

US EPA ARCHIVE DOCUMENT

UNIQUE CHALLENGES of BOOMING FAST FLOWING RIVERS



BOOM DEPLOYMENT TECHNIQUES & STRATEGIES

by

Carl J. Oskins

DOWCAR Environmental Management, Inc.

WHEN ATTEMPTING to BOOM a FAST FLOWING RIVER

THERE are THREE (3) GIVENS:

- *YOUR RADIOS GO DOWN,*
- *YOUR BOATS WON'T START &*
- *YOUR ANCHORS WON'T HOLD.*

ADDITIONALLY,
MOST SPILL RESPONSE TEAMS INITIALLY CONSIST
of

- **ME,**
- **YOU,**
- **BUBBA**

A PICKUP TRUCK with LITTLE or NO EQUIPMENT
and/or the INCORRECT TYPE of EQUIPMENT (BOOM)
for RIVER APPLICATIONS.

OUR **OBJECTIVE** is to PROVIDE a
DECISION PROCESS
to AID the FIRST RESPONDER in the
PROPER SELECTION of APPROPRIATE
SPILL RESPONSE STRATEGIES
for
BOOMING FAST FLOWING RIVERS

SPILL RESPONSE STRATEGIES

- ***MONITOR, WAIT & DO NOTHING***
 - ***IN-SITU BURNING***
 - ***CHEMICAL TREATMENTS***
- ***PHYSICAL CONTAINMENT of OIL***
 - ***PHYSICAL REMOVAL OF OIL***
 - ***SHORELINE/BANK CLEANUP***
 - ***WASTE DISPOSAL***
- ***REMEDIATION & RESTORATION***

BOOM CONSIDERATIONS:

- ***WHAT is PRACTICAL?***
- ***HOW EFFICIENT?***
(*Effort vs Effectiveness*)
- ***WHAT are the RESPONSE OPTIONS?***
(*“Environmental Damaging”*)
- ***WHAT are the IMPLICATIONS of MONITORING?***
(*Self Cleaning Response*)
- ***ARE THERE POLITICAL or SOCIAL SENSITIVITY ISSUES?***
- ***HOW MUCH WASTE will be GENERATED or COLLECTED?***
(*i.e. Disposal*)

SELECTION FACTORS

- *TYPE of WATER BODY*
- *CURRENT SPEED*
- *SHORELINE CONFIGURATION*
- *NATURAL COLLECTION POINTS*
- *WATER DEPTH*
- *AVAILABLE EQUIPMENT*
- *AVAILABLE MANPOWER*
- *AMOUNT of OIL SPILLED*
- *WEATHER CONDITIONS*
- *TIME of YEAR*

“3” BOOM DEPLOYMENT STRATEGIES

- **EXCLUSION BOOMING**

Deflection

- **CONTAINMENT BOOMING**

Lakes/Bays/Ocean/Rivers

- **DIVERSION BOOMING**

*Single
Cascade
Chevron*

- **EXCLUSION BOOMING:**

Boom Deployment **ACROSS** or **AROUND** Sensitive Areas and Anchored in Place to **“EXCLUDE”** a Pollutant from Contaminating the Area.

Used Across:

SMALL BAYS,
HARBOR ENTRANCES,
INLETS,
RIVERS,
CREEK/STREAM MOUTHS,
WATER INTAKE SYSTEMS, ETC.

to **PROTECT an AREA** and/or **PREVENT BEING OILED.**



*Exclusion Booming of Confluence of Rivers
Nonconnah Creek - Memphis, Tennessee Area*

- **DEFLECTION BOOMING:**

Boom is **Deployed from the shoreline away from** the Approaching Pollutant and Anchored in Place.

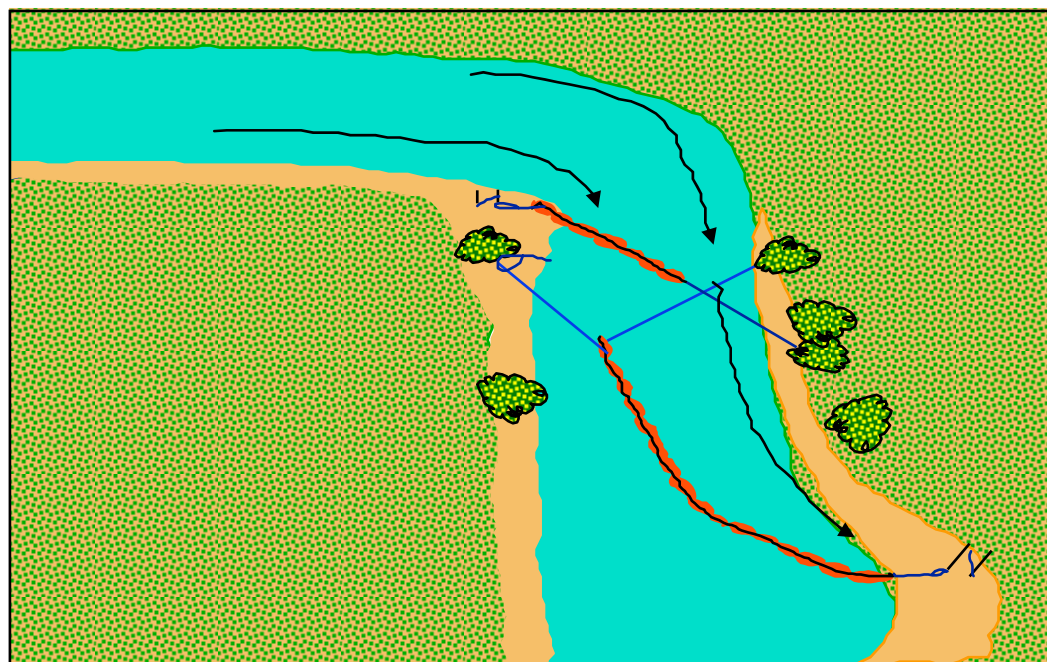
The Pollutant is Deflected away from the River Bank &/or Shoreline

*The Pollutant is “**Deflected and/or Pushed Away**” from a Sensitive Area and/or Prevented from Impacting the Area in Question.*

The Approaching Slick is Forced into a Taking a New Direction.

Used on: **RIVERS,**
STREAMS & CREEKS,
HARBOR ENTRANCES,
INLETS,
BAYS.

Deflection Boom Deployment





Deflection Booming - River Deployment
Weber River - Coalville, Utah Area

- **CONTAINMENT BOOMING:**

In Lake, Bay, or Ocean Response, Boom is Deployed in a “U” or “V” Shape in Front of the Approaching Oil Slick.

Boom Towing Bridles are Anchored &/or Secured to the Work Boat with 100 Ft. Tow Lines or Directly to the Shoreline/Bank.

On Rivers, the Oil is diverted to the Shoreline/River Bank for Containment and Recovery.



Containment Booming - River Bank
Marias River - Shelby, Montana Area

TYPES of DIVERSION BOOMING

- **SINGLE DIVERSION,**
- **CASCADE DIVERSION,**
 - BANK to BANK ROPE SYSTEM***
 - BRIDGE to BANK ROPE SYSTEM***
 - BUOY to BANK ROPE SYSTEM***
- **CHEVRON DIVERSION**
 - CLOSED CHEVRON SYSTEM***
 - OPEN CHEVRON SYSTEM***
 - CASCADE CHEVRON SYSTEM***

- **DIVERSION BOOMING:**

Boom is **DEPLOYED at an ANGLE** to the Approaching Pollutant.

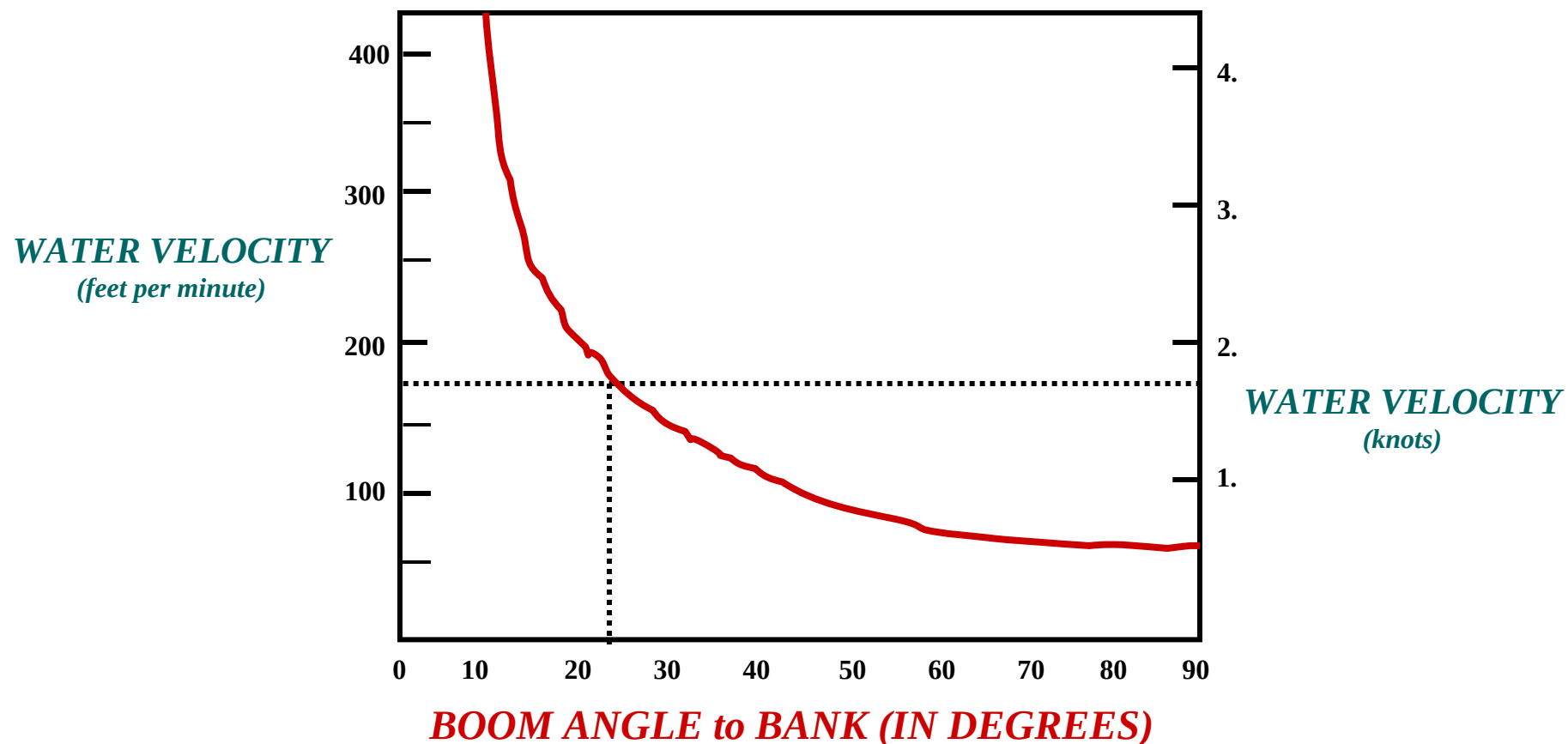
The **FASTER** the Current, the **SMALLER the BOOM ANGLE** of **DEPLOYMENT** into the **FLOWING WATER**.

The Pollutant is Either “**DEFLECTED**” away from a from a Sensitive Area or “**DIVERTED**” to a Central Collection Point on the River Bank to Ease Recovery.

Used on: **RIVERS,**
STREAMS & CREEKS,
HARBOR ENTRANCES,
INLETS,
BAYS

where Currents Exceed **1 KNOTS** &/or **1.15 MILES PER HOURS.**

BOOM ANGLES for VARIOUS CURRENT SPEEDS



Plot of the Maximum Angle for Boom Deployment at Increasing Current Velocities.



*Single Diversion Boom Deployment with Shoreline Protection
Red River of the North - Fargo, North Dakota*

FAST RIVER BOOMING TECHNIQUES

“ ROPE ” CASCADE DIVERSION BOOM DEPLOYMENT SYSTEMS

- ***BANK to BANK ROPE SYSTEM***
- ***BRIDGE to BANK ROPE SYSTEM***
- ***BUOY to BANK ROPE SYSTEM***

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



Bank to Bank Rope Anchor System
Blackstone River - Pawtucket, Rhode Island Area

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



Bank to Bank Rope Anchor System
Spokane River - Spokane, Washington Area

FAST RIVER BOOMING TECHNIQUES

BANK to BANK ROPE SYSTEM

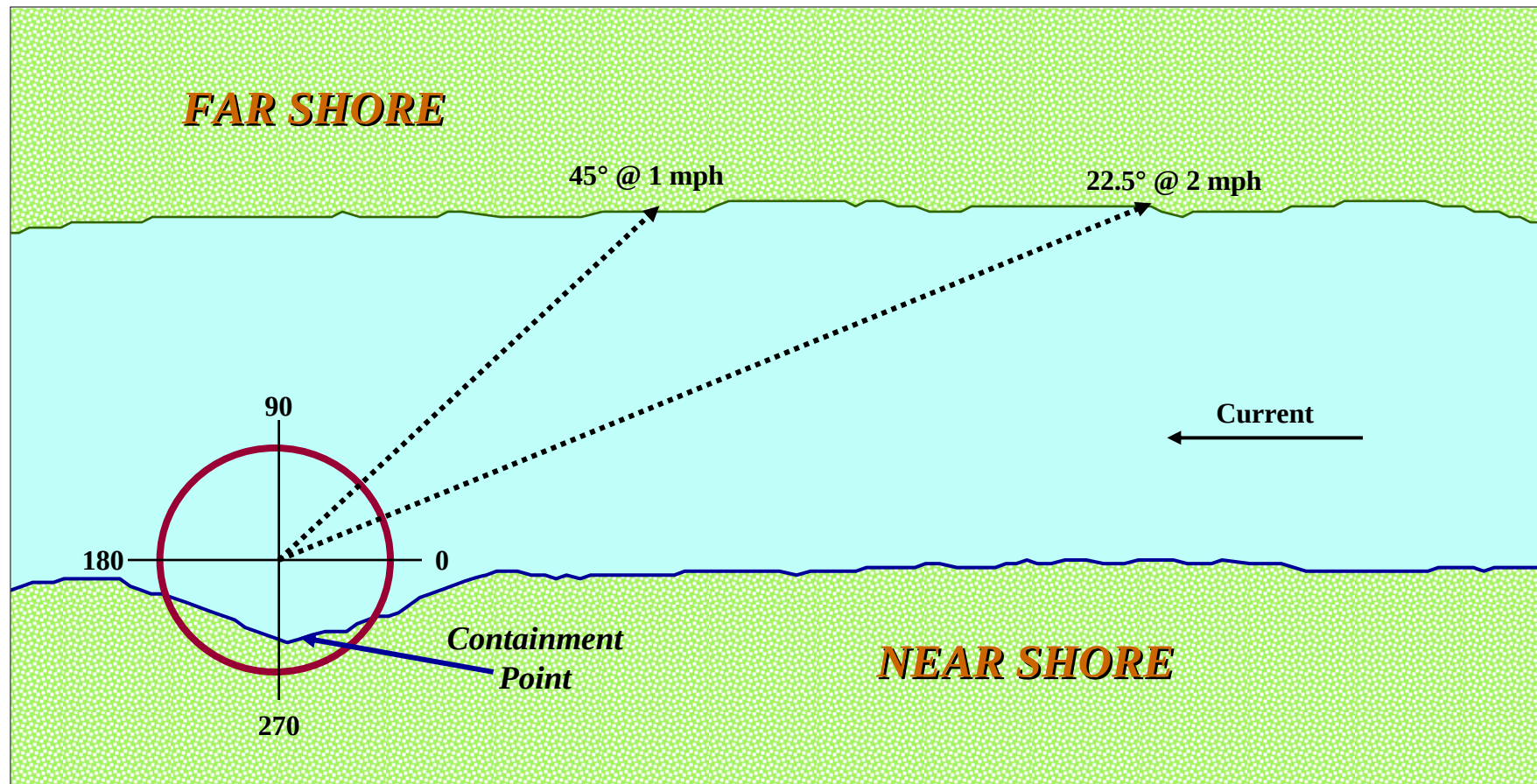
HOW DO WE BEGIN PROCESS of BOOMING the RIVER?

ANSWER:

*DIVIDE OIL SPILL RESPONSE GROUP into 3 SPILL
RESPONSE TEAMS.*

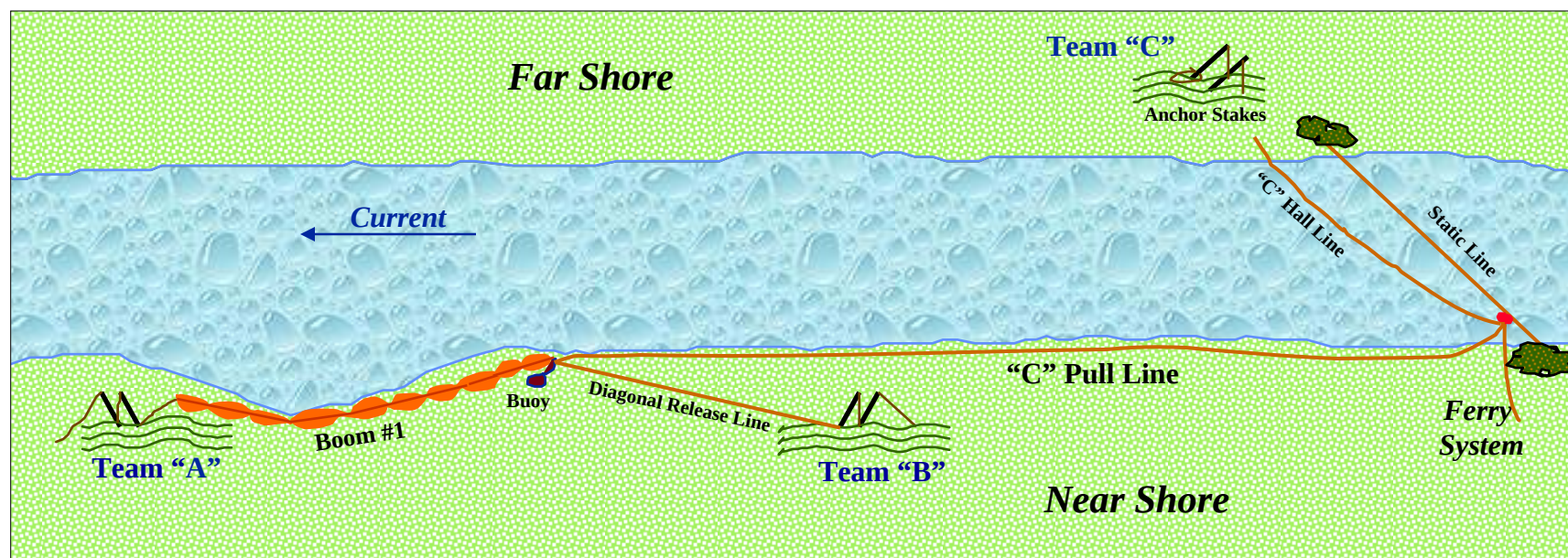
- *TEAM “A”*
- *TEAM “B”*
- *TEAM “C”*

DETERMINING ANGLE to DEPLOY BOOM in FAST FLOWING RIVERS



Fast River Boom Deployment

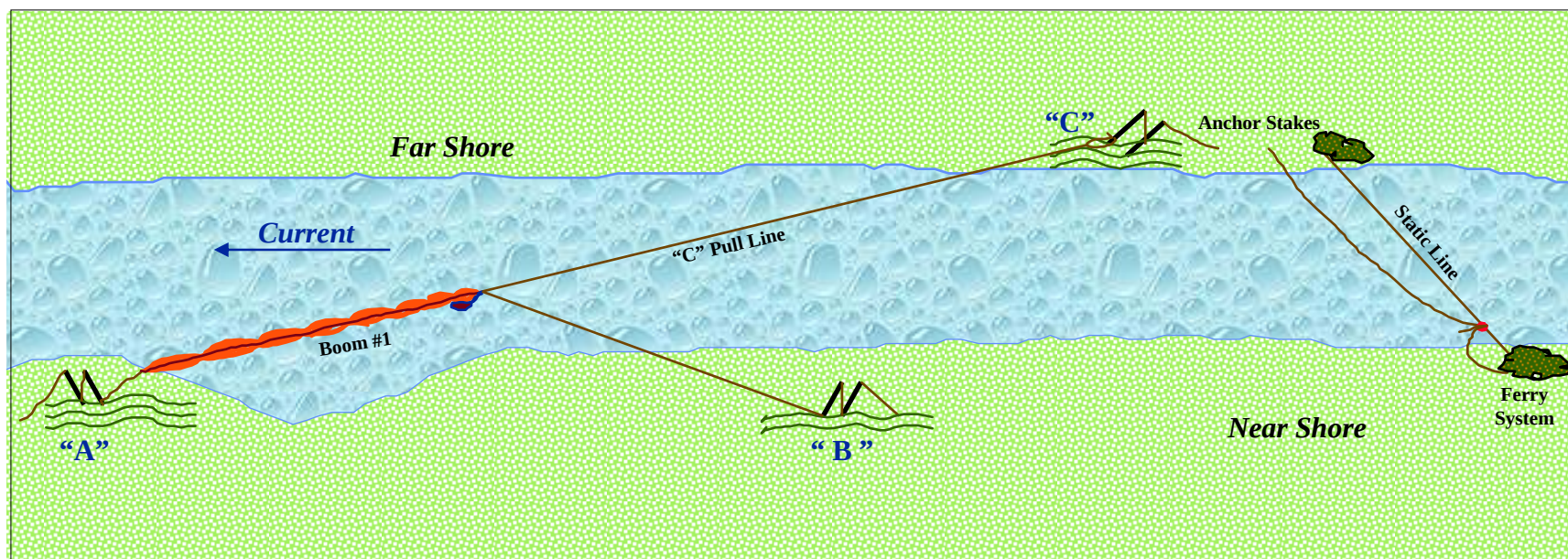
Step 1.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

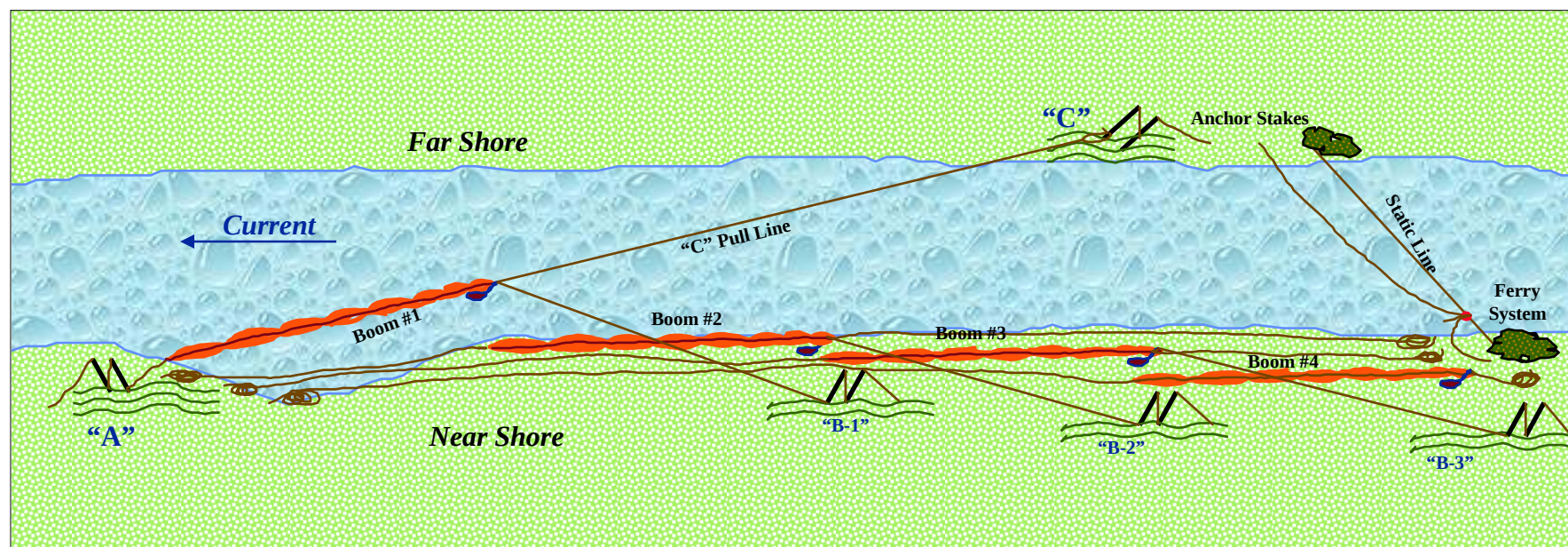
Step 2.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

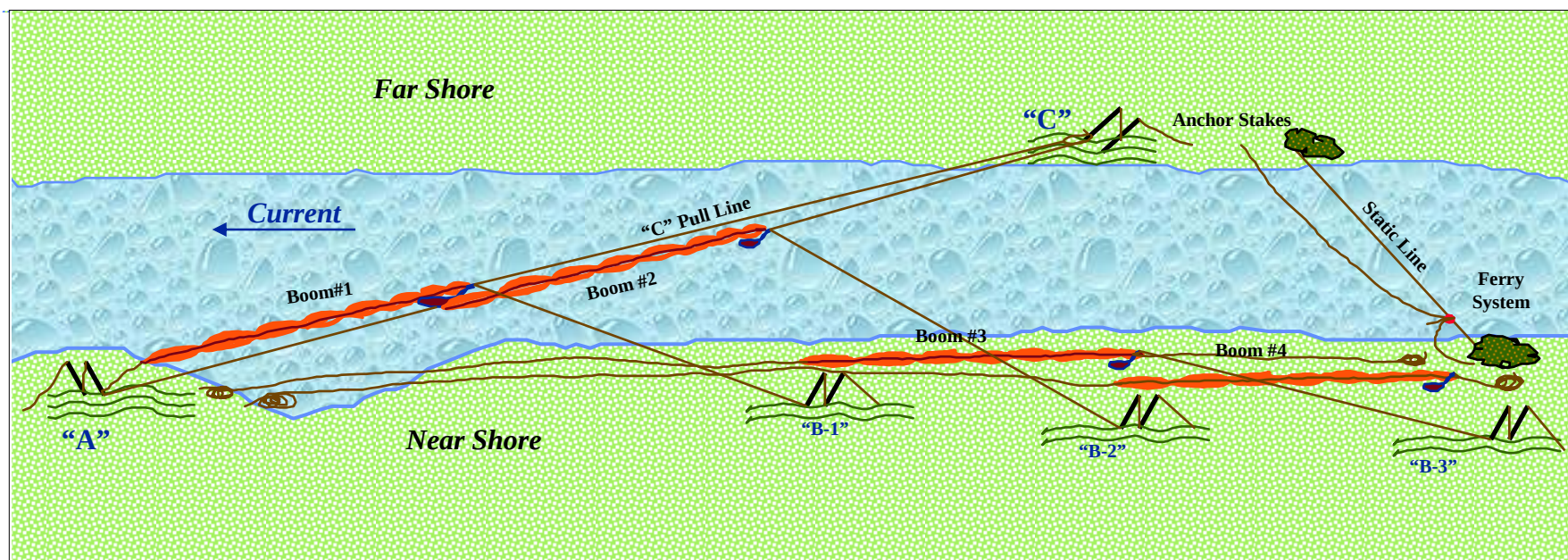
Step 3.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

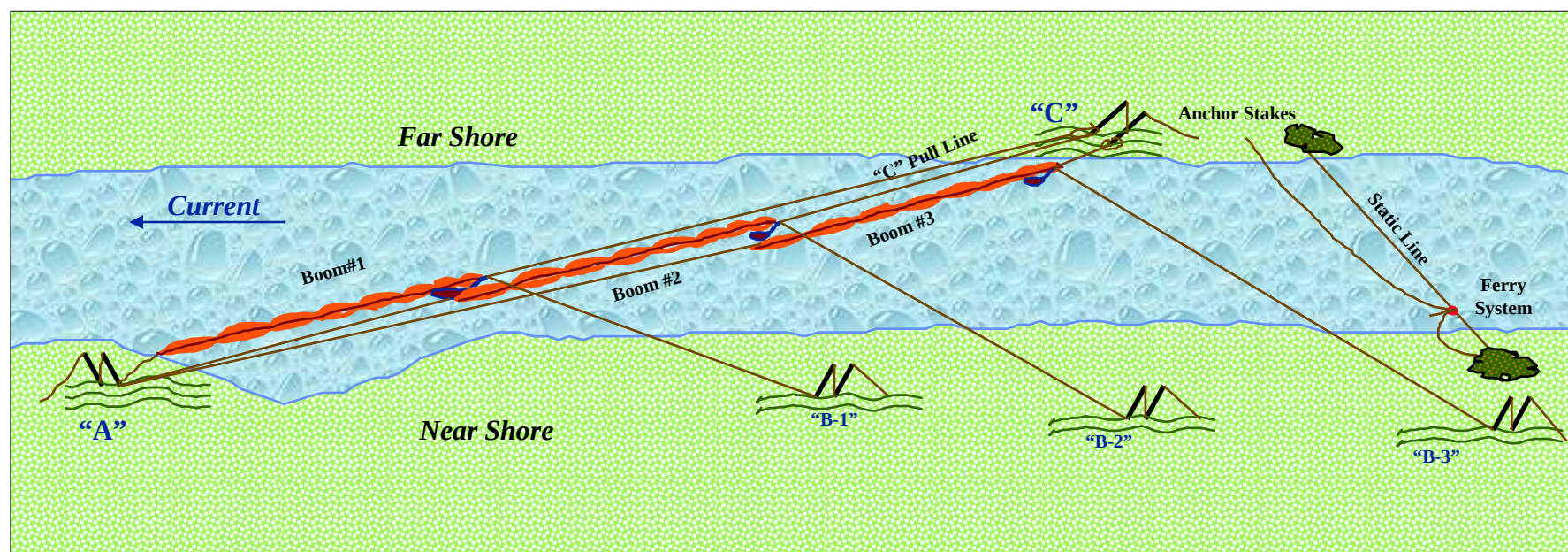
Step 4.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

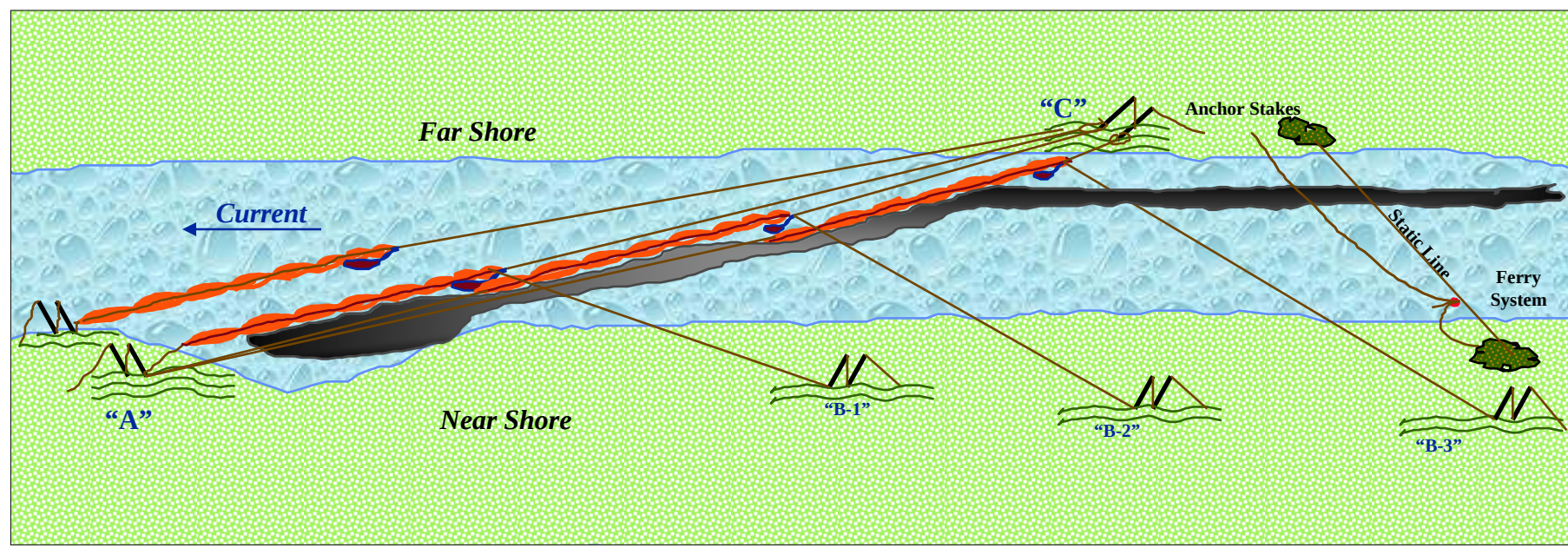
Step 5.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

Step 6.



Bank to Bank Rope Anchor System



***Bank to Bank Rope Anchor System - Bank Layout
American River - Sacramento, California***

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



*No. 1 - Boom Being Deployed - Bank to Bank Rope Anchor System
American River - Sacramento, California*

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



*No. 2 - Boom Deployed - Bank to Bank Rope Anchor System
American River - Sacramento, California*

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



*No. 3 - Boom Deployed - Bank to Bank Rope Anchor System
American River - Sacramento, California*



*No. 4 - Boom Being Deployed - Bank to Bank Rope Anchor System
American River - Sacramento, California*

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



No. 4 - Boom Deployed - Bank to Bank Rope Anchor System
American River - Sacramento, California

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



No. 5 - Boom Deployed - Bank to Bank Rope Anchor System

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



*No. 6 - Boom Deployed - Bank to Bank Rope Anchor System
American River - Sacramento, California*



Bank to Bank Rope Anchor System
North Platte River - Guernsey, Wyoming

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



***Bank to Bank Rope Anchor System
Rio Grande - Taos, New Mexico***

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



***Bank to Bank Rope Anchor System
Boise River - Boise, Idaho Area***

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



Bank to Bank Rope Anchor System
San Juan River - Shiprock, New Mexico Area



Bank to Bank Rope Anchor System
Yellowstone River - Billings, Montana Area

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



***Bank to Bank Rope Anchor System
Platte River - Casper, Wyoming Area***



Bank to Bank Rope Anchor System
Stillwater River - Fitchburg, Massachusetts Area



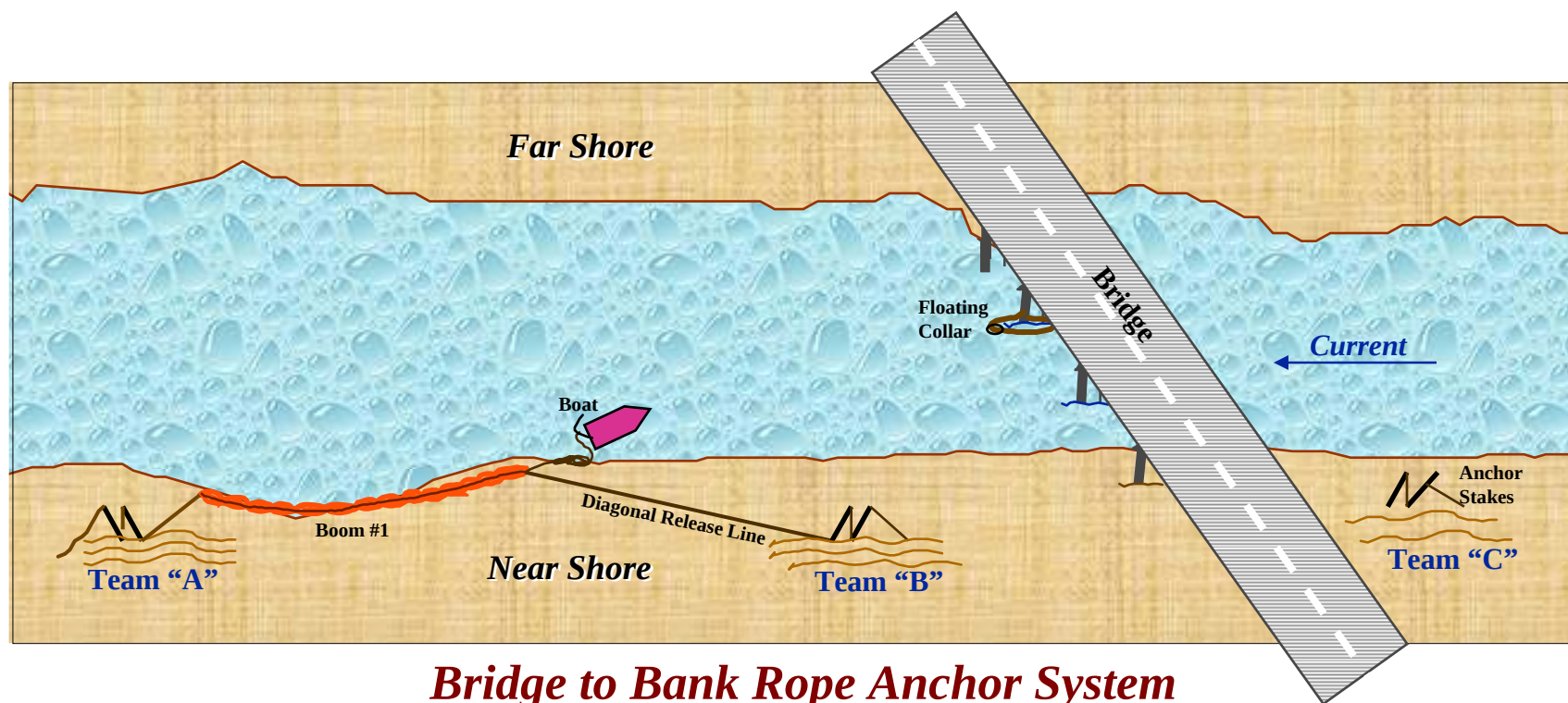
***Bank to Bank Rope Anchor System
Truckee River - Truckee, Nevada Area***

FAST RIVER BOOMING TECHNIQUES

BRIDGE to BANK ROPE SYSTEM

Fast River Boom Deployment

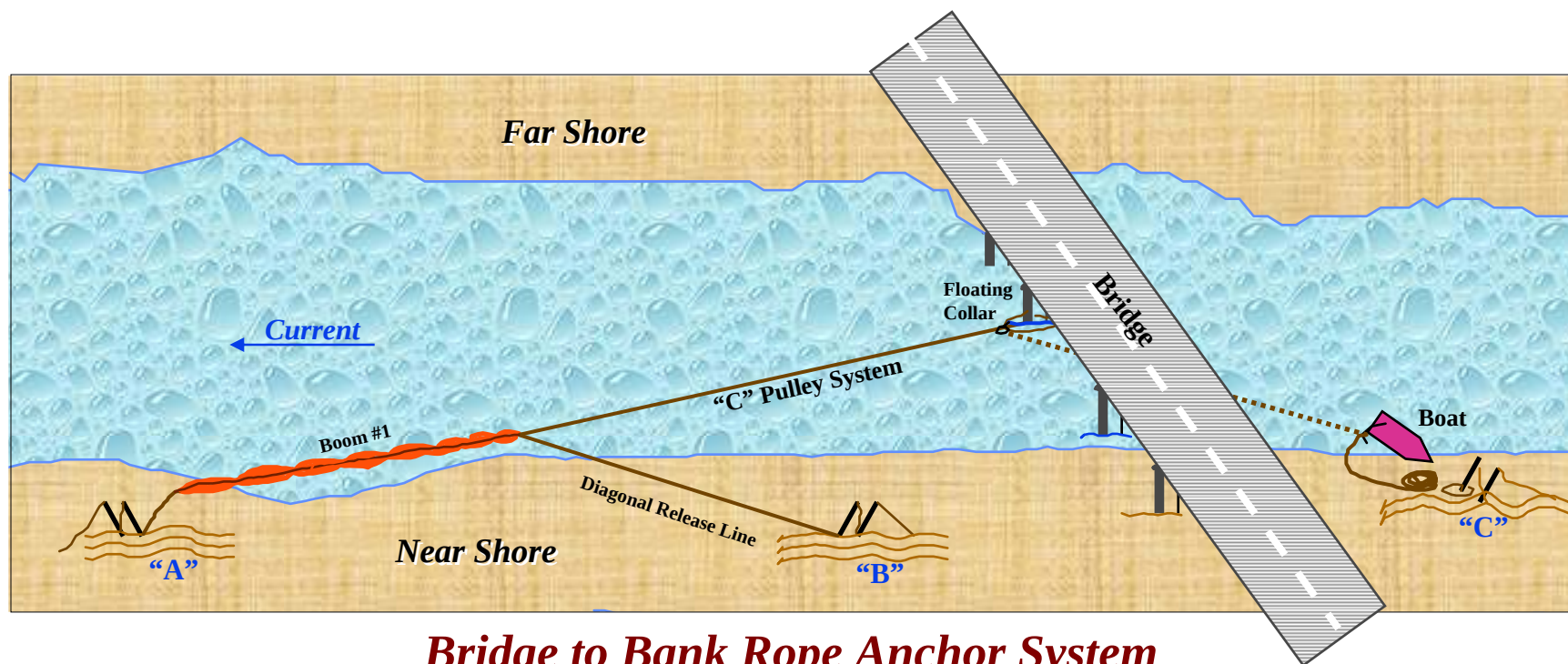
Step 1.



Bridge to Bank Rope Anchor System

Fast River Boom Deployment

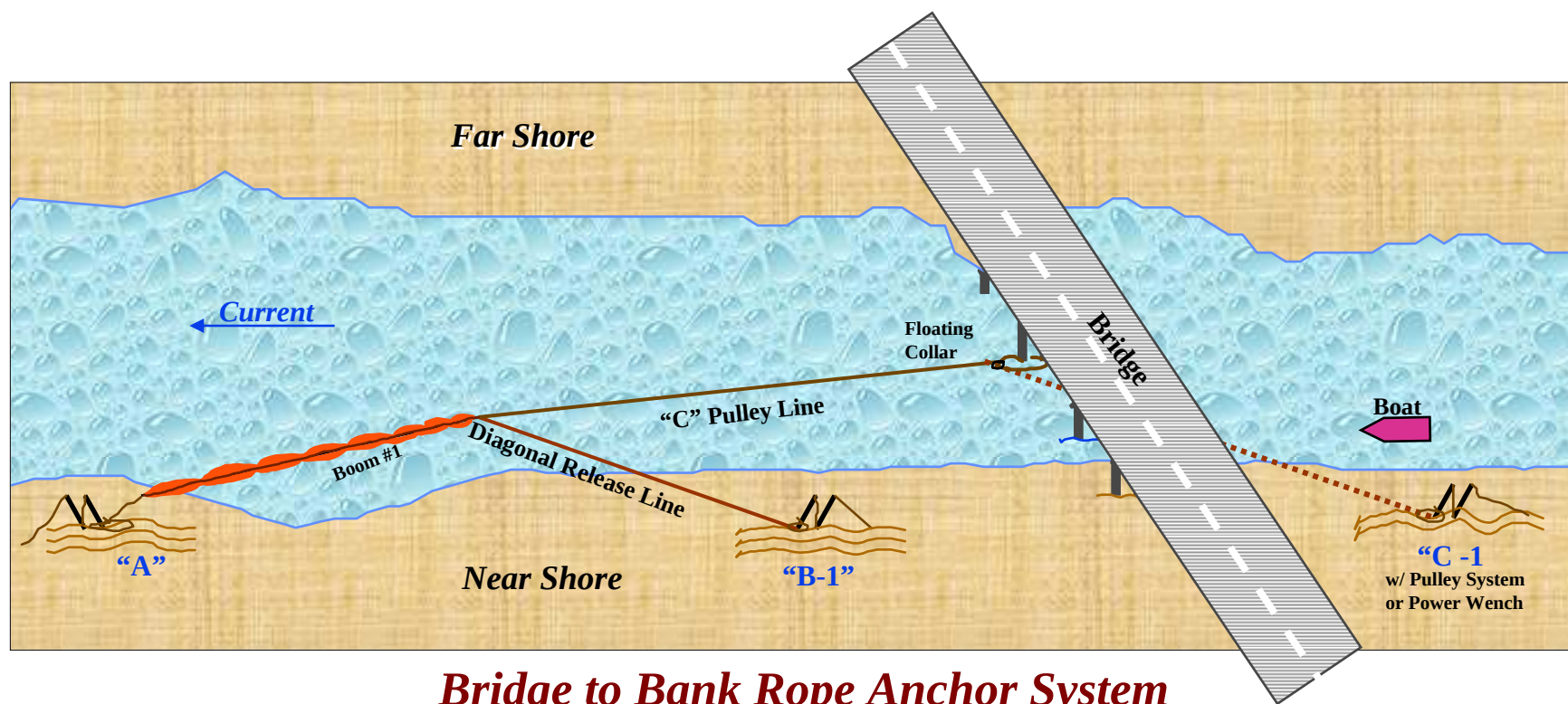
Step 2.



Bridge to Bank Rope Anchor System

Fast Water Booming Technique

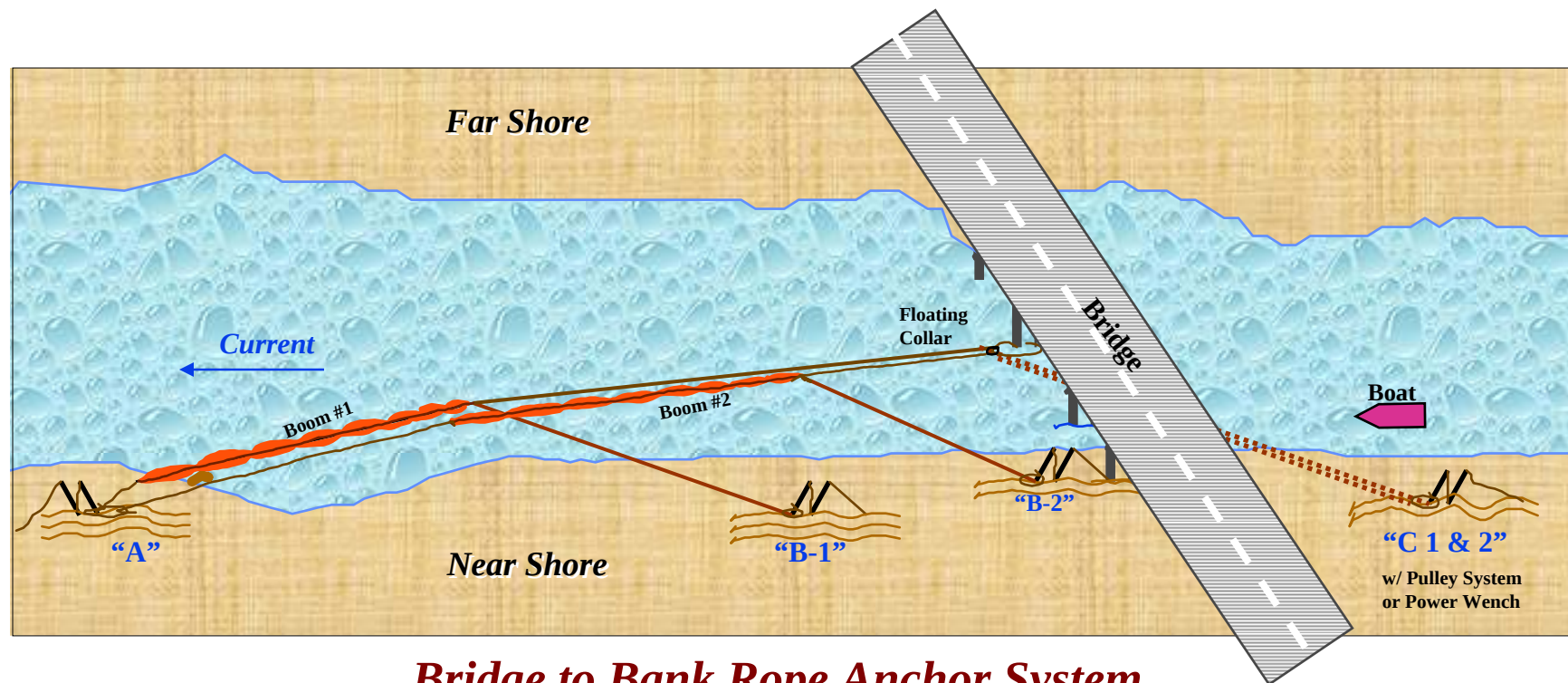
Step 3.



Bridge to Bank Rope Anchor System

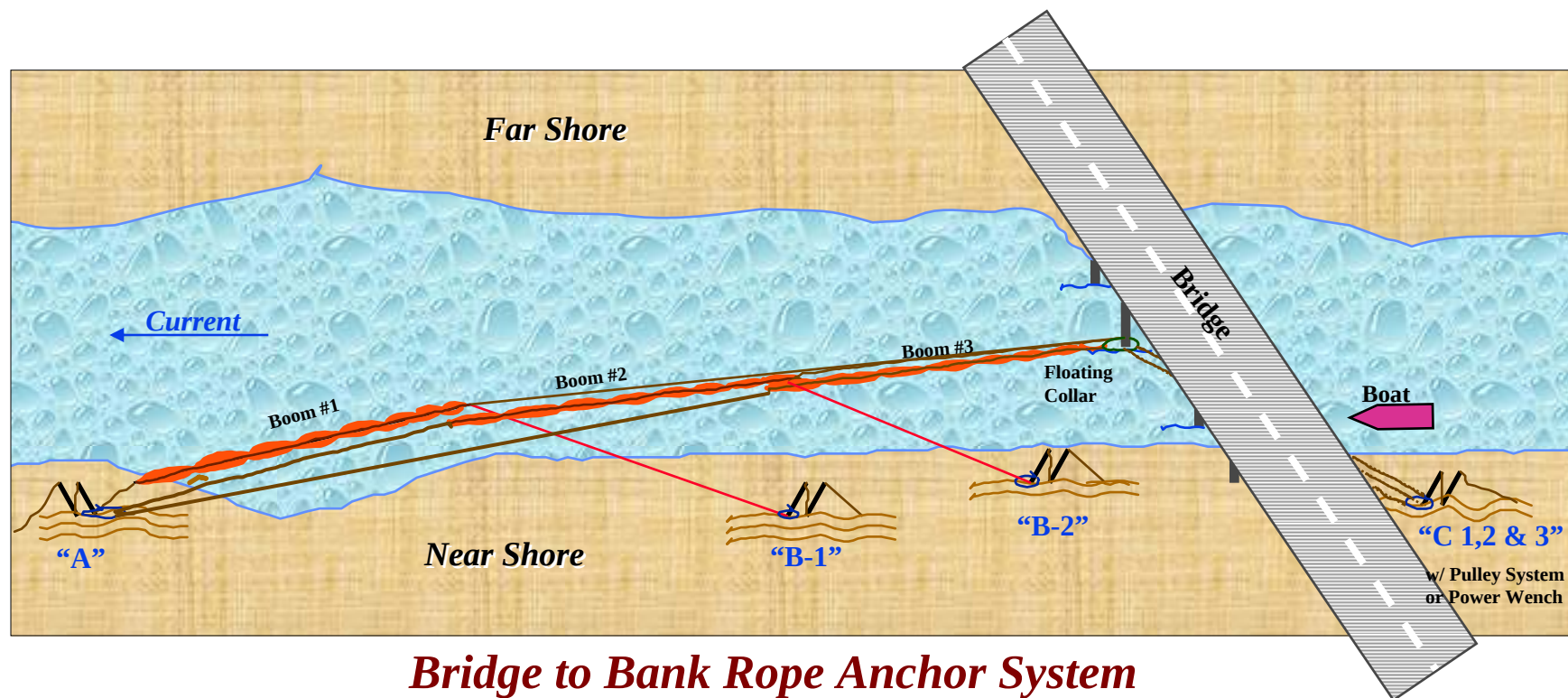
Fast River Boom Deployment

Step 4.



Bridge to Bank Rope Anchor System

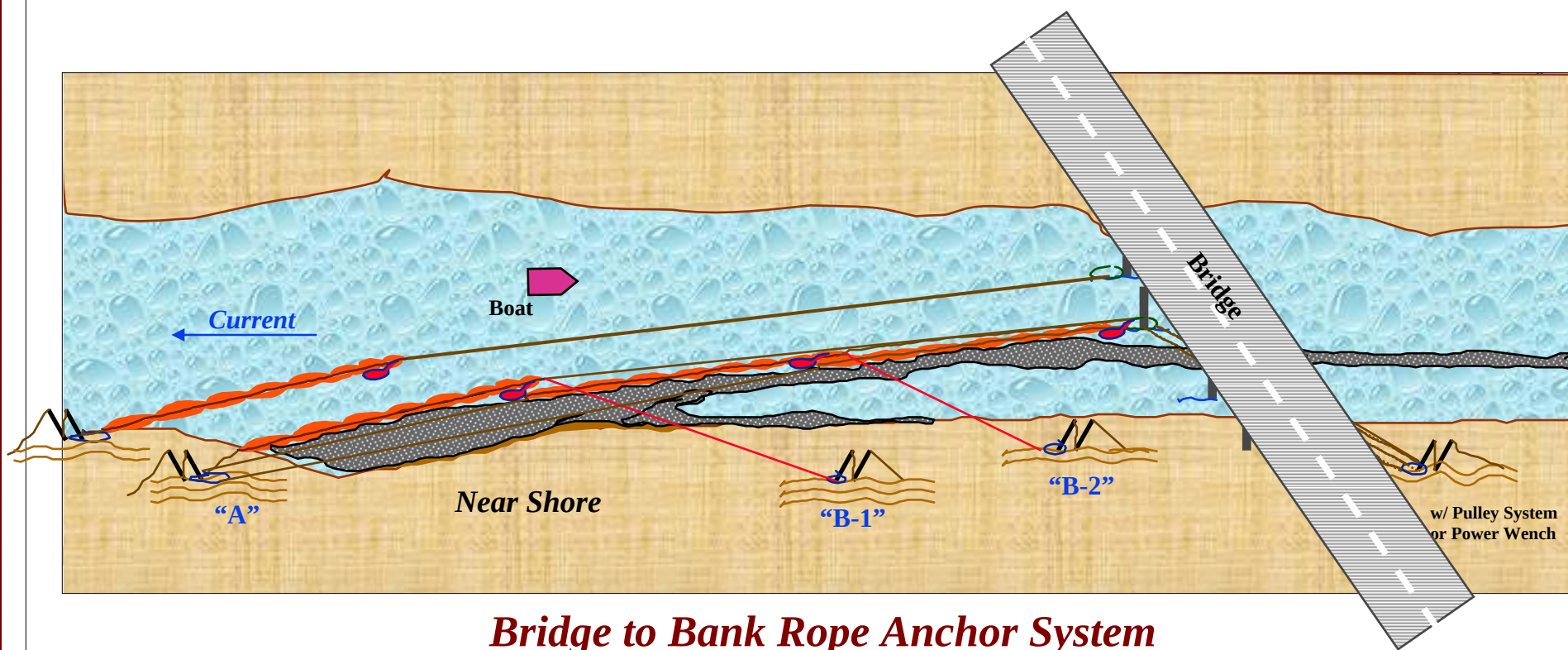
Step 5.



Bridge to Bank Rope Anchor System

Fast River Boom Deployment

Step 6.



Bridge to Bank Rope Anchor System



*Bridge to Bank Rope Anchor System
Colorado River - Bullhead City, Arizona Area*



Bridge to Bank Rope Anchor System
Rope Lead Anchor Collar Around Bridge Column
Colorado River - Bullhead City, Arizona Area



*Rope Being Pulled by Power Winch with Side Capstan Mounted on Stand
Colorado River - Bullhead City, Arizona Area*

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



*Bridge to Bank Rope Anchor System
Colorado River - Blythe, California Area*



*Bridge to Bank Rope Anchor System - Boat & Rope Handling
Colorado River - Blythe, California Area*



Bridge to Bank Rope Anchor System
Power Wench with Rope Lead thru “D” Ring located on Bridge Column
Colorado River - Blythe, California Area



*Bridge to Bank Rope Anchor System
View of Boom Containment & Recovery Site
Colorado River - Blythe, California Area*



*Bridge to Bank Rope Anchor System
Nonconnah Creek - Memphis, Tennessee Area*

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



*Bridge to Bank Rope Anchor System - View of Bridge Rope Anchoring
Weber River - Coalville, Utah Area*



Bridge to Bank Rope Anchor System
Open Chevron Cascade Boom Deployment with Deflection
Weber River - Coalville, Utah Area

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



***Bridge to Bank Rope Anchor System
St. Johns River - Mayport, Florida Area***



*Bridge to Bank Rope Anchor System
St. Johns River - Mayport, Florida Area*

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



*Bridge to Bank Rope Anchor System
St. Johns River - Mayport, Florida Area*



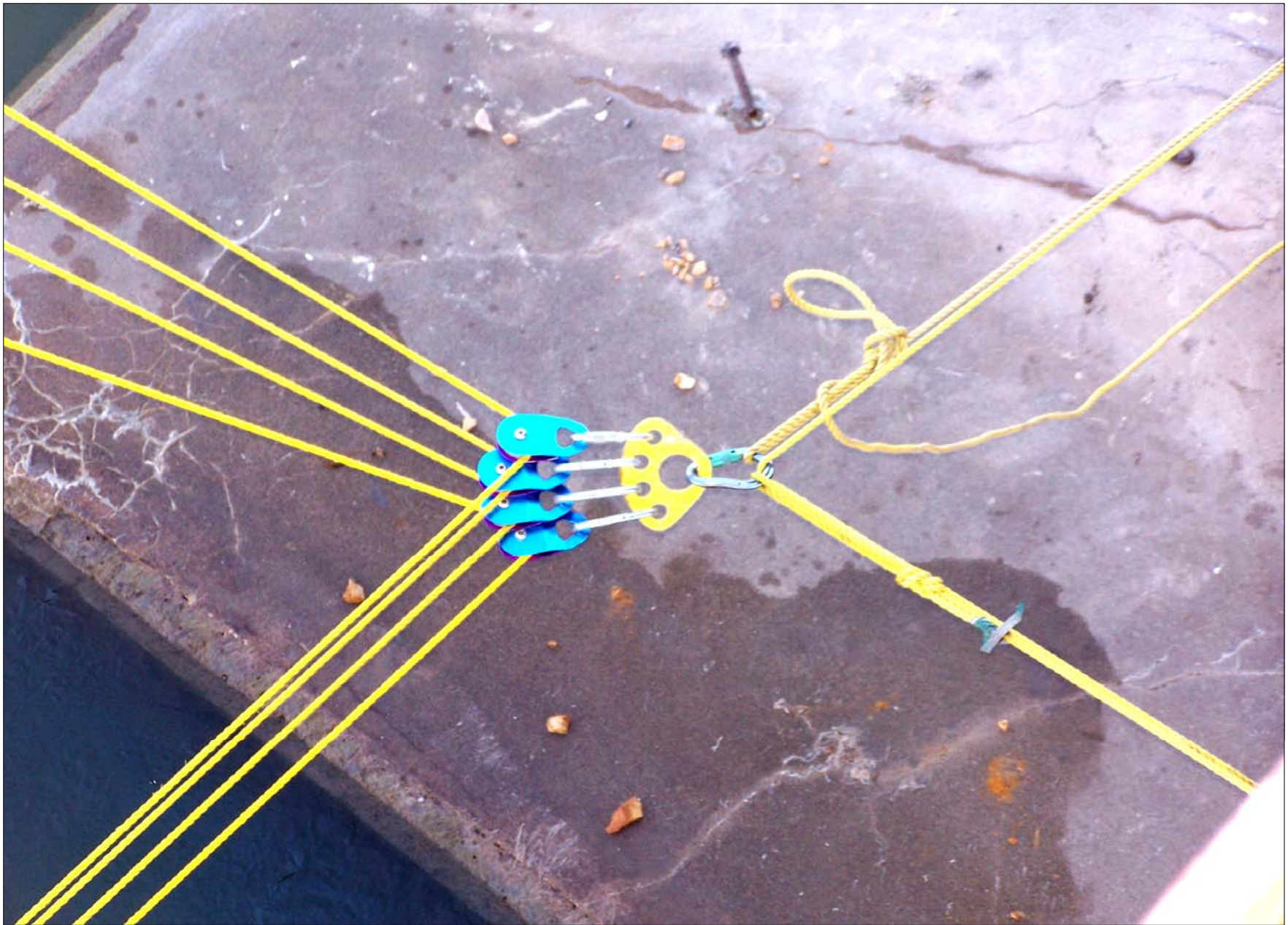
***Bridge to Bank Rope Anchor System - Bridge Column
Missouri River - Fort Benton, Montana***



***Bridge to Bank Rope Anchor System - Bridge Column
Missouri River - Fort Benton, Montana***



***Bridge to Bank Rope Anchor System - Bridge Column to Bank Anchor
Missouri River - Fort Benton, Montana***



***Bridge to Bank Rope Anchor System - Bridge Column
Missouri River - Fort Benton, Montana***



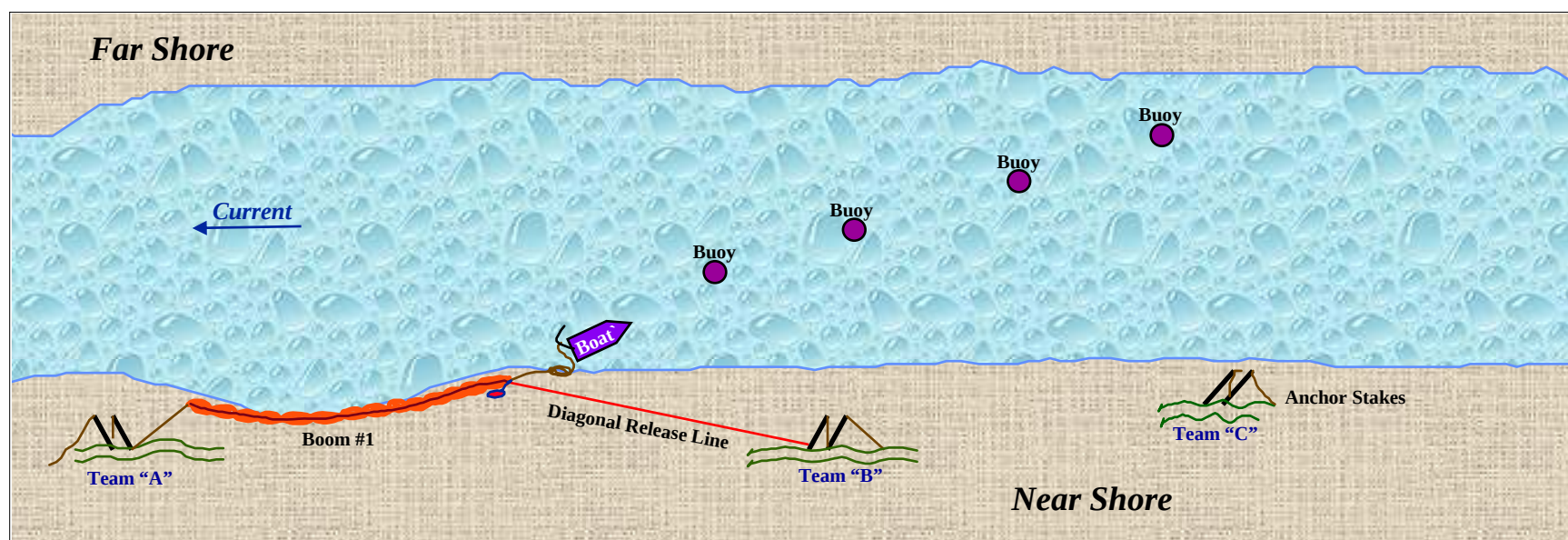
***Bridge to Bank Rope Anchor System - Bridge Column
Missouri River - Fort Benton, Montana***

FAST RIVER BOOMING TECHNIQUES

BUOY to BANK ROPE SYSTEM

Fast River Boom Deployment

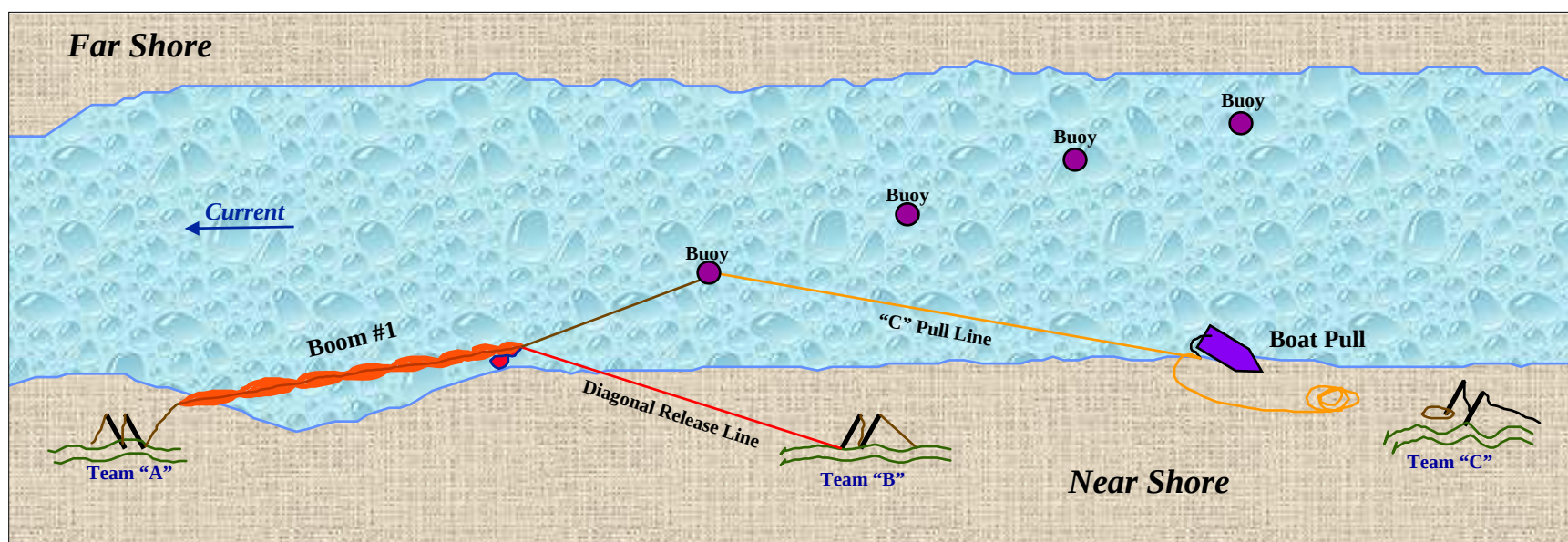
Step 1.



Buoy to Bank Rope Anchor System

Fast River Boom Deployment

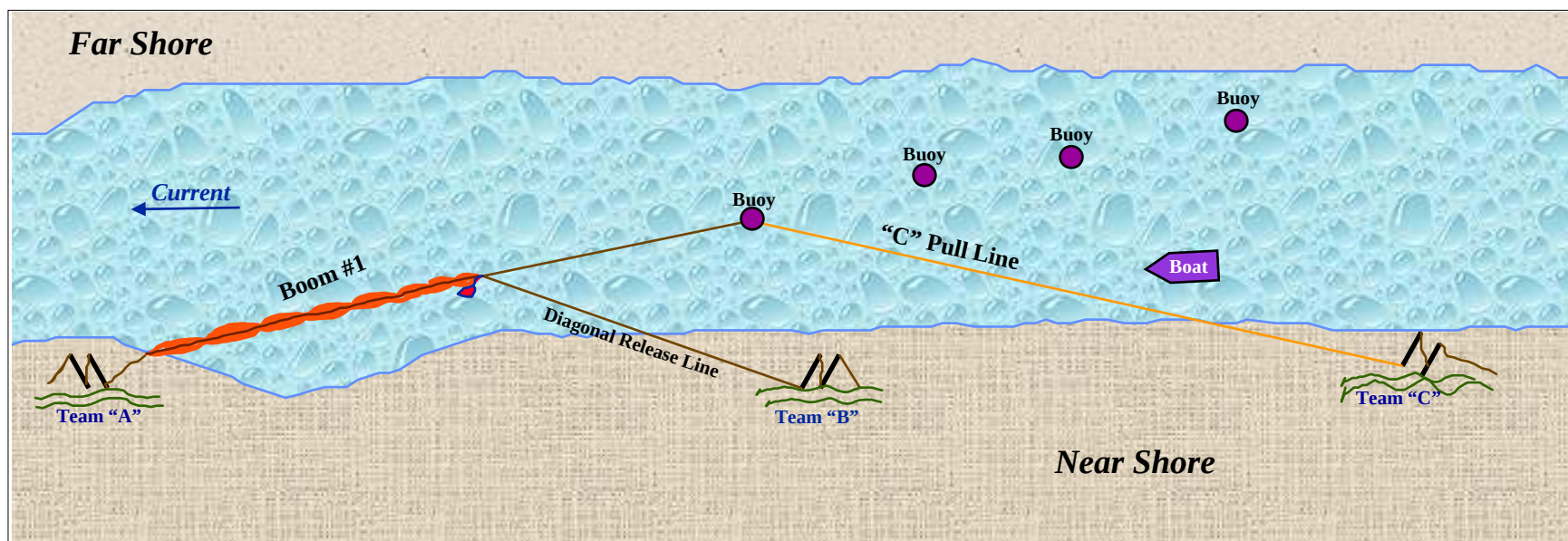
Step 2.



Buoy to Bank Rope Anchor System

Fast River Boom Deployment

Step 3.

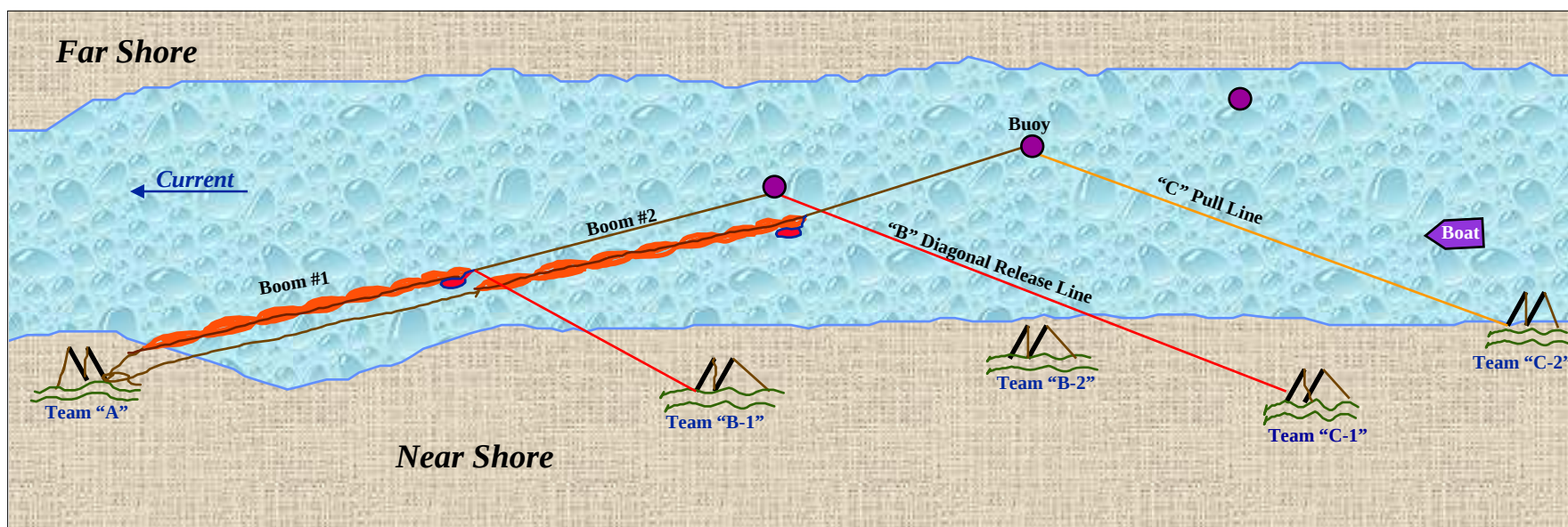


Buoy to Bank Rope Anchor System

(Repeat Process for Each Boom Section)

Fast River Boom Deployment

Step 4.

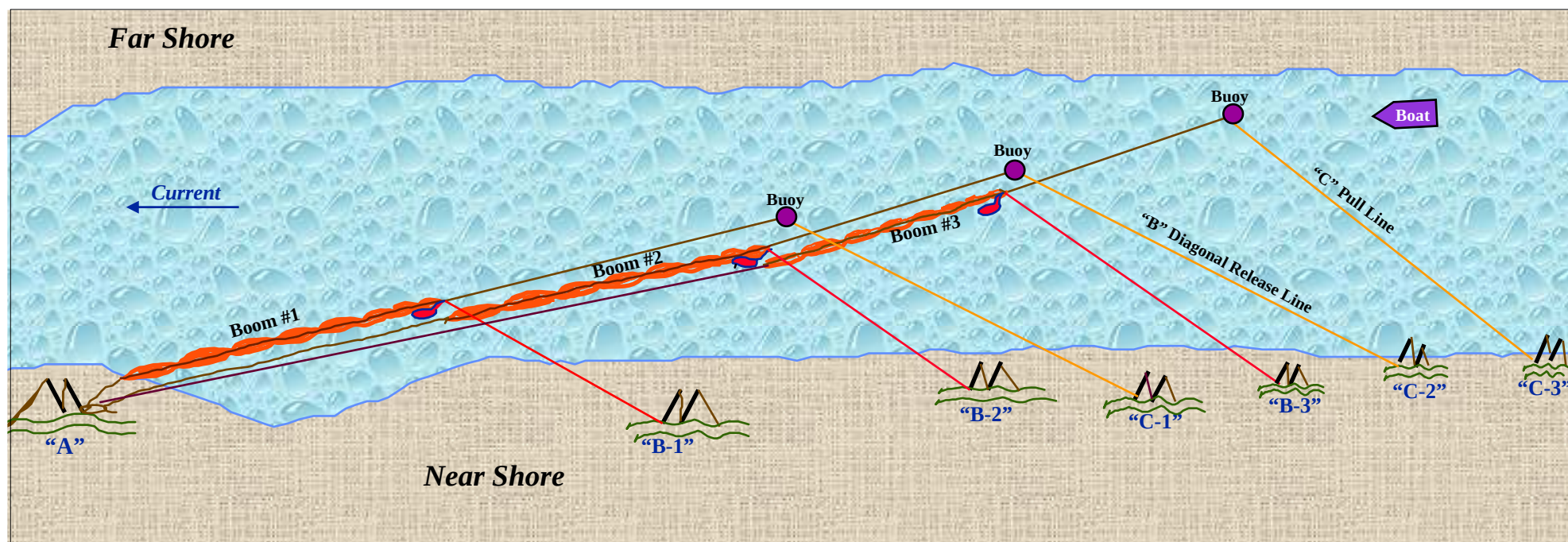


Buoy to Bank Rope Anchor System

(Repeat Process for Each Boom Section)

Fast River Boom Deployment

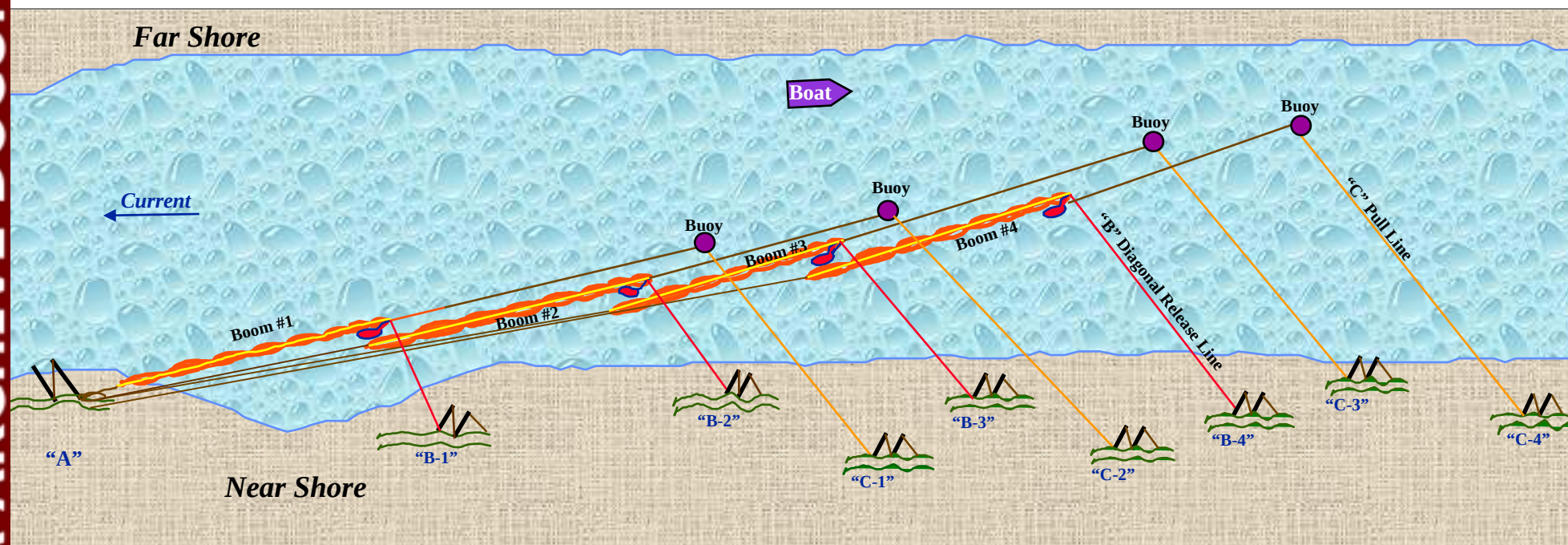
Step 5.



Buoy to Bank Rope Anchor System

Fast River Boom Deployment

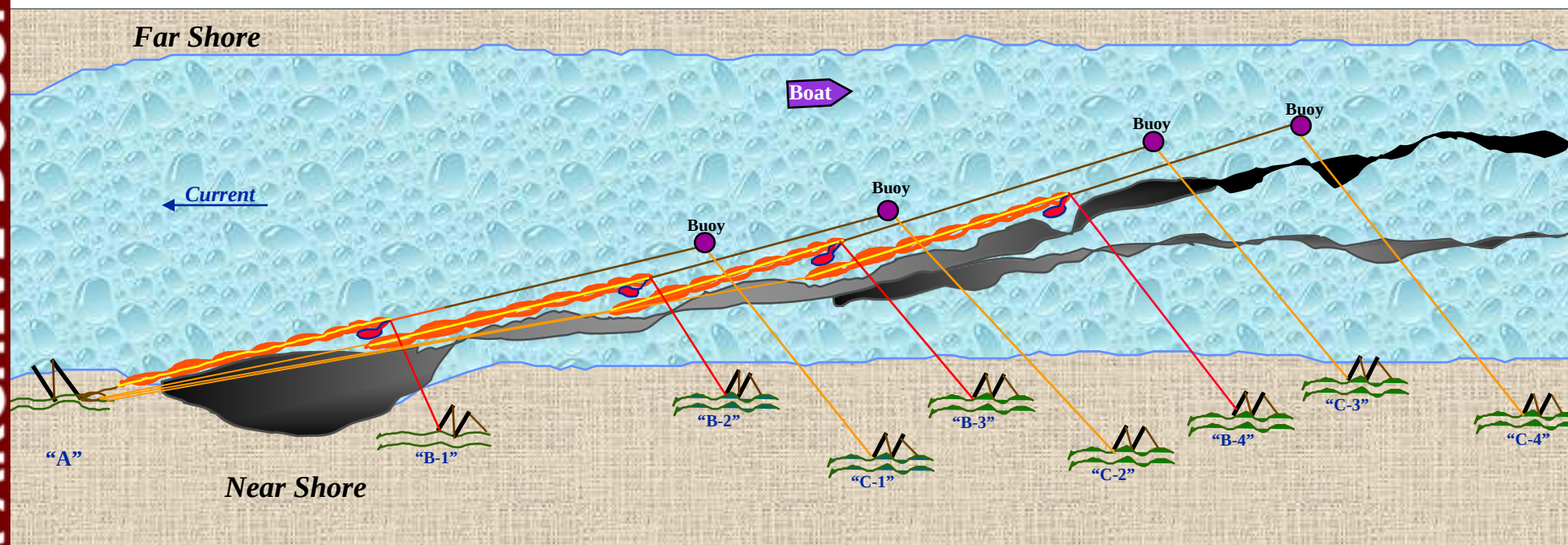
Step 6.



Buoy to Bank Rope Anchor System

Fast River Boom Deployment

Step 7.



Buoy to Bank Rope Anchor System

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



***Buoy to Bank Rope Anchor System - Boom Layout on Bank**
Colorado River - Page, Arizona Area*



Buoy to Bank Rope Anchor System - Permanent Anchor Placement
Colorado River - Page, Arizona



*Buoy to Bank Rope Anchor System - Permanent Anchor Placement
Colorado River - Page, Arizona*



Buoy to Bank Anchor System
USCG Buoy Tender in Position to Drop 1600 lb. Sinker with Buoy
Missouri River - St. Louis, Missouri Area



Buoy to Bank Anchor System
USCG Buoy Tender in Position to Drop 1600 lb. Sinker with Buoy
Missouri River - St. Louis, Missouri Area

UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS



Buoy to Bank Rope Anchor System
Mississippi River - St. Louis, Missouri Area

BOOM CONSIDERATIONS:

- **WHAT IS PRACTICAL?**
- **HOW EFFICIENT?**
(*Effort vs Effectiveness*)
- **WHAT are the RESPONSE OPTIONS?**
(*“Environmental Damaging”*)
- **WHAT are the IMPLICATIONS of MONITORING?**
(*Self Cleaning Response*)
- **ARE THERE POLITICAL or SOCIAL SENSITIVITY ISSUES?**
- **HOW MUCH WASTE will be GENERATED or COLLECTED?**
(*i.e. Disposal*)

***The RESPONSE STRATEGY that is SELECTED WILL DEPEND
on the FOLLOWING FACTORS:***

- ***TYPE of WATER BODY***
- ***CURRENT SPEED***
- ***SHORELINE CONFIGURATION***
- ***NATURAL COLLECTION POINTS***
- ***WATER DEPTH***
- ***AVAILABLE EQUIPMENT***
- ***AVAILABLE MANPOWER***
- ***AMOUNT of OIL SPILLED***
- ***WEATHER CONDITIONS***
- ***TIME of YEAR***

*In SUMMARY -
HOW to DEPLOY BOOM in FAST FLOWING RIVERS*

=====

• *If the RIVER LOOKS FAST - then CONSIDER IT'S FAST.*

• *USE BOOM ANGLE CHART -*

*If in DOUBT ESTABLISH a 20-25 DEGREE POINT into the RIVER
CURRENT to ESTABLISH BOOM DEPLOYMENT & ANCHORING POINTS.*

A GIVEN - "The FASTER the RIVER CURRENT"

▪ *The SMALLER the ANGLE into the RIVER CURRENT to DETERMINE
BOOM DEPLOYMENT ANGLE & ANCHOR POINT on the FAR SHORE*

▪ *The SMALLER the BOOM SIZE that SHOULD be DEPLOYED
(10" and/or 12" is the Maximum Size)*

▪ *& the SHORTER the BOOM LENGTH SECTION that SHOULD be
DEPLOYED
(Generally 50' to 100' Sections)*

*UNIQUE CHALLENGES of BOOMING FAST FLOWING
RIVERS*



DON'T LET THIS BE YOUR BOOM DEPLOYMENT