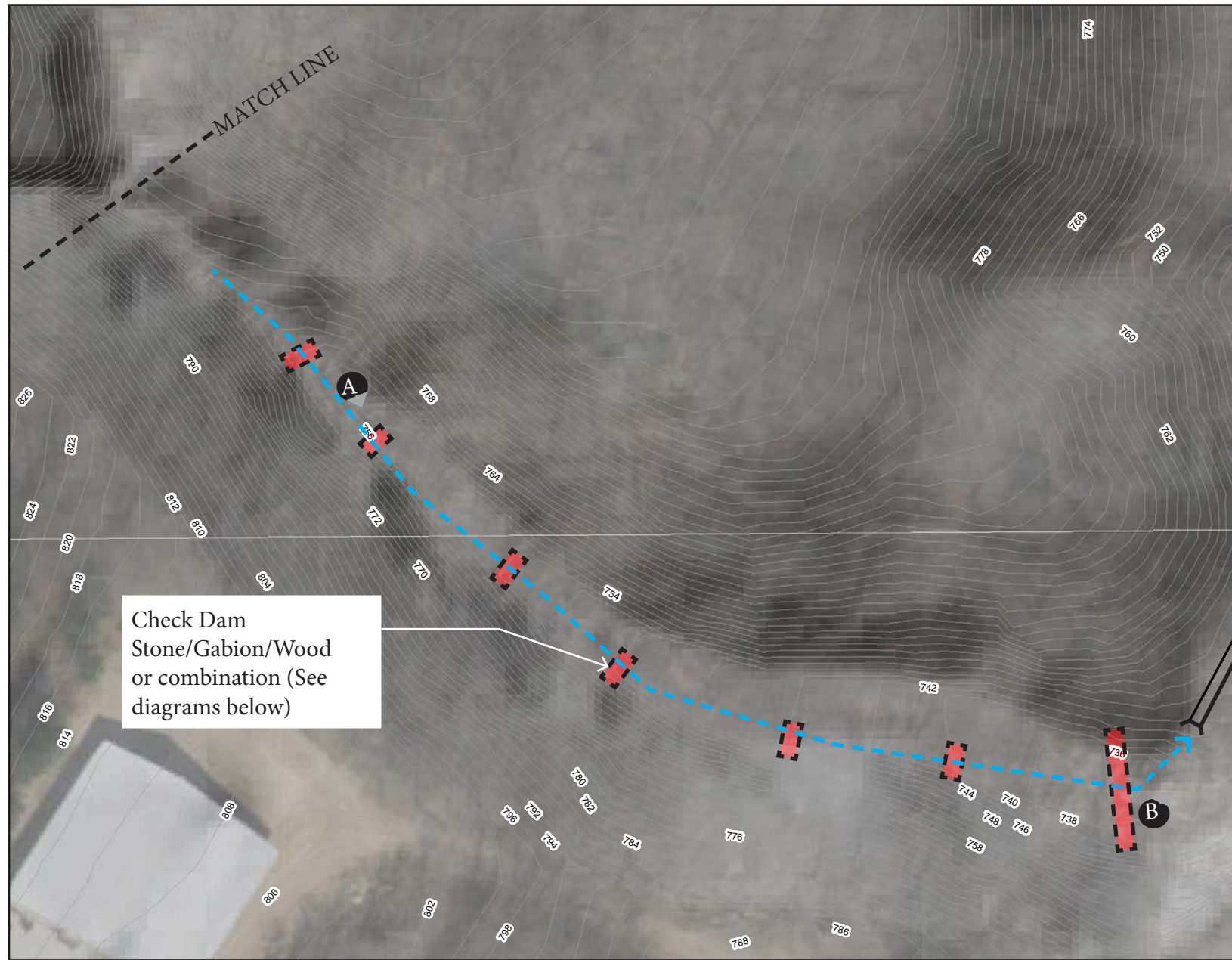
RAVINE STABILIZATION PROJECT
PRELIMINARY ISSUES AND STABILIZATION DESIGN

date: 2 / 2019

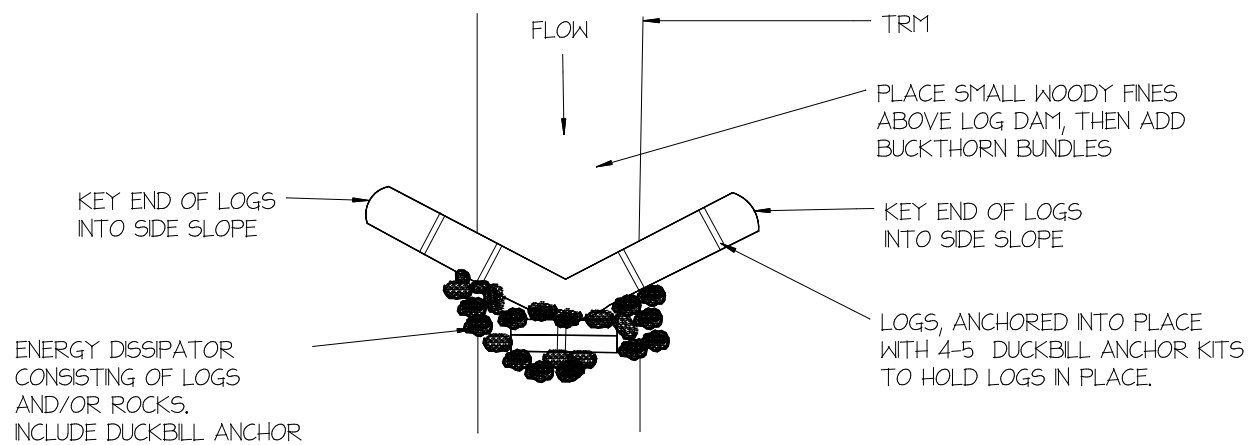
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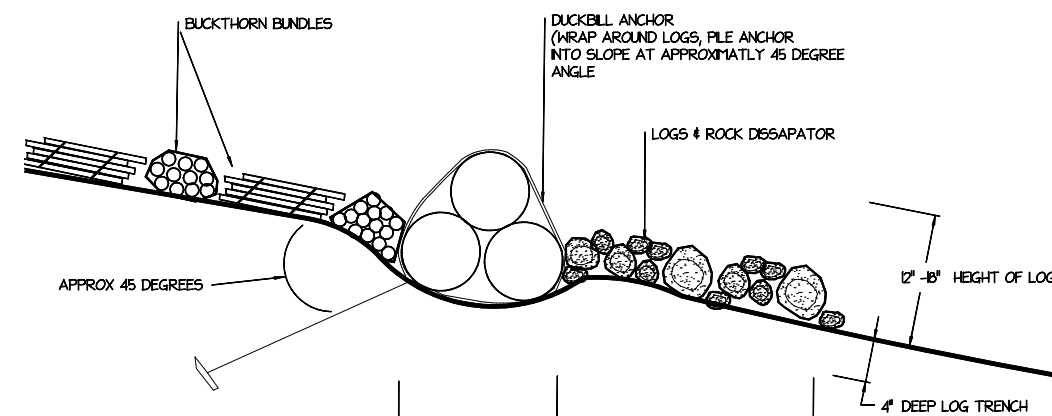
RAVINE - LOWER REACH



Gabion Type Check Dam - Not to Scale



Wood and Stone Check Dam Plan View - Not to Scale



Wood and Stone Check Dam Longitudinal Section - Not to Scale

SITE CONDITIONS

RAVINE STABILIZATION PROJECT

PRELIMINARY ISSUES AND STABILIZATION DESIGN

date: 2 / 2019

