

Passive Treatment System Operation, Maintenance, & Rehabilitation

2012

PA Abandoned Mine Reclamation Conference

State College, PA

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Overview

- Passive treatment applicability
- O&M TAG Program
- O&M experiences

Passive Treatment Applicability

Passive systems can be designed for discharges:

- Highly acidic
- High Iron, Aluminum, and Manganese Concentrations
- Relatively low maintenance

Dents Run 3895 (~5 years old)

Bennett Branch Sinnemahoning Creek Watershed, Elk County, PA

	pH	Acid	Alk	Fe	Mn	Al
Raw	2.7	1390	0	310	20	130
Treated	7.5	-180	220	<1	7	<1

Avg values; Source: www.datashed.org

Why Do Passive Systems “Fail”?

- Design - undersized, wrong application/developing technology, etc.
- Construction - sloppiness, short-cuts, accidental errors
- Site conditions - not enough room, something vs. nothing
- Unanticipated issues - water quality or quantity changes
- Design life met and/or treatment media spent
- Lack of O&M

Passive Treatment
Systems

Are

LOW Maintenance

Not

NO Maintenance

Operation & Maintenance Technical Assistance Program

- ☀ To help watershed groups, non-profits, conservation districts, etc.
- ☀ Initiated late 2011
- ☀ Includes both TA and PTS Snapshot
- ☀ Funding Sources
 - ✱ PA DEP Growing Greener Program
 - ✱ Foundation for PA Watersheds
 - ✱ Regular program sources
 - ✱ GenOn Settlement – Kiski-Conemaugh Basin
 - ✱ In-kind/match watershed groups

Services that can be provided include:

- ☀ Evaluate and troubleshoot maintenance and/or design issues related to treatment performance;
- ☀ Resolve minor maintenance issues;
- ☀ Determine appropriate solutions to major maintenance/performance issues and assist watershed organizations with obtaining funding to address these major issues;
- ☀ Assist watershed organizations in establishing a trust fund for long-term OM&R;
- ☀ Provide educational opportunities.

Need Help?

- Give me a call - (724-776-0161)
- Send me an email – sri@streamrestorationinc.org

Passive Treatment Snapshot

- Purpose:

- Review performance of ~250+ passive systems
- Identify systems that are not functioning to expectation

- Implementation: Relies on a Private-Public Partnership effort

- Babbs Creek Watershed Association
- Broadtop Township
- Clearfield Creek Watershed Association
- Carl Undercoffler
- Dauphin Co. Cons. District
- EPCAMR
- Huntingdon Co. Cons. District
- Kiski-Connemaugh StreamTeam
- Mill Creek Coalition
- Pennsylvania DEP
- Schuylkill Co. Cons. District
- Schuylkill Headwaters Association
- Slippery Rock Watershed Coalition
- Susquehanna River Basin Comm.
- Stream Restoration Incorporated
- Trout Unlimited
- USGS

* Sorry to anyone I forgot

Adopt-A-Passive Treatment System

- “Pilot” project for Slippery Rock Watershed Coalition
- Volunteers assigned to 1 treatment system
 - Visit site to conduct monitoring & inspection
 - Enter data onto Datashed
- Training Workshop and Manual
- Each volunteer given
 - Safety vest
 - Tick repellent hat
 - 5 gallon and 1 gallon bucket
 - Iron, alkalinity, and pH kits
 - Site specific training



O&M Experiences

The names of the following passive systems are not revealed to protect the innocent.

Vegetation in Channels and Spillways



Accumulation of metal solids & debris



Accumulation of metal solids & debris



Cleaning Clogged Pipes



3/18/2004 16:56

Repair Broken Pipes & Valves



Wetland Channelization



Install baffle curtains to improve retention



Treatment Media Rehabilitation

- Flushing
- Backflushing
- Stirring
- Washing



Flushing



6/18/2001 17:24

Backflushing Pipes & Treatment Media



Stirring Treatment Media



Washing Treatment Media





Restoring Treatment Media and Resource Recovery

CLOGGED
HFLB

*DIGGIN' &
SCOOPIN'*



DIPPIN' &
FLIPPIN'



09.06.2007 14:42



Opportunity!

Clean Stone

Clogged Stone

9/10/2007 15:30



09.06.2007 14:46

Vertical Flow Pond Media Replacement



Treatment System Evaluations & Upgrades



Treatment System Evaluations & Upgrades



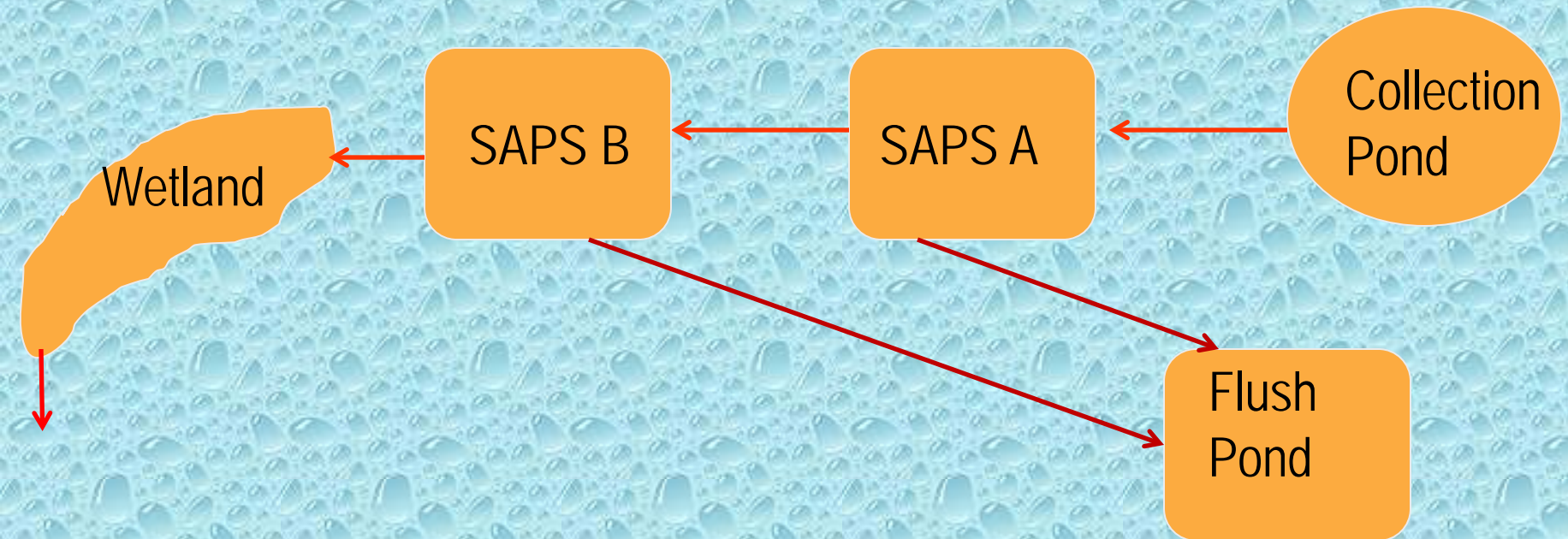
- ☀ Plugging due to Iron
 - ✳ Install Forebay
 - ✳ Utilizes Natural Low pH Iron Processes
 - ✳ Reduce Future O&M

Parameter	Raw	FB-N	FB-S
Acidity	320	200	230
Fe	80	35	50

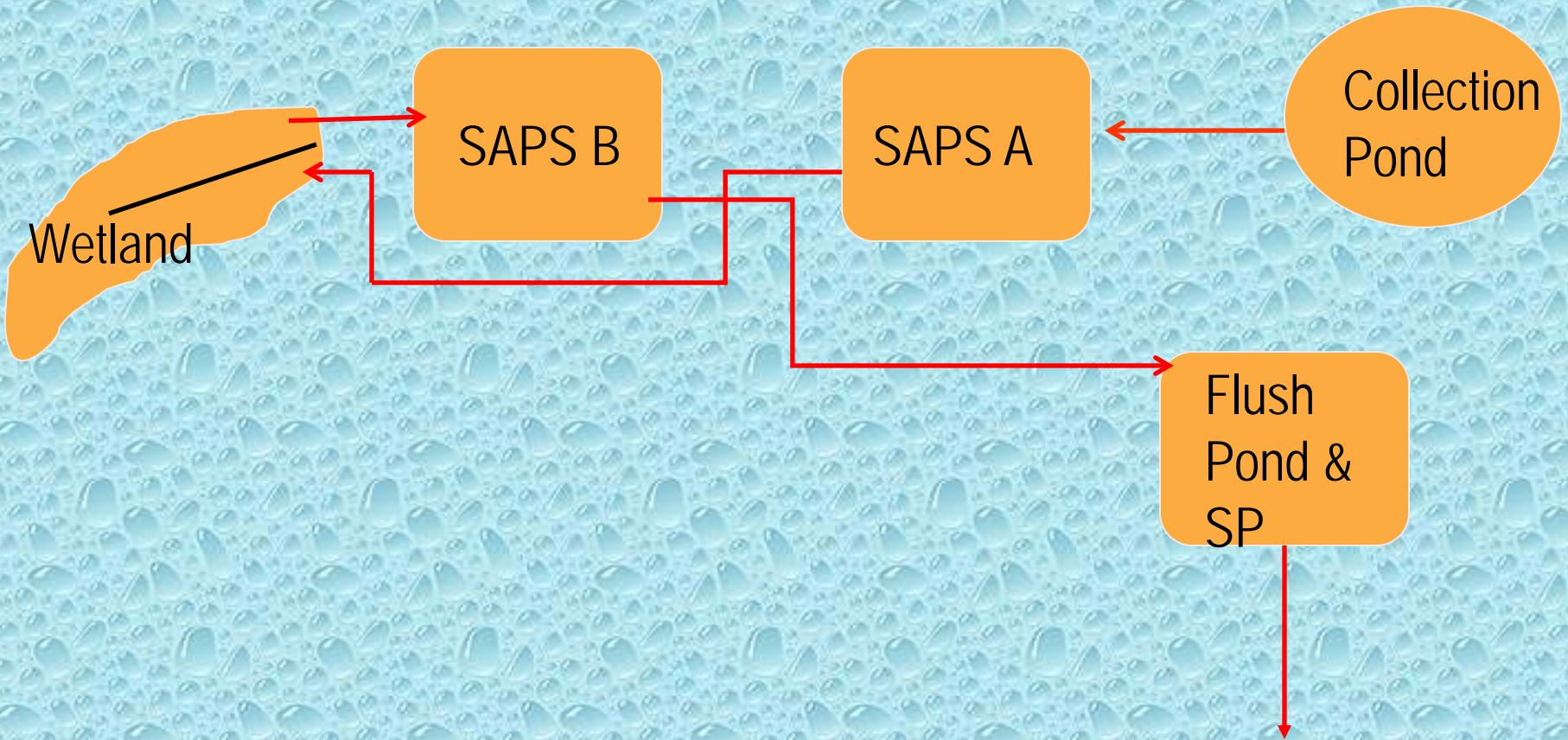


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Treatment System Evaluations & Upgrades



Treatment System Evaluations & Upgrades



Trust Fund Example

Assumptions

Estimated Inflation Rate: 3%

Estimated Earnings Rate: 9%

Initial Donation to Fund: \$3,000

Estimated Annual Contribution to Fund: \$500

TOTAL ESTIMATED REPLACEMENT COST: \$75,300

<u>REPLACEMENT COST & FUND BALANCE PROJECTION</u>			
<u>SYSTEM AGE</u>	<u>YEAR</u>	<u>REPLACEMENT COST</u>	<u>FUND BALANCE</u>
1	2008	\$ 75,300	\$ 3,000
25	2032	\$ 153,069	\$ 62,128

Funding the trust fund?

- ✱ **Grants ?**
- ✱ **Foundations**
- ✱ **Donations**
- ✱ **Fund Raising**
- ✱ **Resource Recovery**



Resource Recovery = O&M = \$?



Questions???



Dismantling with a torch cutter





05.21.2010 11:43

Certified Hot Butt Fusers



