

Attachment 1

Docket Number: CWA-05-2018-0009

**Ridge Prairie Farms, Inc. of Caseyville, IL. And
Alan Begole of Lebanon, IL
Settlement Restoration Plan
For
United States Environmental Protection Agency
Region 5**

I. Existing Physical Conditions

A. The United States Environmental Protection Agency Region 5 has issued an Administrative Order On Consent Under Section 309(a) of the Clean Water Act, 33 U.S.C. paragraph 1319(a). A total of 5 counts against Ridge Prairie Farms, Inc. of Caseyville, IL and Alan Begole of Lebanon, IL. are cited in the Administrative Order. The upper reach of Little Silver Creek (Site 1) shown on Exhibit 1 shows 5660 ft. of stream channel for which mitigation and restoration will be completed, as outlined in this restoration plan, to meet the required mitigation of all five counts issued. The drainage area of the subject site has been calculated using the U.S. Geological Survey "Streamstats" program as 8.82 square miles of rural land (Exhibit 2) and thus does not require a permit from the Illinois Dept. of Natural Resources Office of Water Resources under Floodway/Floodplain Management Part 3700.

II. Proposed Physical Conditions

A. Exhibit 1 shows 5660 ft. of channel to be shaped with a 12 ft. bottom width and 2H:1V (or flatter) sideslopes. The existing channel pattern will be maintained with no changes in pattern or sinuosity. Wetland determinations were made by Gerald Berning, Certified Soil Classifier on February 8, 2018 and existing wetlands are identified on Exhibits 3 thru 6. Material removed during construction of the channel sideslopes will be placed 1) within the channel cross section above the OHW to create design slope 2) in non-wetland depressional areas 3) on prior converted cropland adjacent to the channel 4) in wetlands 1,2,3,6,10,12,13 and 14 for which mitigation credits have been purchased and approved by Corps of Engineers Permit #MVS-2018-313

Attached representative cross sections taken at Sta. 5+46,18+83, 31+47,44+08 and 55+05 are provided to show current and proposed conditions. (Exhibits 7 thru 11) The attached profile survey completed in December 2017 depicts current channel profile and locations and heights of planned Rock Riffle Grade Control Structures and Stone Toe Protection. (Exhibit 12) Locations shown on Exhibits 3-6.

B. *Construction will be completed in the following sequence. All access for equipment will be along the top bank of Little Silver Creek from either Townsend Road or Emerald Mound School Road.

1. Potential Indiana Bat "habitat" has been removed prior to March 31, 2018 on the upper 500 ft. (+ or -) of the left bank.

2. The woody corridor on the upper 500 ft. of the left bank will be shaped by clearing the trees and shaping the banks on a 2H:1V sideslope (or flatter) with no disturbance beyond a point 60 ft. from the existing top bank, within the area determined to be "non-wetland". (See Attachment 1)
3. Disturbed area of this bank will be seeded immediately after shaping.
4. To allow sufficient time for construction to be completed, the bank shaping will begin on or about June 1 and all disturbed banks will be seeded and mulched as construction proceeds. On or about Sept. 30 all seeding done outside of the recommended seeding period of Aug. 1 thru Sept. 20 will be evaluated. Any and all areas where seeding appears to have failed will be reseeded before Sept. 20, 2018.
5. Beginning about June 1, 2018 construction will begin at the upper end of project above Emerald Mound School Road where the left and right bank will be shaped to a 2H:1V sideslope (or flatter). Construction is anticipated to be complete by July 15, 2018.
6. Newly shaped banks will then be seeded and mulched as prescribed on J.S. 342 and 484. (Attachment 2)
7. Beginning about July 15, 2018 Construction will then move to the project reach located between Townsend Road and Emerald Mound School Road. Left and Right banks will be shaped to a 2H:1V sideslope (or flatter). Construction is anticipated to be completed by Aug. 15, 2018.
8. Newly shaped banks will then be seeded and mulched as prescribed on J.S. 342 and 484. (Attachment 2)
9. Beginning about Aug. 15, 2018 Construction will then move to the project reach below Townsend Road and left and right banks will be shaped to a 2H:1V sideslope (or flatter). Construction is anticipated to be completed by Sept. 20, 2018
10. Newly shaped banks will then be seeded and mulched as prescribed on J.S. 342 and 484. (Attachment 2)
11. As bank shaping is completed in each stream reach the planned Rock Riffles will be installed according to IL-ENG-165A and IL-ENG-165B at the stations identified in "Attachment 3" and depicted on Exhibits 3 thru 6.
12. As bank shaping is completed in each stream reach the planned Stone Toe Protection will be installed according to IL-ENG-152 at Reaches 1,2 and 3 at the stations identified in "Attachment 3" and depicted on Exhibits 3 thru 6.
13. Any previously seeded sideslopes damaged during installation of the Rock Riffles and Stone Toe Protection will then be immediately repaired and reseeded according to J.S. 342 and J.S. 484 (Attachment 2)
14. All in-stream structures, bank shaping, seeding and mulching are planned to be completed by Sept. 20, 2018.

***Note: Installation sequence may be modified due to weather conditions.**

- C. Prior to commencement of earthwork, Midwest Streams, Inc. will delineate the site restoration areas to limit construction activities. No work shall occur beyond these boundaries.

III. As-Built Conditions

- A. Restoration site will be surveyed after completion of all earthmoving activities and installation of Stone Toe Protection and Rock Riffle Grade Control Structures. "As-built" plans will be completed from this survey and any variances from the proposed plan will be described and justification provided. To facilitate timely seeding of the restoration area these "as-built" plans will not be submitted prior to seeding activities, but will be submitted within 30 days of project completion.

IV. Performance Standards

These standards shall be met on an annual basis:

- A. The streambanks shall achieve 75% vegetative cover from top of bank to OHWM. Areas disturbed during construction other than the stream banks shall achieve 90% vegetative cover if not in active agriculture.
- B. Less than 15% of the entire restoration area, as measured by areal coverage, shall be invasive and or/non-native species. Invasive and non-native species include, but are not limited to Phragmites, Reed Canary Grass, Cattails, Johnson Grass, Giant Foxtail, Common Ragweed, Canada Thistle, Bull Thistle and Bush Honeysuckle.
- C. Banks, riffles, and stone toe protection shall be stable and functioning as intended and shall exhibit the pattern, profile and dimensions as indicated in the restoration plan drawings without active erosion above the OHWM and without undercutting the banks.
- D. By the end of the fifth growing season, if performance standards are not met the landowner shall be required to take corrective actions and monitoring will continue at the direction of the EPA until performance standards are met or an alternative mitigation plan is approved by the EPA. The landowner acknowledges it is in the landowner's best interest to take any necessary corrective measures early in the restoration effort.

V. Monitoring Requirements

- A. Monitoring will be completed by Midwest Streams, Inc. with annual monitoring reports due to USEPA by October 15 of each calendar year for a minimum of 5 years. The frequency of monitoring will begin with quarterly inspections for the first year, semi-annual inspections beginning the second year and annual inspections in years 3 thru 5 unless performance requires additional monitoring and/or adaptive management.

- B. Permanent photo points will be established at each Grade Control Structure and at Sta. 6+00 to document upstream and downstream conditions at each monitoring event to provide a visual image of the progression of growth and establishment. Successful restoration will be determined by a stable channel facilitating the passage of flood flows and low flows with adequate vegetation cover to prevent bank scouring or sloughing.
- C. During the first year of monitoring a visual check of stream stability will also be made after each major storm exceeding the 2 yr. 24 hr. frequency. (3.3 inches)
The annual monitoring report will include vegetative cover for erosion control in accordance with NRCS Illinois Agronomy Tech Note No. 2 (Attachment 4), stream stability assessment will include stability of the Rock Riffle Grade Control Structures and stability of the Stone Toe Protection in accordance with the Illinois NRCS Operation and Maintenance Plan for Streambank Stabilization (IL580om-1). (Attachment 5)
Monitoring reports will include any needed corrective action to insure the success of the restoration.
- D. As a general provision corrective actions may be taken under the direction of USEPA should monitoring show that performance standards are not met.

V. Inspections

- A. The Designated USEPA Case Manager shall be kept informed via E-mail or Telephone of progress in implementation of the restoration plan in order to allow for USEPA personnel to inspect the site prior to, during or after earthmoving activities and prior to, during or after seeding. USEPA may also randomly inspect the site during the monitoring period with prior notification to the respondent.

VI. Schedule

- A. Restoration will begin after June 1, 2018 and shall be completed by Oct. 30, 2018
- B. Monitoring Schedule w/ Report due by 15th day of month.
Project completion –Oct. 30, 2018

Year 1 -----January 15, 2019

April 15, 2019

July 15, 2019

October 15, 2019

Year 2 ----- April 15, 2020

October 15, 2020

Year 3 ----- October 15, 2021

Year 4 ----- October 15, 2022

Year 5 ----- October 15, 2023

All reports, notifications, documentation and submissions required by this restoration plan will be signed by a duly authorized representative of Prairie Ridge Farms, Inc. using the cover page found below and submitted to the EPA Case Manager at:

Yone Yu

Watersheds and Wetlands Branch

U.S. Environmental Protection Agency (WW-16J)

77 West Jackson Boulevard

Chicago, Illinois 60604-3590

**Report of Activity pursuant to Administrative Order
Issued by USEPA to Prairie Ridge Farms, Inc. of Caseyville,
IL and Alan Begole of Lebanon, IL**

Activity

Reported: _____

**Authorization of reports, notifications, documentation and submissions required by
Administrative Order.**

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Signed:

Date

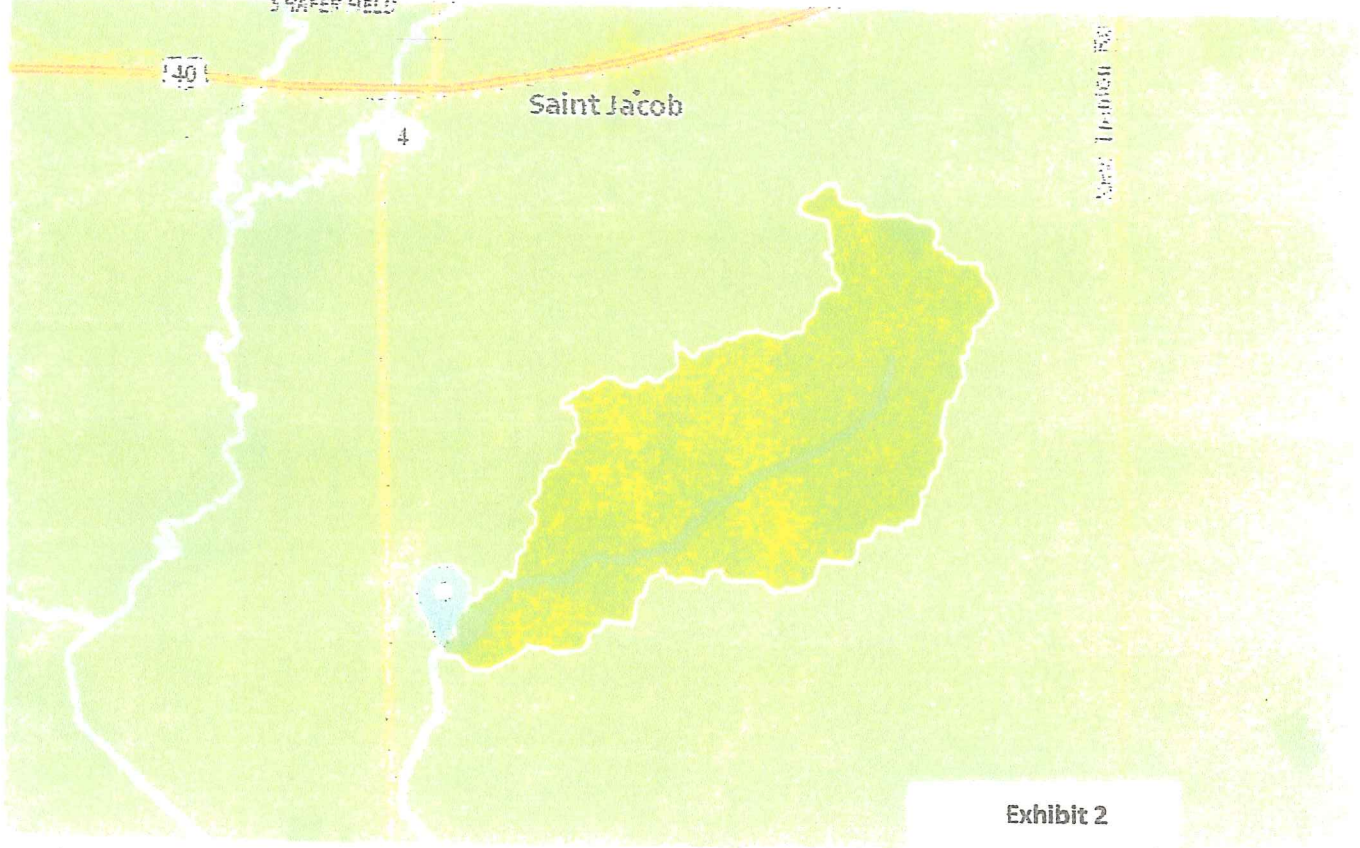
Alan Begole, duly authorized representative of Prairie Ridge Farms, Inc. of Caseyville, IL.



| | | | |
|---|---|---|---------------|
|  United States Department of Agriculture Natural Resources Conservation Service | File No. <i>Alan Begole</i> <i>5Mar2018.dwg</i> | Drawing No. ----- | Date ----- |
| | 2/14/18 1:00 PM Sheet of . | Designed: <i>Ray Johnson</i> Drawn: ----- Checked: ----- Approved: ----- | |
| Alan Begole Property area Sec. 5 T2N R6W St. Clair County, IL St. Clair County, Illinois | | | |

Lower end of Alan Begole Mitigation Area

Region ID: IL
 Workspace ID: IL20180207192117692000
 Clicked Point (Latitude, Longitude): 38.64466, -89.79944
 Time: 2018-02-07 13:21:36 -0600



IDNR-OWR jurisdictional authority for rural watersheds begins at 10 sq. mile drainage area and above

Basin Characteristics

| Parameter Code | Parameter Description | Value | Unit |
|----------------|---|--------|-----------------|
| DRNAREA | Area that drains to a point on a stream | 8.82 | square miles |
| GSL10_85 | Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known | 13.317 | feet per mi |
| SOILPERM | Average Soil Permeability | 0.982 | inches per hour |
| ILREG5 | Indicator variable for IL region 5, enter 1 if site is in region 5 else 0 | 1 | dimensionless |
| URBTHE2010 | Fraction of drainage area that is in urban classes 7 to 10 from Theobald 2010 | 0.003 | dimensionless |



Mound School Rd

Alan Begole
Stream top

Designed: Ray Johnson
Date: _____
Drawn: _____
Checked: _____
Approved: _____

St Clair County, Illinois



File No.
Alan Begole
5Mar2018.dwg
Drawing No.
3/5/18 10:02 AM
Sheet of .

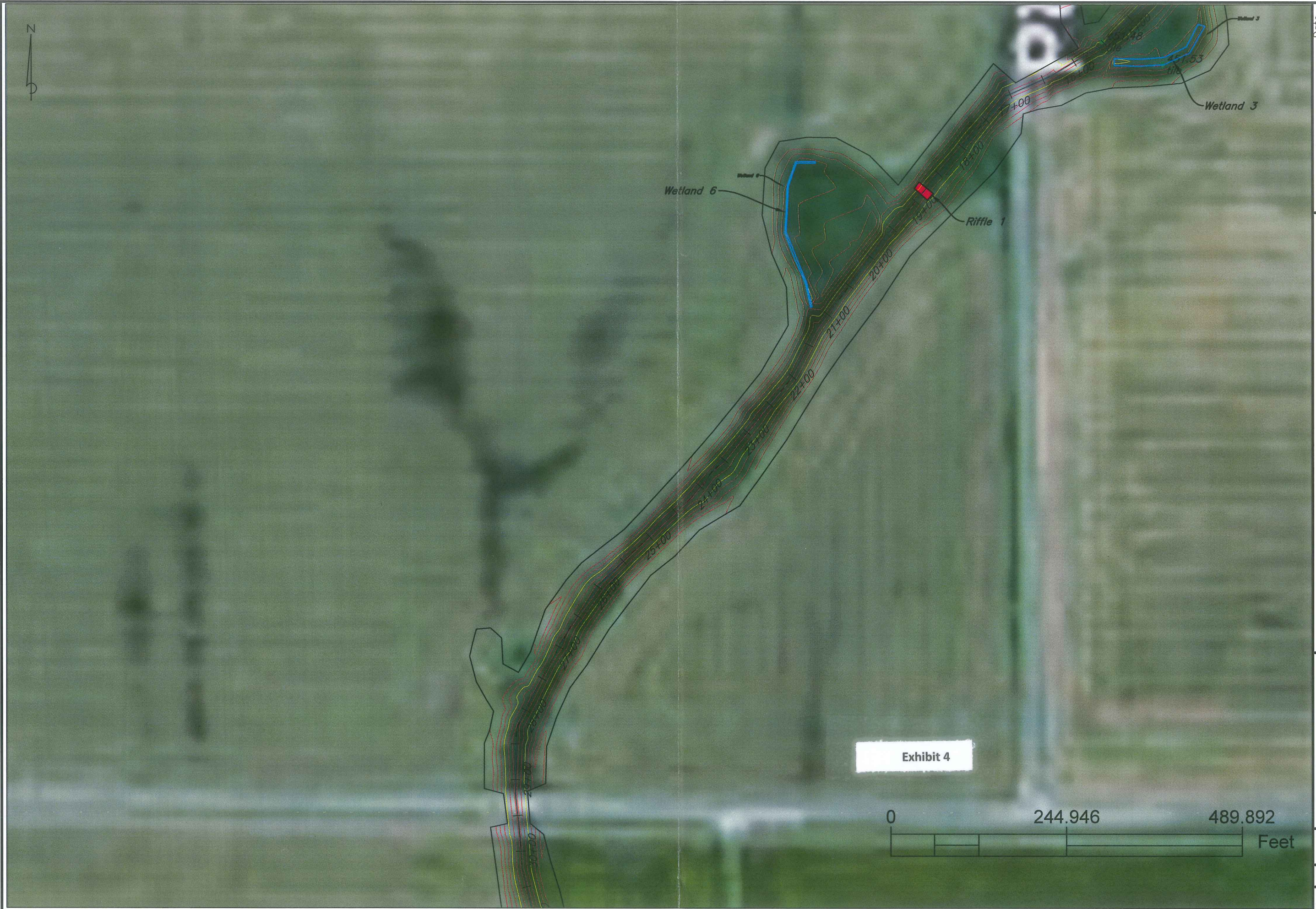
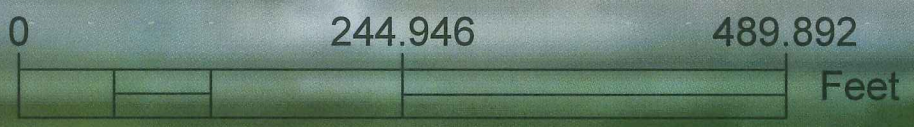


Exhibit 4



Date _____
 Designed: Ray Johnson _____
 Drawn: _____
 Checked: _____
 Approved: _____

Alan Begole
 Stream middle

United States
 Department of
 Agriculture
USDA
 Natural Resources
 Conservation Service

File No.
 Alan Begole
 5Mar2018.dwg
 Drawing No.

 3/5/18 10:02 AM
 Sheet of .

St Clair County, Illinois



Date _____
 Designed: Ray Johnson
 Drawn: _____
 Checked: _____
 Approved: _____

Alan Begole
 Stream bottom
 St. Clair County, Illinois



File No.
 Alan Begole
 5Mar2018.dwg
 Drawing No.

 3/5/18 10:02 AM
 Sheet of _____

STP- REACH 3

Stone toe protection

Riffle 3

STP- REACH 2

Stone toe protection

Riffle 2

Exhibit 5

Wetland 10

Wetland 10

446.92
tile

447.62
tile

448.77
tile

450.01
tile

46+00

45+00

44+00

43+00

42+00

41+00

40+00

39+00

38+00

37+00

36+00

35+00

34+00

33+00

32+00

31+00

30+00

29+00

28+00

27+00

26+00

25+00

24+00

23+00

22+00

21+00

20+00

19+00

18+00

17+00

16+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

20+00

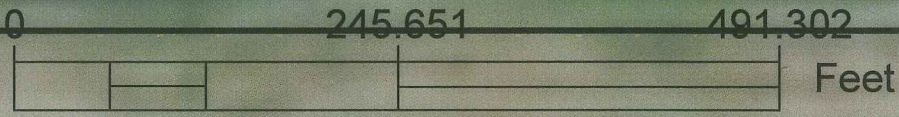
20+00

20+00

20+00



Exhibit 6



Date _____
 Designed: Ray Johnson
 Drawn: _____
 Checked: _____
 Approved: _____

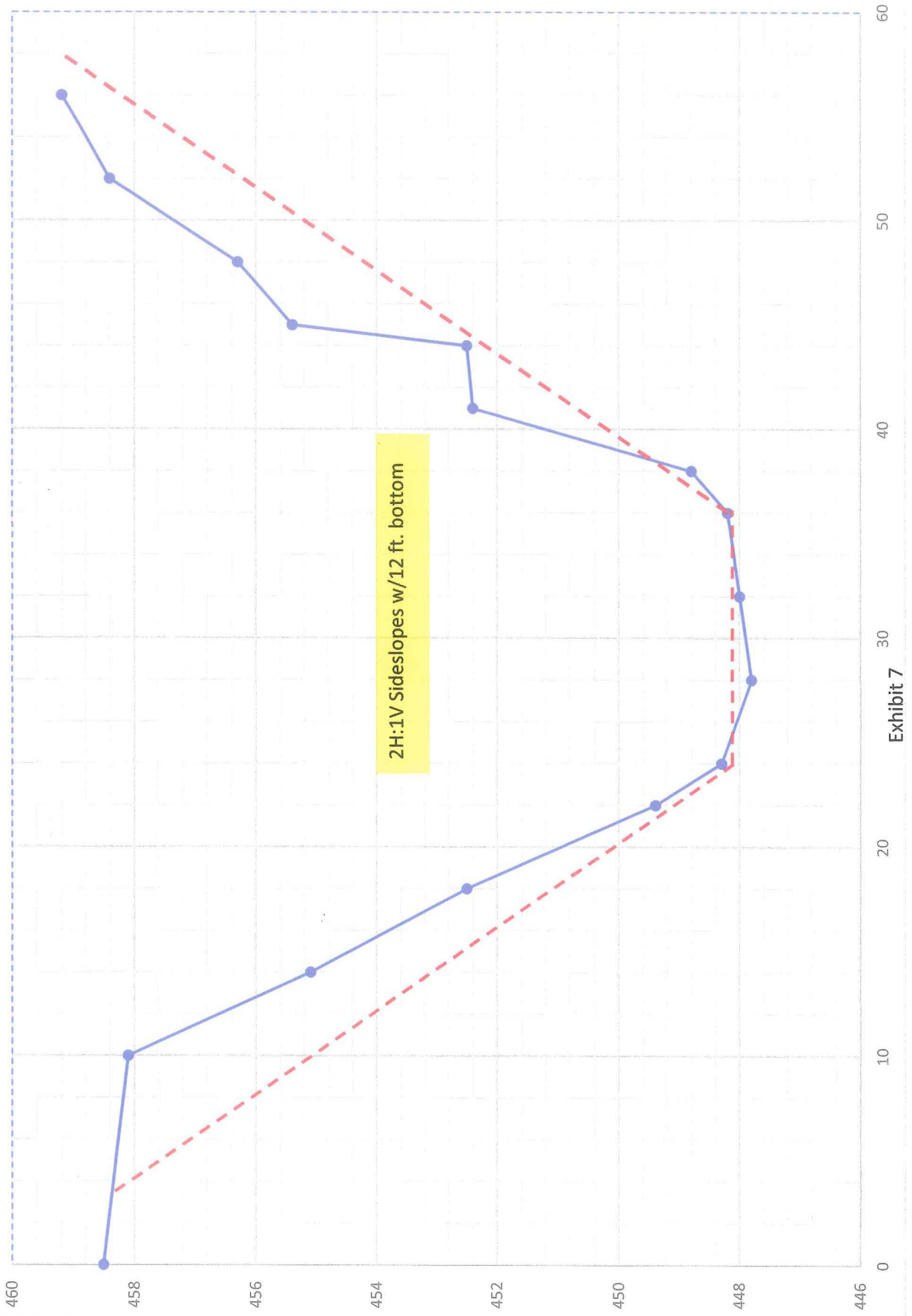
Alan Begole
 Stream bottom
 St Clair County, Illinois



File No.
 Alan Begole
 5Mar2018.dwg
 Drawing No.

 3/5/18 10:02 AM
 Sheet of .

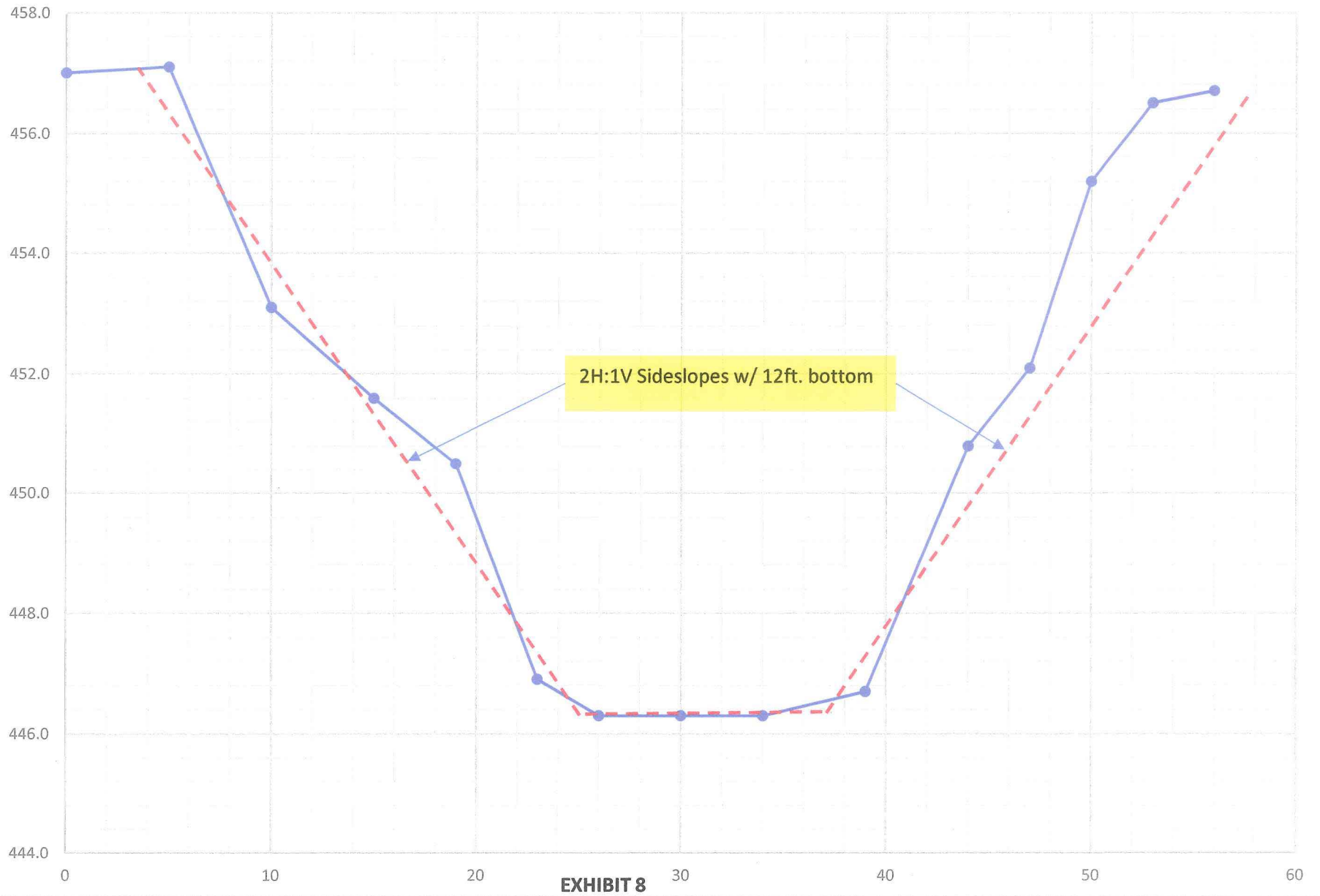
X-sec 5+46



2H:1V Sideslopes w/12 ft. bottom

Exhibit 7

X-sec. 18+83



X-sec. 31+47

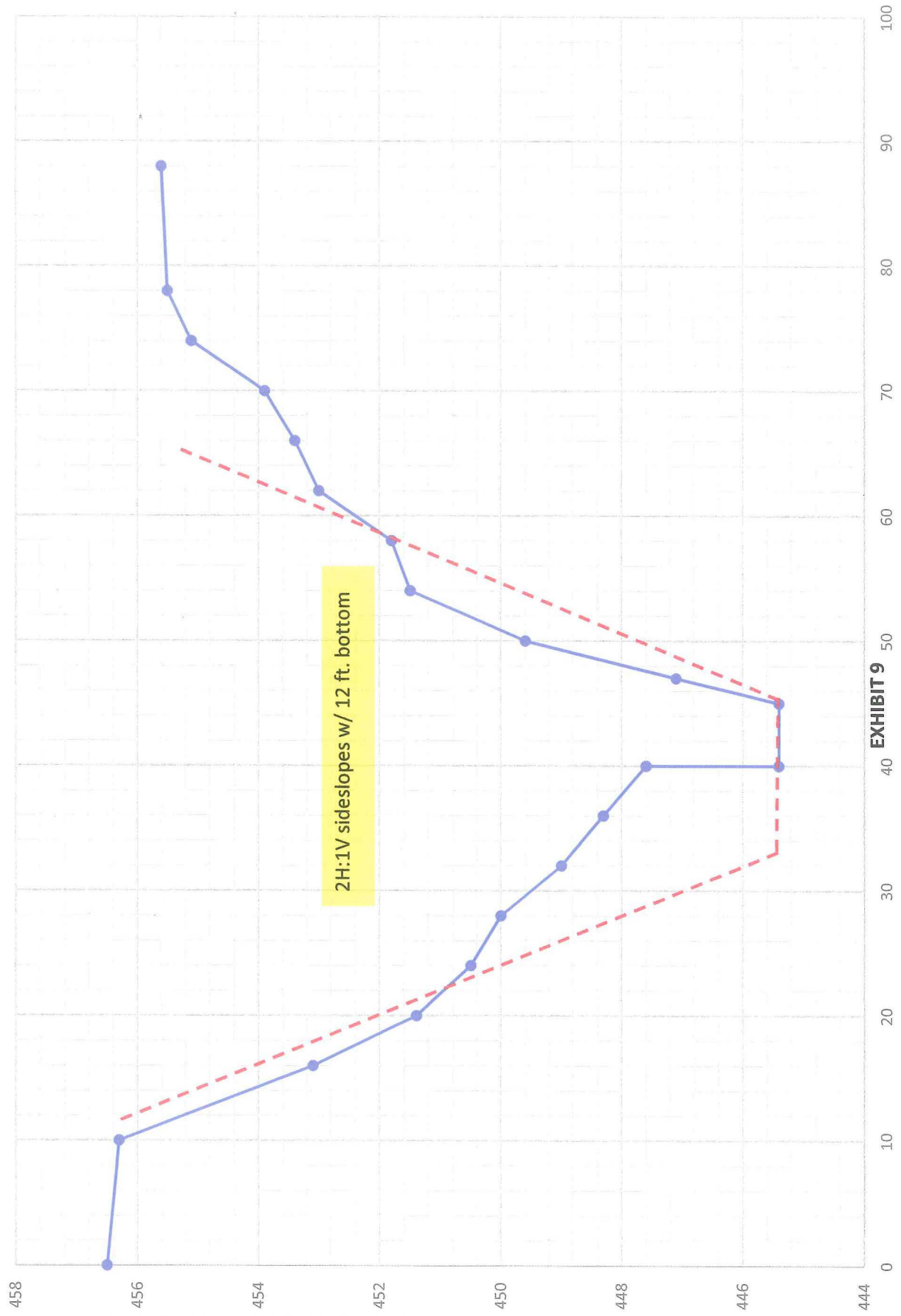
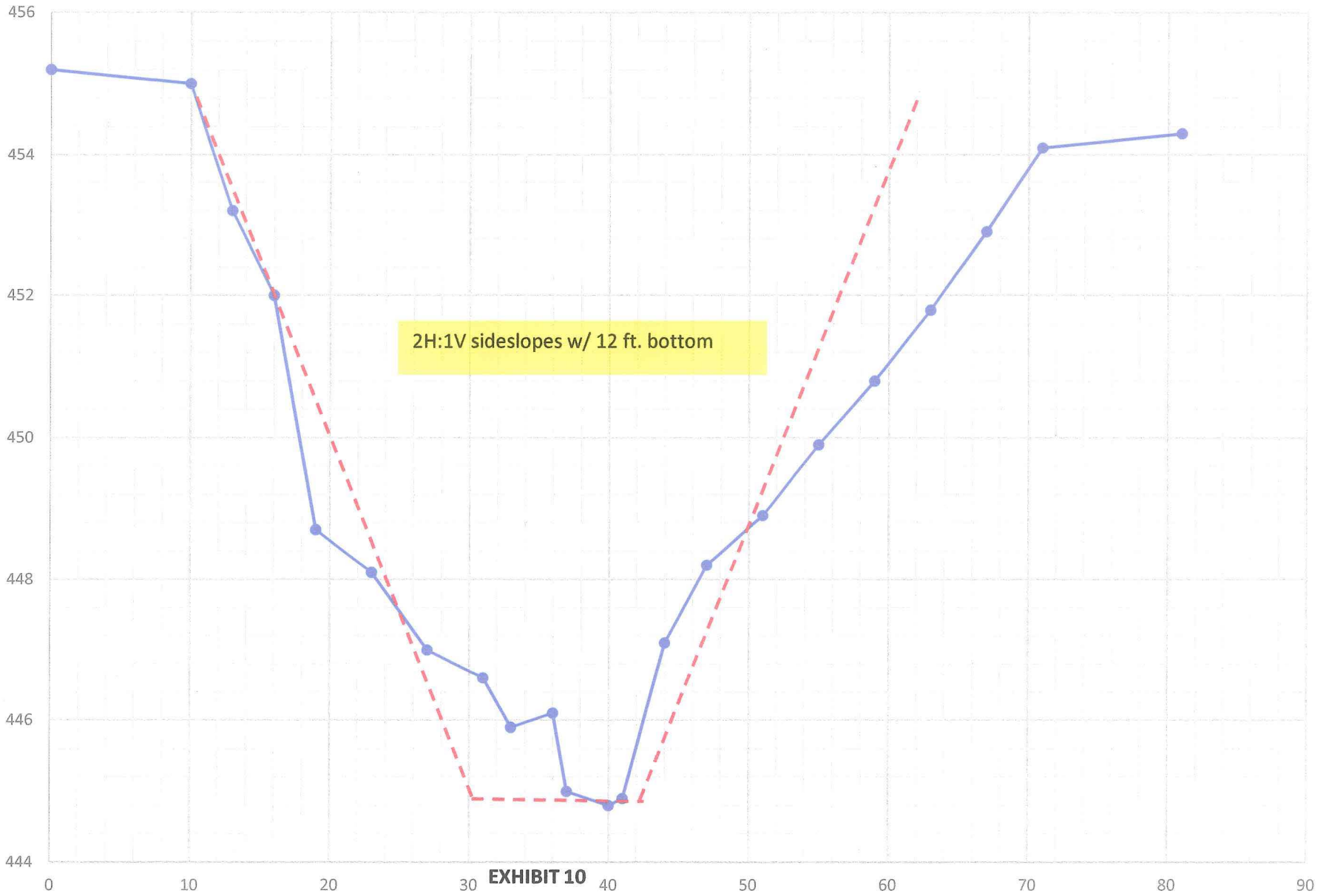
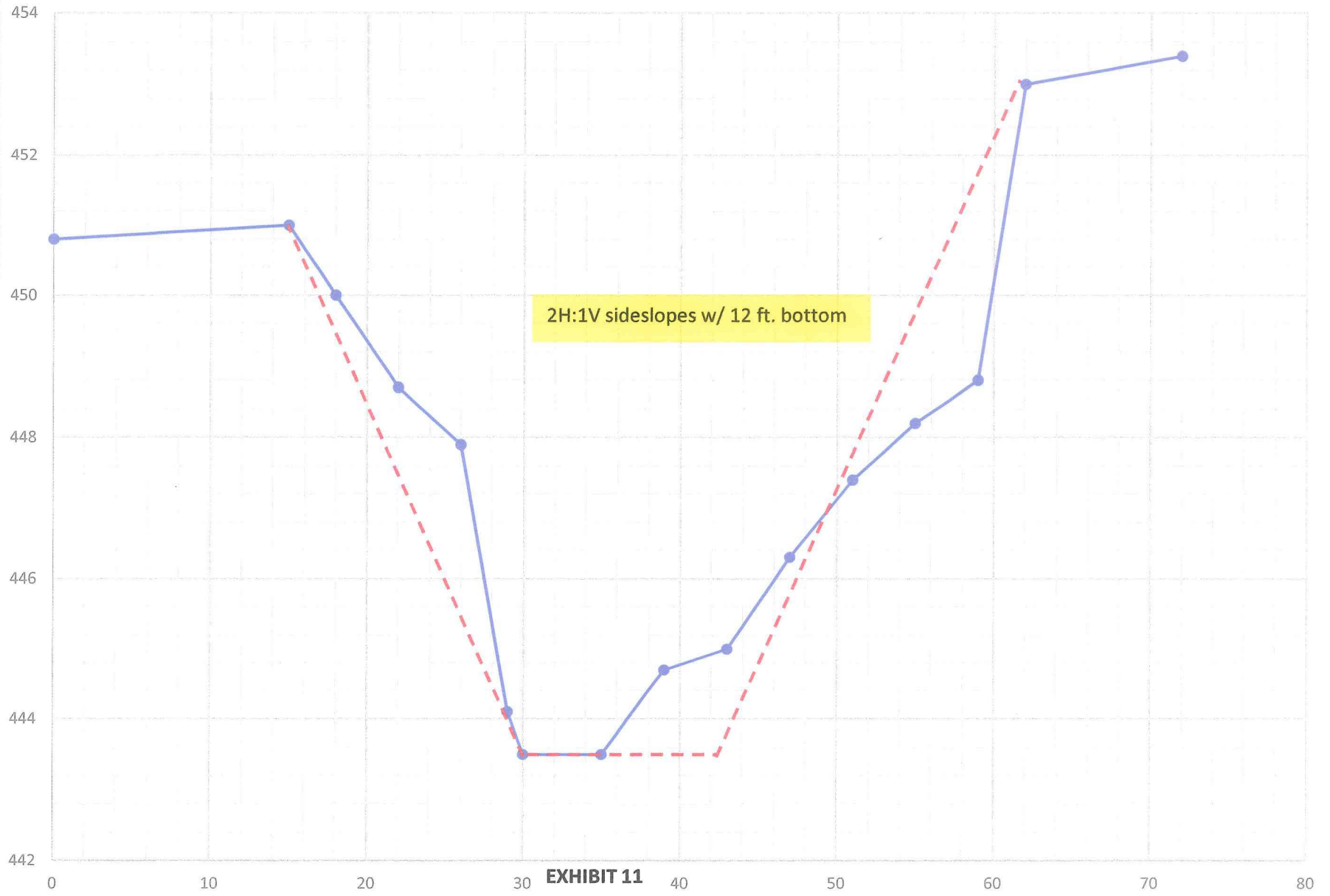


EXHIBIT 9

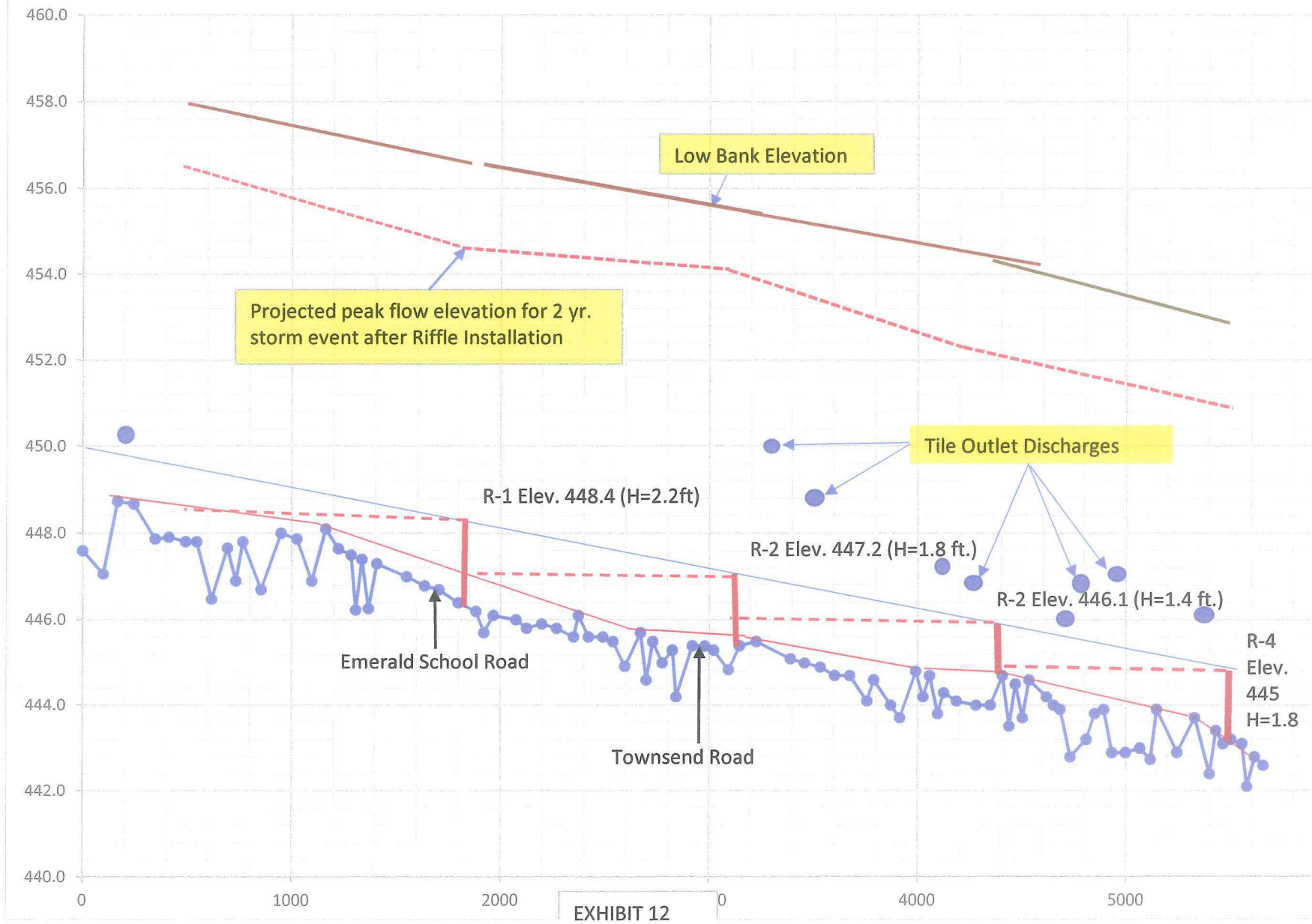
X-sec 44+08



X=sec 55+05



Proposed Riffles Little Silver Creek (Begole)



ATTACHMENT 1



HIGHLY ERODIBLE LAND AND WETLAND CONSERVATION DETERMINATION

| | | | |
|------------------|-------------|--|-------------------|
| Name Address: | Alan Begole | Request Date: 12/17/2011 | County: St. Clair |
| | | Tract No: 8268 | Farm No.: 7244 |
| | | Agency/Person Requesting Determination: | FSA |

Section I - Highly Erodible Land

| | |
|---|-----|
| Is a soil survey now available for making a highly erodible land determination? | Yes |
| Are there highly erodible soil map units on this farm? | No |

Fields in this section have undergone a determination of whether they are highly erodible land (HEL) or not; fields for which an HEL Determination has not been completed are not listed. In order to be eligible for USDA benefits, a person must be using an approved conservation system on all HEL.

| <u>Field(s)</u> | <u>HEL(Y/N)</u> | <u>Sodbust (Y/N)</u> | <u>Acres</u> | <u>Determination Date</u> |
|-----------------|-----------------|----------------------|--------------|---------------------------|
| | | | | |
| | | | | |
| | | | | |

The Highly Erodible Land determination was completed in the office.

Section II - Wetlands

| | |
|--------------------------------------|-----|
| Are there hydric soils on this farm? | Yes |
|--------------------------------------|-----|

Fields in this section have had wetland determinations completed. See the Definition of Wetland Label Codes for additional information regarding allowable activities under the wetland conservation provisions of the Food Security Act and/or when wetland determinations are necessary to determine USDA program eligibility.

| <u>Field(s)</u> | <u>Wetland Label*</u> | <u>Occurrence Year (CW)**</u> | <u>Acres</u> | <u>Preliminary Determination Date</u> | <u>Final Certification Date</u> |
|-----------------|-----------------------|-------------------------------|--------------|---------------------------------------|---------------------------------|
| undetermined | W | | 4.9 | 02/22/2011 | |
| undetermined | NW | | 7.0 | 02/22/2011 | |
| | | | | | |

The Preliminary Wetland Determination was completed in the field.
It was delivered to the USDA participant.

Remarks:

I certify that the above determinations are correct and were conducted in accordance with regulations and procedures contained in 7 CFR Part 12 and the National Food Security Act Manual.

| | |
|---------------------------------------|------------|
| Signature: Designated Conservationist | Date |
| | 02/22/2011 |

I certify the above determinations as Final. Preliminary Appeal Rights have been either concluded or not utilized in accordance with regulations and procedures contained in 7 CFR Part 614 and the National Food Security Act Manual.

| | |
|------------|------|
| Signature: | Date |
| | |

The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Assistant Secretary for Civil Rights, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, S.W., Stop 9410, Washington, DC 20250-9410, or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.

CPA-026e Supplemental Worksheet

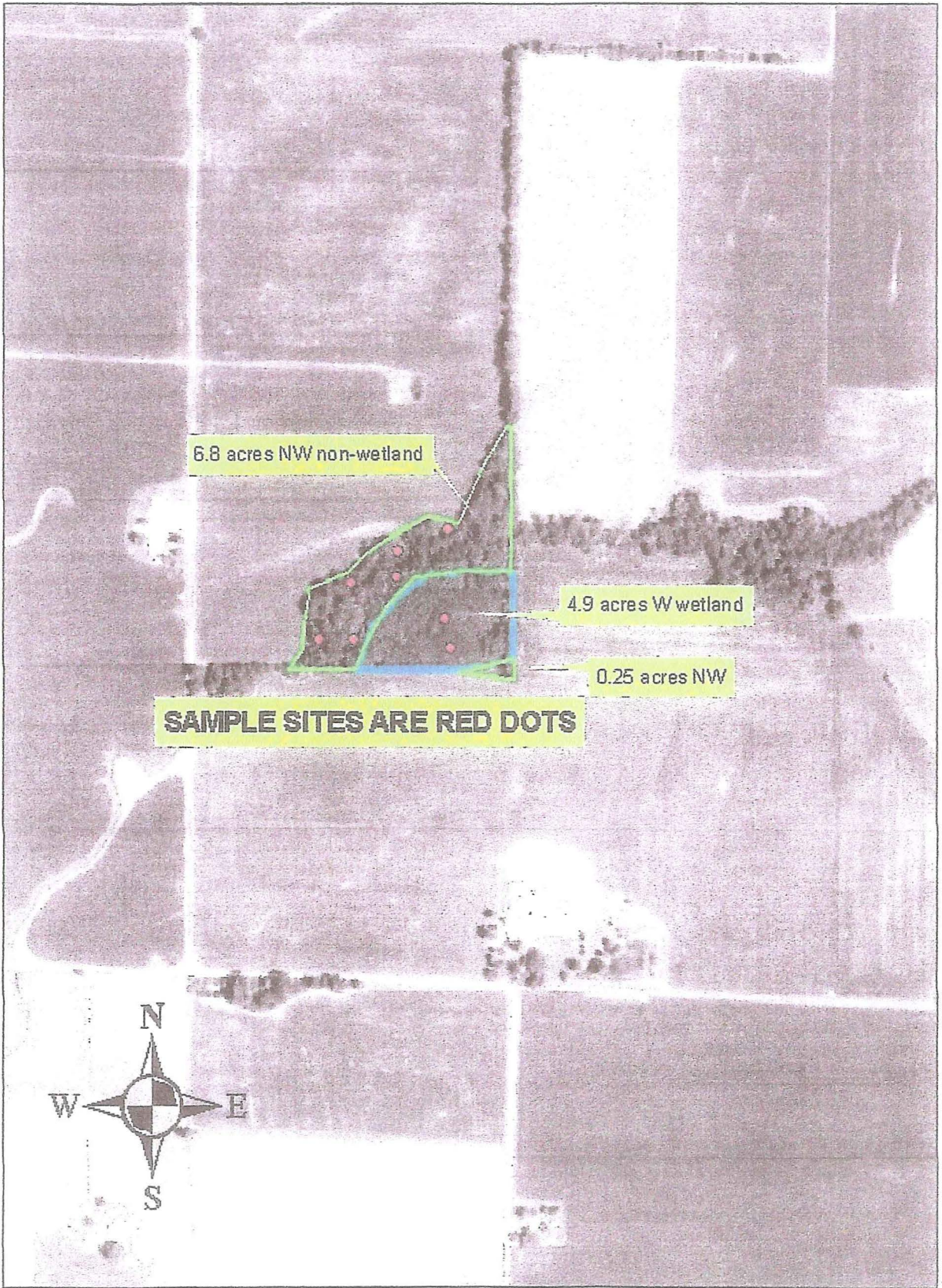
Section I - Highly Erodible Land

| Field(s) | HEL(Y/N) | Sodbust (Y/N) | Acres | Determination Date |
|----------|----------|---------------|-------|--------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Remarks:

The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Assistant Secretary for Civil Rights, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, S.W., Stop 9410, Washington, DC 20250-9410, or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.

Begole Wetland Delineation



6.8 acres NW non-wetland

4.9 acres W wetland

0.25 acres NW

SAMPLE SITES ARE RED DOTS

2,000

1,000

0

2,000 Feet

ATTACHMENT 2



Natural Resources Conservation Service

Critical Area Planting

Illinois Conservation Practice Job Sheet 342

| | | | |
|--------------------|--------------------|----------------------|----------------------|
| Field/Site: | | Area (Acres): | 3 |
| Name: | Alan Begole | Date: | Jan. 29, 2018 |
| Farm # | | Tract # | |

Definition

The establishment of permanent vegetation on sites that have or are expected to have high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.

Purpose(s)

- Stabilize stream and channel banks, pond and other shorelines
- Stabilize areas with existing or expected high rates of soil erosion by wind or water
- Stabilize areas, such as sand dunes and riparian areas

Conditions where practice applies

The practice applies to highly disturbed areas such as:

- active or abandoned mined lands;
- urban restoration sites;
- construction areas;

- conservation practice construction sites;
- areas needing stabilization before or after natural disasters such as floods, hurricanes, tornados and wildfires;
- eroded banks of natural channels, banks of newly constructed channels, and lake shorelines;
- other areas degraded by human activities or natural events.

Seedbed preparation and seeding

Incorporate required amendments to depth of 3 inches leaving a firm seedbed free of large clods, stones, and debris larger than 6 inches in diameter. Seedbed must be firmed with a cultipacker/cultimulcher, harrow, or similar tool designed to break clods, level, and firm the seedbed. Seedbeds are considered firm when footprints leave no more than a 1/2 inch deep depression. Apply seed uniformly at a depth of 1/4-1/2 inch with a drill or cultipacker type seeder. Broadcast methods are acceptable where the seed will be applied uniformly and covered 1/4-1/2 inch deep with a cultipacker/cultimulcher, harrow, or similar tool designed to break clods, level, and firm the seedbed.

Seed, Lime, and Fertilizer (Specify rates per acre)

| Species | Rate per Acre PLS lbs./ac | Acres | Total Quantity Needed | Amount Applied |
|---------------------|---------------------------|-------|-----------------------|----------------|
| Tall Fescue | 12 Lbs./Ac. | 3 | 36 | |
| Perennial Rye | 10 Lbs./Ac. | 3 | 30 | |
| Red Clover | 8 Lbs./Ac | 3 | 24 | |
| | | | | |
| Companion Crop | | | | |
| Oats | 100 lbs/ac | 3 | 300 | |
| Wheat or Cereal Rye | | | | |
| Amendments | | | | |
| Nitrogen(N) | 120 Lbs./Ac. | 3 | 360 | |
| Phosphorus(P205) | 120 Lbs./Ac. | | 360 | |
| Potassium(K20) | 120 Lbs./Ac. | | 360 | |
| Lime (Tons/acre) | | | | |
| | | | | |
| | | | | |

| | |
|-----------------------|-------------------------|
| Seeding Dates: | August 1 – September 20 |
|-----------------------|-------------------------|

All seed shall be of high quality and comply with Illinois Seed and Weed Laws and originate from the United States or Canada.

Seed rates are based on Pure Live Seed (PLS) per acre. Pure Live Seed will be calculated using the following formula:

$$\text{PLS} = \frac{(\% \text{ germination} + \% \text{ dormant seed}) \times \% \text{ purity}}{100}$$

Germination tests are required for all warm and cool season grasses and legumes (excluding companion crops). Germination tests may not be older than 12 months at time of seeding excluding the month of testing.

Legumes not pre-inoculated will be inoculated within 24 hours of seeding.

Pre-inoculated seed must be seeded within 60 days of inoculation unless coated. Coated pre-inoculated seed must be seeded within 12 months of inoculation. In no cases shall inoculum be used after the inoculum expiration date including inoculum that is included with the seed as a pre-treatment.

I certify that this practice, as implemented, meets NRCS standards and specifications.

Planner Signature

Date

Note: Make pen and ink changes to any specifications that were changed during implementation and attach supporting documentation (e.g. bills, seed tag data, photos, etc.) to the Job Sheet. All deliverables as shown in the statement of work are to be documented.

USDA – NRCS IS AN EQUAL OPPORTUNITY PROVIDER AND EMPLOYER





Natural Resources Conservation Service

Mulching

Illinois Conservation Practice Job Sheet 484

| | | |
|--|----------------|----------------|
| Landowner/Operator: Alan Begole | Farm #: | Tract#: |
| Date: Jan. 29, 2018 | Fields: | |

Definition

Applying plant residues or other suitable materials not produced on the site to the land surface.

Purpose (Check all Planned Purposes)

- Conserve soil moisture
- Reduce energy use associated with irrigation
- Provide erosion control
- Facilitate the establishment of vegetation
- Improve soil health
- Reduce airborne particulates



Photo courtesy of NRCS

Where Used

On soils subject to erosion, on critical areas, on soils that have a low infiltration rate, where needed for control of weeds, and where needed to establish seedlings, trees and shrubs.

OPERATION AND MAINTENANCE:

Mulched areas will be periodically inspected, and mulch shall be reinstalled or repaired as needed to accomplish the intended purpose.

Evaluate the effectiveness of the mulch (application, amount of cover provided, durability, etc.) and adjust the management or type of mulch to better meet the intended purpose(s).

Removal or incorporation of mulch materials shall be consistent with the intended purpose and site conditions.

Operation of equipment near and on the site shall not compromise the intended purpose of the mulch.

Prevent or repair any fire damage to the mulch material.

Properly collect and dispose of artificial mulch material after intended use.

Monitor and control undesirable weeds in mulched areas.



SPECIFICATIONS:

| | | | |
|--|--|--|----------------------------|
| Location #1: | Ditch Banks | | |
| Site Preparation: | Shaping with trackhoe and compacting loose soil to make firm | | |
| Type Of Mulch: | Straw | Rate: Specify depth, lbs/1000 ft², or tons/acre: | 2600 Lbs./Ac. |
| Square Ft. or Acres to be Mulched | Estimated Quantity of Mulch Needed | Type of Anchoring | Additional Remarks: |
| 3 | 7800 Lbs. | Crimping | |
| Location #2: | | | |
| Site Preparation: | | | |
| Type Of Mulch: | | Rate: Specify depth, lbs/1000 ft², or tons/acre: | |
| Square Ft. or Acres to be Mulched | Estimated Quantity of Mulch Needed | Type of Anchoring | Additional Remarks: |
| | | | |
| Location #3: | | | |
| Site Preparation: | | | |
| Type Of Mulch: | | Rate: Specify depth, lbs/1000 ft², or tons/acre: | |
| Square Ft. or Acres to be Mulched | Estimated Quantity of Mulch Needed | Type of Anchoring | Additional Remarks: |
| | | | |

I certify that this practice, as implemented, meets NRCS standards and specifications.

Planner Signature

Date

Note: Make pen and ink changes to any specifications that were changed during implementation and attach supporting documentation (e.g. bills, check out notes, photos, etc.) to the Job Sheet. All deliverables as shown in the statement of work are to be documented.

ATTACHMENT 3

NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS CONSTRUCTION SPECIFICATION

STREAMBANK STABILIZATION

Scope

The work shall consist of excavation and earthfill, along with furnishing and installing all materials for the streambank protection measures as shown on the drawings and specified herein.

Utilities and Permits

The landowner and/or contractor shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures. The landowner will obtain all necessary permissions from regulatory agencies, or document that no permits are required.

General

Construction operations shall be carried out in a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

Construction should be done during low flow conditions to minimize in-stream disturbances. Construction equipment should be kept out of the channel unless the project permit allows.

The completed job shall present a workmanlike appearance and shall conform to the line, grades, and elevations shown on the drawings or as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used. Contractor shall be assured that all state laws concerning buried utilities have been met.

Documentation of materials used (rock delivery tickets, geotextile tags, seed tags, etc) shall be saved and provided to NRCS.

All trees, stumps, roots, brush, weeds, broken concrete and asphalt materials, and other objectionable materials shall be removed from designated work area.

Disturbance to the existing banks and trees shall be minimized. Trees with a solid foundation which are not in the location of the rock riprap keys and/or do not restrict access for installation of treatment methods shall be left intact. As shown on the plans, tree limbs which are impeding the channel flow should be cut off, leaving the root wads intact.

Earthwork

To the extent they are suitable and approved by the inspector, excavated materials are to be used as fill materials. Excess spoil material shall be placed at locations shown on the drawings or as directed by the inspector.

Mound fill over the locations of rock riprap keys to ensure positive drainage from the area after settlement, as shown on the drawings.

Rock Riprap

The rock shall be dense; sound; and free from cracks, seams, or other defects conducive to accelerated weathering. The rock fragments shall be angular to sub-round in shape with the least dimensions not less than 1/3 the greatest dimension of the fragment. Riprap will meet the IDOT gradation and quality designation shown on the plans.

The rock shall be placed to the depths, dimensions and finish elevations specified on the drawings. The rock in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another and with the smaller rocks filling the voids. Some hand placing may be required to provide a neat and uniform surface.

Vegetation

A protective cover of vegetation shall be established on any earth surfaces designated on the construction plans. Seedbed preparation, seeding, fertilizing, and mulching shall comply with the construction drawings and Construction Specifications 342, Critical Area Planting.

Rock Riffle Design Drawing Preparation

Landuser: Alan Begole
 Stream: Little Silver Creek
St. Clair County, Illinois
 Location: _____
 Sec.: _____ Twp.: _____ Range: _____

Date: 10/26/2017
 By: Wayne Kinney

| | |
|---|--|
| Given the following bankfull data from the I&E form : | Then the guidelines below should be followed for: |
| Q = 439 cfs V = 2.53 ft/sec width = 41.0 ft | No net increase in flood stage or backwater: Maximum riffle height = 2.1 ft |
| | Structural integrity: Minimum riprap size = 10 inches |

Benchmark EL: 457.44 ft
 Description: Orange paint spot on NW corner of bridge abutment on Townsend
 Road: _____

Key Depth: 5 ft
 Riffle Slope: 20

| REFERENCE TABLE | | |
|-----------------|---------------------------|-----------------|
| IDOT Class | h_4 (D ₁₀₀) | D ₅₀ |
| 4 | 1.3 ft | 7.4 in |
| 5 | 1.7 ft | 9.8 in |
| 6 | 2.0 ft | 12.1 in |
| 7 | 2.5 ft | 14.6 in |

Selected rock gradation:

NOTE: Gradation 5 is the same as former RR-5.

For definitions of dimensions, refer to [IL-ENG-165A](#) and [IL-ENG-165B](#)

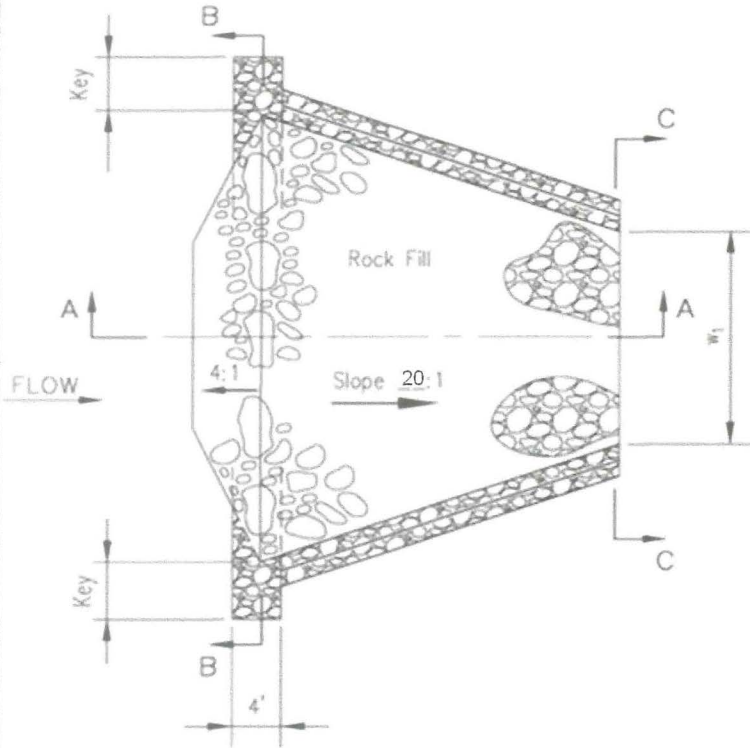
| Riffle No. | STA | Control EL (ft) | h_1 | h_2 | h_3 | h_4 | W_1 | Estimated Rock (Tons) | |
|--------------|-------|-----------------|-------|-------|-------|-------|-------|-----------------------|-----|
| | | | | | | | | Calculated | USE |
| 1 | 18+83 | 448.4 | 2.2 | 2.7 | 9.0 | 1.7 | 12.0 | 146 | 160 |
| 2 | 31+47 | 447.2 | 1.8 | 2.3 | 9.0 | 1.7 | 12.0 | 117 | 130 |
| 3 | 44+08 | 446.1 | 1.4 | 1.9 | 9.0 | 1.7 | 12.0 | 93 | 105 |
| 4 | 55+05 | 445.0 | 1.8 | 2.3 | 9.0 | 1.7 | 12.0 | 117 | 130 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Total Stone: | | | | | | | | 525 Tons | |

Notes:

Benchmark EL 457.44
 Description Orange paint spot on NW corner of bridge abutment on Townsend Road

$(h_2 = h_1 + 0.5')$

| Riffle No | Sta | Control Elev | h_1 | h_2 | h_3 | h_4 | W_1 | Estimated Rock (Tons) |
|-------------|-------|--------------|-------|-------|-------|-------|-------|-----------------------|
| 1 | 18+83 | 448.4 | 2.2 | 2.7 | 9.0 | 1.7 | 12.0 | 160 |
| 2 | 31+47 | 447.2 | 1.8 | 2.3 | 9.0 | 1.7 | 12.0 | 130 |
| 3 | 44+08 | 446.1 | 1.4 | 1.9 | 9.0 | 1.7 | 12.0 | 105 |
| 4 | 55+05 | 445.0 | 1.8 | 2.3 | 9.0 | 1.7 | 12.0 | 130 |
| Total Stone | | | | | | | | 525 Tons |



| GRAD. NO. | h_4 (D_{100}) | D_{50} |
|-----------|---------------------|----------|
| A-4 | 1.3 ft | 7.4 in |
| A-5 | 1.7 ft | 9.8 in |
| A-6 | 2.0 ft | 12.1 in |
| A-7 | 2.5 ft | 14.6 in |

- NOTE:
1. Rock gradation shall meet IDOT requirements for GRAD. NO. 5 riprap, quality designation "A", or as designated by engineer.
 2. Use largest available stones from available material as shown for the emergent boulders and crest stone.
 3. Riffle slope shall be 20:1 or flatter where fish passage is required.

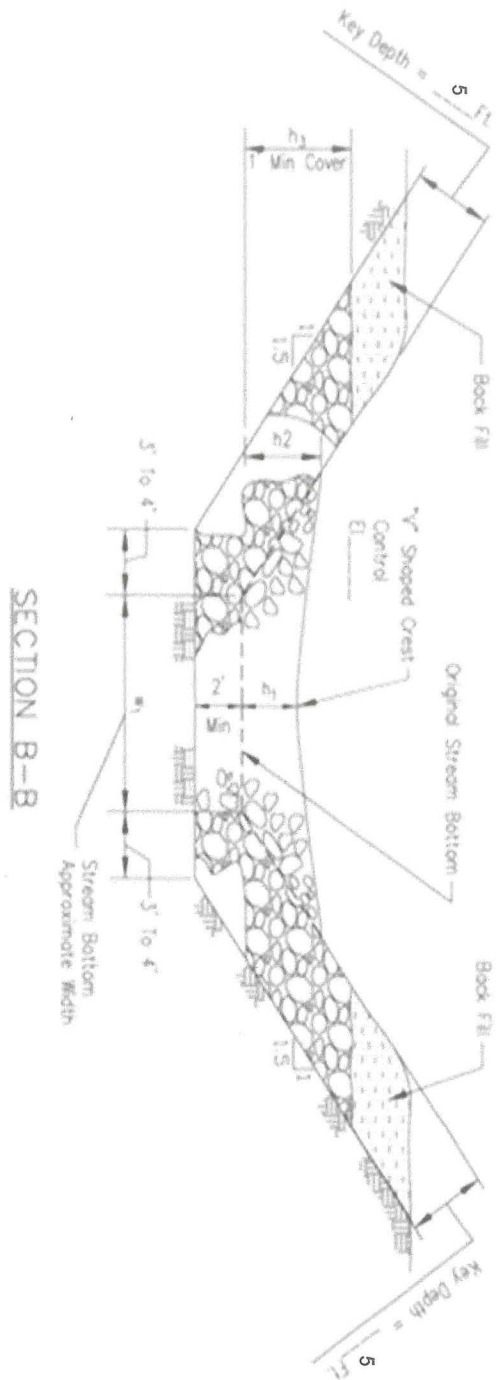
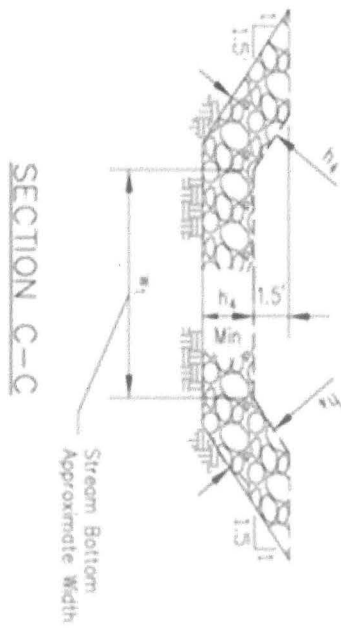
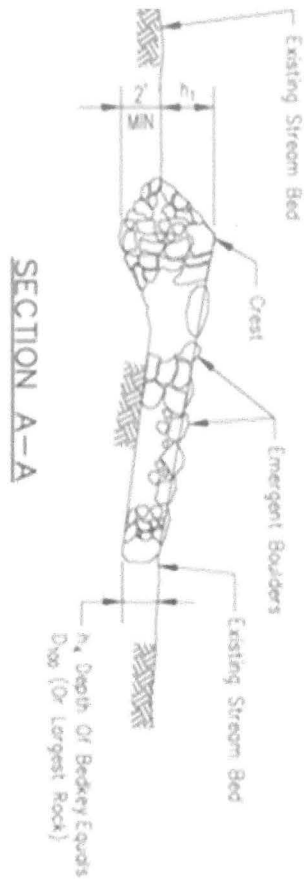
NOT TO SCALE

Designed Wayne Kinney Date 10/26/17
 Drawn Wayne Kinney
 Checked Wayne Kinney
 Approved _____

STREAM BANK STABILIZATION
 ROCK RIFFLE DETAILS



File No. IL-ENG-165A
 Drawing No.



NOT TO SCALE



STREAM BANK STABILIZATION
ROCK RIFFLE DETAILS

| | | | |
|----------|----------|------|----------|
| Designed | Wayne | Date | 10/26/17 |
| Drawn | Kinney | | |
| Checked | QUINONES | 2/08 | |
| Approved | | | |

Longitudinal Peaked Stone Toe (STP) Design Drawing Preparation

Landuser: Alan Begole
 Stream: Little Silver Creek
St. Clair County, Illinois
 Location: _____
 Sec.: _____ Twp.: _____ Range: _____

Date: 10/26/2017
 By: Wayne Kinney

Selected rock gradation: 4
 Typical Riprap Section 1:1
 STP Sideslope: _____
 Key Depth 5 ft

| REFERENCE TABLE | | |
|-----------------|---------------------------------|-----------------|
| IDOT Class | Largest Rock(D ₁₀₀) | D ₅₀ |
| 4 | 1.3 ft | 7.4 in |
| 5 | 1.7 ft | 9.8 in |
| 6 | 2.0 ft | 12.1 in |
| 7 | 2.5 ft | 14.6 in |

NOTE: Gradation 5 is the same as former RR-5.

STP Reach 1

Bank: Left or Right Side Looking Downstream Right ▾
 Beginning (Upstream) Station: 6+46
 Beginning Station Description: _____

Benchmark EL: 461.71 ft.
 Description: Orange paint spot on SW abutment on Emerald School Road 3500

NOTE: Reach 1

Approx. Key Spacing: 100 ft.
 Downstream Riffle Elevation: 448.0 ft.
 Peaked Stone Level Crest EL: 450.0 ft.
 Average STP height: 2.5 ft.
 Total Length of STP: 200 ft. USE
 Average Tons/Ft. for STP: 0.43 0.5 Tons/ft.

For definitions of dimensions, refer to [IL-ENG-152](#)

| Key | STA | h ₁ (ft.) | W ₁ (ft.) | Est. Rock (Tons) | |
|-------------------------------|------|----------------------|----------------------|------------------|------|
| | | | | Calculated | USE |
| 1 | 6+46 | 8.0 | 2.0 | 15 | |
| 2 | 7+46 | 8.0 | 2.0 | 15 | |
| 3 | 8+46 | 8.0 | 2.0 | 15 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Average Tons Per Key: | | | | <u>15</u> | Tons |
| Total Rock Amount (Estimate): | | | | <u>146</u> | Tons |

STP Reach 2

Bank: Left or Right Side Looking Downstream Right ▾
 Beginning (Upstream) Station: 35+00
 Beginning Station Description: _____

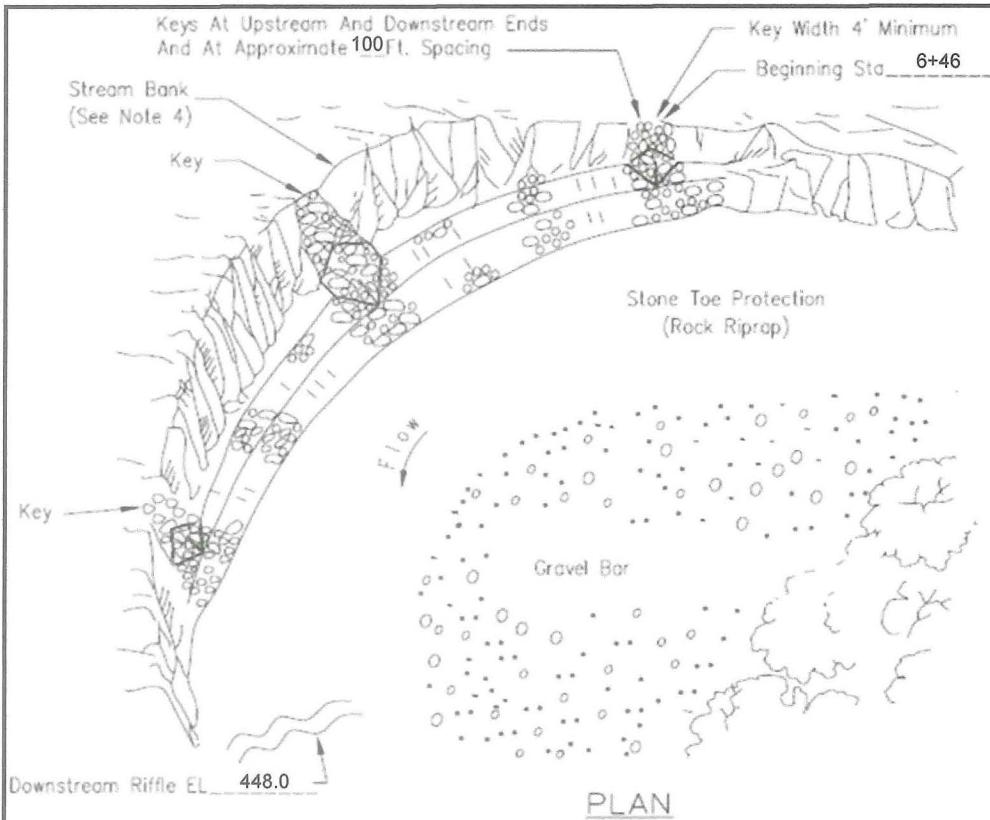
Benchmark EL: 457.44 ft.
 Description: Orange paint spot on NW corner of bridge abutment on Townsend Road over Little Silver Creek

NOTE: Reach 2

Approx. Key Spacing: 100 ft.
 Downstream Riffle Elevation: 447.2 ft.
 Peaked Stone Level Crest EL: 449.2 ft.
 Average STP height: 2.5 ft.
 Total Length of STP: 200 ft. USE
 Average Tons/Ft. for STP: 0.43 0.5 Tons/ft.

For definitions of dimensions, refer to [IL-ENG-152](#)

| Key | STA | h ₁ (ft.) | W ₁ (ft.) | Est. Rock (Tons) | |
|-------------------------------|-------|----------------------|----------------------|------------------|------|
| | | | | Calculated | USE |
| 1 | 35+00 | 8.0 | 2.0 | 15 | |
| 2 | 36+00 | 8.0 | 2.0 | 15 | |
| 3 | 37+00 | 8.0 | 2.0 | 15 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Average Tons Per Key: | | | | <u>15</u> | Tons |
| Total Rock Amount (Estimate): | | | | <u>146</u> | Tons |



| Key | Sta. | h_1 | W_1 | Level Crest El. |
|-----|------|-------|-------|-----------------|
| 1 | 6+46 | 8.0 | 2.0 | 450.0 |
| 2 | 7+46 | 8.0 | 2.0 | 450.0 |
| 3 | 8+46 | 8.0 | 2.0 | 450.0 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

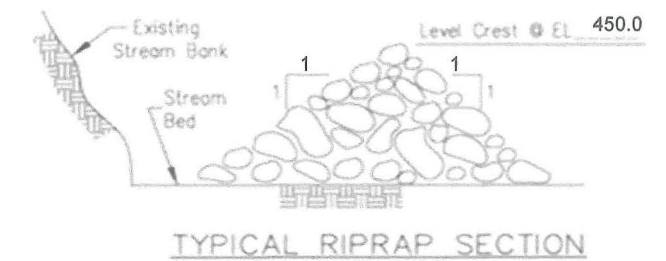
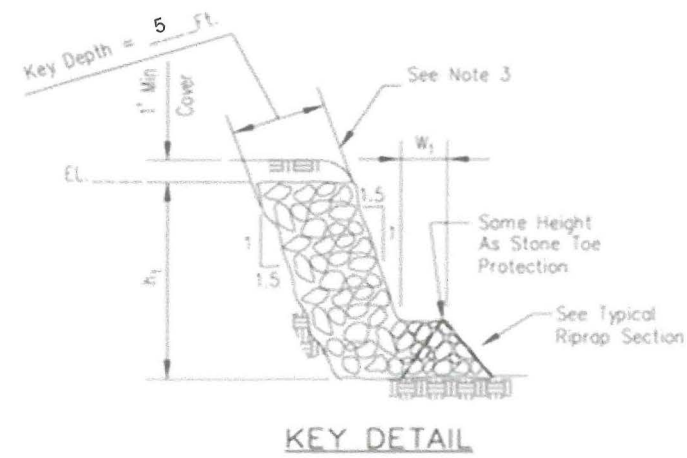
NOTE: Reach 1

Benchmark EL. 461.71

Description Orange paint spot on SW abutment on Emerald School Road 3500

Beginning Sta. Description _____

- Notes:
1. Rock gradation shall meet IDOT requirements for GRAD. NO. 4 riprap, quality designation "A", or as designated by engineer.
 2. Stone Toe 200 ft. @ 0.50 Tons / Ft. average
Keys 3 @ 15 Tons Each
Total Rock Amount (Estimate): 146 Tons
 3. Key shall be constructed so that the vertical section remains embedded in the existing stream bank.
 4. Location Right side of streambank looking downstream.



NOT TO SCALE

Date 10/26/17

Designed Wayne Kippney

Drawn M. GUBONES

Checked _____

Approved _____

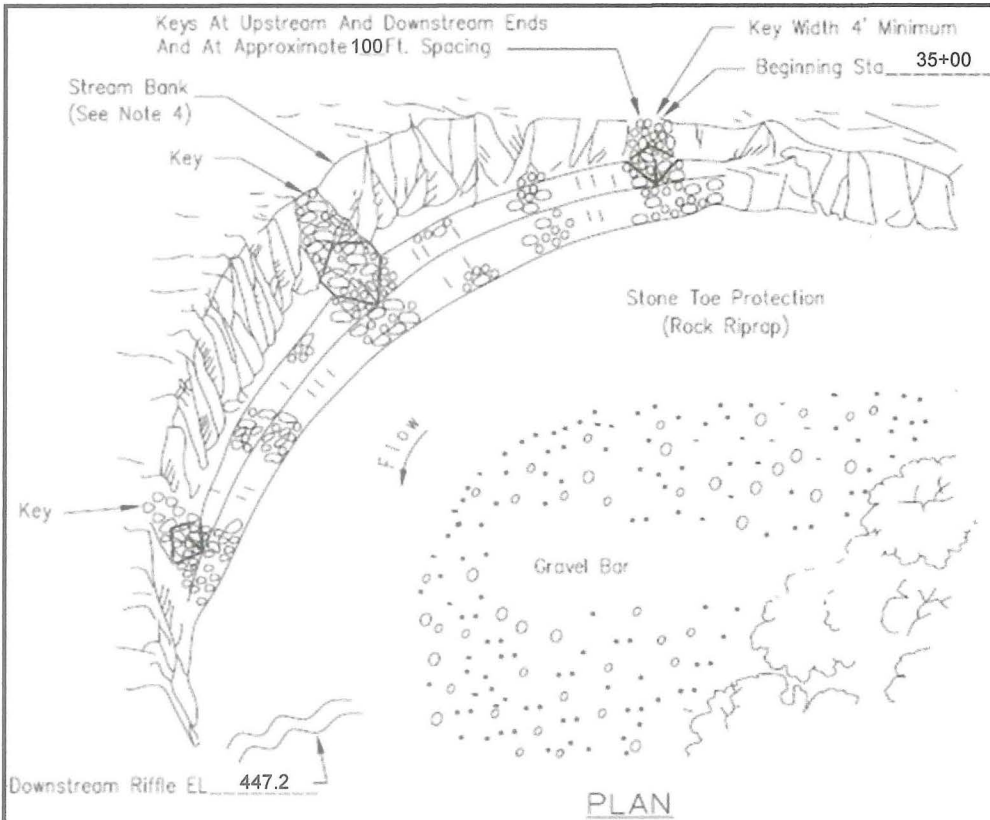
STREAM BANK STABILIZATION
STONE TOE PROTECTION



File No. ENG-152

Drawing No. _____

Sheet 1 of 1



| Key | Sta. | h_1 | W_1 | Level Crest El. |
|-----|-------|-------|-------|-----------------|
| 1 | 35+00 | 8.0 | 2.0 | 449.2 |
| 2 | 36+00 | 8.0 | 2.0 | 449.2 |
| 3 | 37+00 | 8.0 | 2.0 | 449.2 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

NOTE: Reach 2

Benchmark EL. 457.44

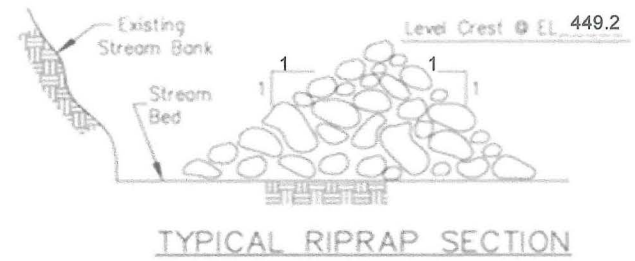
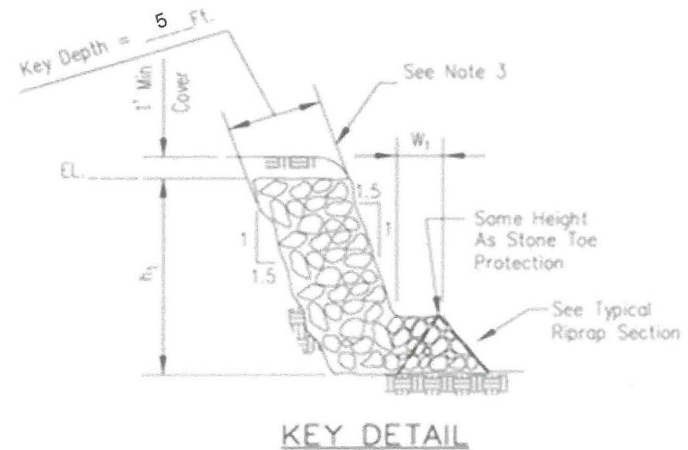
Description Orange paint spot on NW corner of bridge abutment on Townsend Road over Little Silver Creek

Beginning Sta. Description _____

Landowner Alan Begole

Stream Little Silver Creek

- Notes:
1. Rock gradation shall meet IDOT requirements for GRAD. NO. 4 riprap, quality designation "A", or as designated by engineer.
 2. Stone Toe 200 ft. @ 0.50 Tons / Ft. average
Keys 3 @ 15 Tons Each
Total Rock Amount (Estimate): 146 Tons
 3. Key shall be constructed so that the vertical section remains embedded in the existing stream bank.
 4. Location Right side of streambank looking downstream.



NOT TO SCALE

Date 10/26/17

Designed Wayne Kippay

Drawn M. GUINONES

Checked _____

Approved _____

**STREAM BANK STABILIZATION
STONE TOE PROTECTION**

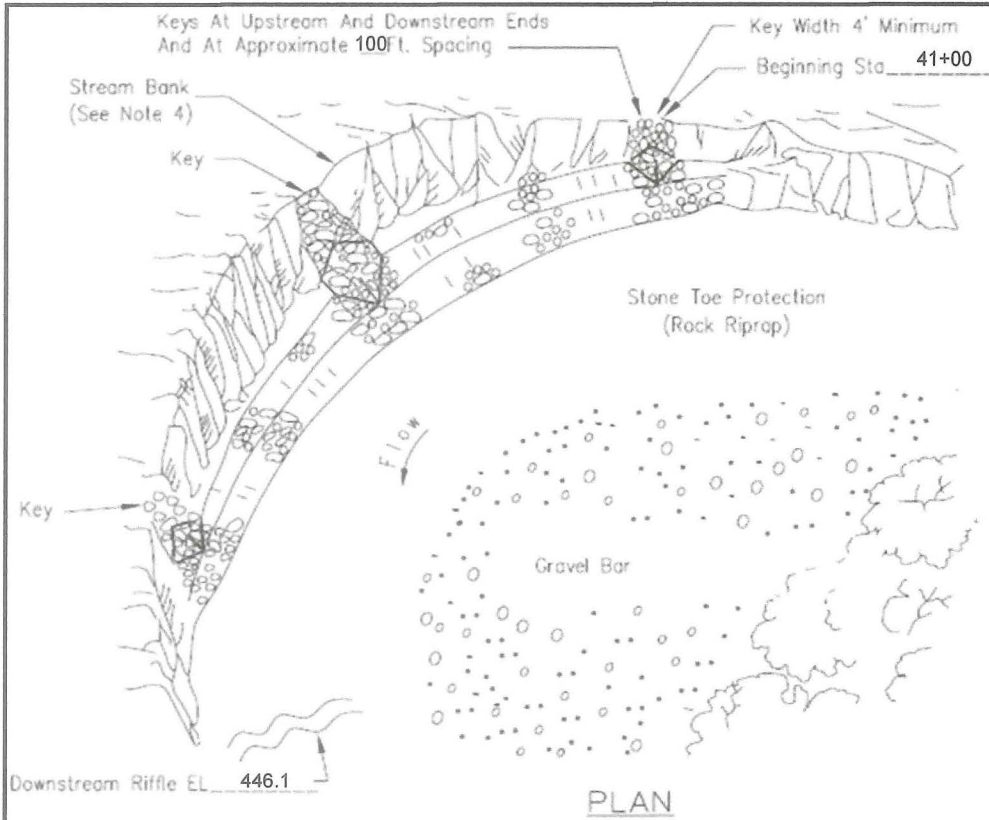


File No. ENG-152

Drawing No. _____

Sheet 1 of 1

Location T R St. Clair County, IL



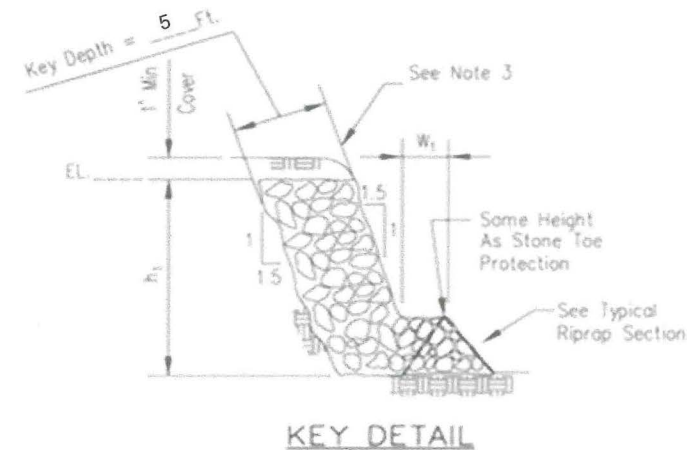
PLAN

| Key | Sta. | h_1 | W_1 | Level Crest El. |
|-----|-------|-------|-------|-----------------|
| 1 | 41+00 | 8.0 | 2.0 | 448.1 |
| 2 | 42+00 | 8.0 | 2.0 | 448.1 |
| 3 | 43+00 | 8.0 | 2.0 | 448.1 |
| 4 | 43+50 | 8.0 | 2.0 | 448.1 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

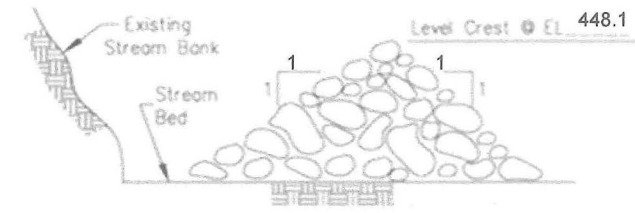
NOTE: Reach 3

Benchmark EL. 457.44
 Description Orange paint spot
On NW corner of bridge abutment on
Townsend Road over Little Silver Creek
 Beginning Sta. Description _____

- Notes:
1. Rock gradation shall meet IDOT requirements for GRAD. NO. 4 riprap, quality designation "A", or as designated by engineer.
 2. Stone Toe 250 ft. @ 0.50 Tons / Ft. average
 Keys 4 @ 15 Tons Each
 Total Rock Amount (Estimate): 187 Tons
 3. Key shall be constructed so that the vertical section remains embedded in the existing stream bank.
 4. Location Left side of streambank looking downstream.



KEY DETAIL



TYPICAL RIPRAP SECTION

NOT TO SCALE

Date 10/26/17
 Designed Kirby
 Drawn M. QUINONES
 Checked _____
 Approved _____

STREAM BANK STABILIZATION
 STONE TOE PROTECTION



File No. ENG-152

Drawing No. _____

ATTACHMENT 4

Natural Resources Conservation Service Guidelines for Determining Herbaceous Stand Adequacy & Diversity *Illinois Agronomy Technical Note No. 2*

After a grass/legume seeding, the question occasionally arises whether the stand is adequate for the intended purposes. This may include a determination of stand adequacy (density) and/or stand diversity. The purpose of Agronomy Technical Note IL-2 is to provide methodology that will be helpful in determining stand adequacy and plant diversity.

Assessing Stand Adequacy

For a newly established stand to be deemed adequate, it must protect the soil resource, and achieve the planned purpose(s).

Protection of the soil resource is determined by the percentage of the soil surface that is protected by the vegetative cover.

Rapid establishment of dense stands is more important for plantings that will be used for forage production and stabilizing critical areas than for seedings used on non-erosive idle land for wildlife purposes.

Successful establishment is dependent on: weather (temperature and moisture), seedbed conditions, planting depth, seed soil contact, seeding rate, seed quality (germination and % purity), insects and diseases.

After emergence, grasses and legumes progress to a climax density. Monocultures of grasses or legumes often reach a climax density when mature. Management of monoculture seedings can influence the ultimate climax density. For example, stands of most grasses that are mowed 3 to 5 times a year will generally have a higher plant and stem density than a stand that is never mowed or mowed only once a year. Pure legume stands mowed 2 or 3 times per year are likely to have higher plant densities than when mowed less or more frequently than 2 or 3 times.

Mixtures of introduced grasses and legumes typically reach their climax densities within

two years and mixtures of native grasses and forbs within three years. Management and environmental conditions ultimately dictate stand density. Assuming an adequate job of seeding and optimal growing conditions, a much higher density of plants would be expected four to six months after seeding than one year after seeding. Likewise, expect fewer plants two years after seeding than one year.



Stands that are obviously adequate or inadequate by visual observation generally do not need a formal stand evaluation. Where visual observations cannot be conclusive and/or the stand determination is likely to be disputed, methods of determining stand emergence and/or establishment are needed to help make a decision whether a stand is adequate or needs to be reseeded and for documentation and reference purposes. Determining stand density can be done in an accurate manner and in a short period of time by using one of three methods described below.

Skill in correct plant identification at the various growth stages is necessary for this determination. Knowledge of the vegetative characteristics of species to be sampled is also essential. If the field is sampled soon after emergence, a plant can often be uprooted with the seed attached to aid in identification.

The time the sampling is done should be based on the purpose of the seeding. Initial verification of introduced cool season grasses and legume seedings can be evaluated as soon as 4-6 weeks after emergence. An evaluation after one full growing season or one year after seeding should give a good indication of what the final stand will be. Meaningful evaluations of diverse native species stands are often not possible until a year or two after the initial seeding.

If the stand is spotty and includes skip areas, then more samples than the minimum may be required. If a portion of the field has had a different cropping history, fertilization program or major differences in soil types or slopes, the sampling should be stratified and the average plant densities kept separate for the different areas. Tabular entries should be made after each frame count to ensure accuracy. Initial stand counts should be made before excessive plant growth makes frame alignment and the counting procedure more difficult.

Table 1 provides some guidelines to help determine if a stand is adequate or inadequate based on species planted and the planned use. Using a frame size of one square foot, the number of seedlings counted per frame or the average of the samples taken on an area and compared to the values in Table 1 will indicate if a stand is adequate, or inadequate according to the numbers. If the count falls between adequate and inadequate then the stand is questionable. Questionable stands will need to be re-evaluated at a later time.

Weeds may also be inventoried during the sampling process; however, they should not be used to determine the adequacy of the stand.

If the stand is a mixture of species, all values in Table 1 should be reduced by the percentage of the ratio of each species planned in the mixture. For example, if the planned seeding is to result in a mixture of 50% orchardgrass and 50% alfalfa then the values in table 1 would be reduced by 50% for both components of the mixture. A sample form is included for your information and use. The information obtained from sampling plant density can be used as a reference point for making management decisions or evaluating seedings for program purposes. In some cases it may be determined that spot seeding is necessary because of a non-uniform stand. The sketch diagram indicating how the field is sampled should help define the areas needing reseeding. As the field is being sampled, the observer has the opportunity to spot weed infestations which may need to be controlled before they cause seedling mortality. The stand evaluation worksheet should be used as a management tool as well as a means of documenting stand establishment.

Frame Method

A one square foot frame is easily constructed with a variety of materials and shapes. A circular frame will present the least edge to area ratio. Error due to sampling increases as the ratio of edge to area increases, and the smaller the sampling unit, the greater the edge error. A circular one square foot frame will have a circumference of approximately 42.5 inches. One can be constructed from 3/16 inch plastic covered cable. The ends can be joined with a short section (1 inch) of .25 outside diameter cooper tubing.

The number of samples required depends on factors such as stand uniformity and the number of species to be counted. Generally a minimum of 10 counts or samples per 10 acres or less of field size would result in a representative sample. An effort must be made to avoid end rows or turn around areas that may have been double seeded. The observer must not be biased by dense or sparse stands, but needs to sample equally in a systematic manner.

To begin a sampling transect, select a landmark on the horizon and walk towards it in a straight line. The sampling pattern should be such that a representative plant density is obtained. A pre-determined number of steps should be taken on a line that is diagonal or perpendicular to the drill rows or the direction the seeding was done. When the number or pre-determined steps have been taken, drop the frame at the toe of your shoe on the final step. Only those plants that are rooted within the frame will be counted and used in determining the stand density. Normally, only the crowns are counted as counting each tiller will overestimate the actual number of plants per square foot.

Assessing Plant Diversity

Plant diversity is required for many different natural resource objectives. The desired plant diversity can only be obtained with a combination of proper seed mixture design and subsequent stand management. Absent any disturbance, natural succession usually leads to stands that are less diverse and thus less able to provide the desired plant community required by targeted wildlife and insect species. In many cases the acceptability of a plant stand is determined by a minimum number of plants per square foot. Additional criteria such as number of species of various types also need to be evaluated. Two additional methods for plant sampling are described below. With these two methods, planners can determine the species present and their frequency of occurrence. The information is

then used to gauge the adequacy of the stand for desired diversity objectives as well as determine conformance with specific conservation program requirements.

Line Transect Method

A stand may be evaluated using the line transect method similar to the line transect



This is an example of the stand count within the 1 ft circle ring three grasses and four Crimson Clovers. The black arrows represent the grass and the red arrows represent the clover.

method used in measuring crop residue in row crops. A 50-100 foot cable, tape measure or cord that has 100 equally spaced beads, marks, or knots will be required. As with all sampling methods avoid areas that visually appear atypical. Stretch the line across the field as close to the ground as possible. The line may have to be manipulated to get past the canopy while not allowing the vegetation to shift the alignment of the line. The person doing the counts will need to stand in such a way that the eye is directly over the marks on the line. Sight on one point of the bead, mark, or knot. A point is considered the size of a pinpoint. Walk the entire line counting and recording the number of plants by plant species on the evaluation form. Record basal hits. Basal hits are live plants and should only be counted if the crown is at or below a 1-inch height above the ground and intercepted by a point on the line. A minimum of 300 points (3 transects) per field should be taken. The tabulation of the percent occurrence of each species would be tallied the same as when measuring crop

residue. The total number of marks should then be divided into the number of desired species to determine percent of stand.



While completing the transect, count this as one plant (it contains multiple stems).

Step Point Method

The step point method is similar to the line transect method. To estimate the percent occurrence of each species or species type, mark a point on the toe of each shoe at which to site. Select an area that is representative of the field and walk a straight line across the area by sighting at an object in the horizon. The line should be selected randomly and should be typical for the field or the portion of the field being evaluated. Walk along the line and stop at every third pace and site down at the point on the shoe. A point is considered the size

of a pinpoint. Record basal hits as described for the line transect method. Walk 300 paces recording the type and number of plants by species on the stand evaluation form. Counting weedy species is optional.

If it is obvious both visually and after 150 paces that the stand diversity is not adequate (i.e. the stand is all one species), take a photo of the field and enter a comment on the worksheet that the stand diversity is obviously not adequate. If the stand diversity on a field is somewhat questionable after one transect (300 paces), then complete one or two additional transects.

In general, the following guidelines will be used to determine acceptable diversity in plant stands.

| | Frequency of Occurrence (%) |
|---|-----------------------------|
| Legumes ¹ | 15% or more |
| For an individual plant species to be counted as adequate | 10% or more |
| Total desirable species | 60% or more |

¹Criteria would be used if presence of legumes is specified.

STAND ADEQUACY EVALUATION

Conservationist: _____ Landowner: _____

Date: _____ Program: _____

Tract/Field: _____ Practice Name: _____ Code: _____

| Plant Species | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Total | Avg. | |
|------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|------|--|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL PER COUNT* | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*(If more than 25 counts ignore bottom totals)

Guidelines

Planting Date _____ Soil Type(s) _____
 Age of seeding _____ yrs _____ mo Seeding direction _____
 Total acres _____ Density of seeded species _____
 Plant vigor _____ Avg. Plant Height _____
 Stand is _____ Adequate _____ Questionable _____ Inadequate
 Weed Competition _____

Comments _____

 Recommendations to Cooperator _____

- Sample in a systematic and uniform manner
- Minimum of 10 counts for each 10 acres or less of field size
- Avoid areas that may have been double seeded
- Sample perpendicular or diagonal to drill rows - use a 1 square foot frame (12 in. x 12 in.) - use table 1 to determine stand adequacy
- Sketch how field was sampled



**TABLE 1 - PLANTS NEEDED PER SQUARE FOOT AT THE END OF SECOND
GROWING SEASON FOR HERBACEOUS STAND EVALUATION 1/**

| SPECIES | Forage Production | | Critical Areas | | Idle Land | |
|--------------------|-------------------|------------|----------------|------------|-----------|------------|
| | Adequate | Inadequate | Adequate | Inadequate | Adequate | Inadequate |
| Big Bluestem | >2.0 | <0.5 | >3.0 | <1.0 | >1.0 | <0.25 |
| Indiangrass | >2.0 | <0.5 | >3.0 | <1.0 | >1.0 | <0.25 |
| Switchgrass | >2.0 | <0.5 | >3.0 | <1.0 | >1.0 | <0.25 |
| Little bluestem | >3.0 | <0.75 | >3.0 | <1.0 | >1.0 | <0.25 |
| Kentucky bluegrass | >5.0 | <2.5 | >8.0 | <4.0 | >4.0 | <2.5 |
| Orchardgrass | >5.0 | <2.5 | >8.0 | <2.5 | >4.0 | <2.0 |
| Redtop | >5.0 | <2.5 | >8.0 | <4.0 | >4.0 | <1.5 |
| Smooth bromegrass | >4.0 | <2.0 | >8.0 | <4.0 | >4.0 | <1.0 |
| Tall Fescue | >5.0 | <2.5 | >8.0 | <4.0 | >4.0 | <2.0 |
| Timothy | >6.0 | <3.0 | > 8.0 | <4.0 | >4.0 | <2.0 |
| Alfalfa | >6.0 | <3.0 | >10.0 | <5.0 | >4.0 | <2.0 |
| Alsike clover | >6.0 | <3.0 | >10.0 | <5.0 | >4.0 | <2.0 |
| Birdsfoot trefoil | >6.0 | <3.0 | >10.0 | <5.0 | >4.0 | <2.0 |
| Crownvetch | >4.0 | <2.0 | >4.0 | <2.0 | >2.0 | <1.0 |
| Ladino clover | >6.0 | <2.0 | >8.0 | <2.0 | >4.0 | <1.0 |
| Red clover | >6.0 | <3.0 | >10.0 | <5.0 | >4.0 | <2.0 |
| Sweet clover | >6.0 | <3.0 | >10.0 | <5.0 | >4.0 | <2.0 |
| Korean Lespedeza | >6.0 | <3.0 | >10.0 | <5.0 | >4.0 | <2.0 |

- > = greater than
- < = less than

1/ For stands less than one year old, multiply values by 2. For stands with one but less than two full growing seasons multiply values by 1.5.

Example: A pasture seeding was completed. A mixture of tall fescue was seeded at 8 lbs. PLS. /acre and birdsfoot trefoil at 5 lbs. PLS. /acre. A total of 13 PLS lbs. /acre of seed was used. Roughly 62% of the total seed was tall fescue and 38% of the total seed was birdsfoot trefoil. The seeding was evaluated 6 months after establishment using a one foot square frame. Based on Table 1, $0.62 \times 10 = 6.2$ plants per square foot of tall fescue would be needed and $0.38 \times 12 = 4.5$ plants per square foot of birdsfoot trefoil would be needed. The stand is adequate.

EXAMPLE STAND ADEQUACY EVALUATION

Conservationist: _____ Landowner: _____
 Date: 10/15/2015 Program: EQIP
 Tract/Field: T2500, Field 2 Practice Name: Forage and Biomass Planting Code 512

| Plant Species | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Total | Avg. |
|-------------------|----|---|----|----|----|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|------|
| Tall Fescue | 10 | 5 | 15 | 20 | 8 | 10 | 4 | 6 | 8 | 12 | | | | | | | | | | | | | | | | 98 | 10 |
| Birdsfoot trefoil | 2 | 5 | 7 | 2 | 15 | 10 | 3 | 3 | 4 | 7 | | | | | | | | | | | | | | | | 58 | 6 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL PER COUNT* | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stand is Adequate _____ Questionable _____ Inadequate

Stand Diversity Summary Line Transect or Step Point Method

Conservationist: _____ Landowner: _____
 Date: _____ Program: _____
 Tract/Field: _____ Practice Name: _____ Code: _____
 Desired Species Diversity: _____

| Species | % Occurrence Transect 1 | % Occurrence Transect 2 | % Occurrence Transect 3 | Total % Occurrence | Average % Occurrence |
|---------|----------------------------|----------------------------|----------------------------|-----------------------|-------------------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Instructions: The stand diversity evaluation worksheet was developed to record observations for 100 points when using the line transect or step point method. At each point of the line or step, record the observed species and place a check mark in the box. Compute the total number of observations of each species and enter it into the summary table. Total desired species must equal at least 60%. Legume species must equal at least 15% and each desired individual grass species must equal at least 10% for the stand diversity to be adequate.

Stand is _____ Adequate _____ Questionable _____ Inadequate

Weed Competition _____

Comments _____

Recommendations to Cooperator _____

STAND DIVERSITY EVALUATION WORKSHEET

| | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | | |
|---------------|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|--|--|
| Plant Species | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | | |
| Plant Species | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | | |
| Plant Species | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | | |
| Plant Species | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Example: A pasture originally seeded to Orchardgrass and Alfalfa has been grazed for several years and occasionally hayed. The pasture has been thinning due to grazing practices and dry weather with some weeds encroaching. In the spring, Red Clover was frost seeded and hayed in early summer. A transect was performed to evaluate the species composition and the success of the Red Clover establishment. Only the species of interest were tallied. Some points along the transect were void of pasture species and were observed to be bare ground or weeds.

| STAND DIVERSITY EVALUATION WORKSHEET | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|--------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----------|----|
| Plant Species | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | |
| Red clover | * | | | | | * | | | | * | | * | | | | | | | | * | | | | | | | 5 |
| Orchardgrass | | * | | * | | | * | | | | | | | | | * | * | * | | | * | | * | * | * | | 10 |
| Tall Fescue | | | | | | | | * | * | | | | * | * | * | | | | | | * | | | | | | 6 |
| Alfalfa | | | | | * | | | | | | | | | | | | | | | * | | | | | | | 2 |
| STAND DIVERSITY EVALUATION WORKSHEET | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant Species | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | |
| | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | | |
| Red clover | * | * | | | | | | | | | * | | | | * | | * | | | | * | * | | | | | 7 |
| Orchardgrass | | | | * | * | | | | | | | * | * | * | | * | | * | | | | | | * | * | | 9 |
| Tall Fescue | | | | | | * | * | * | | | | | | | | | | | | | | | | | | | 3 |
| Alfalfa | | | | | | | | | | * | | | | | | | | | * | * | | | * | | | | 4 |
| STAND DIVERSITY EVALUATION WORKSHEET | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant Species | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | |
| | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | | |
| Red clover | | | | | | * | | | | * | | | | * | | * | | | | | | | | | * | | 5 |
| Orchardgrass | * | * | | | * | | * | * | | | * | | | | * | | | | | | | * | * | * | | | 10 |
| Tall Fescue | | | * | | | | | | * | | | | | | | | * | * | * | * | * | | | | | | 7 |
| Alfalfa | | | | * | | | | | | | * | | | | | | | | | | | | | | | | 2 |
| STAND DIVERSITY EVALUATION WORKSHEET | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant Species | Sample Point | | | | | | | | | | | | | | | | | | | | | | | | | Subtotal | |
| | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | | |
| Red clover | * | | | | | | | | | | * | | * | | | * | * | | | | * | | | | | | 6 |
| Orchardgrass | | * | * | | | | | * | * | | | | | | | | | | | | | * | * | * | * | | 8 |
| Tall Fescue | | | | | | | | | | * | | | | * | * | | | | | | | | | | | | 3 |
| Alfalfa | | | | * | | * | * | | | | | | | | | | | | * | | | | | | | | 4 |

Example Stand Diversity Summary

| Species | Total % Occurrence |
|--------------|--------------------|
| Red clover | 23 |
| Orchardgrass | 34 |
| Tall Fescue | 19 |
| Alfalfa | 12 |

Summary: Only one step point transect was taken. Legumes are over 15% and each individual grass species is over 10%. The pasture consists of 35% legumes, 53% pasture grass species and 88% desirable species. The stand diversity is adequate.

ATTACHMENT 5

NATURAL RESOURCES CONSERVATION SERVICE

ILLINOIS OPERATION AND MAINTENANCE

STREAMBANK STABILIZATION

Follow the operation and maintenance plan below to keep your streambank stabilization measures functioning as intended:

- Inspect treated areas and associated practices annually, after significant storm events, and after ice flow to identify repair and maintenance needs.
- Check all rock riprap sections for accelerated weathering and displacement. Replace to original grades if necessary. Some movement of smaller stone and sorting of material is expected.
- If any crest stones (large rocks used to form the center ridge of a rock riffle or stream barb) are displaced, the structure should be repaired immediately.
- Periodically inspect the bank area above the rock keys. If any settlement or displacement of the earth fill is observed, the settled area should be promptly refilled and compacted to prevent the formation of a surface flow channel that would erode the supporting bank material.
- All settlement or cracks in the soil should be investigated to determine the cause and immediately repaired.
- Remove any debris that accumulates at the protected section, and immediately upstream or downstream from the installed structures.
- In cases where the bank is left in a near vertical position, expect continued bank failure until a stable slope is reached.
- Natural regeneration of native vegetation including woody plants should be left intact to improve bank stability and wildlife habitat.
- If fences are installed, they shall be maintained to prevent unauthorized human or livestock entry.
- Control livestock access on unfenced areas.
- Keep machinery away from steep side slopes. Keep equipment operators informed of all potential hazards.
- Immediately repair any vandalism, vehicular, or livestock damage.

Additional Details:

11-11-12 11:11 AM