

10. Floc Log Mixing System

To introduce site-specific Floc Logs to turbid waters in such a manner to facilitate mixing and reaction between the polymer and the suspended particles.

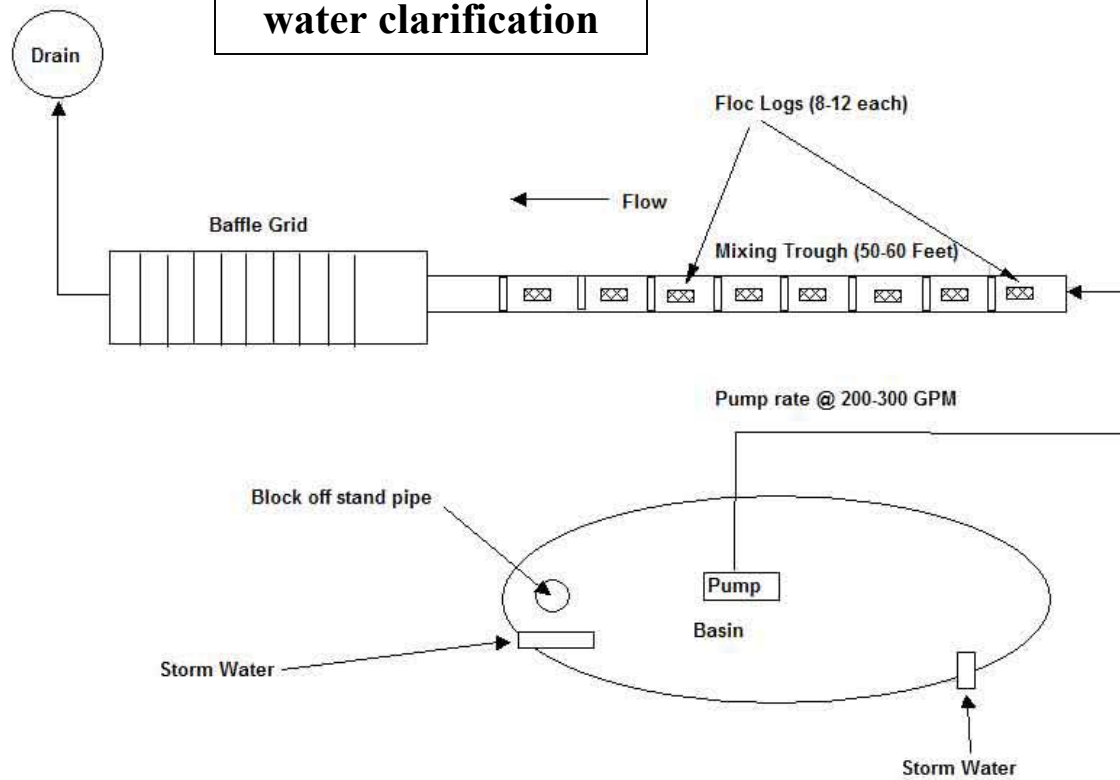
i. Standard/ Box System

A rectangular area is excavated and lined with plastic. Solid panels are placed inside to create a raceway that snakes back and forth, allowing the velocity and turbulence to build up. Floc Logs are secured along the raceway, allowing the water to mix with the polymer and begin reacting with the suspended sediment.

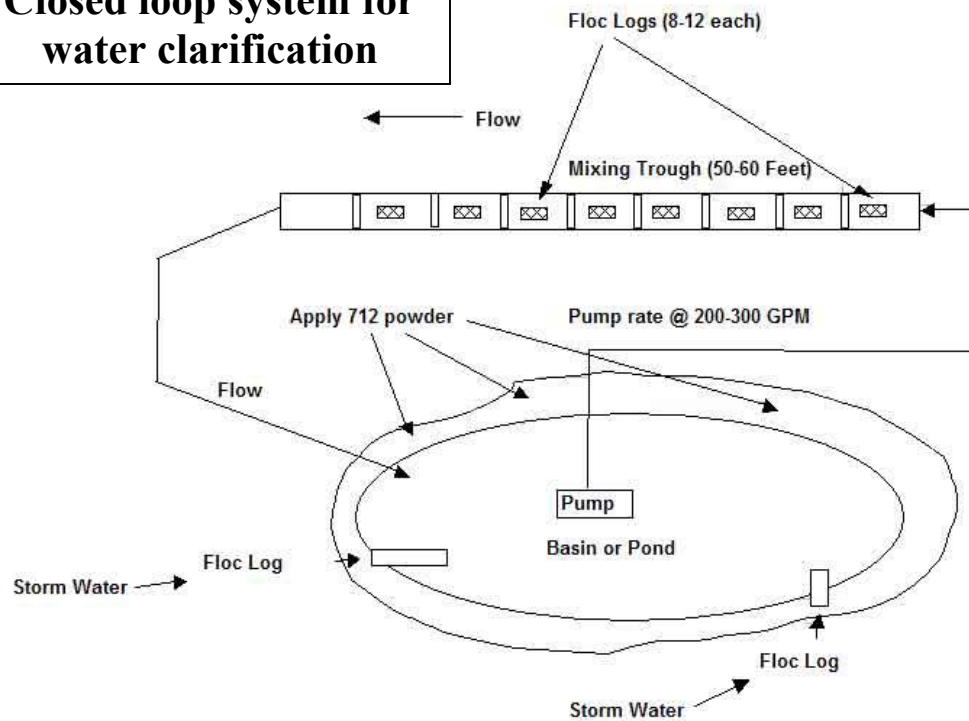
- i. Can be used with either an open or closed loop water treatment system, but must have moving water to work.
- ii. Turbid water (not mud) is introduced into the mixing chamber, which consists of a raceway that snakes back and forth, directing the water downward.
- iii. Floc Logs are secured along the raceway, allowing the water to flow over and around them. Logs should be placed apart, in a series whenever possible. The number of logs is determined by the flow rate of the water and the length of the mixing chamber is determined by the reaction time required for the polymer. Longer mixing times will have the best reduction of turbidity.



Open loop system for water clarification



Closed loop system for water clarification



j. Polymer Enhanced Mixing Ditch System

For use on temporary or changing sites and is used for dewatering operations. A ditch is built up, either by digging out the bed or building up the walls, and can be lined with plastic to prevent erosion if needed. The ditch is lined with jute or similar matting. Checks are placed along the ditch, forcing the water to snake around them. Floc Logs are secured along the raceway, allowing the water to mix with the polymer and begin reacting with the suspended sediment.

- i. Open ditch system is an alternative to a pipe or closed drain systems, especially before permanent pipe structures have been installed.
- ii. Cover the exposed soil with jute matting and apply Silt Stop powder to prevent erosion. With highly erosive soils protection with geotextile or plastic sheeting may be necessary.
- iii. Build checks in the ditch and secure the Floc Logs on the downstream side of each check. Make sure that the logs are not resting in mud, drive rebar “feet” into the logs to raise them slightly if needed.
- iv. Logs should be placed apart, in a series. The number of logs is determined by the flow rate and particle chemistry of the water and the length of the mixing chamber is determined by the reaction time required for the polymer.
- v. Used in conjunction with a settling pond upstream and usually with a sediment collection system (baffle grids, rip-rap, settling pond, filter, dispersion field, ect.) downstream.



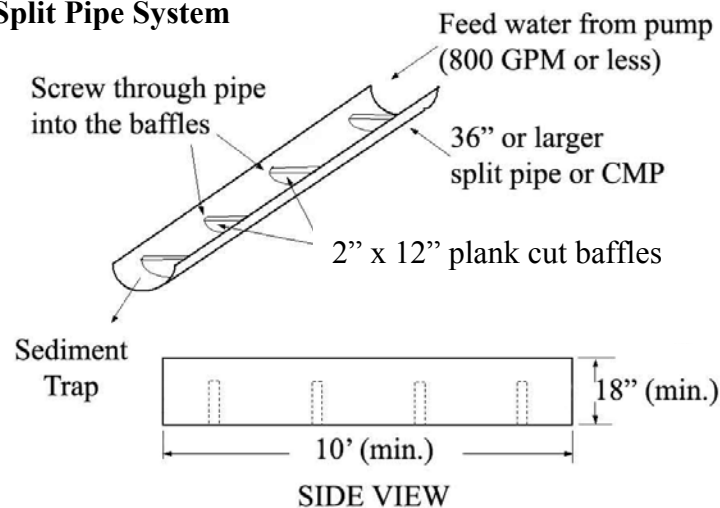
k. Flume or Split Pipe Floc Log Mixing System

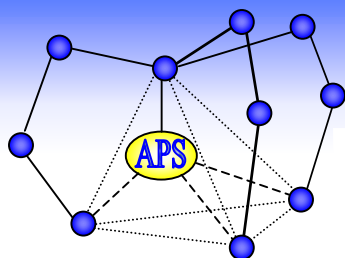
This system is for use on sites with extremely limited space or difficult terrain not conducive to excavation. A flume or split pipe is installed, with a series of checks built into it. Below each check, a Floc Log is placed, allowing the water to mix with the polymer and begin reacting with the suspended sediment.

- i. Flume or Split Pipe systems are similar to an open ditch system, but are used where a ditch system cannot be installed.
- ii. It is constructed using PVC pipe, Corrugated Metal Pipe, or similar pipe sawn in half or some similar plastic piping.
- iii. Within the pipe, construct checks that are secured into the pipe. These can be made using plywood, plastic, metal, cinder blocks, sand bags, ect.
- iv. Downstream of each of these checks, place a Floc Log; just as you would in a ditch system.
- v. The number of Floc Logs is determined by the flow rate of the water and the length of the flume is determined by the reaction time required for the polymer.
- vi. Sediment is collected before final discharge, using a sediment collection system (baffle grids, rip-rap, settling pond, filter, ect.) downstream of the mixing pipe, or by lining the pipe with jute matting to collect flocculated sediment as it forms.



Example of Split Pipe System





Applied Polymer Systems, Inc.

519 Industrial Drive Woodstock, GA 30189 678-494-5998



Ph (800) 452-4435
Fax (615) 822-9460
info@jenhill.com
www.jenhill.com

® www.siltstop.com

Floc Log®

The Applied Polymer Systems, Inc. 700 Series Floc Log is a semi-hydrated polyacrylamide blended block that when placed within turbid water flows will remove fine particles and reduce NTU values. Each Floc Log is formulated for the soil and water chemistry of the geographical area where placement and usage are intended.

The Floc Log is one of the most innovative approaches to using polyacrylamide blends in water applications. Not only is the Floc Log non-toxic, but it also eliminates the need for machinery or other electrical devices for pumping or mixing when using liquid materials to treat turbid water. The Floc Log contains materials that enhance its performance by reducing reaction times and decreasing NTU values. This enables the Floc Log to outperform the results of PAM or chitosan alone. The Floc Log is for use wherever turbid water flows occur. As with all Applied Polymer Systems, Inc. products, proper soil or water sample analysis must be done to determine which Floc Log type is correct for your soil.



Floc Log ditch placement, used in conjunction with BMP's



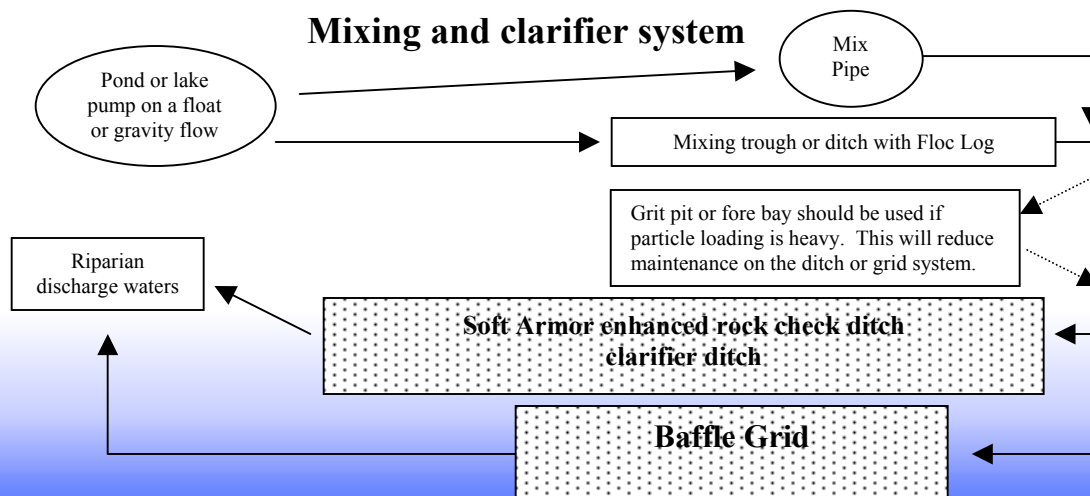
Turbid water before and after being treated with the Floc Log

Floc Log Specifications

ANSI/NSF Standard 60 Drinking Water Treatment Chemical Additives
EPA/600/4-90/027F 48Hr. Acute Static Screen Toxicity Test (*Daphnia Magna*)
EPA/600/4-91/002 7 Day Chronic Toxicity Test (*Pimephales promelas*)

APS, Inc. currently has over 50 types of Floc Logs. Each Floc Log is tailored for the specific requirement of water chemistry and soil within your geographical area. Most soils within EPA Region 4 have been classified and will not require a soil and water sample. Areas outside EPA Region 4 will require a soil and water sample.

The Floc Log is available in two forms, clarifier and particle. Clarifier Floc Log is used for colloidal water and very fine suspended particles. Particle Floc Log is used for heavily particle laden water in areas before sediment traps and sediment ponds. **(Floc Log is available in boxes of 4)**



Floc Log Placement and Various Mixing Systems

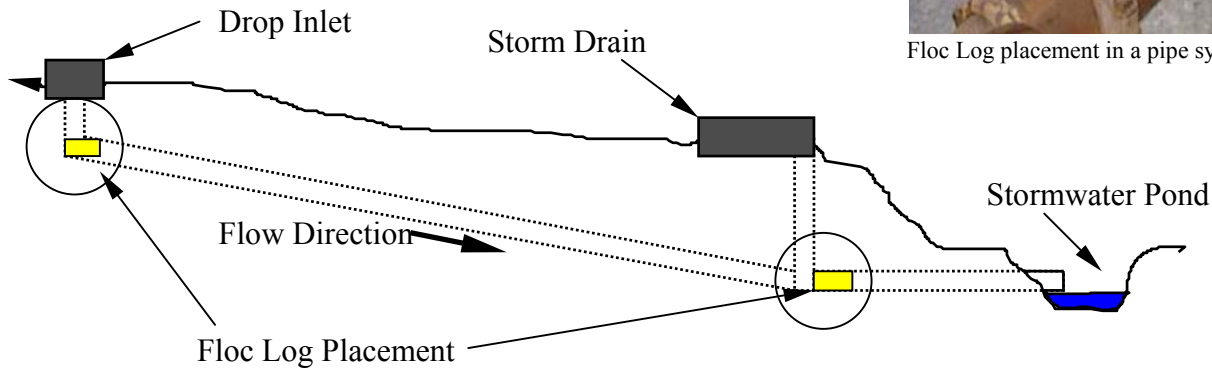
Placement

Placement of the Floc Log should be as close to the source of the particle suspension and turbidity as possible. Finer particles and colloidal suspensions will require greater mixing times, usually never greater than 75 seconds, but typically 10 to 30 seconds. The mixing time is the time it takes for the water to flow through a ditch system or a pipe. Ideal performance will be attained when the Floc Log is used in conjunction with the Best Management Practices. Rock checks, drop inlets, storm drains, retrofits and slope drains all greatly enhance the effectiveness of the Floc Log. The Floc Log is designed for a base flow rate of 60 – 75 GPM (Gallons Per Minute). A typical placement is shown in the following diagrams.

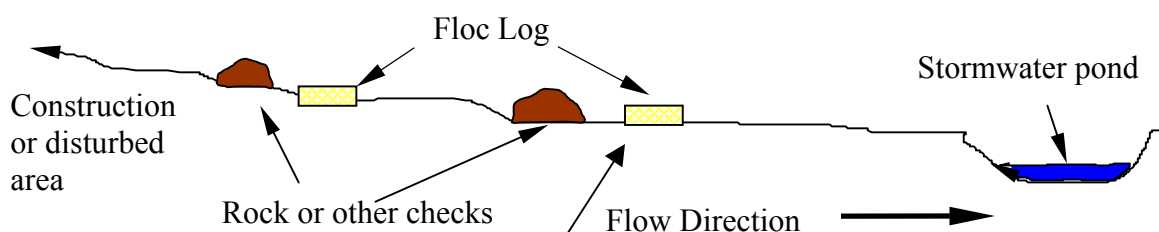


Floc Log placement in a pipe system

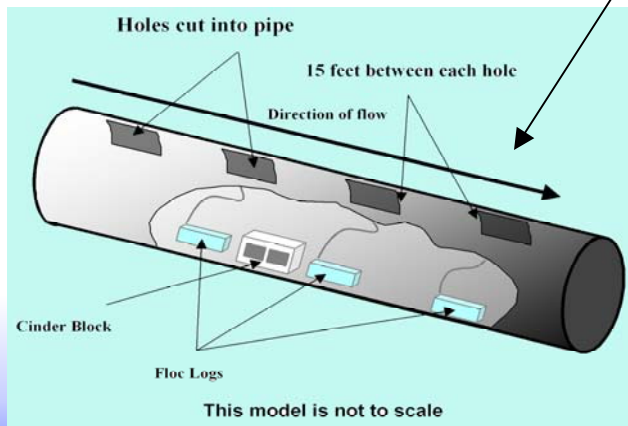
Closed drain placement



Open ditch placement



Example: Pipe Mixing System



As shown in the diagrams, the Floc Log can be used in a variety of mixing systems. Placement between each Floc Log is typically 15 feet, and they should be well upstream from the discharge point to allow for adequate mixing time. For best results, Floc Logs should be kept moist and should not be placed in direct sunlight.

For a no cost sample analysis contact us at 678-494-5998. This analysis is imperative as there is no one Floc Log for all soil types.

Ph (800) 452-4435
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info@jenhill.com
www.jenhill.com

Piping system using the Floc Log