Classroom Examples

Classroom Example #1 (page 24)

- Flooding has occurred in Woodhull, NY in the south Branch of Tuscarora Creek and repair work is needed on a small stretch of stream. There is a bridge ¼ mile downstream of the affected area with a drainage area of 19.6 square miles.

- Find the following:
  - Bankfull width
  - Bankfull depth
  - Bankfull area
  - Floodplain width

1. Find the Drainage Area (D.A.)

- Drainage area at the bridge is 19.6 square miles
  - Use the appropriate Regional Bank-full Hydraulic Geometry Table from Appendix C
  - Use 20.0 square miles

2. Select the Proper Table (Appendix C)

- There is a table for each of the Hydrologic Regions in New York State

- Woodhull is located in the Southern Tier Region

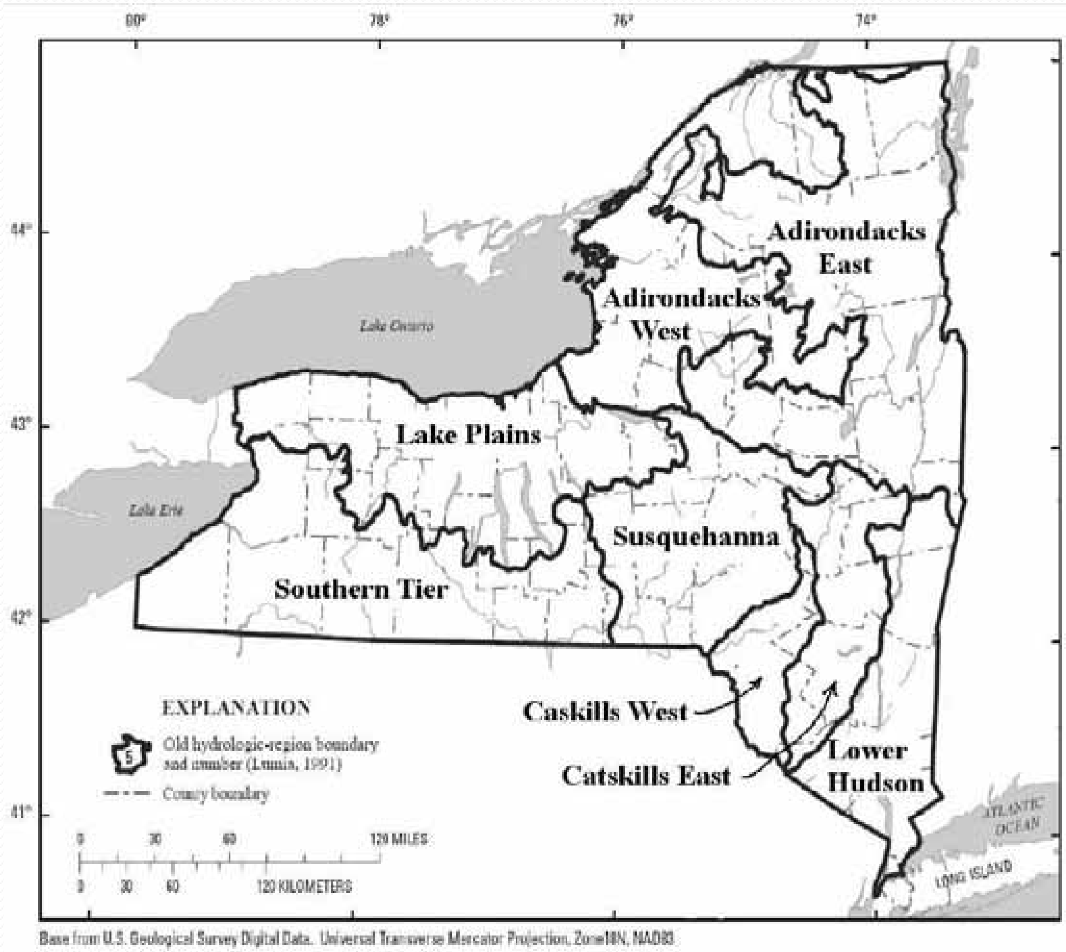


Figure 3.7 Hydrologic Regions in New York State

3. Find the Construction Dimensions

- Enter the table at the correct D.A. in the left hand column
- Read across & note the construction dimensions

Southern Tier Region

Bank Full Hydraulic Geometry vs. Drainage Area for Selected Hydrologic Regions

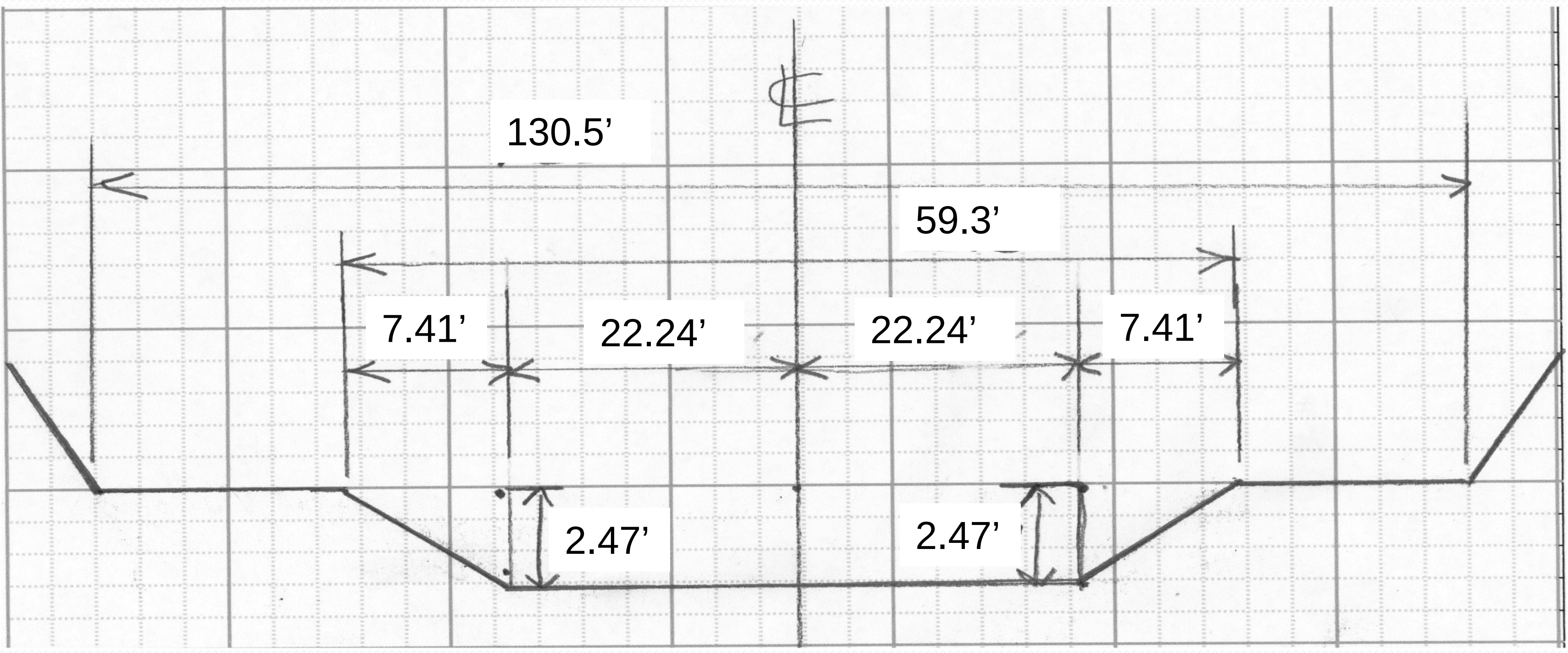
DA (sq. mile)	Bank-Full Area (sq. ft)	Bank -Full Width (ft)	Bank-Full Depth (ft)	Construction Dimensions					
				channel side slope	D (ft)	3D (ft)	X (ft)	TW (ft)	Min. FP (ft)
1.0	17.60	16.90	1.04	3:1	1.38	4.13	4.32	16.90	37.18
2.5	32.28	24.81	1.30	3:1	1.62	4.85	7.56	24.81	54.58
5.0	51.08	33.17	1.54	3:1	1.85	5.55	11.04	33.17	72.98
7.5	66.80	39.31	1.70	3:1	2.01	6.02	13.63	39.31	86.49
10.0	80.82	44.35	1.82	3:1	2.13	6.39	15.78	44.35	97.57
12.5	93.68	48.70	1.93	3:1	2.23	6.70	17.65	48.70	107.13
15.0	105.70	52.56	2.01	3:1	2.32	6.96	19.32	52.56	115.64
17.5	117.06	56.07	2.09	3:1	2.40	7.20	20.84	56.07	123.35
20.0	127.88	59.30	2.16	3:1	2.47	7.41	22.24	59.30	130.45

Answer to Example #1

- Bankfull width = 59.30 ft.
- Bankfull depth = 2.16 ft.
- Bankfull area = 127.88 ft.^{2}
- Floodplain width (FP) = 130.45 ft.

Classroom Example #1

- It is highly recommended that you prepare a sketch of the proposed cross section to use during stake out & construction

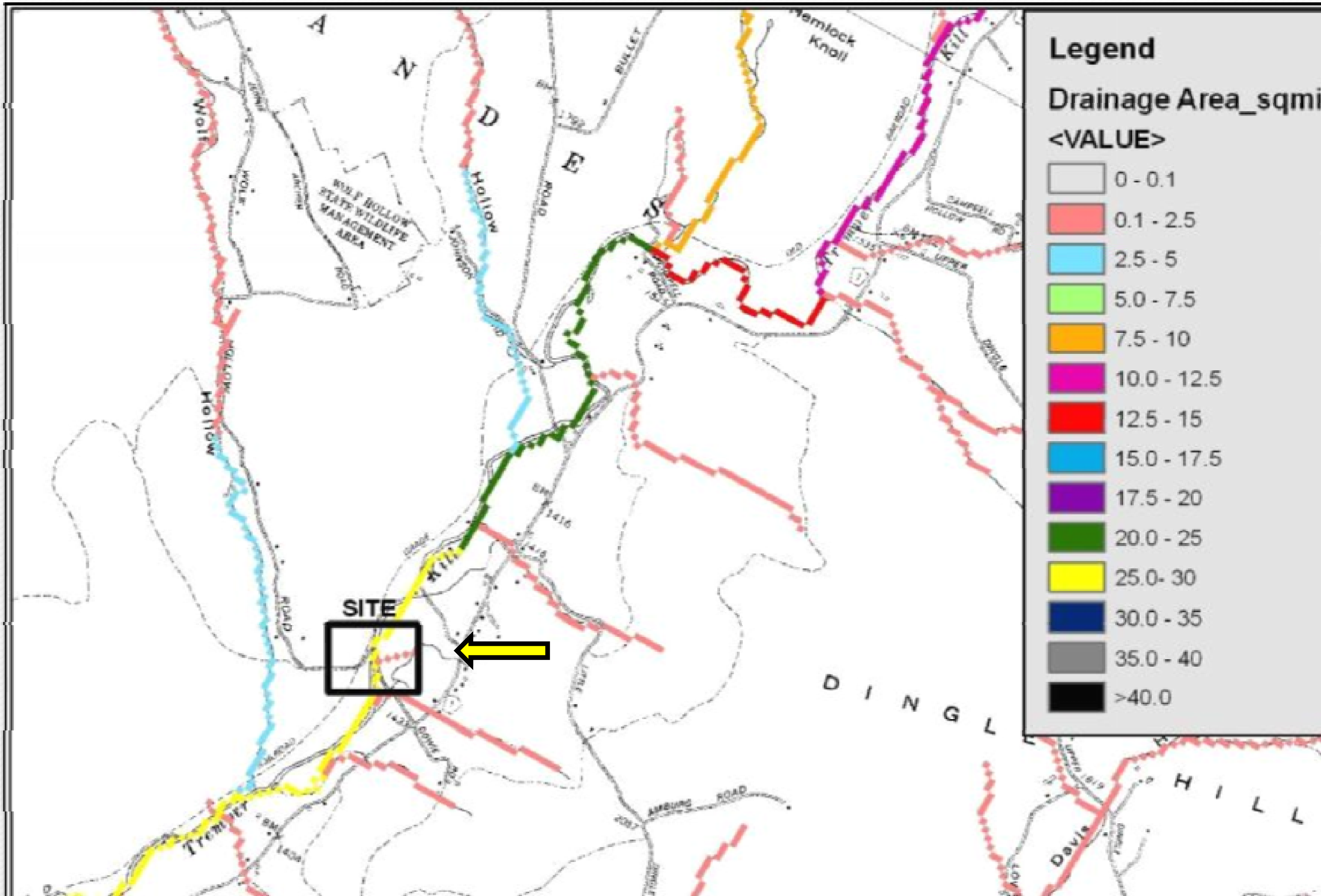


Classroom Example #2 (page 25)

- Flooding has occurred in Andes, NY on a portion of the Tremper Kill stream near Wolf Hollow Road.

- Find the following:
  - Drainage Area
  - Construction Dimensions

1. Find the Drainage Area (D.A.)



1. Find the Drainage Area (D.A.) Cont.

- On the map, the reach is coded **YELLOW**
- The key tells us that this is between 25-30 square miles
- Wolf Hollow road intersection is near the upper end of the reach – use 25 square miles

2. Select the Proper Table (Appendix C)

- There is a table for each of the Hydrologic Regions in New York State
- Andes is located in the Catskill West Region

Base from U.S. Geological Survey Digital Data. Universal Transverse Mercator Projection, Zone18N, NAD83

Figure 3.7 Hydrologic Regions in New York State

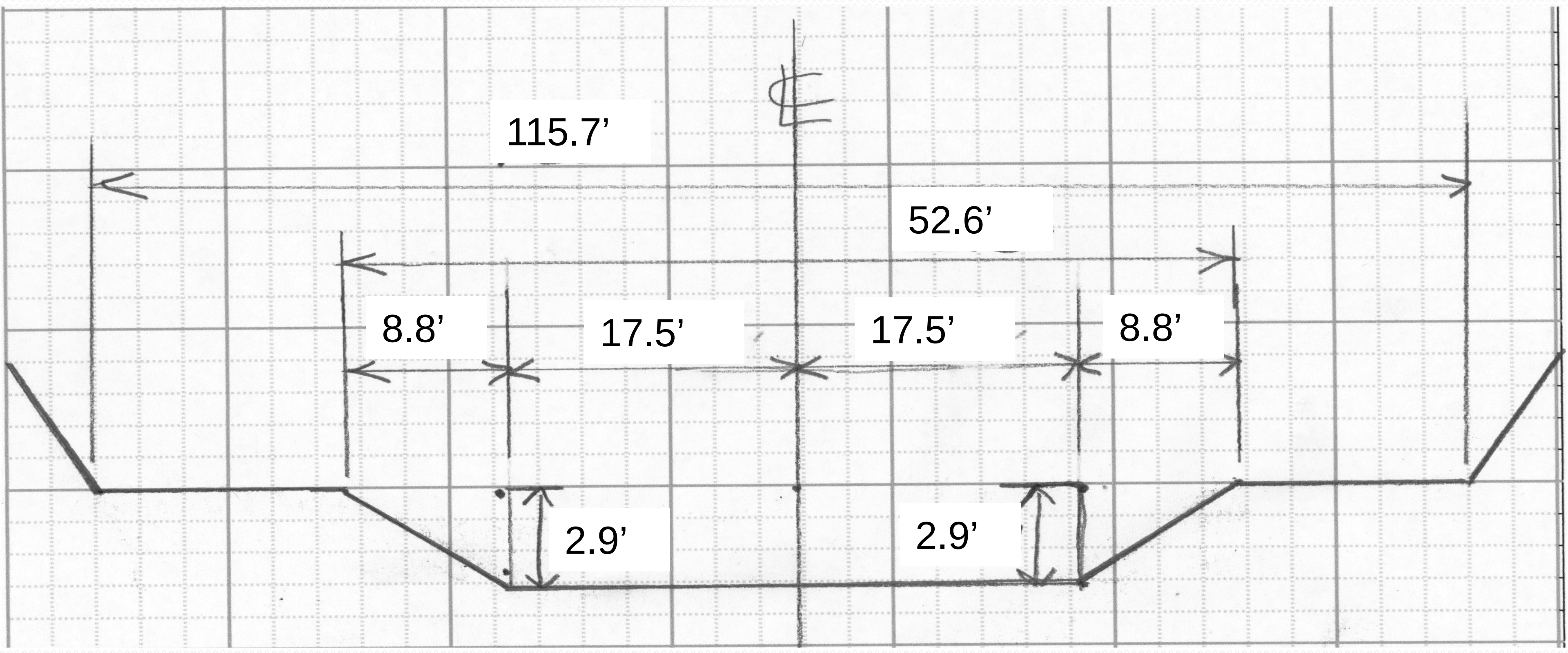
3. Find the Construction Dimensions

- Enter the table at the correct D.A. in the left hand column
- Read across & note the construction dimensions

				Construction Dimensions					
DA (sq. mile)	Bankfull Area (sq. ft)	Bankfull Width (ft)	Bankfull Depth (ft)	channel bank side slope	D (ft)	3D (ft)	X (ft)	TW (ft)	Min. FP (ft)
1	7.2	9.1	0.8	2:1	1.0	2.1	2.5	9.1	20.0
2.5	16.3	15.0	1.1	3:1	1.6	4.8	2.7	15.0	33.0
5	30.4	21.9	1.4	3:1	1.9	5.6	5.3	21.9	48.1
7.5	43.6	27.3	1.6	3:1	2.1	6.2	7.4	27.3	60.0
10	56.4	31.9	1.8	3:1	2.2	6.7	9.2	31.9	70.2
12.5	68.9	36.0	1.9	3:1	2.4	7.2	10.9	36.0	79.3
15	81.1	39.8	2.0	3:1	2.5	7.5	12.4	39.8	87.6
17.5	93.0	43.3	2.2	3:1	2.6	7.9	13.8	43.3	95.3
e20	104.8	46.6	2.3	3:1	2.7	8.2	15.1	46.6	102.5
22.5	116.5	49.7	2.3	3:1	2.8	8.5	16.3	49.7	109.2
25	128.0	52.6	2.4	3:1	2.9	8.8	17.5	52.6	115.7
27.5	139.3	55.4	2.5	3:1	3.0	9.0	18.7	55.4	121.9
30	150.6	58.1	2.6	3:1	3.1	9.3	19.8	58.1	127.8

Classroom Example #2

- It is highly recommended that you prepare a sketch of the proposed cross section to use during stake out & construction



Work Methods

Limiting Gravel Removal

- Do **<u>NOT</u>** remove gravel to such a depth that the channel is disconnected from the floodplain
- Do **<u>NOT</u>** remove point bars
  - Removing them may increase deposition & destabilize the system
  - If you think a point bar has grown too large ask for advice from local SWCD or NYSDEC

Limiting Gravel Removal

- Generally, center bars & side bars can be safely removed
- Do **NOT** over excavate or over-widen
- If the center bars & side bars are **NOT** a product of the flood leave them alone. You have more important things to do

Reconnecting to the Floodplain

- The provided tables give you the dimension for the floodplain
- The elevation of the floodplain is at the bankfull elevation
- The channel is automatically reconnected to the floodplain
- If there is not enough room available for the recommended width, make the floodplain as wide as you can

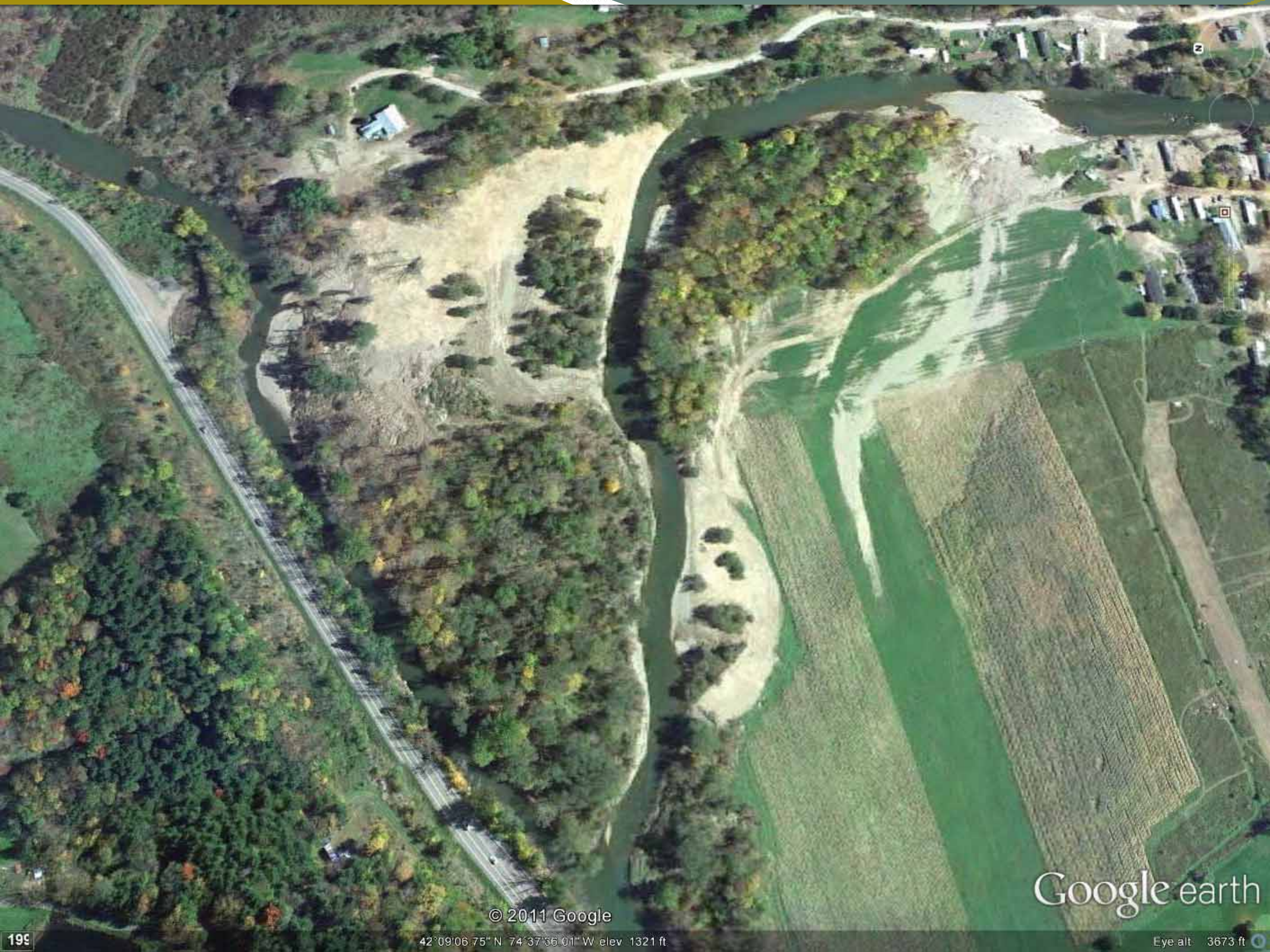
Due to the lack of room, there is floodplain on one side of the channel only


3-30-09


07-29-09

2011 Hurricane Irene

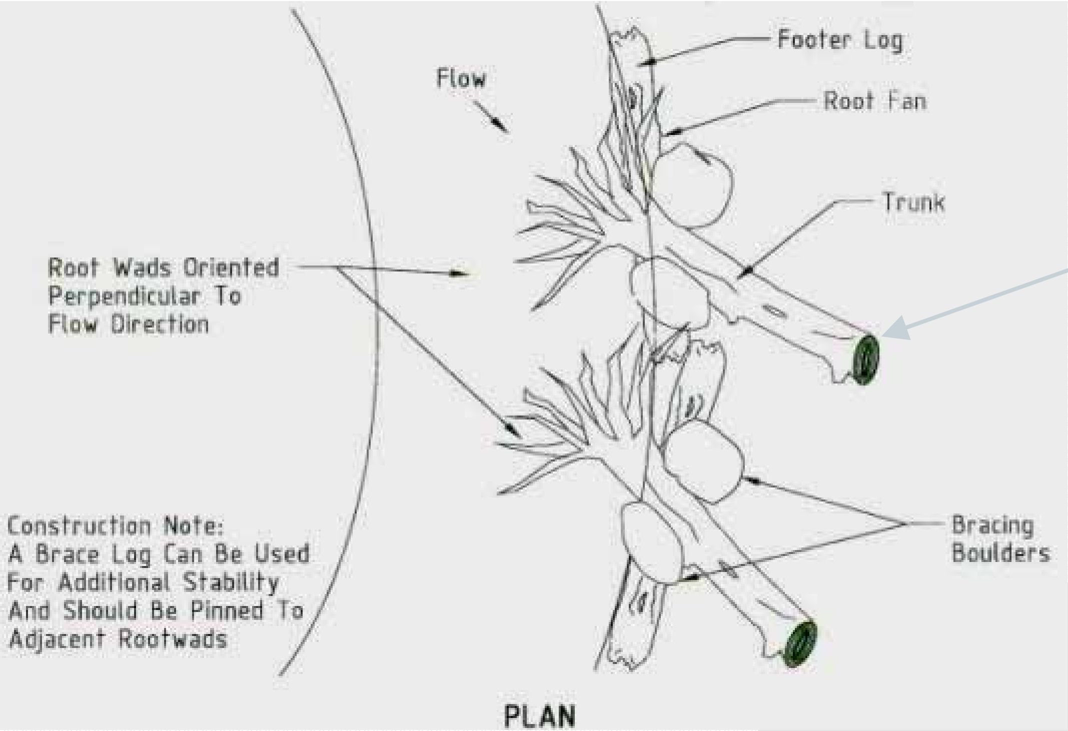
Impact on Dry Brook Stream in Arkville, NY


© 2011 Google
Google earth
42°09'06.75" N 74°37'36.01" W elev 1321 ft
Eye alt 3673 ft

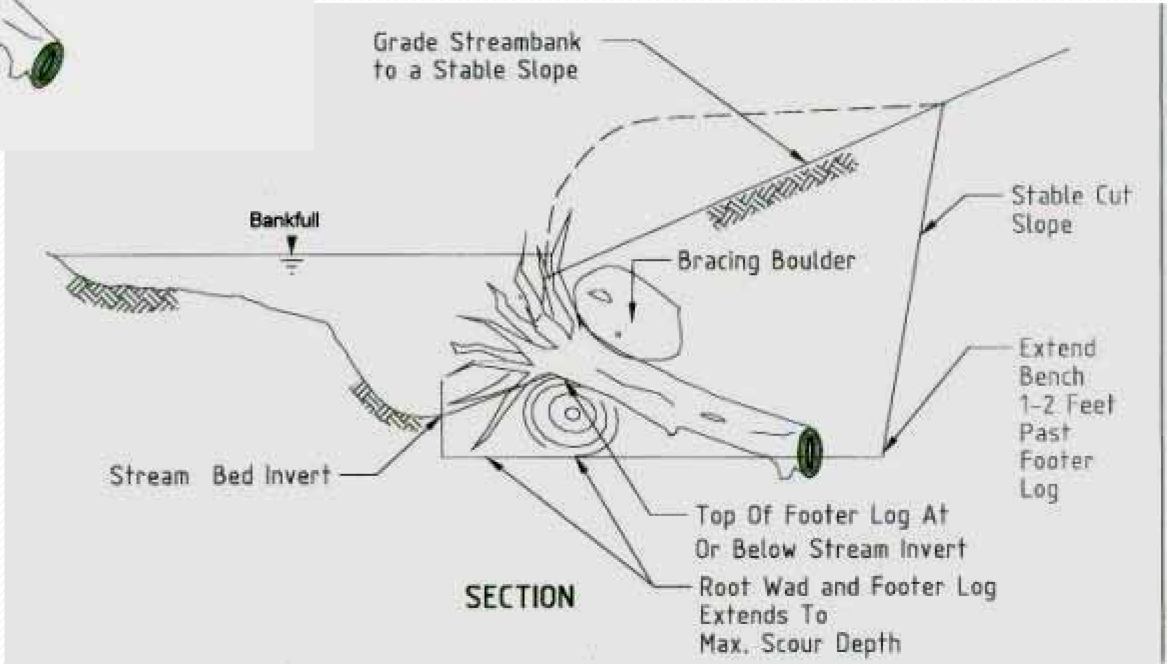
Root Wads

- Root wads can be used to stabilize the streambank
- Use debris trees that are conveniently located nearby
- The bottom of the root ball should be below the channel grade
- Brace with boulders or other large logs

Root Wads



Leave trunk as long as possible



Root wads were placed in two layers with large rocks to hold them in place


9-22-2011

Vegetation

- Vegetation holds the streambanks together
- For emergency work, there is no time to plant trees and shrubs
- Grass will provide short term stability and prevent fine sediment runoff
- Seed and mulch or hydroseed (this will be a NYSDEC permit condition)

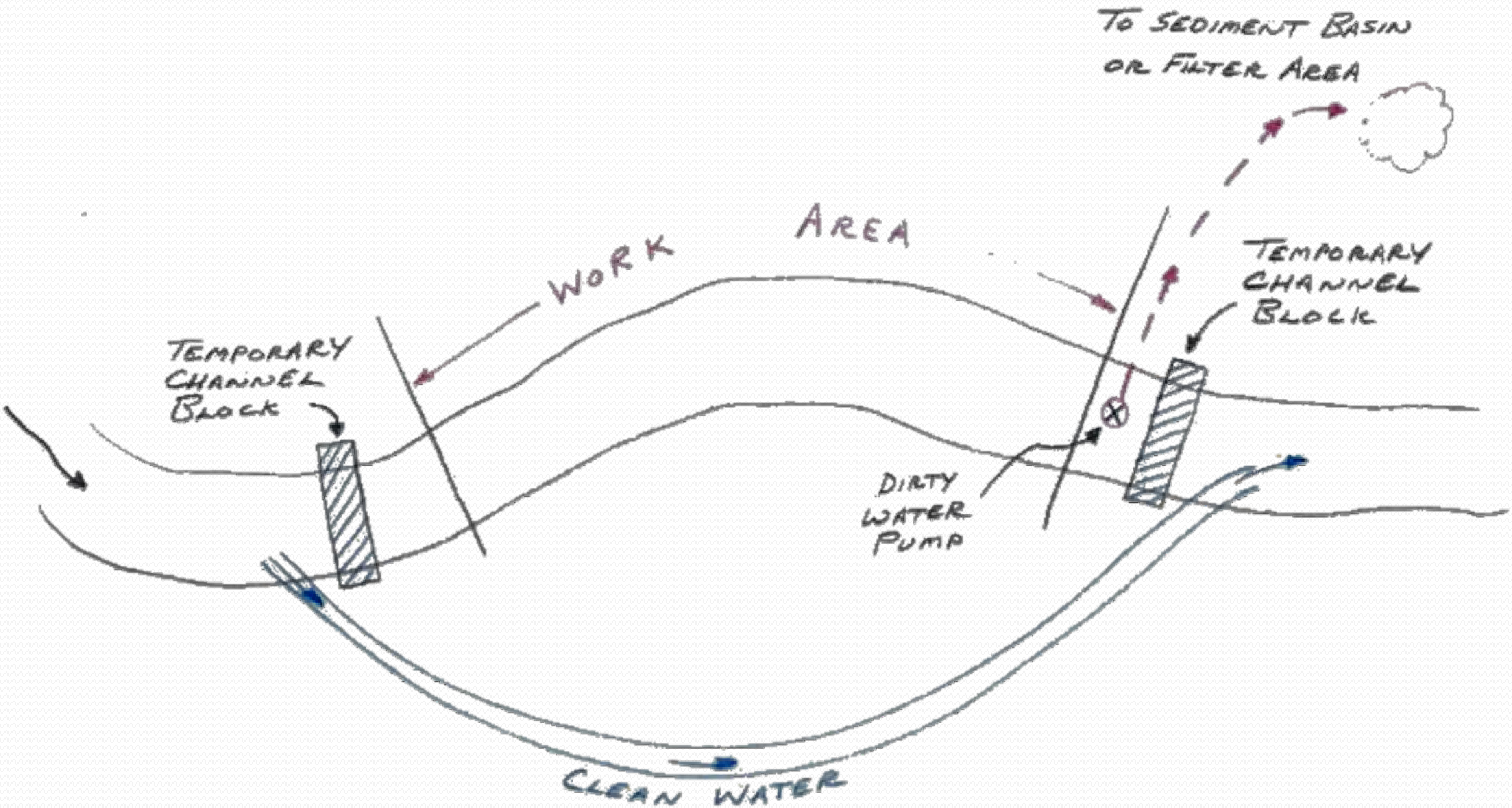
Vegetation

- After repair if there is an absence of woody vegetation on the banks inform local SWCD, NYSDEC, and the local municipality
- A proper vegetation plan can be designed & implemented later

De-watering

Must Isolate the Work Area

General Work Area Schematic



De-watering – Avulsion

De-watering – Avulsion

De-watering – Point Bar

Diversion – General Rules

- Place the barrier as close to the work area as possible without interfering with the operations
  - This maximizes area open to flow
- Plan the staging of your barrier – minimize the number of times the barrier will have to be moved
- The ends of the barrier will have to tied in to the bank or placed high enough so that they cannot be outflanked by the water

Diversion – Barrier


Blocks wrapped
in plastic
8-03-07

Pumping Around

Take advantage of your site

Pumping Around

- Generally only done on small streams
  - Dave Post farm (DA = 3 mi^2)
    - Planned on pumping 5 cfs
    - Actually pumped 15 cfs
- May be done on short term projects during known periods of low flow
  - Combination of bypass and pumping

Pump Capacities

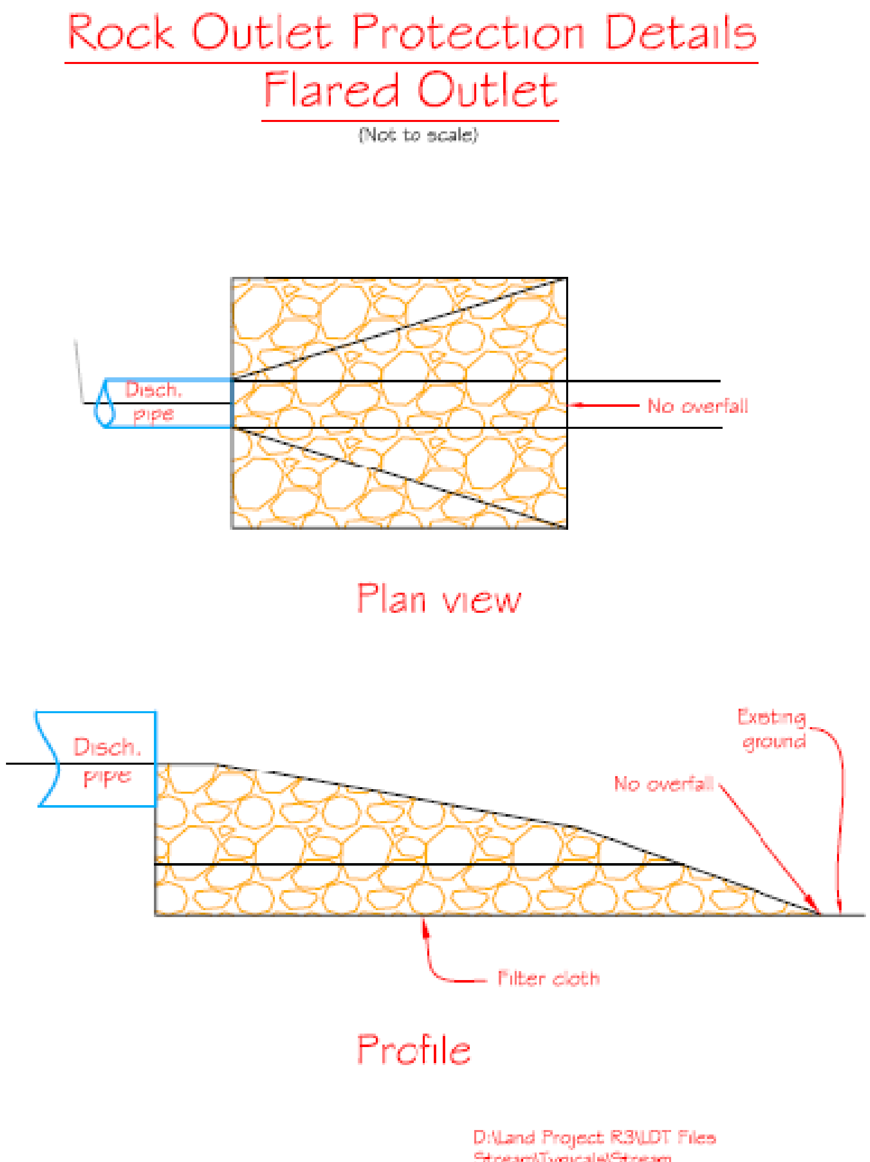
Pump Size	Max Capacity CFS	Max Capacity GPM
2"	0.5	216
3" 4"	0.7 1.6	300 700
6"	4.5	2000
8" 10"	7 7.8	3200 3500
12"	10	4500

Source: Godwin Pump, CD Series Dri-Prime

Pumping Around

- Place the pipe outlet at a well vegetated area
- Construct the energy dissipater
- Check frequently to be sure that the device is working and that no erosion is occurring
- Clean water in sheet flow enters the stream – *only!*

Pump Outlet Protection



- Leave rock loose and "jumbled"
- Adjust elevation of pipe if necessary
- Add rock and cloth if necessary
- *Intent is to induce sheet flow and avoid erosion*


08-12-10

Diversion or Pumping Around

- No turbid water may leave the site
- Cause no erosion
- Check your operation often!
- If have any problems, **stop and repair at once!**