Becker County

Shoreland Contractor Certification Program

Becker County Permitting Considerations

APPENDIX A:

Shoreland Classification Lists and Development Standards

LAKE CLASSIFICATION & SIZ SETBACK:

1. Public Waters Classification for Becker County
   - You will have to scroll through the PDF
2. Find the Lake your Project is on
3. Determine the Classification
4. This Determines the Shore Impact Zone Setback
   - SIZ Setback

SHORE IMPACT ZONE SETBACKS (SIZ):

NE – Natural Environment Lake	75 feet
RD – Recreation Development Lake	50 feet
GD – General Development Lake	37.5 feet

DOWNLOAD PDF

1

3. PUBLIC WATERS CLASSIFICATION FOR BECKER COUNTY

	Shore Impact Zone	Building setback
Key: NE - Natural Environment Lake	75 feet	150 feet
RD - Recreational Development Lake	50 feet	100 feet
GD - General Development Lake	37.5 feet	75 feet

Numbers in parenthesis ( ) indicate lake acres in other counties

3

Lake ID #	Lake Name	Township	Sections	Acres	Lake Frontage Required	Lot Area Required in Sq ft	Classification
2	Abbey	Lake View	14, 23	286	250 ft	100,000	NE
39	Abners	Savannah	17	100	400 ft	160,000	NE
258	Acorn	Burlington	20,21,28,29	144	150 ft	40,000	RD
266	Albertson	Burlington	35, 36	73	150 ft	40,000	RD
432	Anderson	Callaway	21, 22, 28	44	600 ft	240,000	NE
567	Apple	Spring Creek	5, 6	73	500 ft	200,000	NE
496	Arrow	Lake Eunice	18, 19	18	600 ft	240,000	NE
104	Aspenwall	Pine Point & Round Lake	30, 31, 25, 36	178	400 ft	160,000	NE
521	Audubon	Audubon	N 15, 16	91	150 ft	40,000	RD
660	Axberg	Lake Park & Clay Co	19, 24	24 (47)	500 ft	200,000	NE
336	Bad Boy	Maple Grove	19	44	600 ft	240,000	NE
85	Bad Medicine	Forest	4, 5, 7 - 9, 17 - 19	782	150 ft	40,000	RD
478	Baker	White Earth & Spring Creek	19, 24	41	100 ft	20,000	GD
652	Balke	Atlanta	24, 25	121	400 ft	160,000	NE
178	Ballard	Height of Land	10, 11, 14, 15	64	500 ft	200,000	NE
292	Balsam	Holmesville	11, 12	148	400 ft	160,000	NE

Becker County Zoning Ordinance — Appendix A — 153

Shore Impact Zone (SIZ)

Lake Classifications

1	NE – Natural Environment Lake	75 feet
2	RD – Recreation Development Lake	50 feet
3	GD – General Development Lake	37.5 feet

Permitting Considerations

APPENDIX A:

Shoreland Classification Lists and Development Standards

DOWNLOAD PDF

ORDINARY HIGH WATER LINE (OHWL):

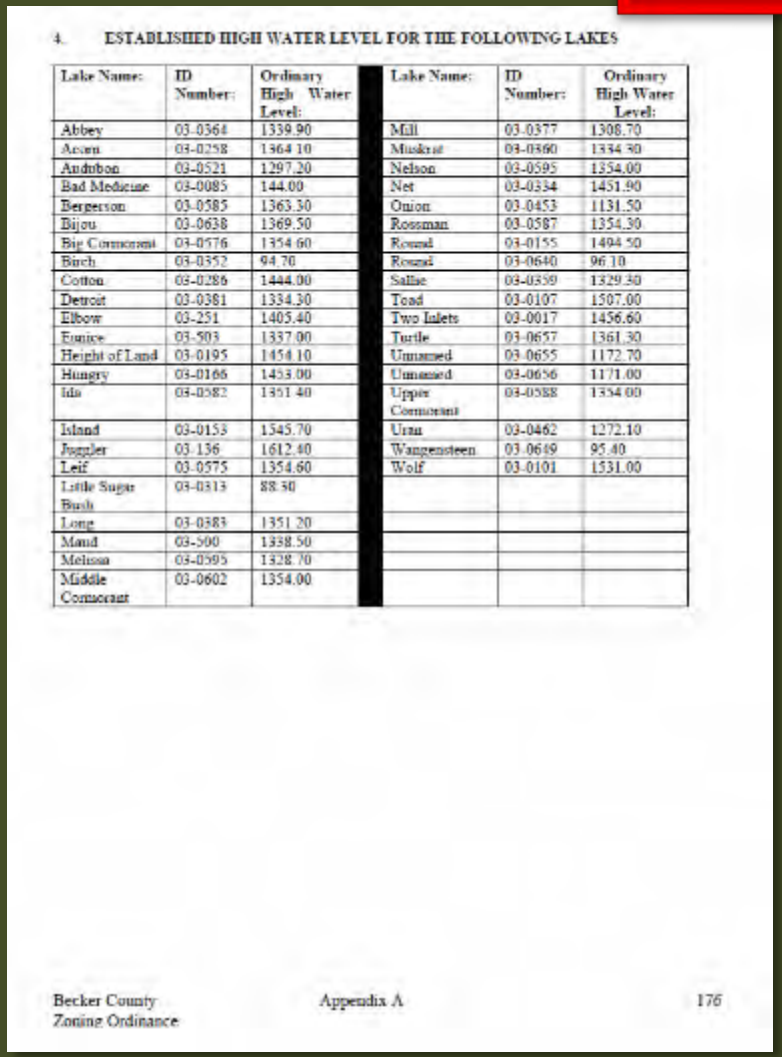
1. Established High Water Lever for Major Lakes
   - You will have to scroll through the PDF
2. Find the Lake your Project is on
   - You may have to contact the DNR if your lake is not listed
3. Determine Elevation of Current Water Line
4. Determine the SIZ Setback

Do I need a permit from the DNR?

KNOWN OHWL – PRESENT READING =

MEASUREMENT ABOVE H20 LINE

(area below OHWL is considered Public Waters which DNR has regulatory jurisdiction)



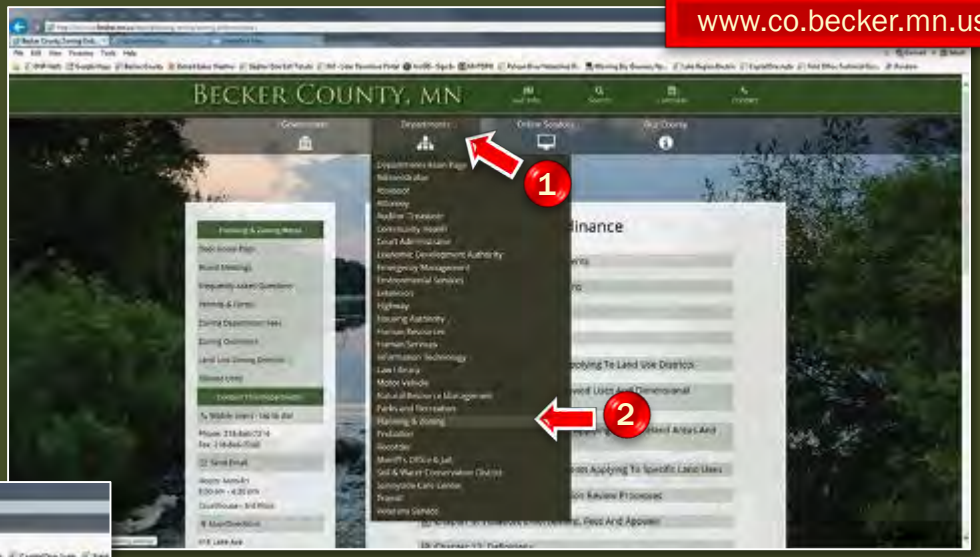
4. ESTABLISHED HIGH WATER LEVEL FOR THE FOLLOWING LAKES

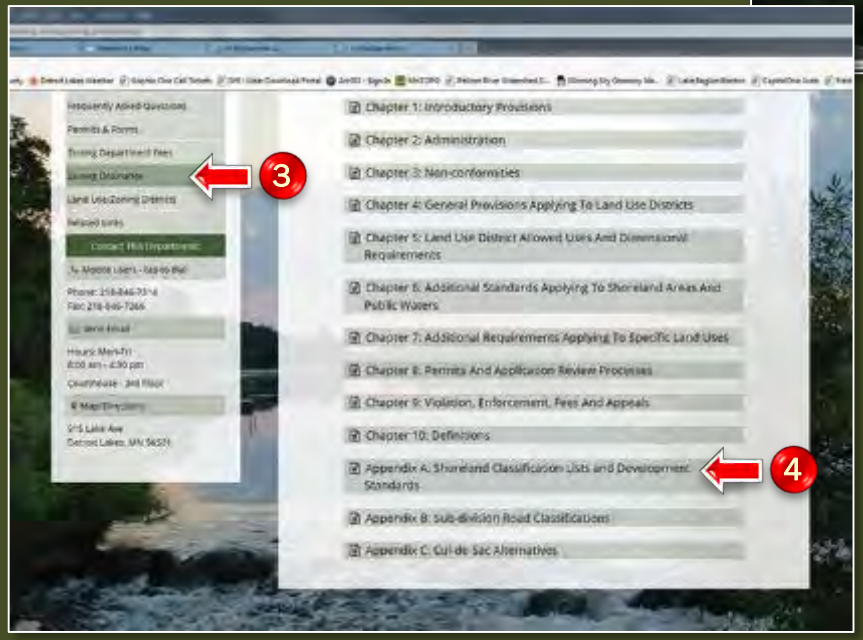
Lake Name:	ID Number:	Ordinary High Water Level:	Lake Name:	ID Number:	Ordinary High Water Level:
Abbey	03-0364	1339.90	Mill	03-0377	1308.70
Acorn	03-0258	1364.10	Muskrat	03-0360	1334.30
Audubon	03-0521	1297.20	Nelson	03-0595	1354.00
Bad Medicine	03-0085	144.00	Net	03-0334	1451.90
Bergerson	03-0585	1363.30	Onion	03-0453	1131.50
Bijou	03-0638	1369.50	Rossman	03-0587	1354.30
Big Cormorant	03-0576	1354.60	Round	03-0155	1494.50
Birch	03-0352	94.70	Round	03-0640	96.10
Cotton	03-0286	1444.00	Sallie	03-0359	1329.30
Detroit	03-0381	1334.30	Toad	03-0107	1507.00
Elbow	03-251	1405.40	Two Inlets	03-0017	1456.60
Eunice	03-503	1337.00	Turtle	03-0657	1361.30
Height of Land	03-0195	1454.10	Unnamed	03-0655	1172.70
Hungry	03-0166	1453.00	Unnamed	03-0656	1171.00
Ida	03-0582	1351.40	Upper Cormorant	03-0588	1354.00
Island	03-0153	1545.70	Urna	03-0462	1272.10
Juggler	03-136	1612.40	Wangensteen	03-0649	95.40
Leif	03-0575	1354.60	Wolf	03-0101	1531.00
Little Sugar Bush	03-0313	88.80			
Long	03-0583	1351.20			
Maud	03-500	1338.50			
Melissa	03-0595	1328.70			
Middle Cormorant	03-0602	1354.00			

Becker County Zoning Ordinance — Appendix A — 176

Applying for a permit …

- LAKE CLASSIFICATION
- SHORE IMPACT ZONE (SIZ)
- ORDINARY HIGH WATER LINE (OHWL)





Visit Becker County Website:
www.co.becker.mn.us

1. Click “Departments” Heading
2. Choose: Planning & Zoning
3. Zoning Ordinance
4. **Appendix A: Shoreland Classification Lists & Development Standards**

Zoning – Shoreland Ordinance

Watershed District Rules

Pelican River & Cormorant Lakes Watershed Districts

Shore Impact Zone Alterations

- Rip-Rap
- Sand Blankets
- Vegetation Removal
- Impervious Surface
- Retaining Walls

Shore Impact Zone Alterations

Rip-rap installation and repair

- Must follow DNR guidelines
  - Randomly Placed
- Must be needed to control bank erosion

- Permit Required

Sand Blanket Installation and Repair

- Must Follow DNR guidelines

- Can be replaced/new sand added once per at same property

- Permit Required

Shore Impact Zone Alterations

Ice Ridge Alterations

- Repair
  - Repair for previous winter damage
  - Permit Required

- Walkway
  - 4 foot wide walkway allowed
  - Permit Required

Impervious Surfaces

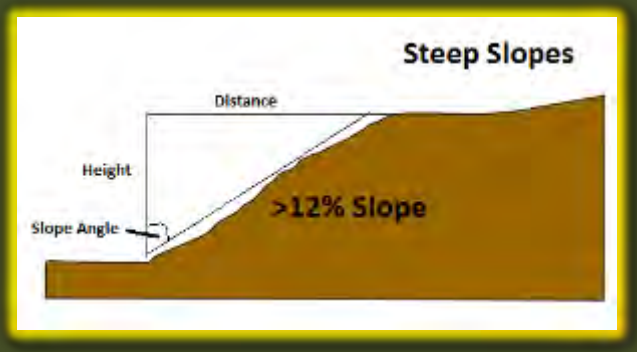
Watershed District Permits Required if surface is

- Within the SIZ – walkways, landings, stairs, etc.
- Greater the 25% lot coverage*
- More than 10,000 sq. ft. within 1000 feet of a lake (or 300 feet from a river)*
- Greater than 1 acre in combined surface area*

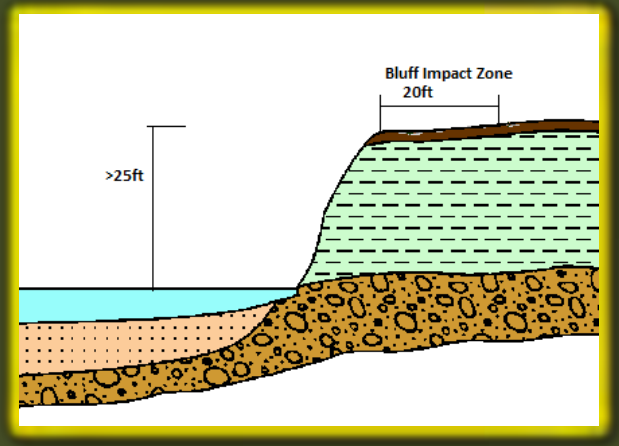
*Requires a Stormwater Management Plan

Steep Slopes, and Bluffs

Steep Slope – 12% or greater



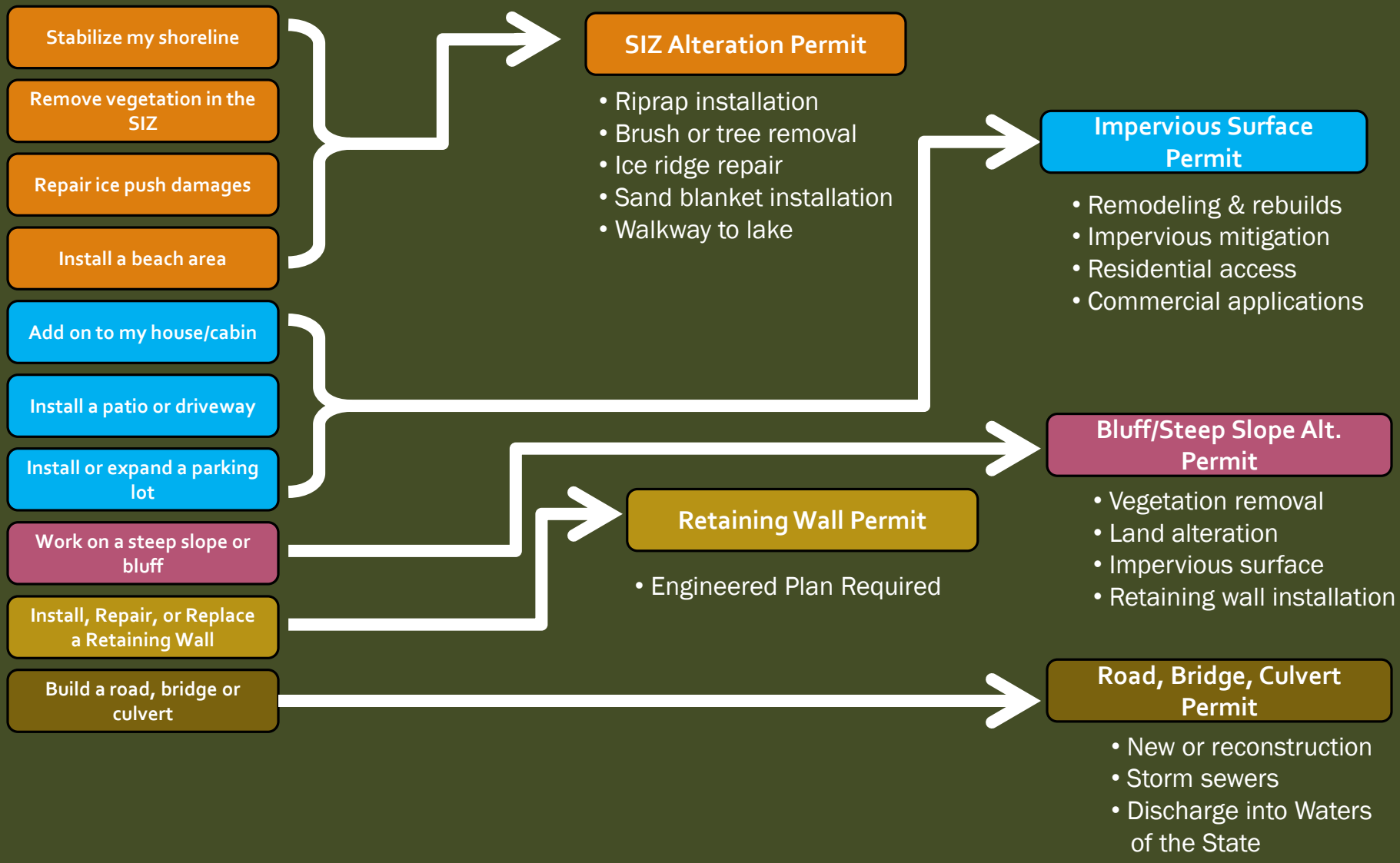
Bluff – A topographic feature rising 25 feet above the OHW located in a shoreland area which drains a waterbody with a slope greater than 30%



Generally, if the project site is located with the Shoreland Zone and will affect areas with 12% slope or greater, a permit is required.

- Vegetation Removal
- Impervious surface
- Retaining Wall*
- Land Alteration

Will you need a Watershed District Permit?



Public Waters Work Permits MN DNR

Public Waters

So what are Public Waters and Public Water Wetlands?

Waters:

- Lakes
- Natural Rivers and Streams
- Altered Rivers and Streams
- Trout Streams
- Ponds depending on location

Wetlands:

- Wetland below the OHW attached to a Public Water
- All shallow and deep marshes and shallow open water that are 10 or more acres in unincorporated areas and 2.5 acres in incorporated areas

Public Waters Work Permits

When do I need a Public Waters Work Permit?

Work in Public Waters and Wetlands needing Public Waters Work Permits:

- Filling
- Excavating
- Building Water Control Structures
- Culverts
- Bridges

Work needing other MN DNR Permits:

- Dewatering
- Covering and/or Removal of Aquatic Vegetation

Public Waters Work Permits

Projects in Public Waters That Don't Need an Individual Public Waters Work Permits

Work in Public Waters and Wetlands Not Needing Public Waters Work Permits:

- Riprap
- Beach Blankets
- Boat Ramps
- Temporary Bridges and Low-Water Ford Crossings
- Docks

Caution!

Projects not needing a Public Waters Work Permit May Still Need Other Permits.

ALWAYS CHECK!

Public Waters Work Permits

Who do I contact about Public Waters Work Permit?

Rodger Hemphill, Area Hydrologist
14583 County Hwy 19
Detroit Lakes, MN 56501
(218) 846-8384
FAX (218) 846-8397

Minnesota Wetland Conservation Act (WCA)

Wetland Conservation Act (WCA)

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Wetland Conservation Act (WCA)

Do’s and Don'ts ??

Soils – Textures & Infiltration

Soils – Texture & Infiltration

DOWNLOAD PDF

Becker Soil and Water Conservation District
809 8th Street SE, Detroit Lakes, MN 56501
(218) 846-7360

Becker Soil & Water Conservation District

Soil Texture Field Test

Moist Ball Test -

Make a *moist ball of soil in your hand. If the soil holds together (i.e. forms a ball) when you open your hand, toss the ball in the air. The more durable the ball, the more clay is in the soil. If the ball does not hold together, the more sand is in the soil.

Ribbon Test -

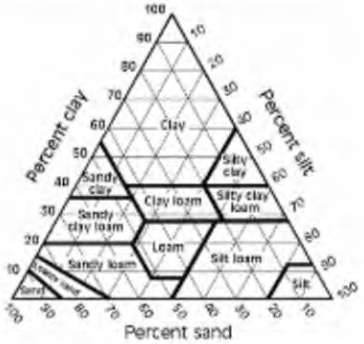
Squeeze the *moist soil out between the thumb and a forefinger to form the longest and thinnest ribbon possible. The longer the ribbon, the more clay is in the soil. Soils with high silt content will tend to flake rather than ribbon.

Feel Test -

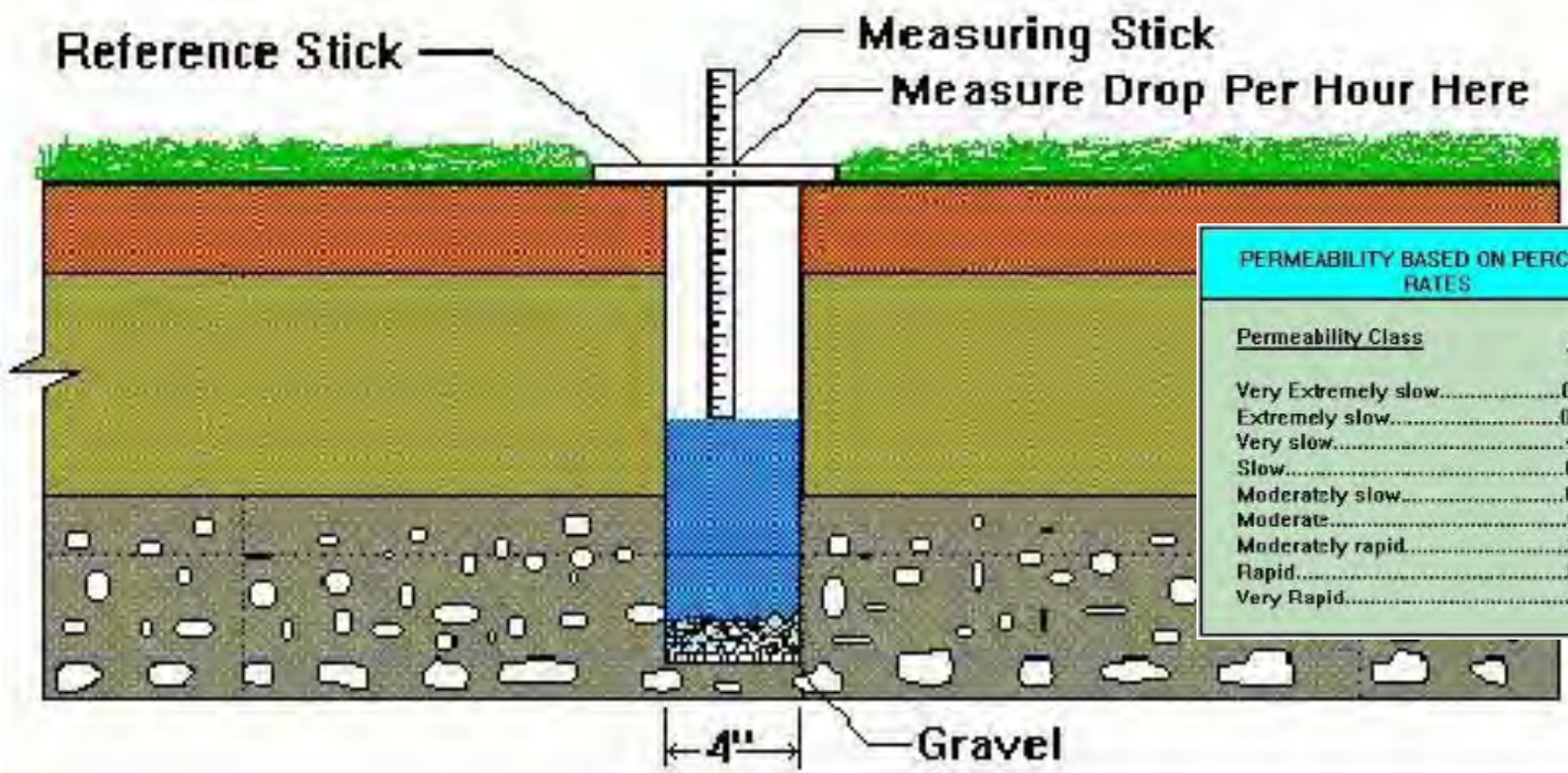
Rub *moist to wet soil between the thumb and fingers to asses the percentage of sand. Sand feels gritty. Silt feels smooth and silky like talcum powder, but isn't sticky. If neither grittiness nor smoothness predominates, the soil is a loam.

***Moist Soil** - Add water to soil and knead soil to break down all aggregates. Soil is the proper consistency when plastic and mobile, like moist putty.

Soil Type	Steady Infiltration Rate (inches/hour)
Sands	> 0.8
Loams	0.2 - 0.4
Clays	0.04 - 0.2



FIELD MEASUREMENT OF PERCOLATION RATE



PERMEABILITY BASED ON PERCOLATION RATES	
Permeability Class	in./hr.
Very Extremely slow	0.0-0.01
Extremely slow	0.01-0.06
Very slow	<0.06
Slow	0.06-0.2
Moderately slow	0.2-0.6
Moderate	0.6-2.0
Moderately rapid	2.0-6.0
Rapid	6.0-20.0
Very Rapid	>20.0

Documenting Site Features

Documenting Site Features

DOWNLOAD PDF

Becker Soil & Water Conservation District

809 8th St. SE, Detroit Lakes, MN 56501 (218) 846-7360

Shoreland Site Evaluation Form

Name:	Date:
Address:	Phone:
	Phone:
Lake:	Email:
Township:	Section:
Site Evaluation Appointment:	Parcel Number:

SITE EVALUATION	Site Evaluation by:
Shoreline Length:	Soil Type: SANDS LOAMS CLAYS GRAVEL
Area of Shoreline Impacted: (L x W)	Lake Classification: NE RD GD
Shore Direction:	Wave Direction:
Ordinary High Water Mark: (OHWL) - =	
Existing Plant Material:	Proposed Plant Material:
Existing Trees:	
Utilities:	
Septic/Drainfield Location:	Wellhead Location:
Stormwater & Erosion Concerns:	

AGENCIES TO CONTACT:	Ticket Number:
Gopher State One Call: Call 811 or visit www.gopherstateonecall.org	
Becker County Zoning: (218) 846-7314 or visit www.co.becker.mn.us/dept/planning_zoning	
DNR Hydrologist:	**Permits Required:**
Watersheds:	

DOWNLOAD PDF

LANDOWNER: ____________ LAKE: ____________

ADDRESS: ____________ DATE: ____________

SITE PLAN Scale: 1/4" = ______

SITE PLAN CHECK LIST:

- ___ North Arrow
- ___ Impervious Areas (Driveways, structures, etc.)
- ___ Contours or Drainage Arrows
- ___ Existing Vegetation (trees and plant material)
- ___ Location of Temporary Erosion / Sediment Control
- ___ Location of Permanent Stormwater Management Areas
- ___ Location & Distances to Nearest Structures, Septic & Well Head
- ___ SIZ Setback / Lake Classification

REMINDERS:

Do NOT compact the soils in proposed rain garden

Gopher One: Call 511 or www.gopherstateonecall.org

Current Waterline Elevation

SETBACKS FROM WELL HEADS:

Perforated Pipes (French Drain) = 50 feet

Solid Pipe 8" and over = 20 feet

Site Evaluation Form

Client Site Plan

(8.5x11 or 11x17 sheet sizes available for download)

Documenting Site Features

So what needs to be documented for the Site Plan?

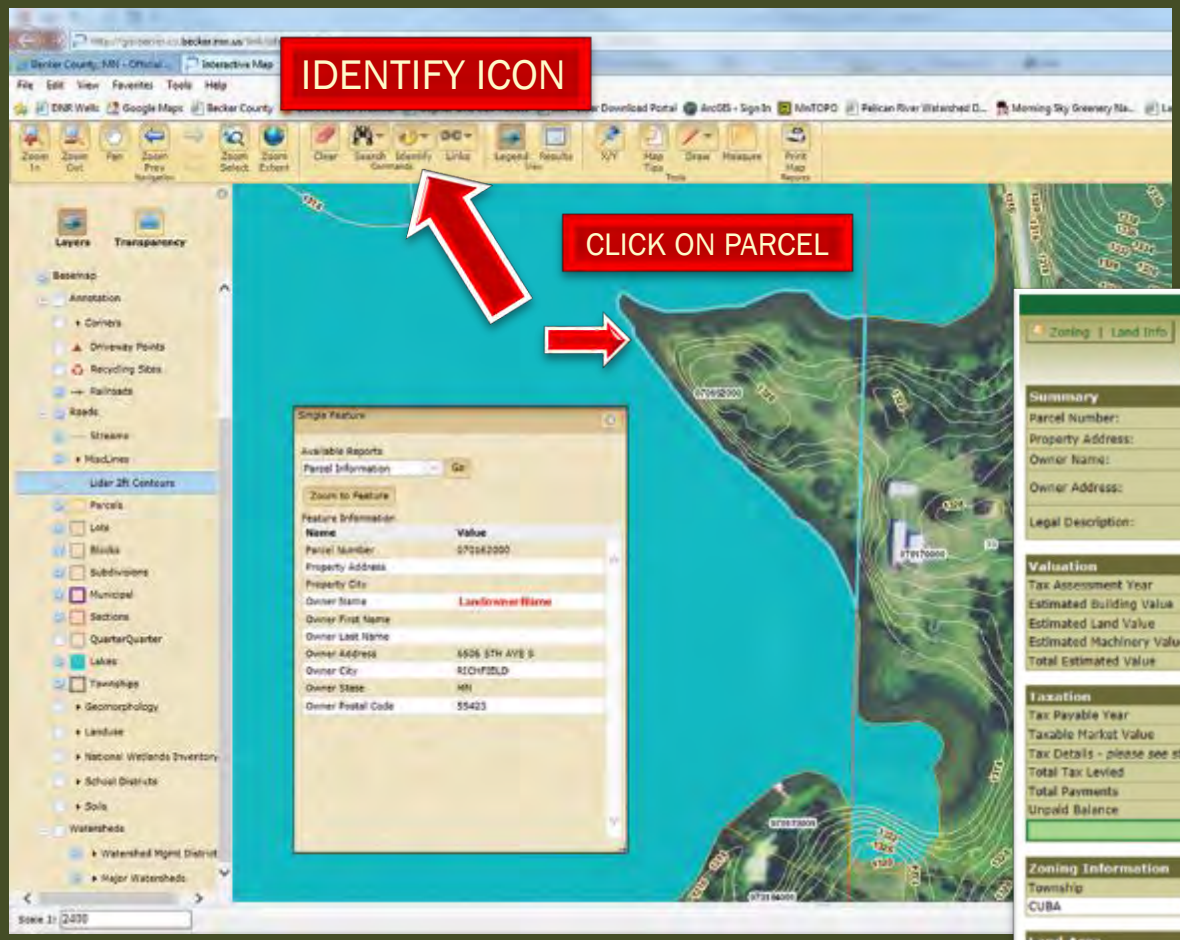
Documenting Site Features

Becker County GIS website

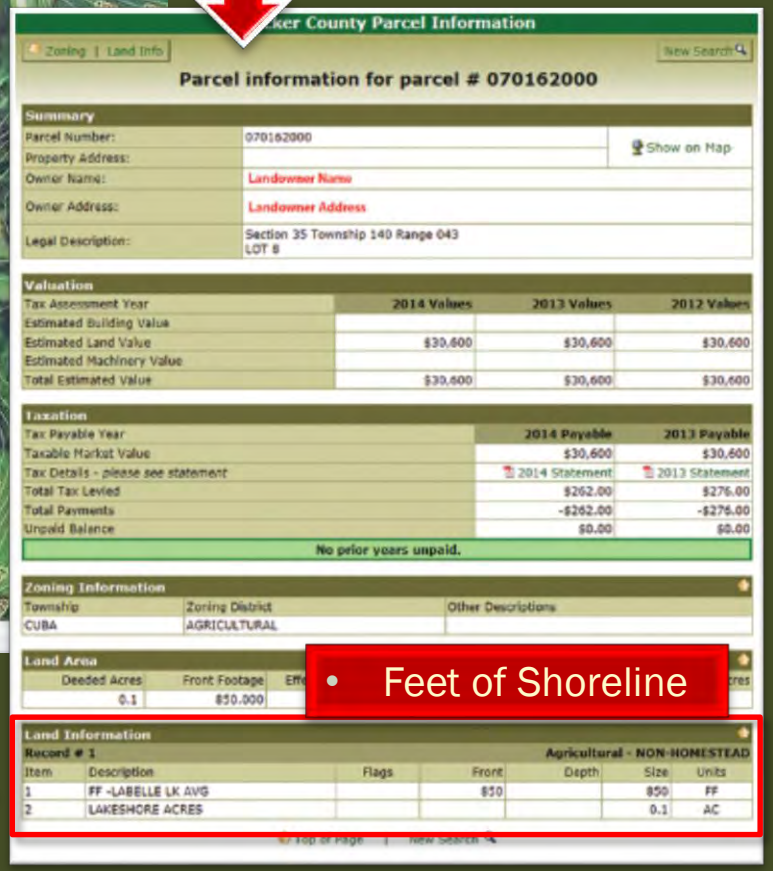
www.co.becker.mn.us

- Landowner Name
- Landowner Address
- Township / Section & Parcel Number
- Lake
- Feet of Shoreline
- Shore Direction

Documenting Site Features



- Landowner Name
- Landowner Address
- Township / Section & Parcel Number



- Feet of Shoreline

Becker County GIS Website

www.co.becker.mn.us

Documenting Site Features

Becker County GIS website

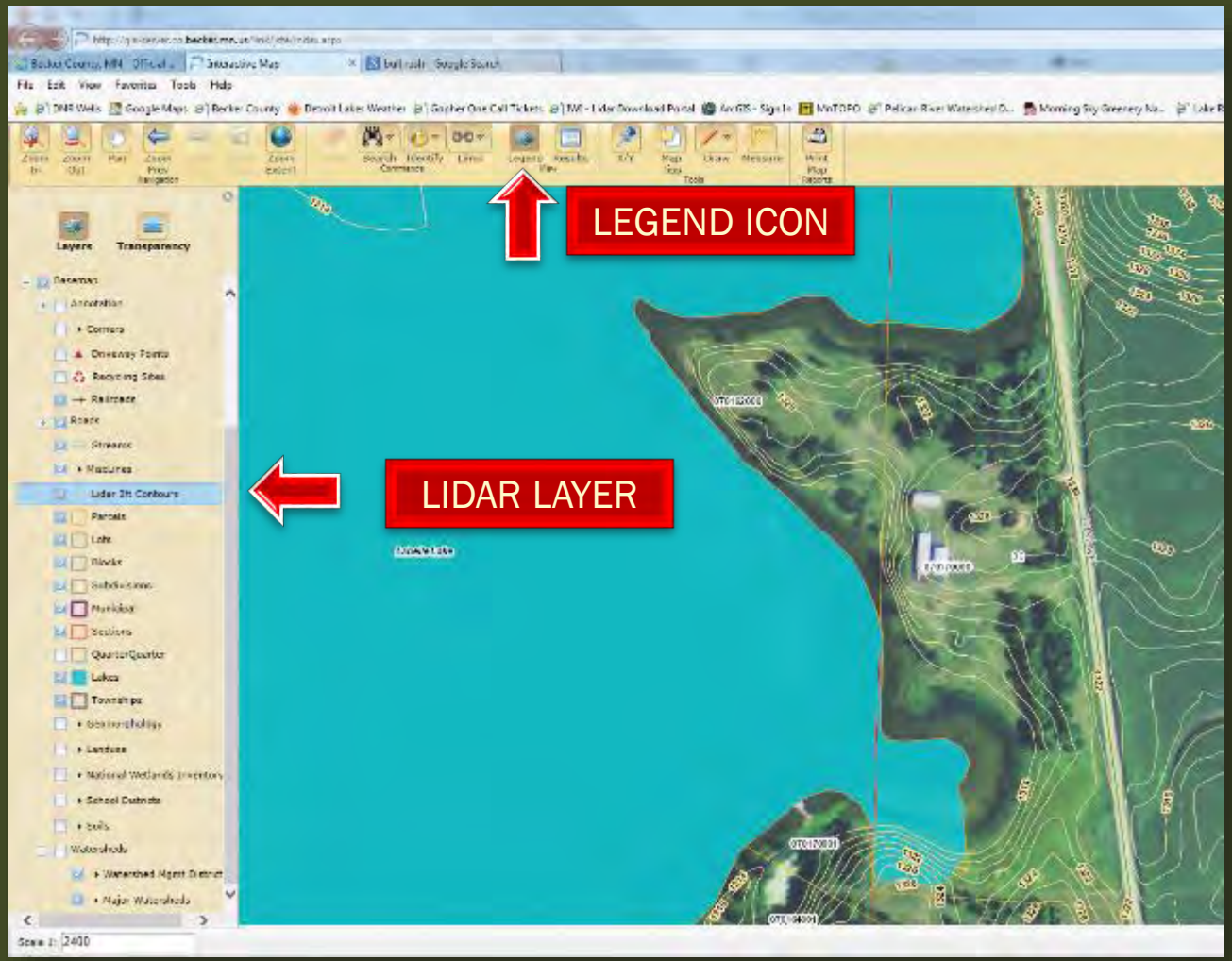
www.co.becker.mn.us

- Turn on Legend

  You will find Layers here

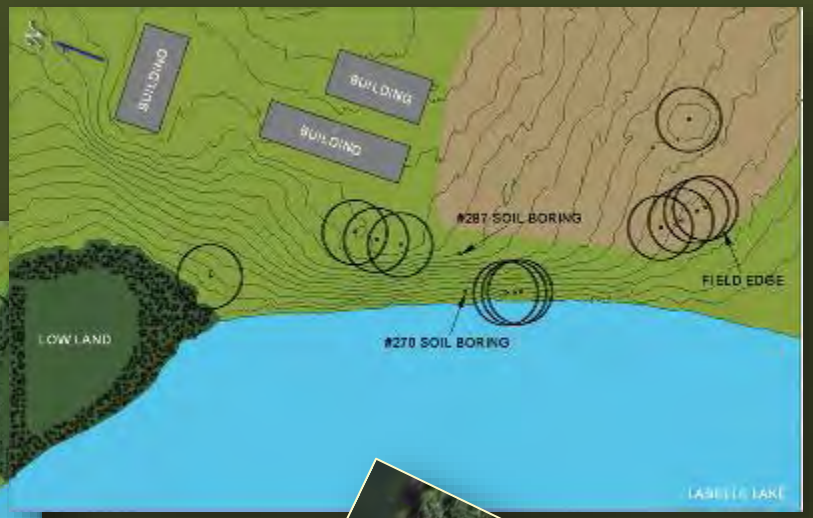
- LIDAR Layer

  Like RADAR - Instruments fitted to aircraft and satellites generate topographical mapping (contours) that reveals slopes



Documenting Site Features

So what needs to be documented for the Site Plan?



Google Earth Aerial
w/ Contour Overlay

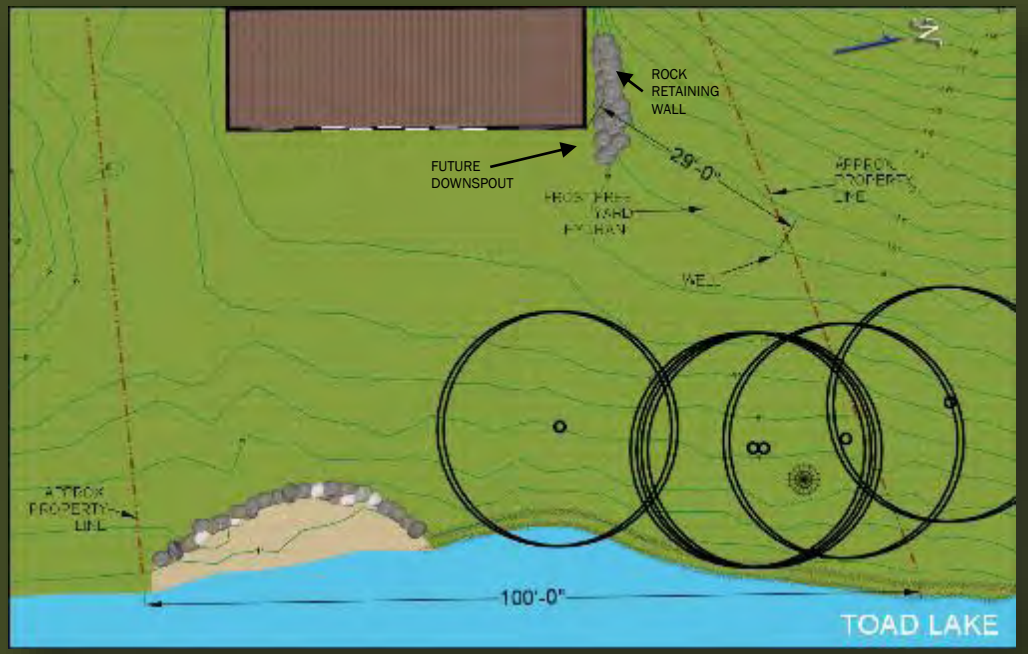
SITE FEATURES INCLUDE:

- Contours or Drainage Arrows
- Existing Structures (Buildings, docks, patio, etc.)
- Erosion & Stormwater (downspouts, problem areas)
- Property Lines & Utilities
- Shoreline Features (Rip Rap, Sand Blankets)
- Unique Features (Ice Ridges, etc)

Documenting Site Features

MEASUREMENTS TO GET:

- Structures
- Septic / Drainfield Location
- Wellhead Location
- Current Lake Elevation (waterline elevation)
- OHWL



LOCATE EXISTING VEGETATION:

- Plant Material
  - Aquatic Emergents,
  - Grasses, Forbs, Sedges
  - (etc., anything you see)
- Existing Trees

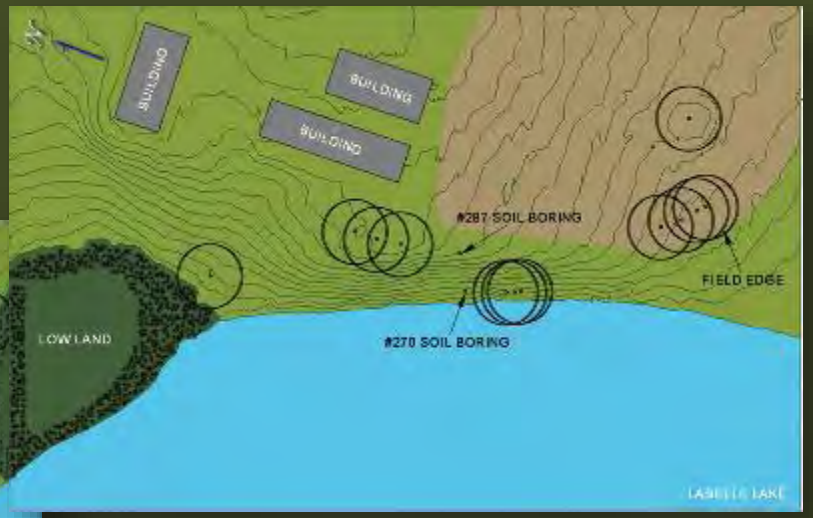
Documenting Site Features

TAKE PHOTOS

Toad Lake Site Plan Perspective View

Documenting Site Features

RECAP: What needs to be documented for the Site Plan



- TAKE PHOTOS

SITE FEATURES INCLUDE:

- Contours or Drainage Arrows
- Existing Structures (Buildings, etc.)
- Erosion & Stormwater (downspouts, problem areas)
- Property Lines & Utilities
- Unique Features (Ice Ridges, etc)
- Shoreline Features (Rip rap /sand)

MEASUREMENTS:

- Structures
- Septic/Drainfield Location
- Wellhead Location
- Current Lake Elevation
- OHWL

EXISTING VEGETATION:

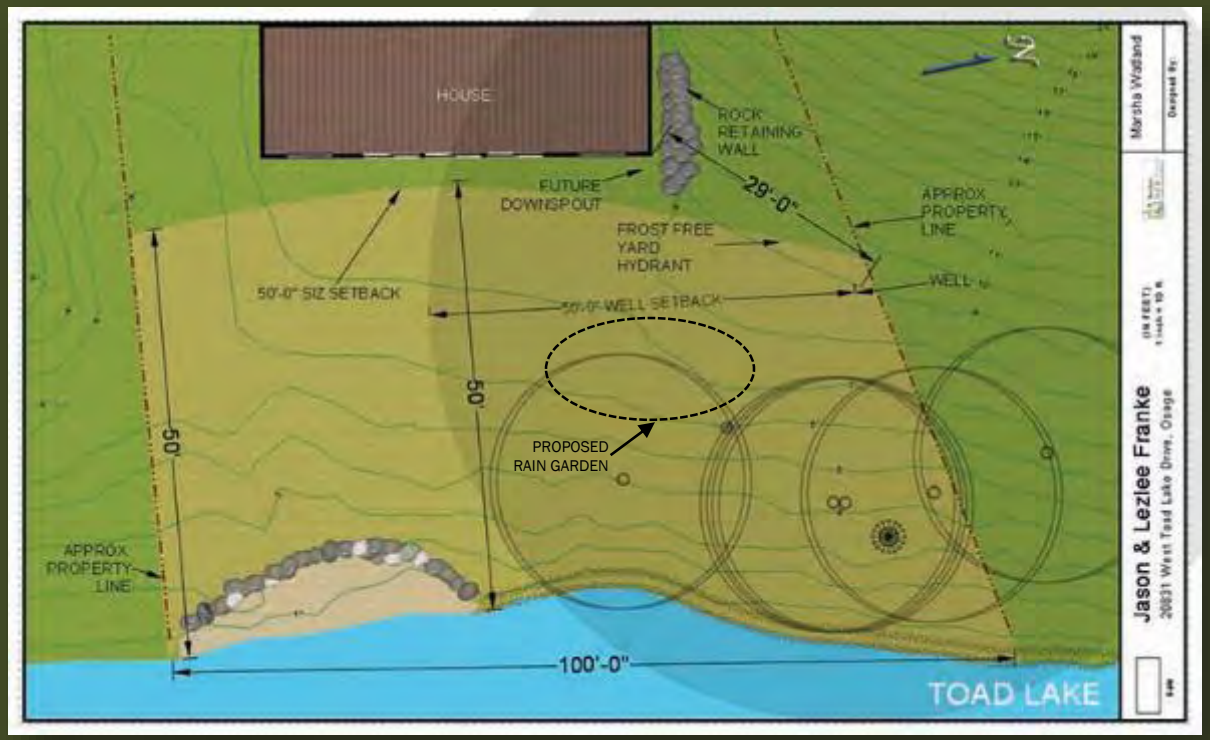
- Plant Material
  Aquatic Emergents, Grasses, Forbs, Sedges, etc.
  (Anything you see)
- Existing Trees

Design & Planning Elements

Design and Planning Elements

SITE FEATURES TO INCLUDE ON THE PLAN:

- North Arrow
- Contours or Drainage Arrows
- Property Lines & Utilities
- Erosion & Stormwater (problem areas)
- Existing & Proposed Structures
- Unique Features (Ice Ridges, etc)
- Shoreline Features (Rip rap /sand)
- Downspouts
- Septic / Drainfield Location
- Permanent Stormwater Management Areas



MEASUREMENTS:

- Accurately Scale Your Drawing
- Structures
- OHWL / SIZ Setback
- Wellhead Setback

EXISTING PLANT MATERIAL AND TREES:

- Identify & Mark Location of Existing Vegetation

Water Fluctuation: 10 year available through DNR

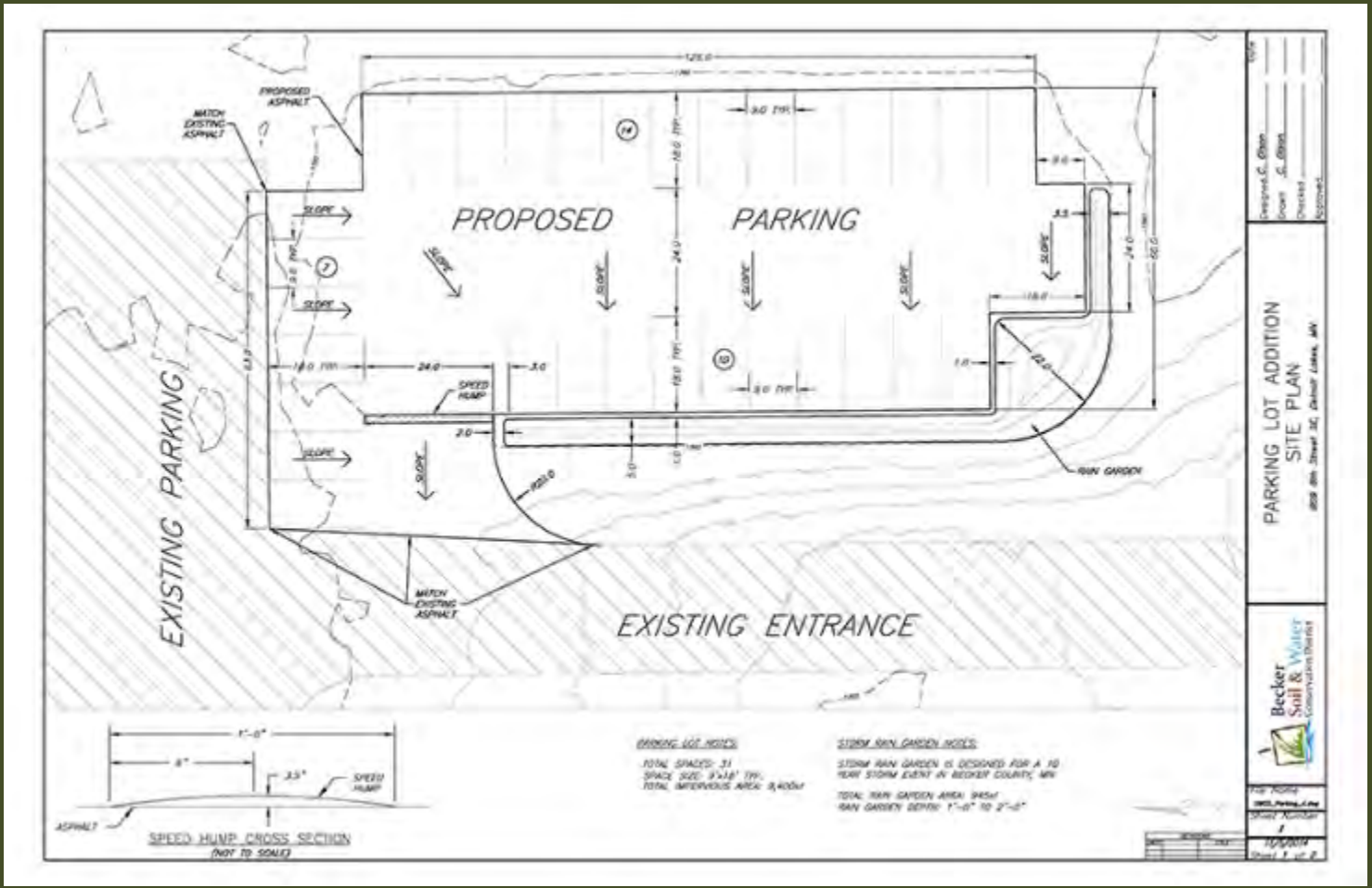
Ordinary High Water Level (OHWL)

Design and Planning Elements

Site Plan Example

ELBOW LAKE IS A RECREATIONAL DEVELOPMENT LAKE = 50’ SIZ Setback

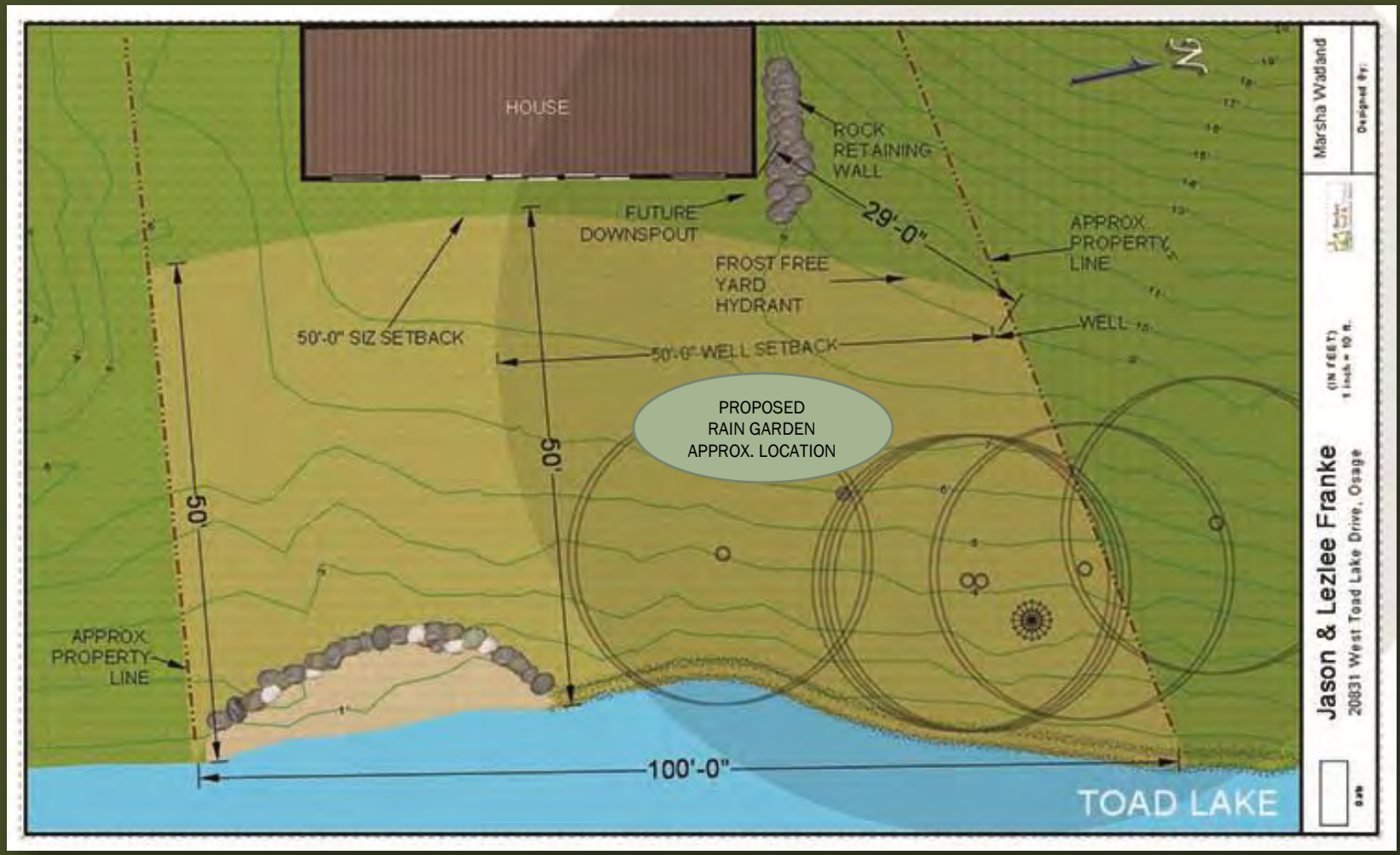
Design and Planning Elements



Site Plan Example

Design & Planning Elements for a Rain Garden / Infiltration Basin

Design and Planning Elements

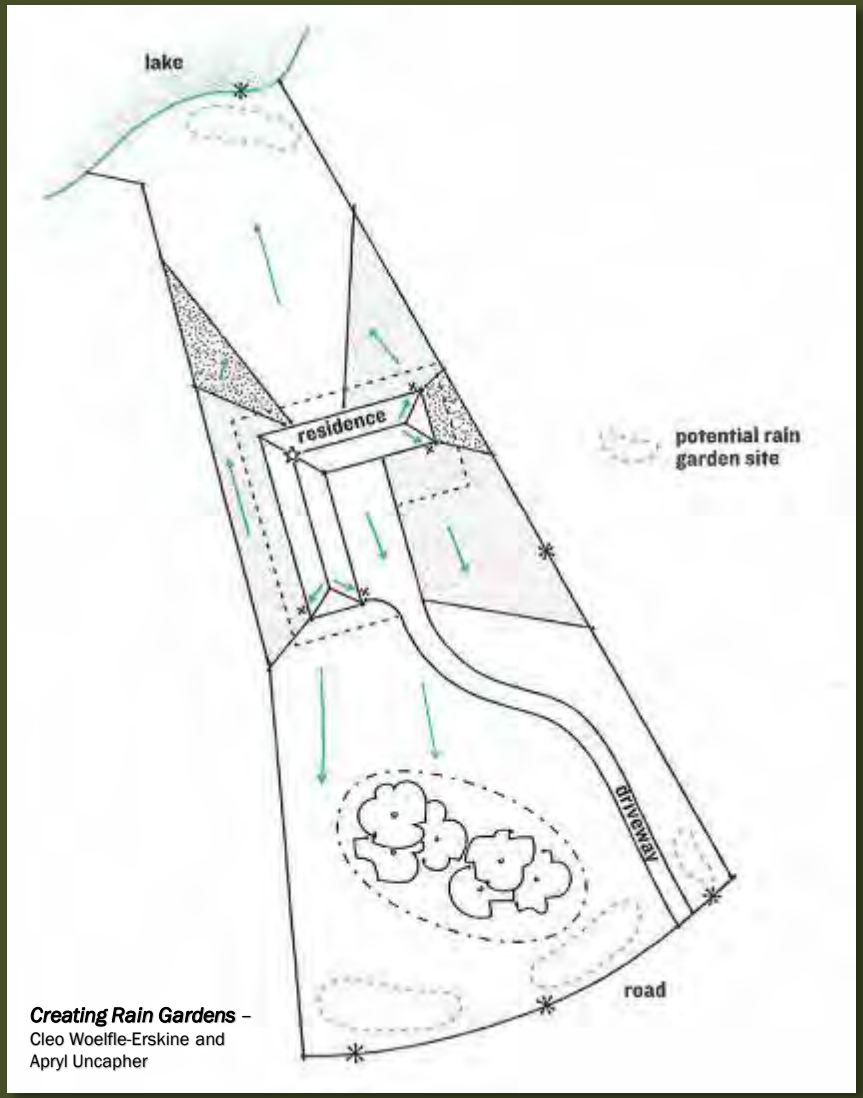


Site Plan Example

Design and Planning Elements

Tips on Designing a Rain Garden or Infiltration Basin:

1. Use the Site Watershed you Mapped out using a Base Map or Site Plan
2. Calculate Stormwater Runoff
3. Determine Where to Effectively Catch Stormwater
4. Determine Soil Type
5. Determine the Shape & Size



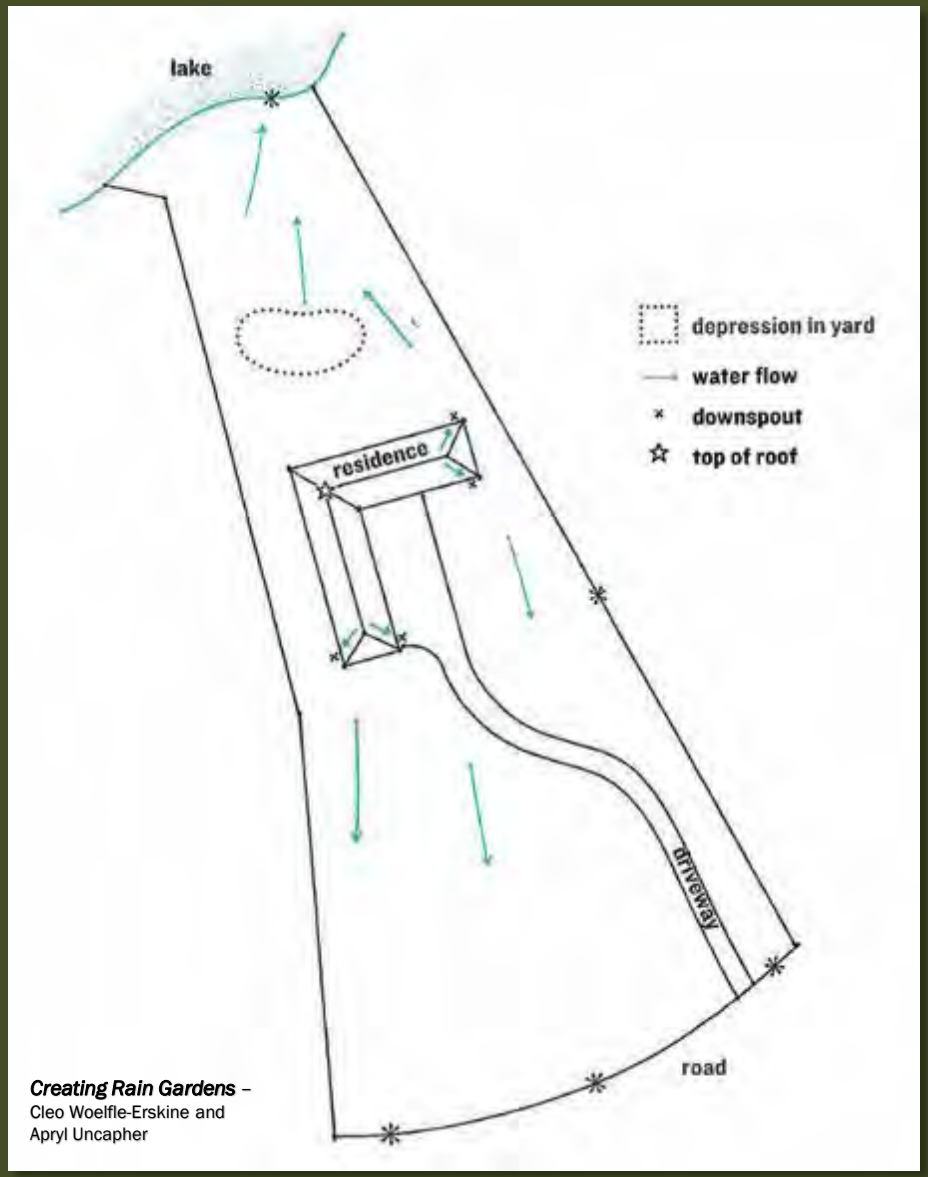
Creating Rain Gardens – Cleo Woelfle-Erskine and Apryl Uncapher

Assessing Stormwater Flow

Assessing Stormwater

Assess Your Site:

1. Map the Site Watershed using a Base Map or Site Plan
    - Draw Direction Arrows of Water Flow – Paths Followed by Water as it Flows Through Your Site
    - Draw All Structures & Direction Arrows of Water Flow on Roof Structures
    - Do the Roof Structures have Gutters? Mark Where the Downspouts are
    - Mark What Areas of the Yard are Lower (or Higher) than the House
    - Document Depressions or Vegetated Areas Where Water Naturally Collects
    - Start Getting an Idea of Impervious Surface Area (Becker County GIS Website has Structure Sizes and a Measure Tool, but On-Site Documentation is Still Required)
2. Get an Idea of Where the Water is Going

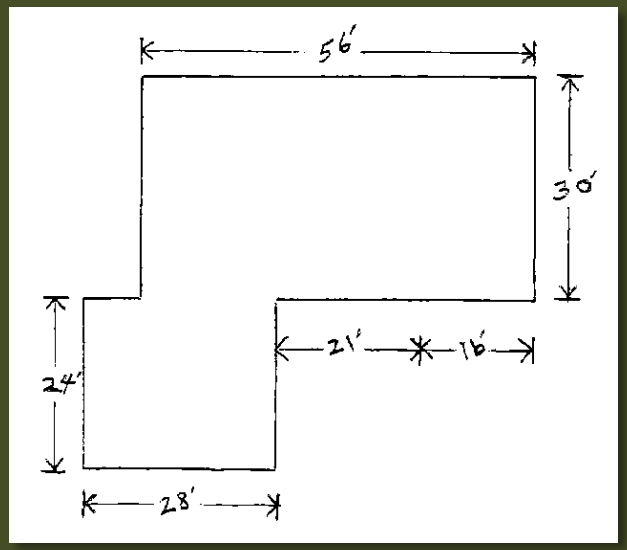


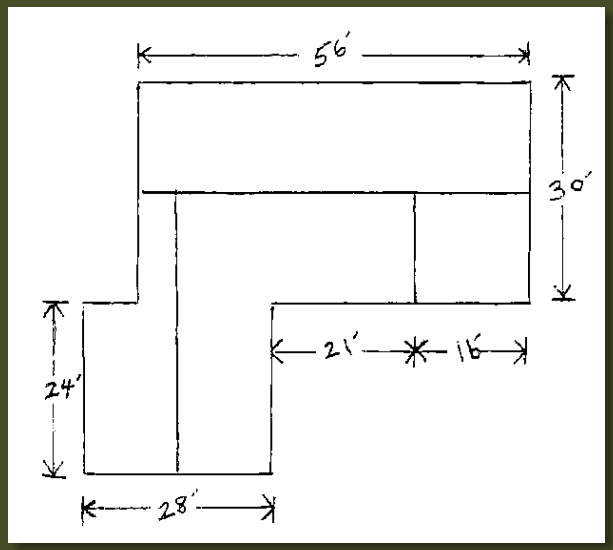
Creating Rain Gardens – Cleo Woelfle-Erskine and Apryl Uncapher

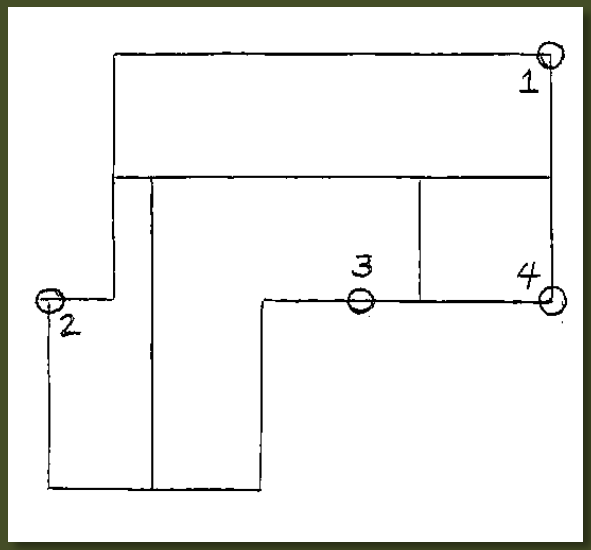
Assessing Stormwater Flow

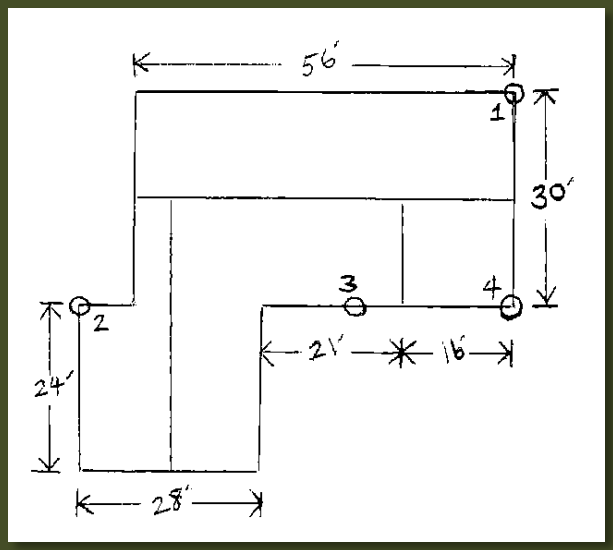
Assess Your Site:

1. Draw All Footprints of Structures with Dimensions (include roof overhangs)
2. Draw in Rooflines Peaks (not valleys)
3. Draw in and Number Roof Gutter Downspout Locations







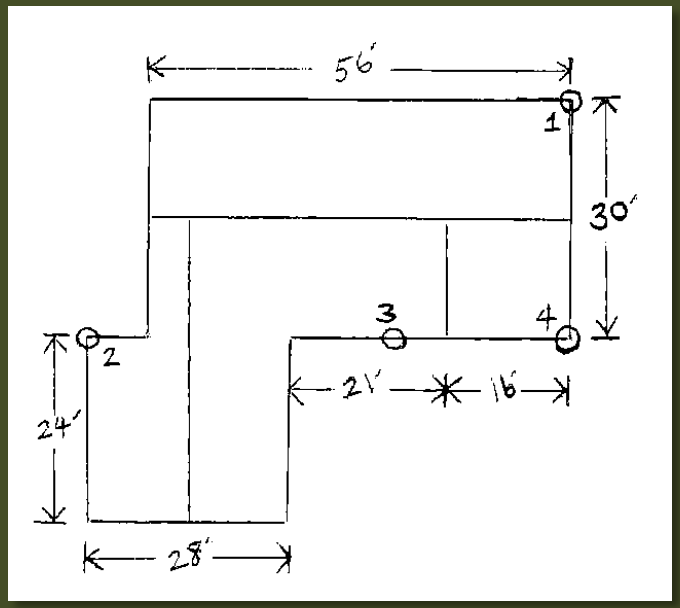


Assessing Stormwater Flow

Assess Your Site:

5. Calculate the Square Footage within Footprint that Flows to Each Downspout (Drainage Area)

6. Determine the Size & Depth of Infiltration Basin (*Stormwater & Rain Garden Calculation Worksheet*)



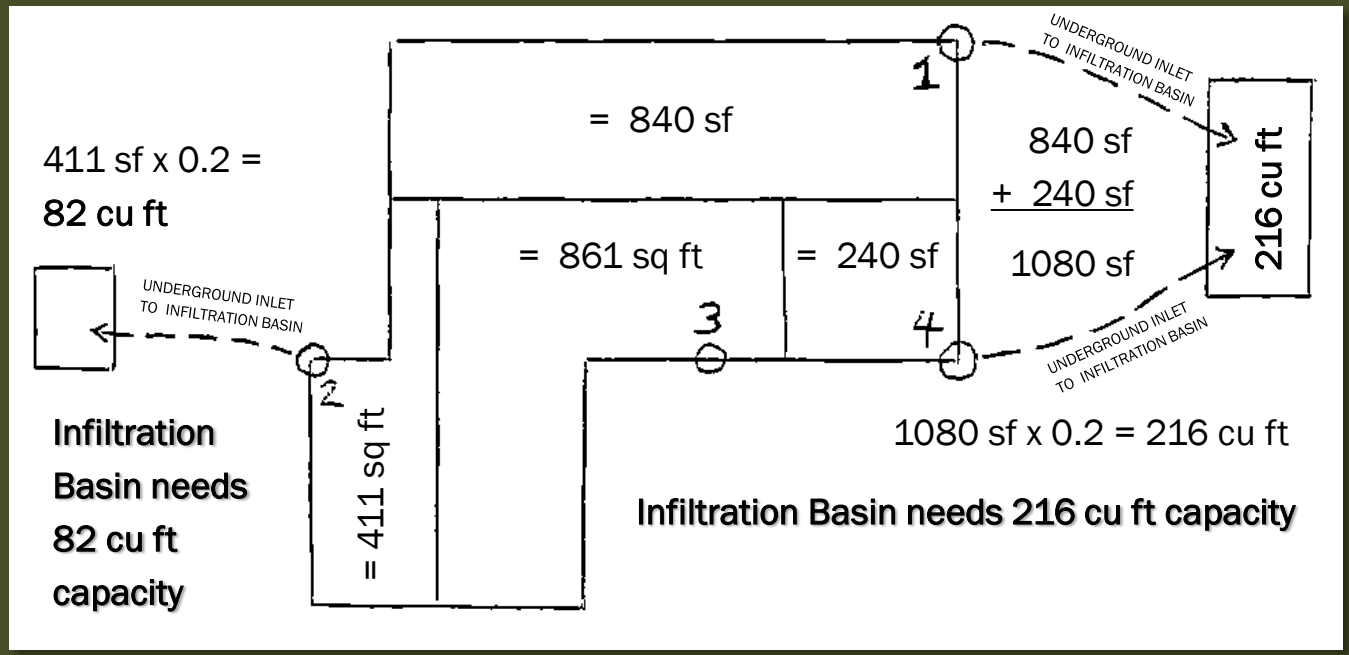
DOWNSPOUTS:

1. 15' x 56' = 840 sf

2. 24' x 14' = 336 sf
   15' x 5' = 75 sf
   = 411 sf

3. 39' x 14' = 546 sf
   15' x 21' = 315 sf
   = 861 sf

4. 15' x 16' = 240 sf



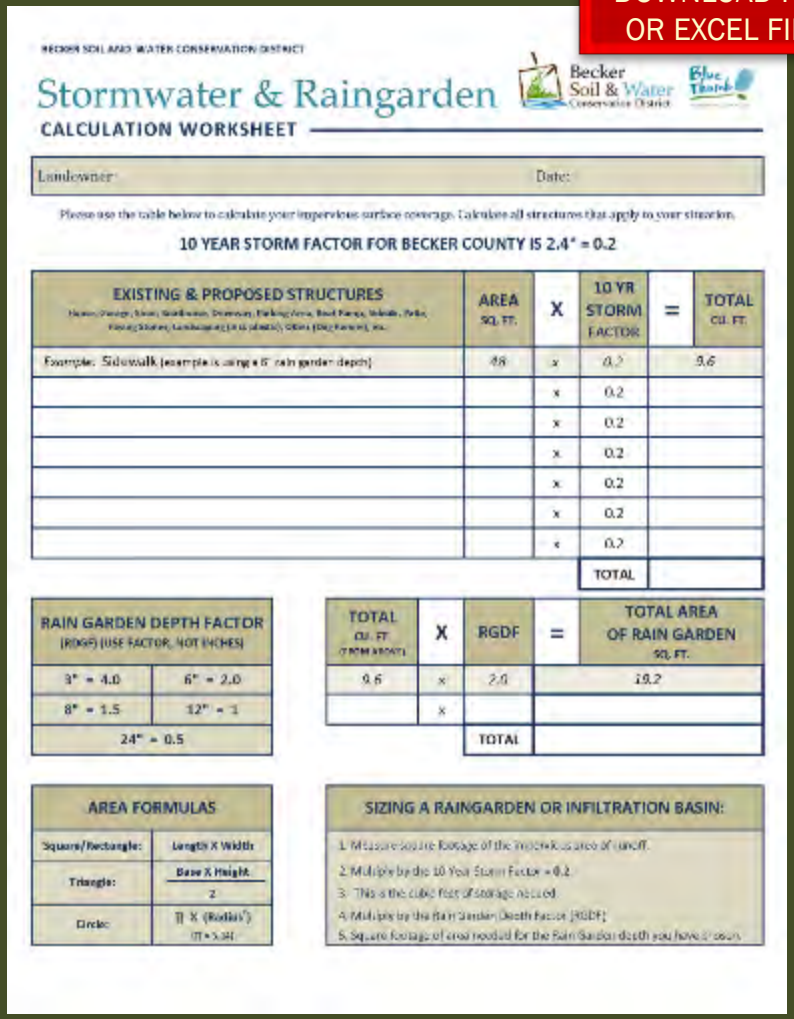
Assessing Stormwater

Using the Stormwater & Rain Garden Calculation Worksheet:

www.co.becker.mn.us

1. Calculate the Area (sq ft) of ALL the Existing & Proposed Impervious Structures that apply to your situation
   - This can include the House, Garage, Driveway, Boat Ramp, Sidewalk, Patio, Paving Stones, Landscaping, etc.
2. Multiply area by the Becker County 10 Year Storm Factor = 0.2 (2.4") to get cubic yards
   - This will give you the Cubic Feet of Storage Needed
3. Multiply Cubic Yards by the Depth Factor (not feet and/or inches)
   - This gives you the Square Feet of Area of treatment needed

DOWNLOAD PDF OR EXCEL FILE



Becker Soil & Water Conservation District

Stormwater & Raingarden

CALCULATION WORKSHEET

Landowner: Date:

Please use the table below to calculate your impervious surface coverage. Calculate all structures that apply to your situation.

10 YEAR STORM FACTOR FOR BECKER COUNTY IS 2.4" = 0.2

EXISTING & PROPOSED STRUCTURES	AREA SQ. FT.	X	10 YR STORM FACTOR	=	TOTAL CU. FT.
Example: Sidewalk (example is using a 6" rain garden depth)	48	x	0.2		9.6
		x	0.2		
		x	0.2		
		x	0.2		
		x	0.2		
		x	0.2		
		x	0.2		
			TOTAL		

RAIN GARDEN DEPTH FACTOR (RGDF) (USE FACTOR, NOT INCHES)	
3" = 4.0	6" = 2.0
8" = 1.5	12" = 1
24" = 0.5	

TOTAL CU. FT. (FROM ABOVE)	X	RGDF	=	TOTAL AREA OF RAIN GARDEN SQ. FT.
9.6	x	2.0		19.2
	x			
		TOTAL		

AREA FORMULAS	
Square/Rectangle:	Length X Width
Triangle:	Base X Height / 2
Circle:	π X (Radius²) (π = 3.14)

SIZING A RAINGARDEN OR INFILTRATION BASIN:

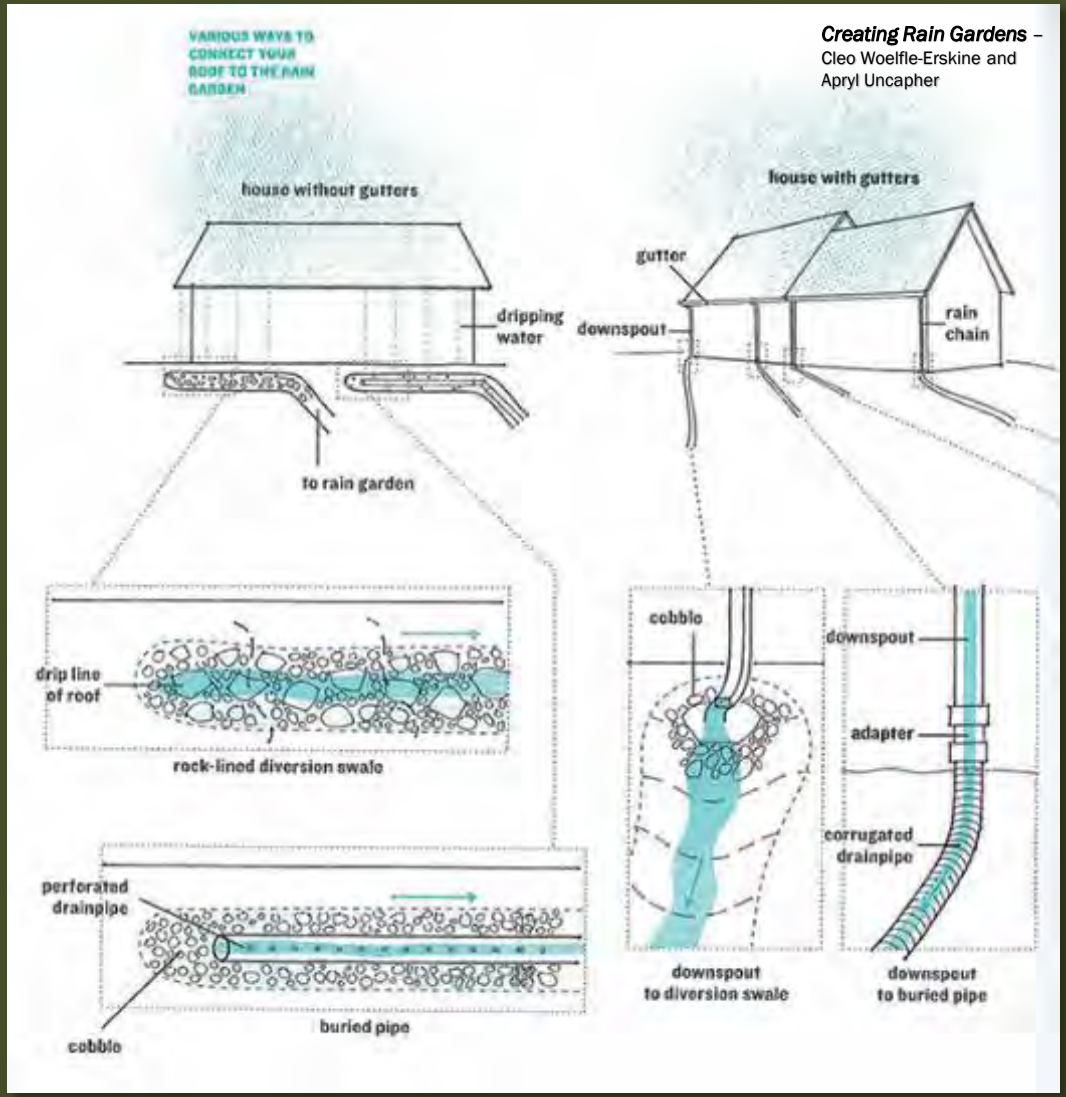
1. Measure square footage of the impervious area of runoff.
2. Multiply by the 10 Year Storm Factor = 0.2
3. This is the cubic feet of storage needed
4. Multiply by the Rain Garden Depth Factor (RGDF)
5. Square footage of area needed for the Rain Garden depth you have chosen

Stormwater & Raingarden Worksheet

Design and Planning Elements

Getting Water Into the Rain Garden:

1. Sheet Flow over Land
   - Use Gravity - Water Flows Downhill
2. Rock Lined or Vegetated Diversion Swale
   - 18 to 24 inches Wide
   - 2%-4% Slope
3. Buried Drain Pipe
   - Pipe Needs at least 2% Slope, but do not exceed 8%
   - Can Not be Flat or Reverse Grade
   - Can Connect Directly to Downspout
   - Typically a 4 inch Diameter Pipe; Corrugated Pipe (flexible) or PVC

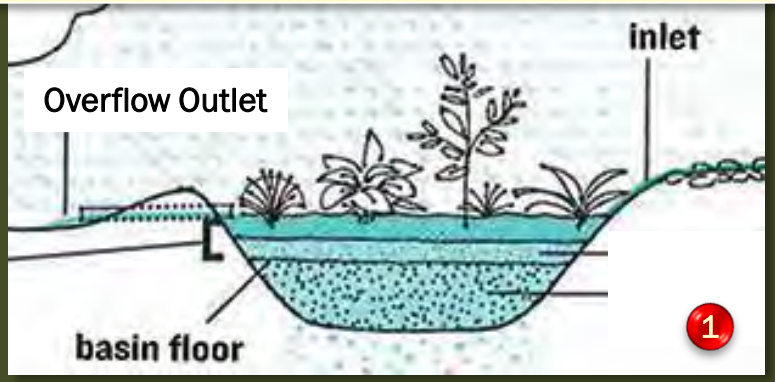


Creating Rain Gardens – Cleo Woelfle-Erskine and Apryl Uncapher

Design and Planning Elements

Getting Water Out of the Rain Garden: PIPE OUTLET OPTIONS (outlets are optional)

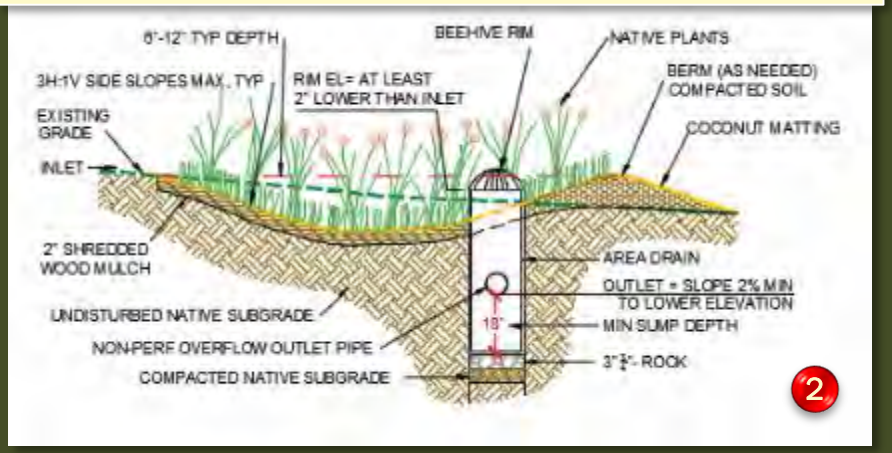
Above Ground Outlet in Relation to Basin Depth



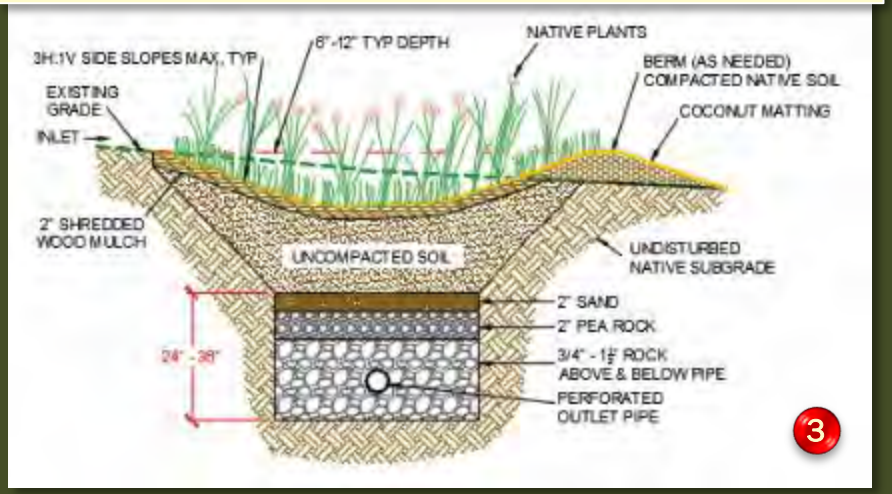
Creating Rain Gardens – Cleo Woelfle-Erskine and Apryl Uncapher

1. ABOVE GROUND:
   - Drains Above Ground in Desired Direction Using Gravity
   - PVC Pipe (non-perf) - Top of Pipe 6 inches from Top of Berm. Invert of Pipe 6-9 inches from Top of Basin
2. SUB SURFACE DRAIN:
   - Drains Under Ground Using Sloped Pipe
   - Vertical Pipe (non-perf) Extends Upward
   - Top of Pipe at Least 2 inches Lower than Inlet
3. ROCK INLET:
   - ¾”-1½” Rock 6 inches Above & Below Perforated Pipe
   - 2-3 inches of Pea Rock
   - 2-3 inches of Sand

Sub Surface Drain: Vertical Pipe w/Non-Perforated Outlet

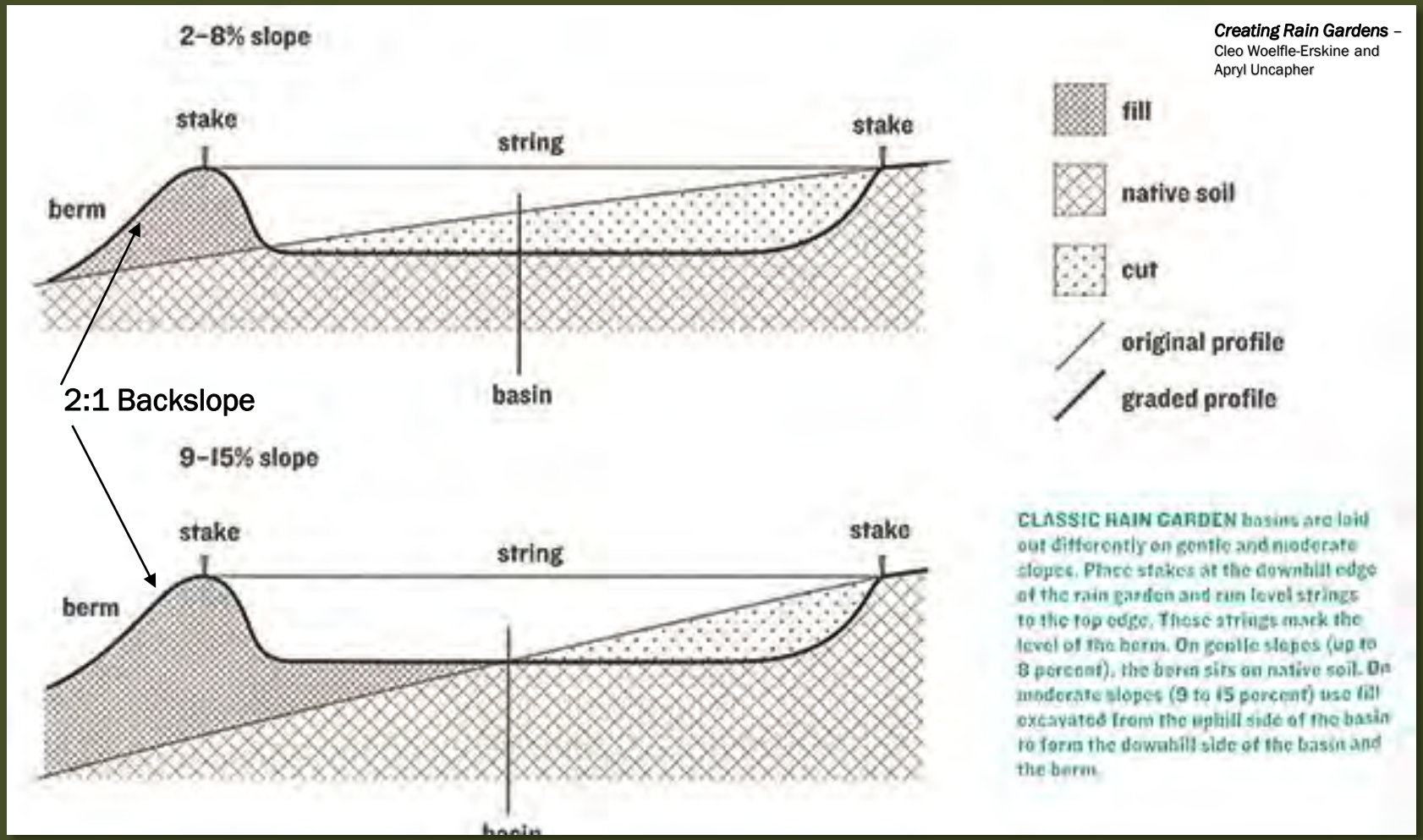


Rock Inlet: Overflow Pipe w/Non-Perforated Outlet



Design and Planning Elements

Creating a Berm:



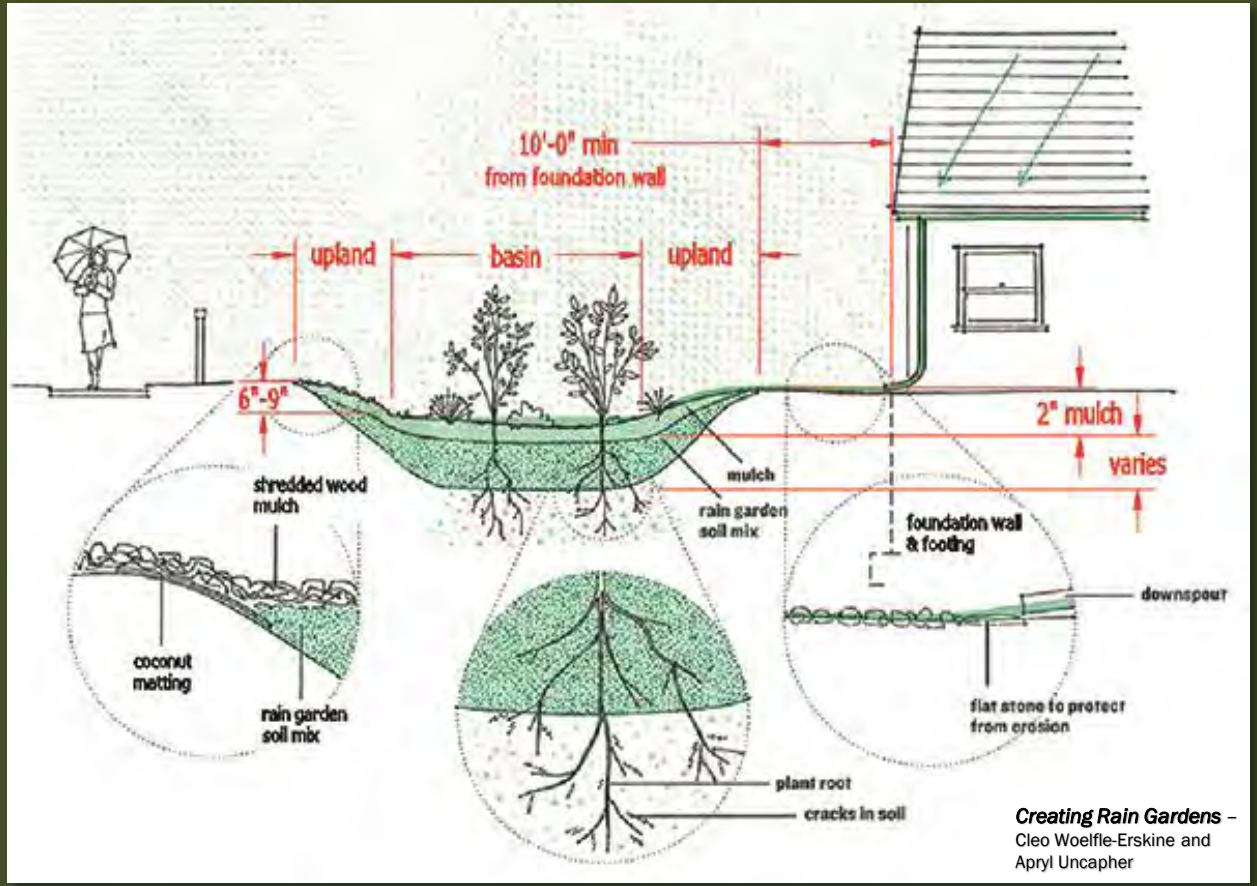
Creating Rain Gardens – Cleo Woelfle-Erskine and Apryl Uncapher

Design and Planning Elements

Important Measurements:

1. Allow for a Buffer Zone around Building Foundations and Septic Drainfields

- Minimum of 10 FEET AWAY
- 20 FEET is recommended on sites that have a basement or are prone to flooding
- Infiltration of Water can cause Liquid Waste or Sewage to Rise to the Surface near Drainfields



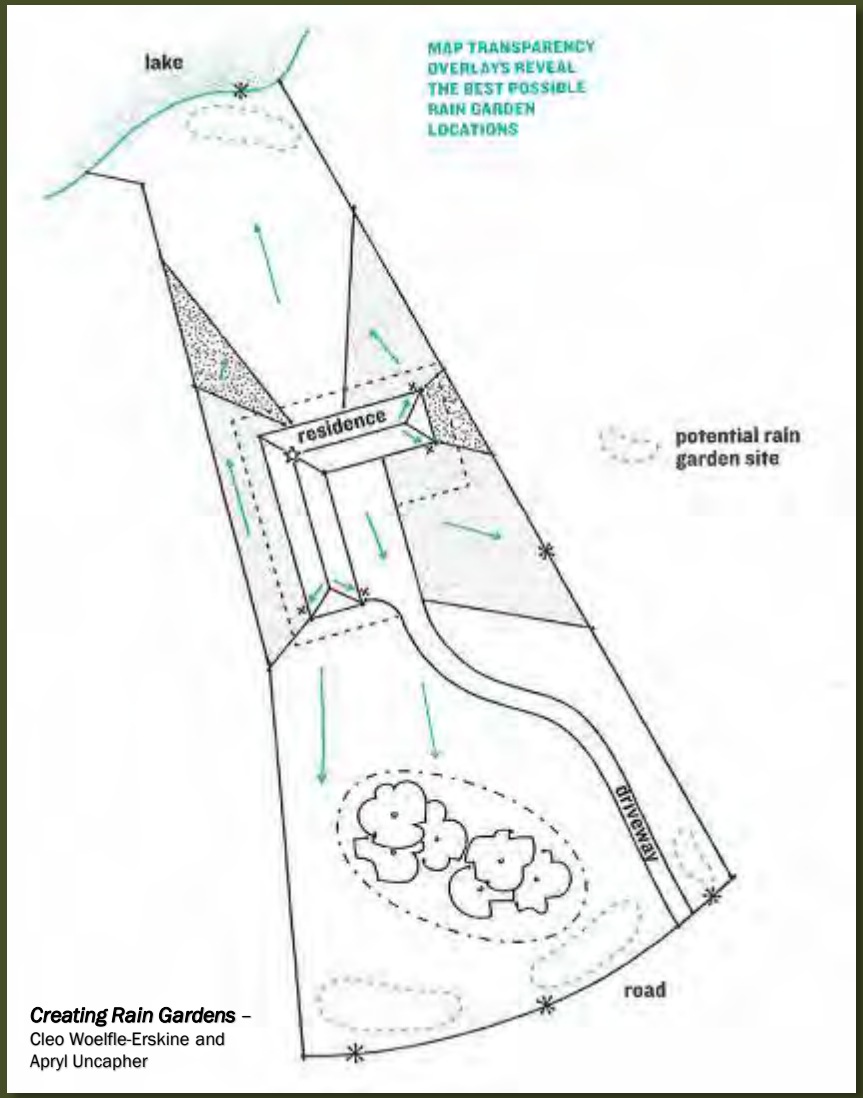
2. Leave a 6 to 9 inch Depression from the Basin to Existing Ground

3. 2 inches Shredded Wood Mulch
   - Not Required But Recommended

Design and Planning Elements

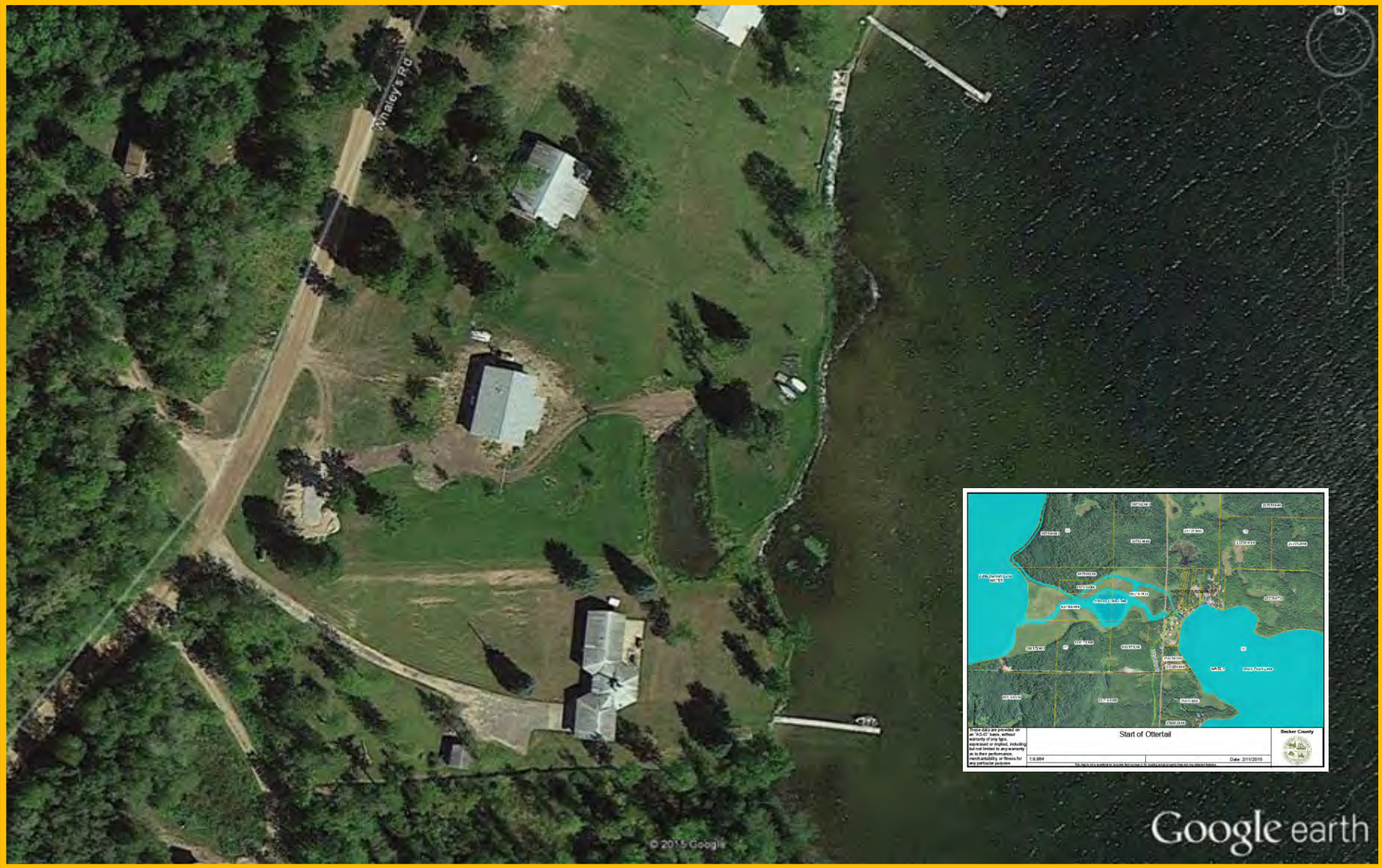
When Choosing Potential Sites for a Rain Garden or an Infiltration Basin *AVOID* Sites That Are:

1. Less than 10 FEET from a Building Foundation and Septic Drainfield
2. Shallow Water Table that is Less than 1 FOOT from the Bottom of the Rain Garden
3. In Poorly Draining Depressions
4. Over Utility Lines
5. On a Slope GREATER THAN 15%
6. On Locations that are Higher than the Bottom of the Downspout
7. Under Trees that Don't Tolerate Flooding
8. Under Mature Trees Where Roots will Limit Rain Garden Size and Make Digging Difficult



Material Suitability

Erosion Control Product: evaluate site to decide which products to use.



Material Suitability

Erosion Control Products

Coir log barrier for shore work

- Use of coconut matting for making a taco when scraping soil or bringing in soil

Biotech Soil: use with coir logs, plantings

Erosion Control Products

Wattles and Nurse Grass

Erosion Control Products

Coconut Mat

Straw Wattle

Erosion Control Products

Rip Rap


Erosion Control Products
5/22/2013
Shoreline Repair
Two Inlets Lake
Wave buffer to establish shoreline
13 Year Old Coir Log
Coir Log and Stakes
Brush Wattles

Erosion Control Products

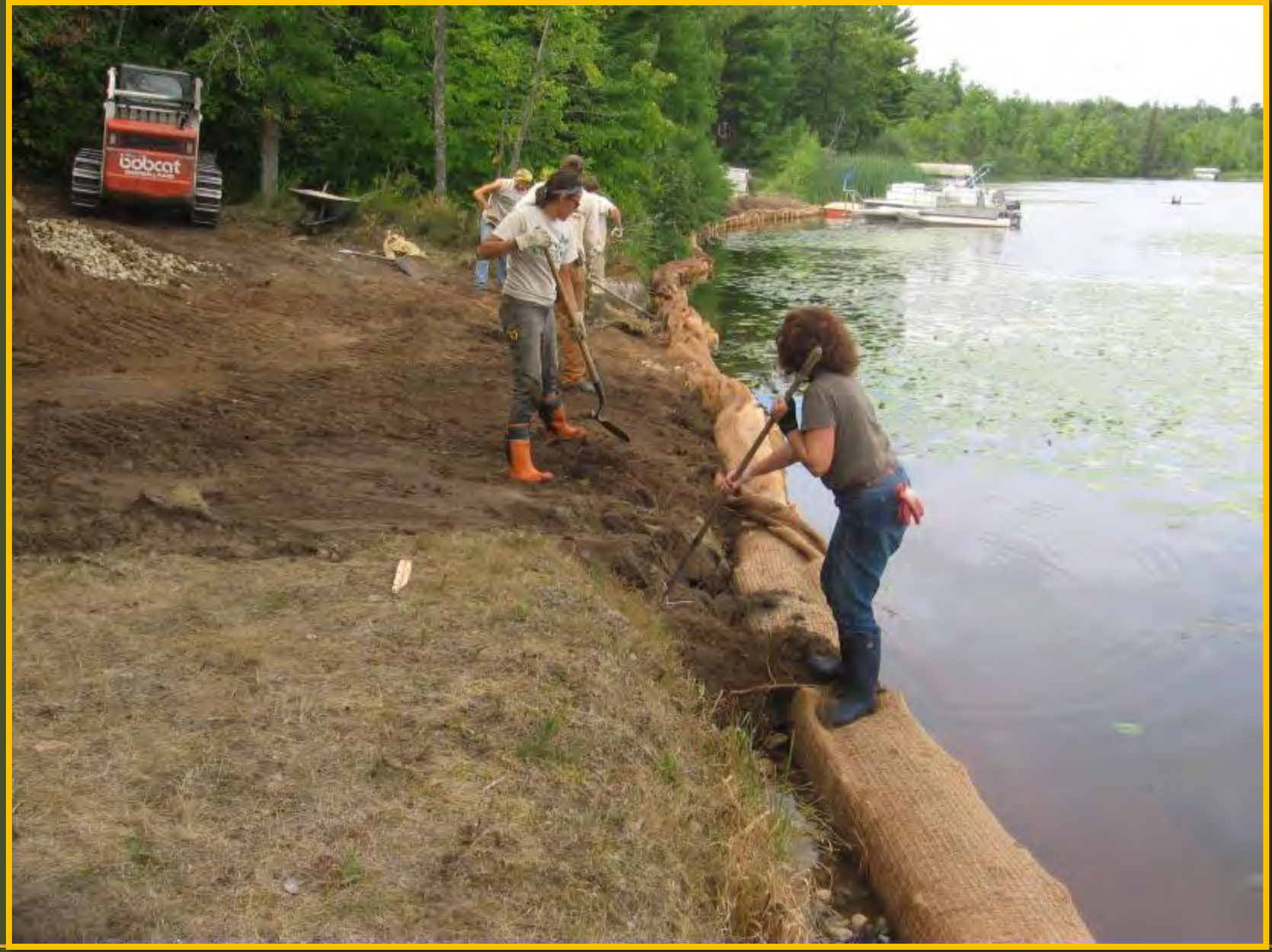
Silt Fence & Wattle -no stump removal

Zoning & Watersheds:

- Building permit
- Riprap permit (November Project)

Erosion Control Products

Coir logs and matting for erosion control measures




6/7/2013
Floyd Lake

Erosion Control Products

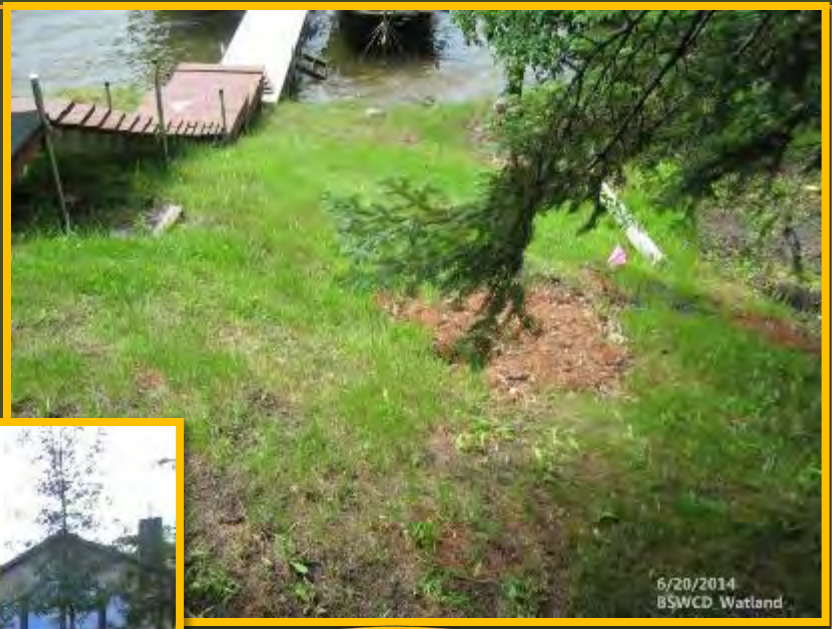
Material Suitability: Shoreline Erosion

Rodent Damage & Repair

Use the right materials

Material Suitability: Shoreline Erosion

Seep Areas



Seep Area

Scott Van Dam, Tulaby Lake, Plant Legend

Key	Common	Botanical	Key	Common	Botanical	Key	Common	Botanical
1	Bebb's Sedge	Carex bebbii	15	Dwarf Blazing Star	Liatris cylindracea	29	Pale-leaved Sunflower	Helianthus strumosus
2	Bicknell's Sedge	Carex bicknellii	16	Dwarf Blazing Star	Liatris cylindracea	30	Pennsylvania Sedge	Carex pensylvania
3	Big Bluestem	Andropogon gerardii	17	False Indigo	Amorpha fruticosa	31	Prairie Blazing Star	Liatris pycnostachya
4	Black Ash	Fraxinus nigra	18	Golden Alexander	Zizia aurea	32	Purple Prairie Clover	Dalea purpureum

Undercutting

Material Suitability: Shoreline Erosion

Wave Action

Material Suitability: Shoreline Erosion

Material Suitability: Shoreline Erosion

Pickerel Lake Slough

Erosion Control: Work with existing rock, evaluate trees

Riprap: Do not organize in shapes, work with nature

Plant Material

Native Plant Benefits for Buffers & Rain Gardens

1. Reduce shoreline erosion caused by wind and boat traffic
2. Acts as a filter for chemicals like fertilizers or pesticides before reaching lake.
3. Reduces lawn acreage, which reduces maintenance.
4. Increases water quality by filtering impurities and allowing sediments to settle
5. Improves wildlife habitat for birds, fish, mammals, amphibians and pollinators
6. Improves aesthetic value of your property from house to waterfront

Site Preparation for Plants

1) This is key to success with native plantings
2) Knowing soil structure: choose plants that fit structure
3) Remove existing non-native vegetation, the competition needs to be removed.

Remove Non-Native Vegetation (Weeds)

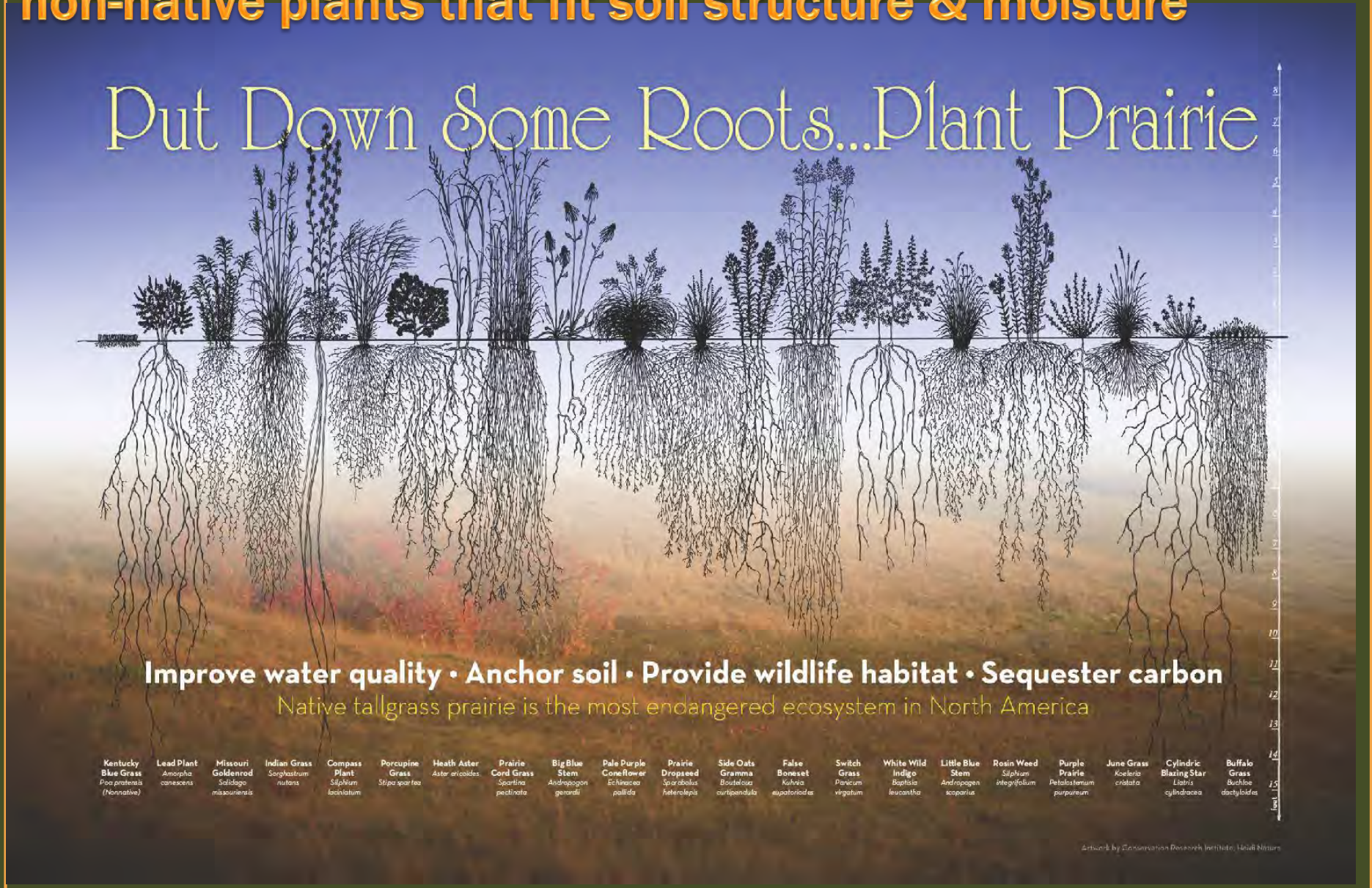
Reed canary grass (*Phalaris arundinacea*)

Reed Canary Grass -treatment and native planting

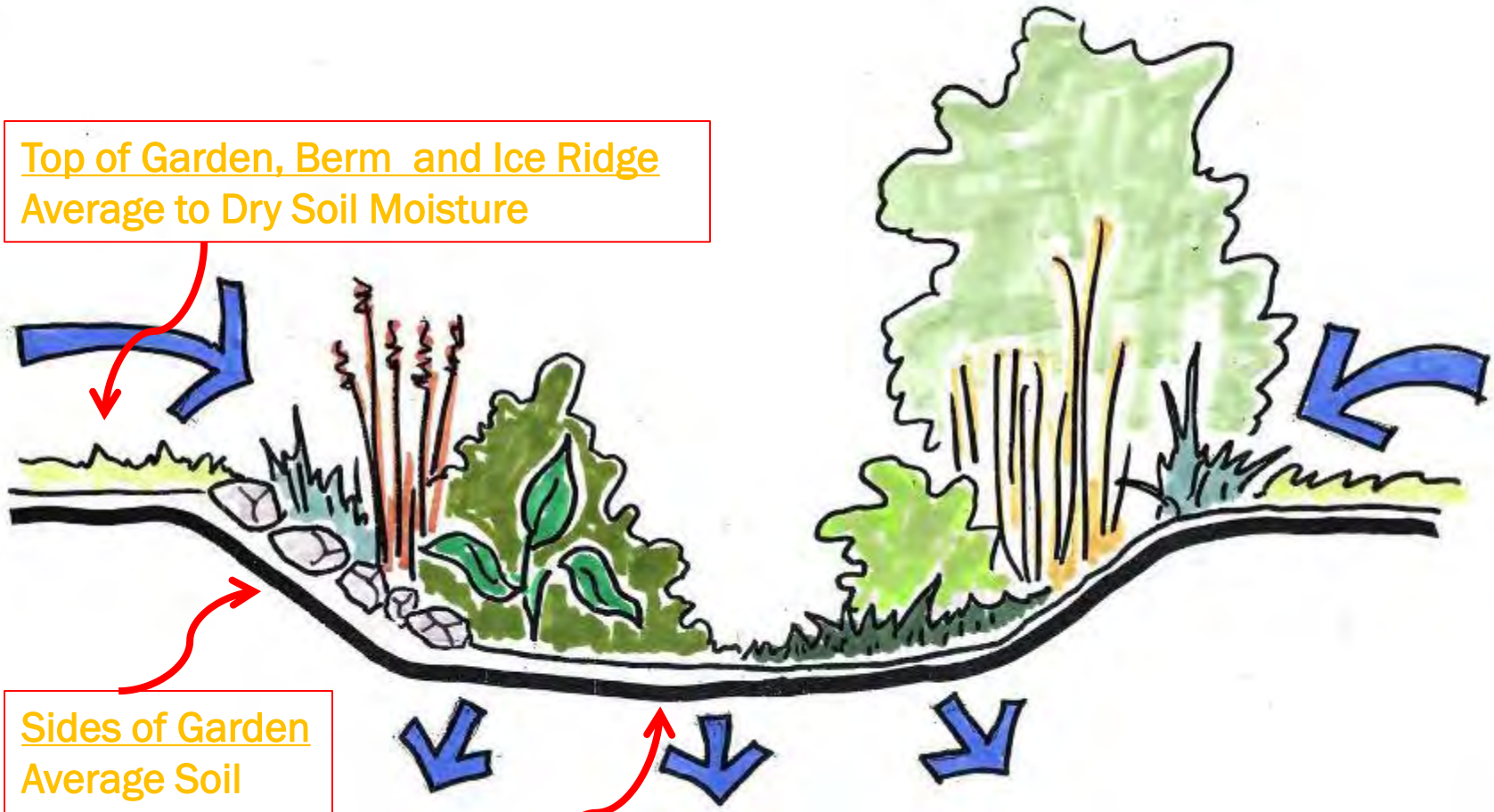
Choose Native Plants That Compete With Invasive Plants

Keep Your Equipment Clean

Root Structure: Choose plants to compete with non-native plants that fit soil structure & moisture



Plant Material



Top of Garden, Berm and Ice Ridge
Average to Dry Soil Moisture

Sides of Garden
Average Soil Moisture

Bottom of garden
Average to Moist Soil Moisture

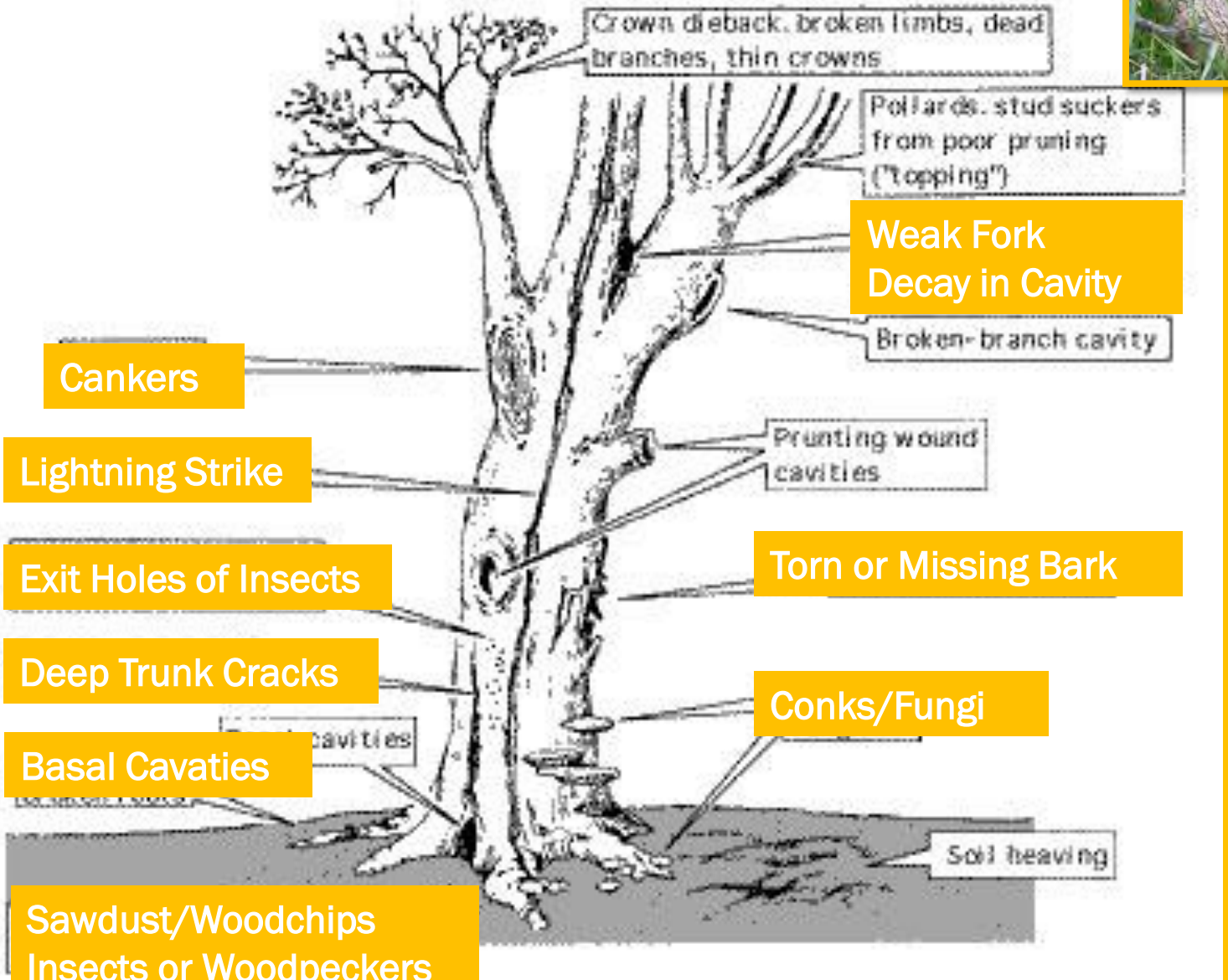

Plant Selection
5/28/2014
BSWCD_Watland

Plant Material: Removal Process

Insect Issues

Plant Material: Tree Removal Concerns

Tree Concerns



Trees-No Stump Removal by Lake

Shoreline Project Preparation

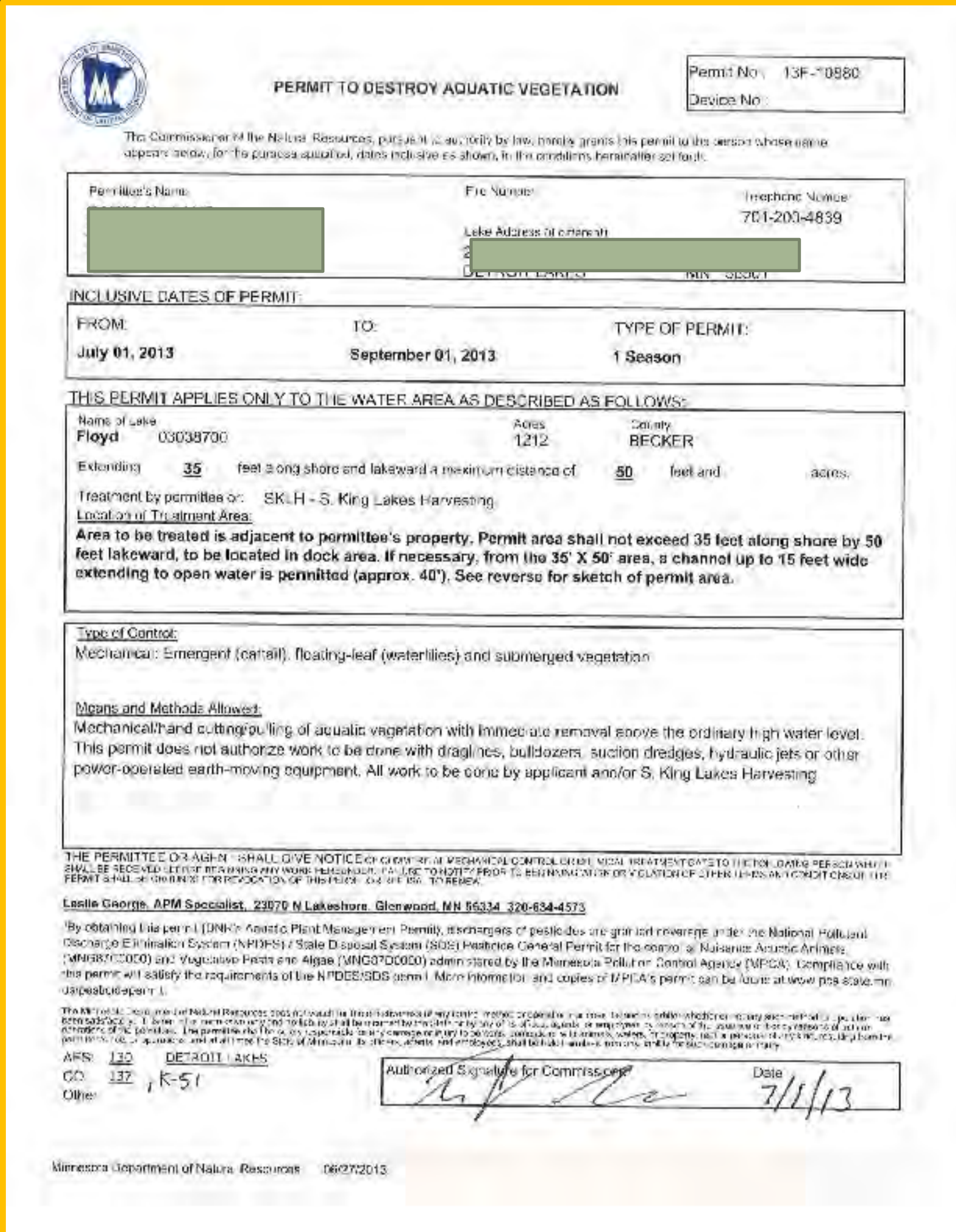
Pre-Construction Meeting

- Go over plan
- Required Permits in Place?
- **Go over plan**
- Take photos

Contractor Meeting 7/10/14 Install 7/30/14

Shoreline Project Preparation

Required Permit



PERMIT TO DESTROY AQUATIC VEGETATION

Permit No: 13F-10880
Device No:

The Commissioner of the Natural Resources, pursuant to authority by law, hereby grants this permit to the person whose name appears below, for the purpose specified, dates inclusive as shown, in the conditions hereinafter set forth.

Permittee's Name: [redacted]

File Number:

Telephone Number: 701-200-4839

Lake Address of permittee: [redacted] MN

INCLUSIVE DATES OF PERMIT:

FROM:	TO:	TYPE OF PERMIT:
July 01, 2013	**September 01, 2013**	**1 Season**

THIS PERMIT APPLIES ONLY TO THE WATER AREA AS DESCRIBED AS FOLLOWS:

Name of Lake		Acres	County
Floyd	03038700	1212	BECKER

Extending **35** feet along shore and lakeward a maximum distance of **50** feet and acres.

Treatment by permittee or: SKLH - S. King Lakes Harvesting

Location of Treatment Area:

Area to be treated is adjacent to permittee's property. Permit area shall not exceed 35 feet along shore by 50 feet lakeward, to be located in dock area. If necessary, from the 35' X 50' area, a channel up to 15 feet wide extending to open water is permitted (approx. 40'). See reverse for sketch of permit area.

Type of Control:

Mechanical: Emergent (cattail), floating-leaf (waterlilies) and submerged vegetation

Means and Methods Allowed:

Mechanical/hand cutting/pulling of aquatic vegetation with immediate removal above the ordinary high water level. This permit does not authorize work to be done with draglines, bulldozers, suction dredges, hydraulic jets or other power-operated earth-moving equipment. All work to be done by applicant and/or S. King Lakes Harvesting

THE PERMITTEE OR AGENT SHALL GIVE NOTICE ... TO RENEW.

Leslie George, APM Specialist, 23070 N Lakeshore, Glenwood, MN 56334 320-634-4573

By obtaining this permit (DNR's Aquatic Plant Management Permit), dischargers of pesticides are granted coverage under the National Pollutant Discharge Elimination System (NPDES) / State Disposal System (SDS) Pesticide General Permit for the control of Nuisance Aquatic Animals (MNG87C000) and Vegetative Pests and Algae (MNG87D000) administered by the Minnesota Pollution Control Agency (MPCA). Compliance with this permit will satisfy the requirements of the NPDES/SDS permit. More information and copies of MPCA's permit can be found at www.pca.state.mn.us/pesticidepermit.

AFS: 130 DETROIT LAKES
CO: 137 , K-51
Other:

Authorized Signature for Commissioner: [signature] Date: 7/1/13

Minnesota Department of Natural Resources 06/27/2013

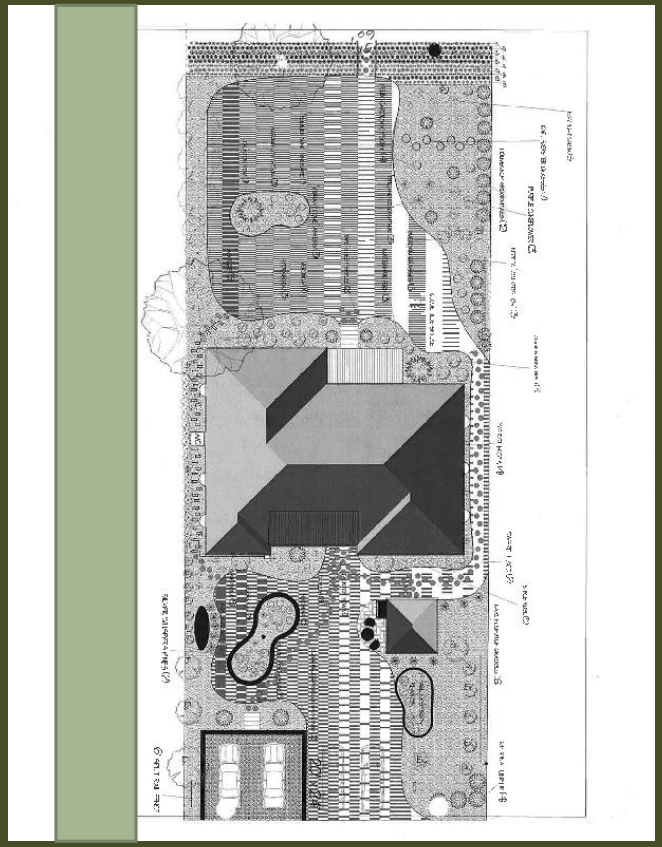
Shoreline Project Preparation

Project Design

Are Elements Communicated?

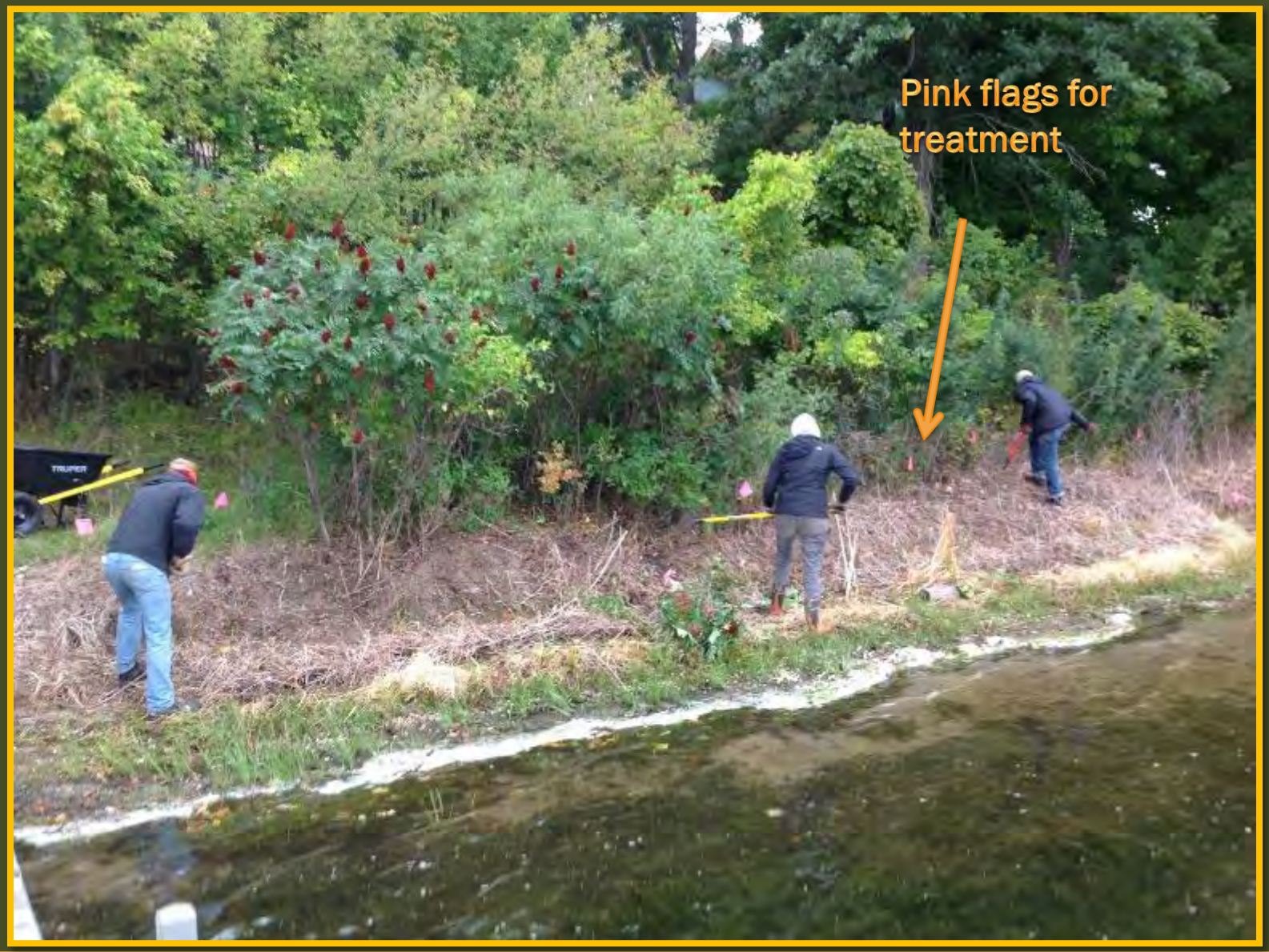
Landowners Design

Contractor's Plan



Shoreline Project Preparation

Flag Areas for Pre-treatment



Chemical Pretreatment

Rodeo Switched Owners

The active ingredient in this product inhibits an enzyme found only in plants and microorganisms that is essential to the formation of specific amino acids.

BMP Installation

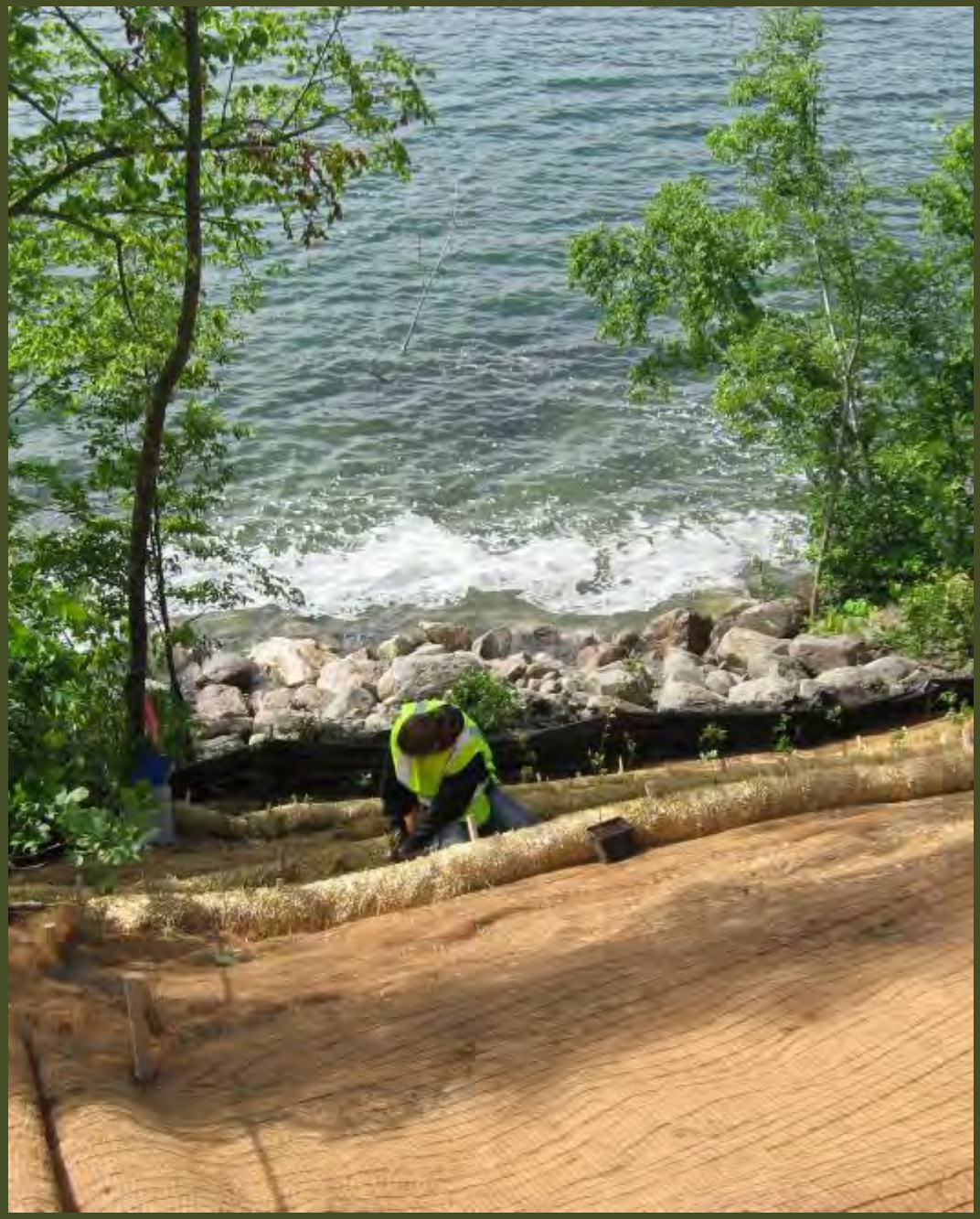
Staking:
Matting, Wattles, Plants, Coir logs

BMP Installation

Straw Wattles

1” x 1” x 24” Wood Stakes

Steeper slopes = more stakes



BMP Installation

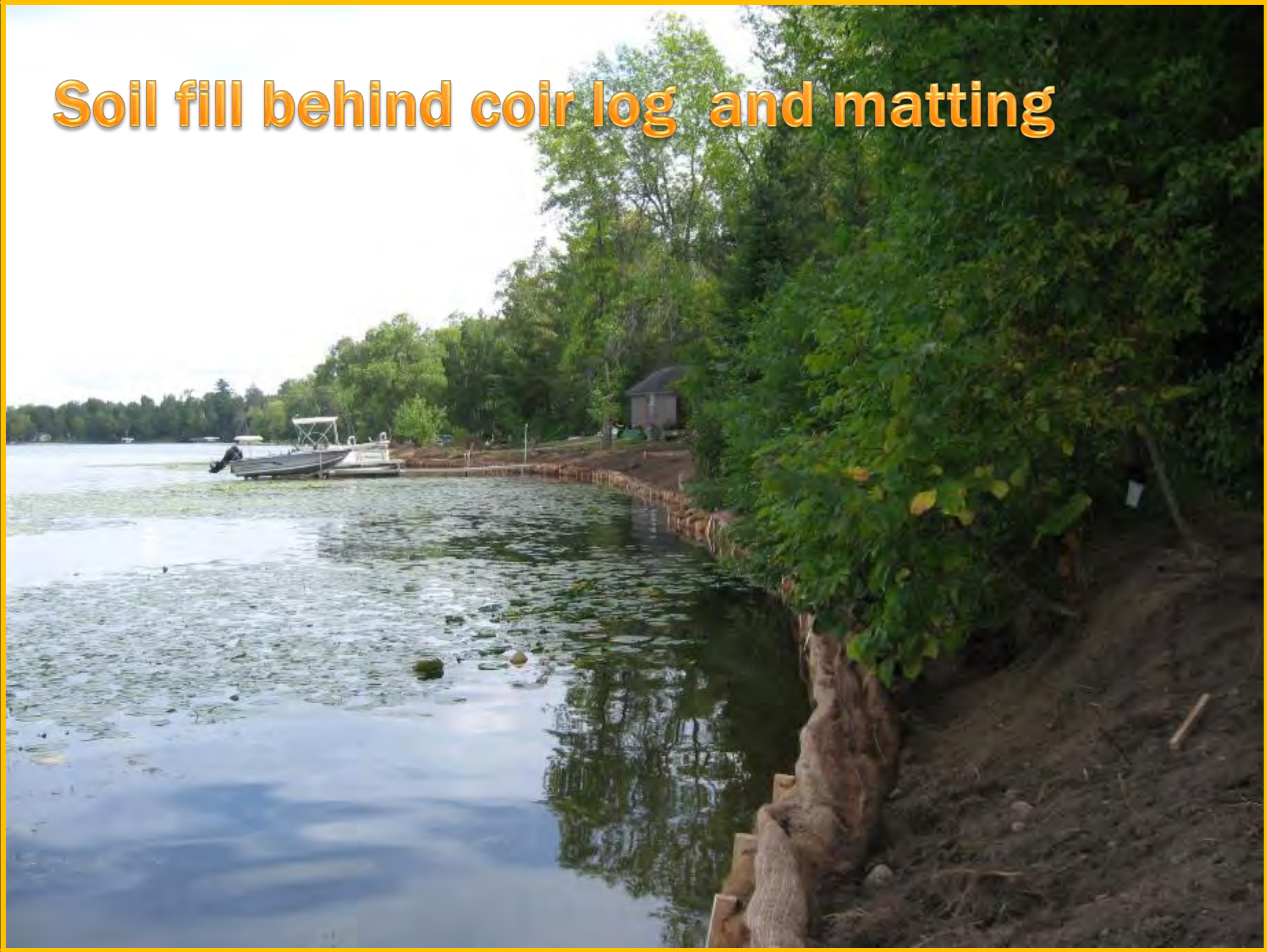
Coir Logs

12” x 10’ & 16” x 10’ Common

2”x4”x 3’ Wedge

18/bundle

Hemp Rope


Soil fill behind coir log and matting


Installing: Coir log → coconut matting for making a taco → bank cleanup → soil fill → oats → pull matting over soil → stake

Edging & Mulch

Rain Garden Installation


Rain Garden Installation
11/5/2013
Work with site topography

Rain Garden Installation

Rain Garden Installation


Rain Garden Installation
Mat slope and low area
5/27/2014
BSWCD_Watland

Rain Garden Installation

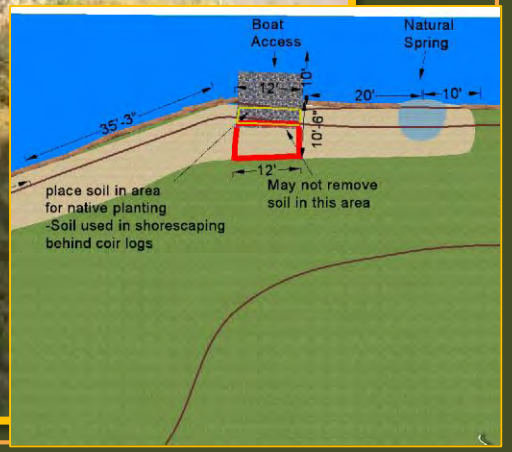
Nurse Grass: Prep area and scatter oats or annual rye (fall seeding doesn't require clipping)

Nurse Grass Correct Seeding


Retaining Walls?
10’
12’

Retaining Walls?

Lake Access?


Boat Access
Natural Spring
12'
10'
20'
10'
35'-3"
10'6"
12'
place soil in area
for native planting
-Soil used in shorescaping
behind coir logs
May not remove
soil in this area

…. if within DNR Regulations and permitted by Becker County Zoning

Project Completion

Inspections & Monitoring

- Inspections may be required if Stormwater Plans are required by Planning and Zoning or Watershed Districts
- Work with appropriate agencies for inspections and monitoring requirements
- If Cost-Sharing from Becker SWCD is involved, we will do the inspections

Operation & Maintenance

Post planting: First Year

1. The site will be immediately watered to settle in the plantings
2. **Watering**
3. **Weeding** - Check for weeds at least once every 2 weeks
4. **Mowing**
5. **Plant Identification**
6. **Mulch**
7. **Wave Breaks**
8. **Rain Garden/Drainage Area**

Operation & Maintenance

Post Planting: Second Year

1. Dead Vegetation
2. Weeding
3. Mowing
4. Water
5. Supplemental planting
6. Rain Garden/Drainage Area

Operation & Maintenance

Third Year and Beyond

1. Spring Weeding and Standing Vegetation
2. Weeding
3. **Supplemental planting** as necessary, continuous vegetation cover is the goal
4. Project Expansion
5. Dead Vegetation
6. Prescribed Burn
7. Rain Garden/Drainage Area