Manta Water Solutions, LLC

blueearthproducts™ the science of safe water®

FLORAN®

cleanitas® safer. cleaner. better.®

WHO AM I?

Bart Kauffmann

Filter Media Cleaning

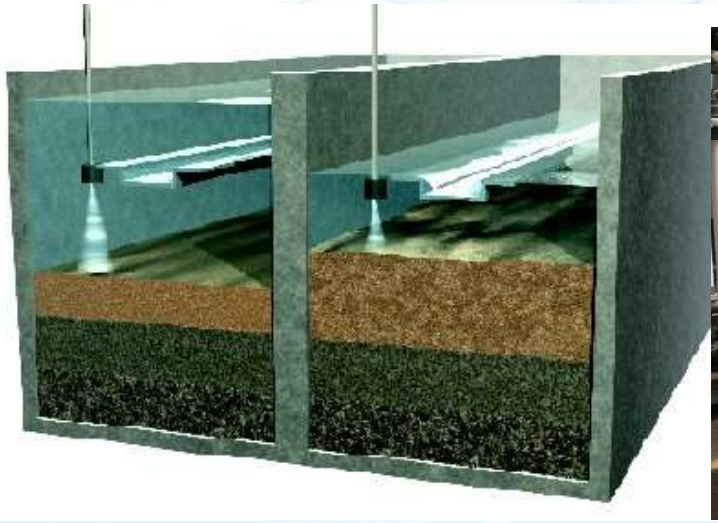
- What is a Chemical Cleaning?
- Qualification Process
- Why You Would or Wouldn’t
- Results
- Examples
- Concerns
- Costs

Filters

Suitable Filters

Pressure Filters

Gravity Filters



Unsuitable Filter

Membrane Filters

Filter Media

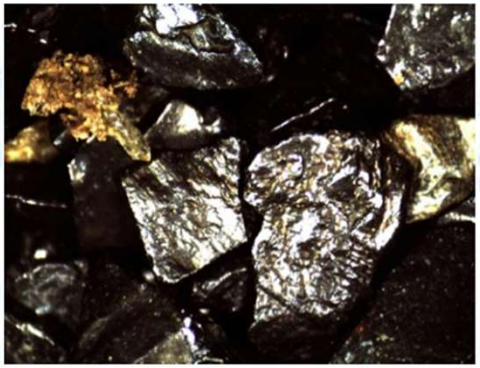
Media

- Anthracite
- Silica Sand
- Greensand
- Support Gravel
- GAC?

Fouling

Calcium

Iron



Aluminum

Process

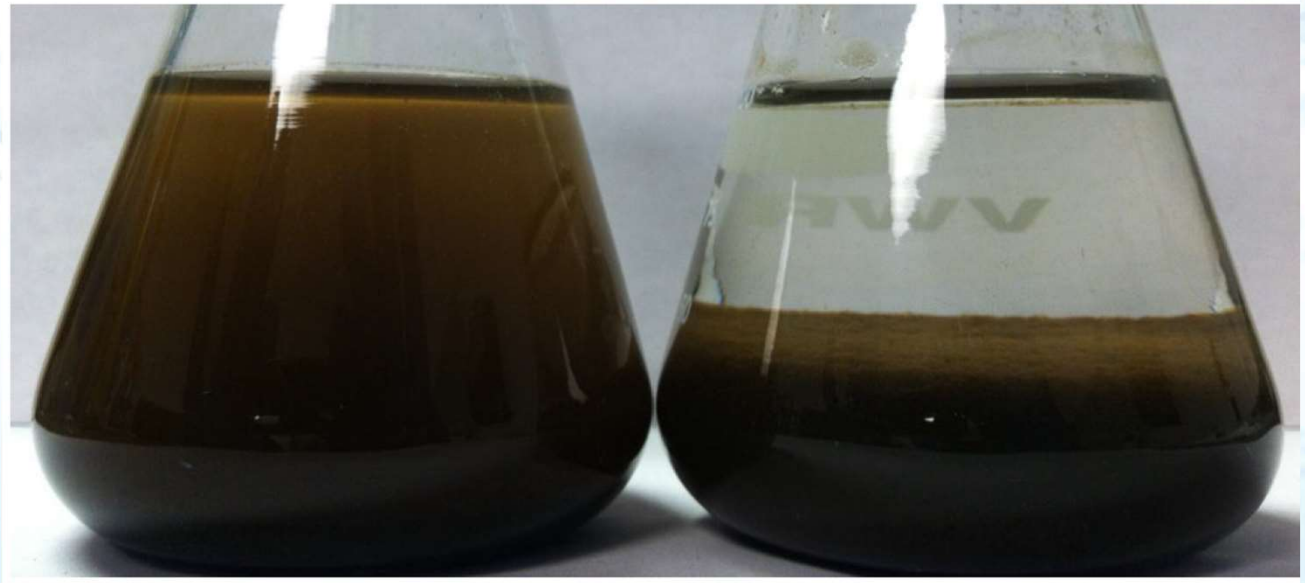

Filter Media Inspection
Media Analysis Report
Filter Media Cleaning
Acid Blend Application
Neutralizion
Filter back online
• Media Analysis and Sample Collection
• If filter meets the criteria or not
• Shipping product to plant
• Let soak for 24h
• Neutralize acid backwash
• Post Cleaning Analysis
2 weeks
3 days
2 days

Is It Right For You?

- 1st step – Filter Inspection
- What we look for
  - Mounding
  - Mudballs
  - Channeling
  - Cracking
  - Media Interface
  - Uneven Airscour
  - Grab Media Samples

Is It Right For You?

- 2nd Step – Filter Media Analysis

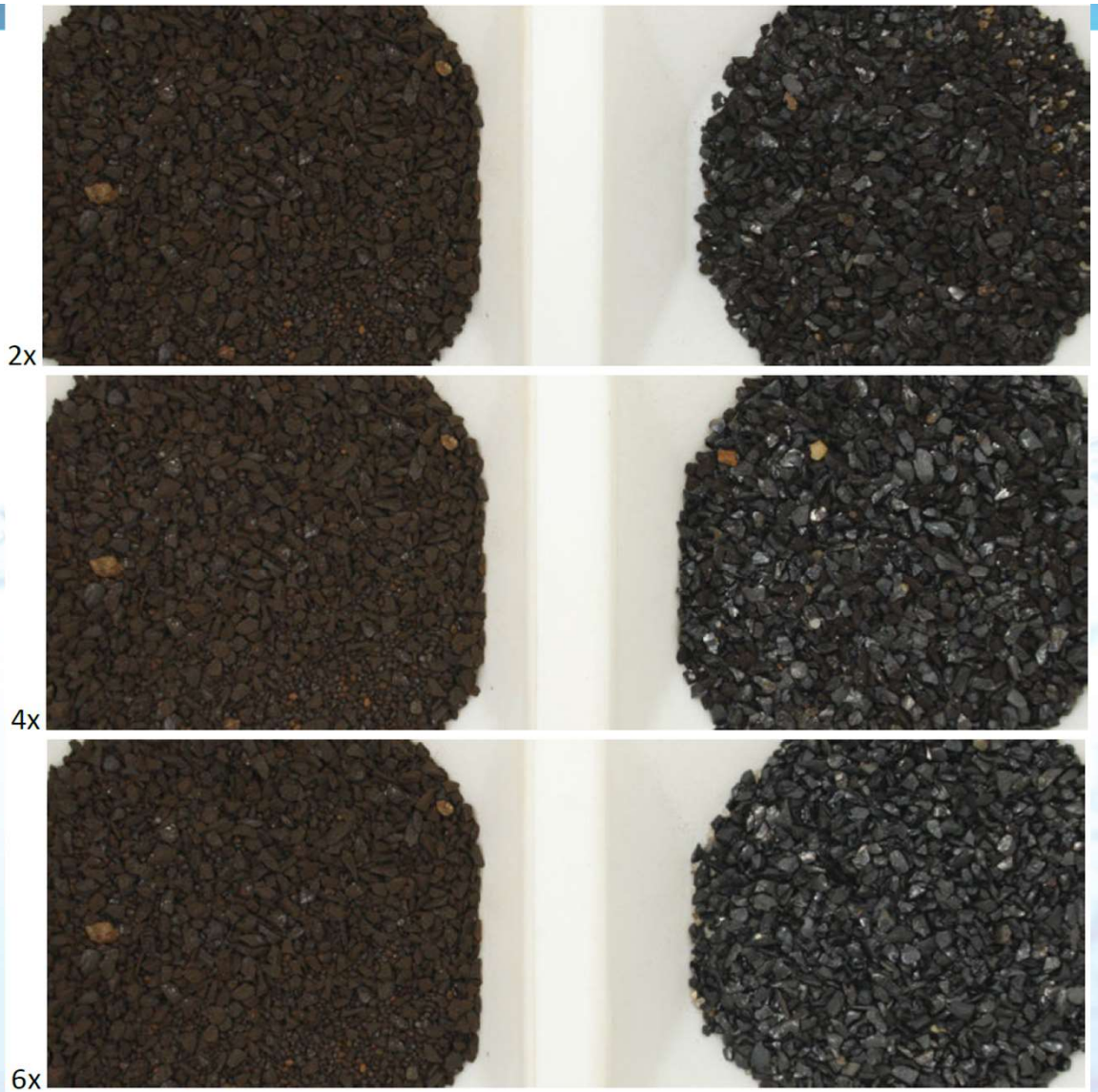


Pre-Treatment

4x

6x

Post-Treatment

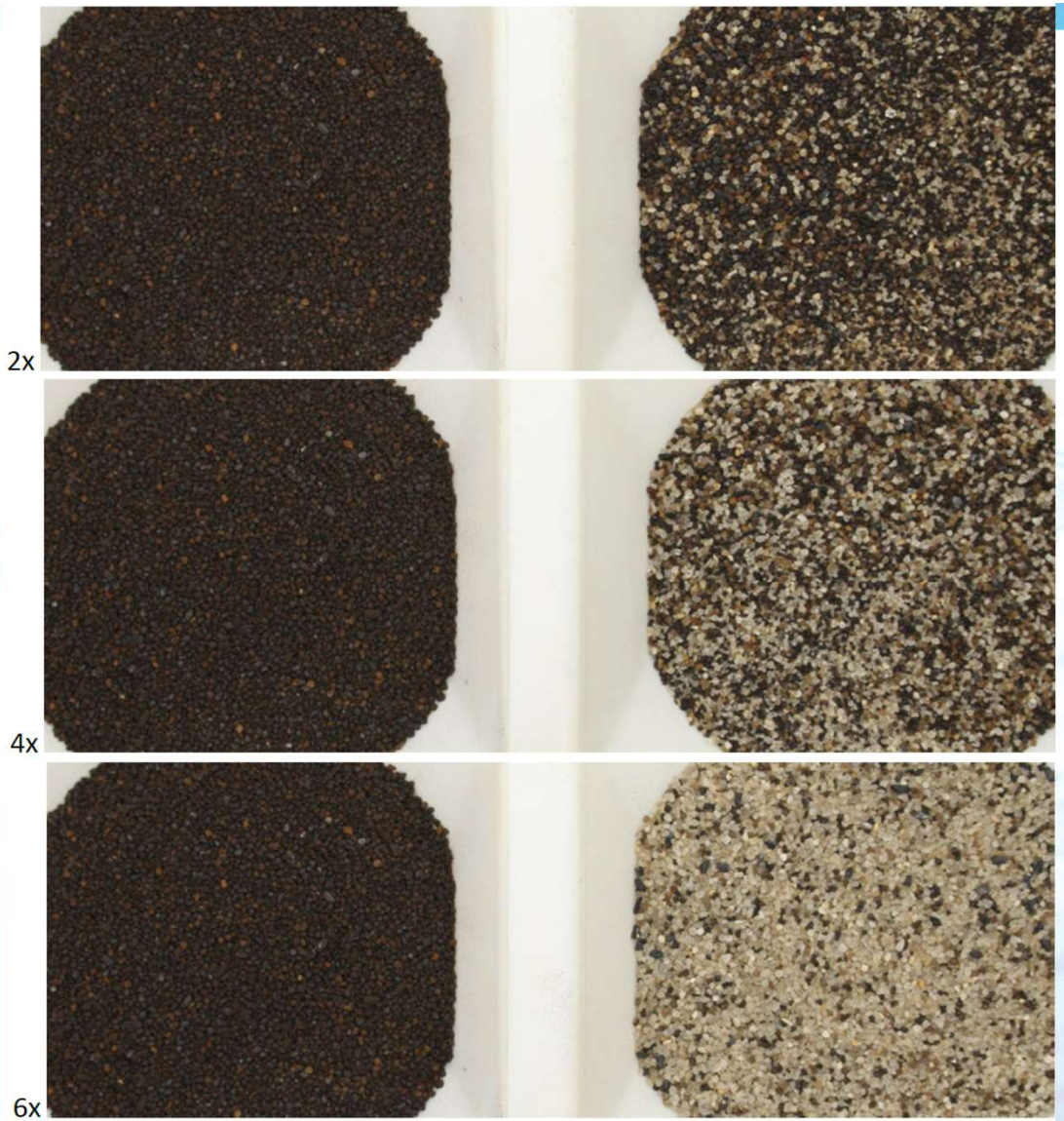

2x
4x
6x
Pre-Treatment
Post-Treatment

Pre-Treatment

4x

6x

Post-Treatment


2x
4x
6x
Pre-Treatment
Post-Treatment

Sieve Analysis

Sieve dia. (mm)	Anthracite % Weight Passing	Sand % Weight Passing
2.800	100.00	100.00
2.000	100.00	100.00
1.700	95.43	100.00
1.400	64.52	100.00
1.000	16.36	100.00
0.850	8.35	97.92
0.710	4.15	63.27
0.500	0.00	12.00
0.355	0.00	4.00
0.250	0.00	1.21
0.180	0.00	0.74
0.125	0.00	0.07
0.090	0.00	0.07

	Anthracite	Sand
Effective Size (mm):	0.88	0.46
60% passing (mm):	1.36	0.70
Uniformity Coefficient:	1.55	1.50

UC Anth 1.0-1.7
ES Anth 0.6-1.6

UC Sand < 1.7
ES Sand 0.35-0.65

ICP

6010 MET ICP **Analytical Method: EPA 6010 Preparation Method: EPA 3010**

Parameters	ICP Results	Units	Report Limit	Wt. %
Aluminum	102.6	mg/L	0.075	**4.1%**
Barium	0.3	mg/L	0.01	**0.0%**
Boron	ND	mg/L	0.1	
Cadmium	0.0	mg/L	0.005	**0.0%**
Calcium	170.2	mg/L	0.1	**6.8%**
Chromium	0.3	mg/L	0.005	**0.0%**
Copper	4.7	mg/L	0.01	**0.2%**
Iron	1789.3	mg/L	0.05	**71.2%**
Lead	0.3	mg/L	0.005	**0.0%**
Magnesium	59.0	mg/L	0.05	**2.3%**
Manganese	24.9	mg/L	0.005	**1.0%**
Nickel	53.6	mg/L	0.005	**2.1%**
Phosphorus	1.5	mg/L	0.1	**0.1%**
Potassium	6.1	mg/L	0.5	**0.2%**
Silicon	281.9	mg/L	0.5	**11.2%**
Sodium	1.5	mg/L	0.5	**0.1%**
Zinc	18.5	mg/L	0.05	**0.7%**
			Total:	100.0%

Table 4: Metals analysis of deposits removed from media.

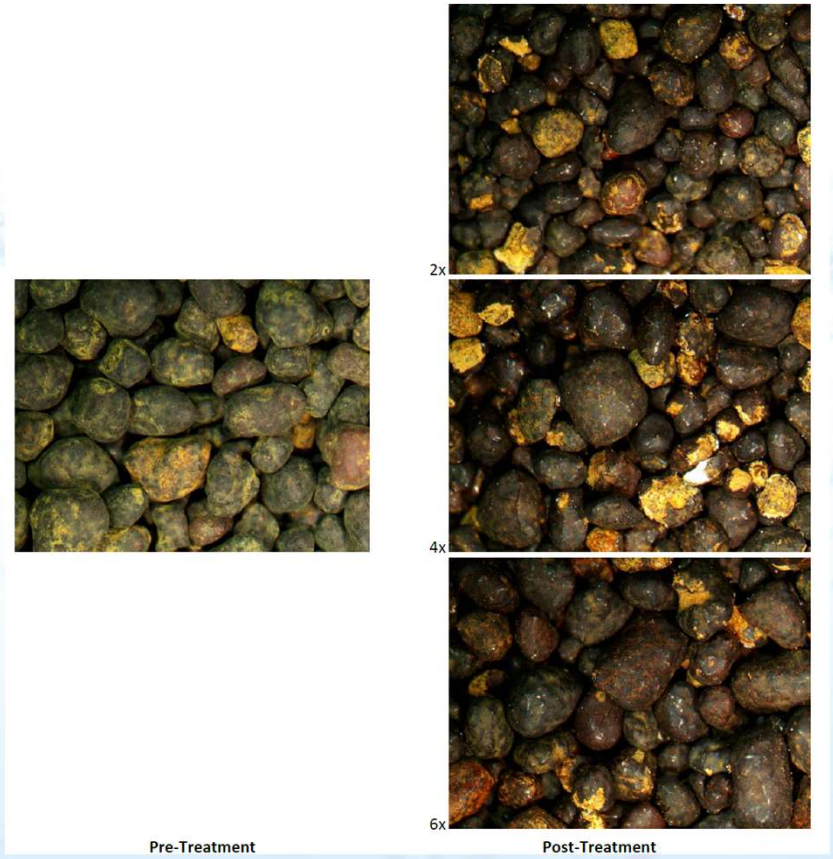
Dosing and Neutralization

Filter ID: 1,2	Dosage		
Dosing	**2x**	**4x**	**6x**
neXt (lbs)	2574	5148	7722
Note: No Floran Catalyst is Required			
Deposits Removed (lbs)	1442	1885	2021
Final Runoff pH	2.6	2.3	1.7
Containers of neXt (50 lbs each)	51	103	154
Neutralization Options			
pHinish-S (lbs)	482	958	1903
pHinish-L (gal)	182	362	718
pHaze (lbs)	1206	2395	4756
Alternative Treatment Chemistry (Equivalent Dosage by Calculation)			
Media Master RR (lbs)	2358	4716	7074
Floran Catalyst (gal) for Media Master RR	60	120	180
Media Master (lbs)	1800	3600	5400
Floran Catalyst (gal) for Media Master	60	120	180
CSR Plus (gallons)	494	989	1483
Floran Catalyst (gal) for CSR Plus	60	120	180
Filter Fit (gallons)	323	647	970
Floran Catalyst (gal) for Filter Fit	60	120	180

Table 6: Chemical dosing and neutralization requirements for each dosage tested.

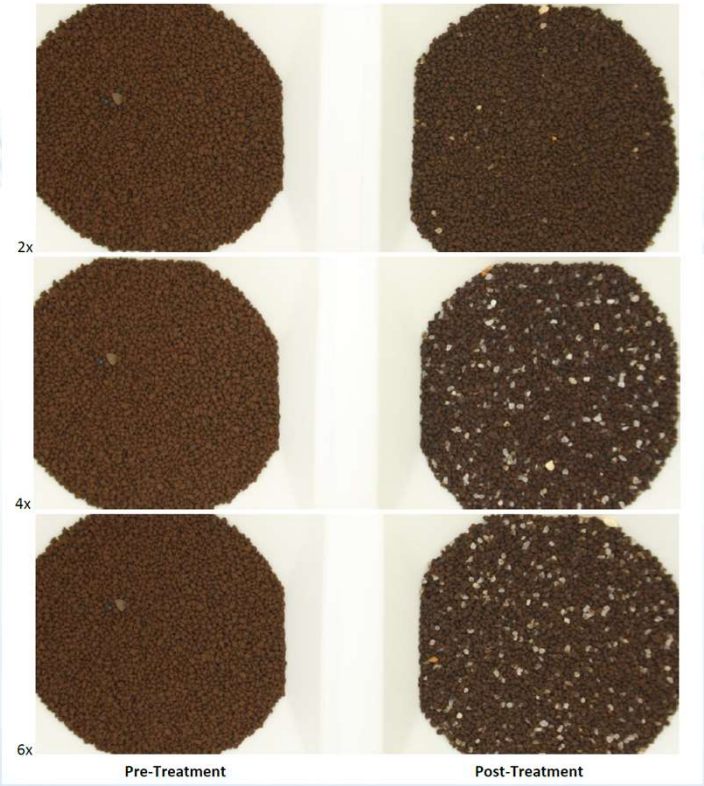
It’s Not Right For You

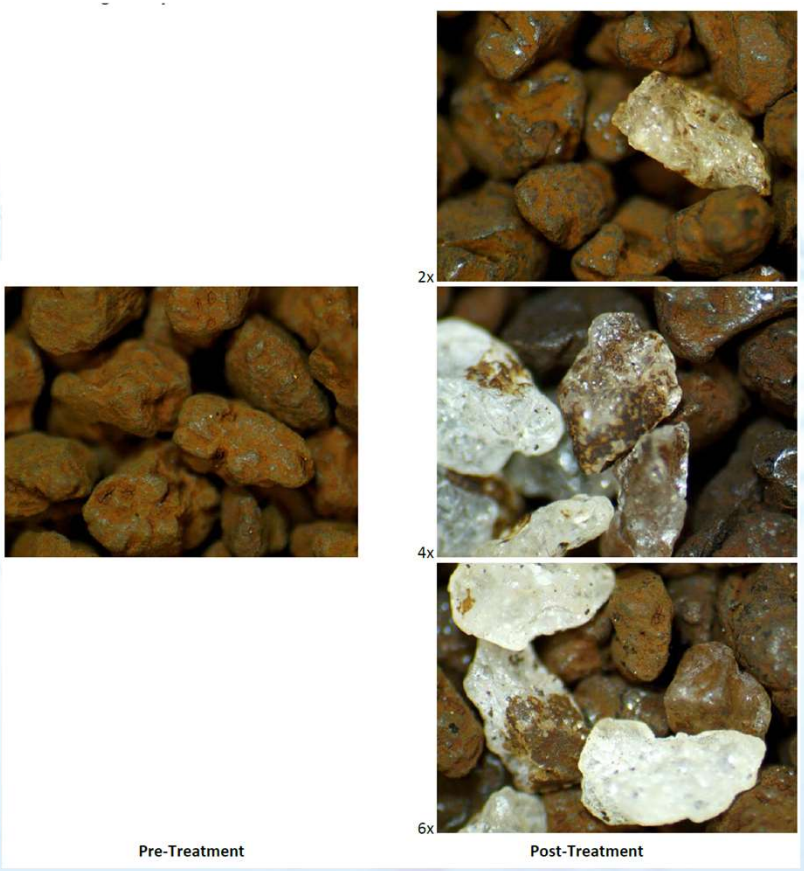
- Analysis Makes It Clear
  - Doesn’t Clean up Well
  - Media Out of Spec
    - UC & ES



Local Example

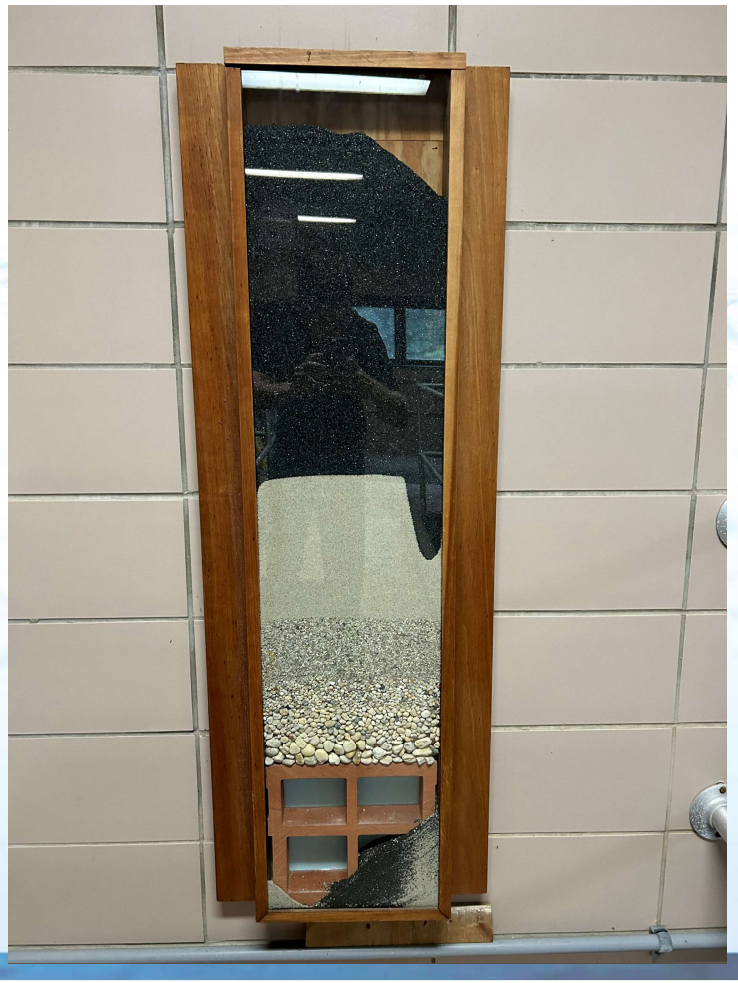
- Northeast AL Water
- Didn't Recommend Cleaning

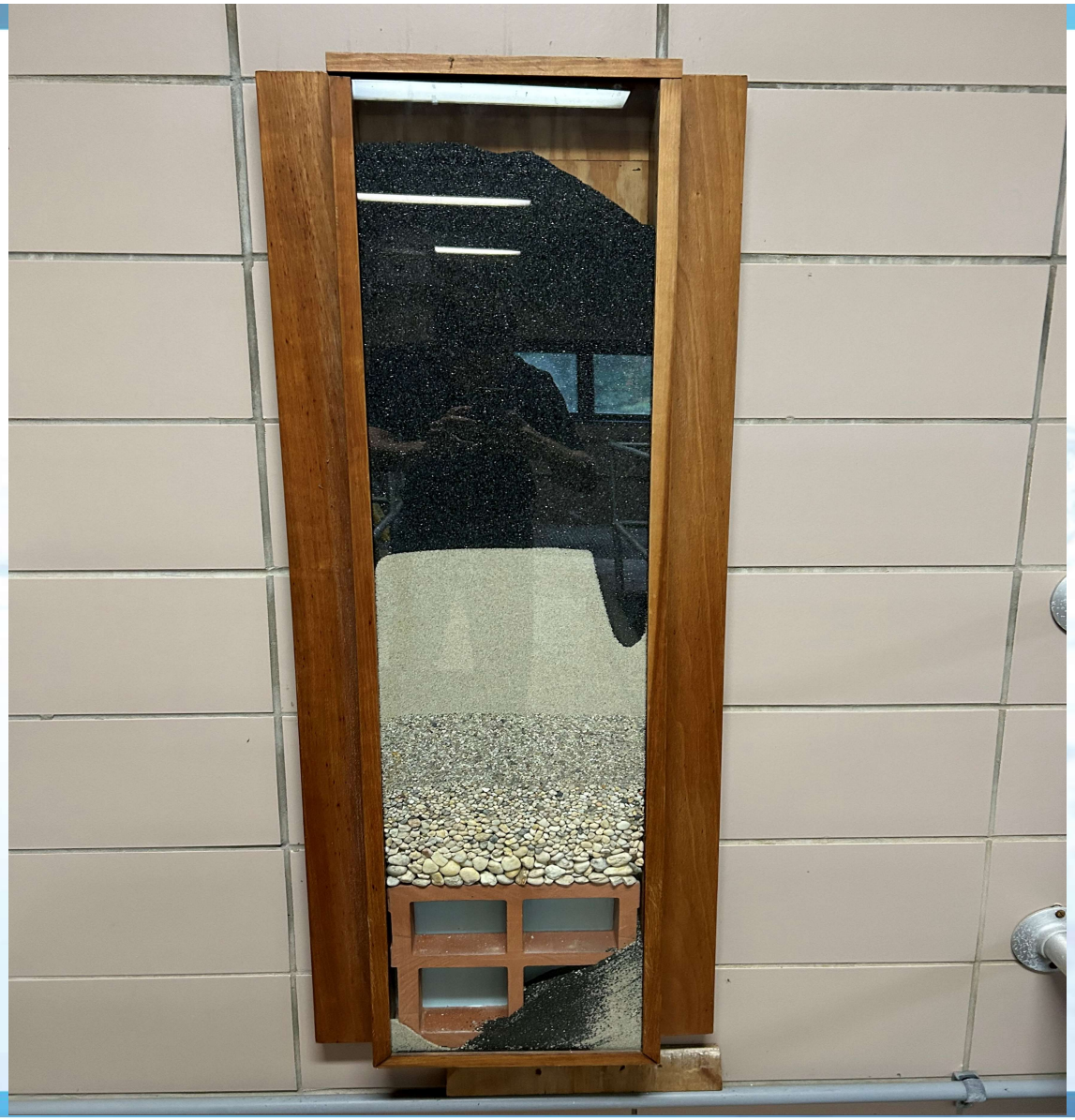




It’s Not Right For You

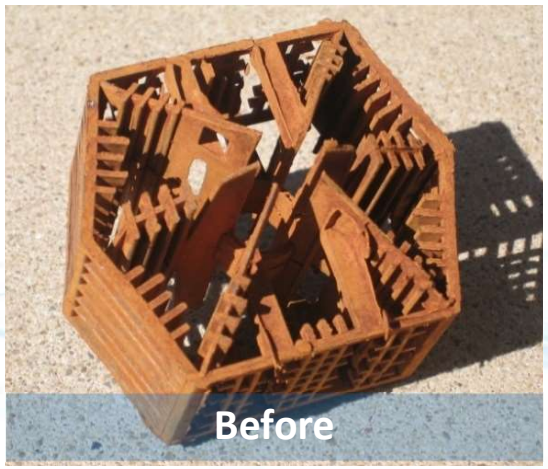
- Inspection makes it clear due to
  - Depressions: Potential Underdrain Issues

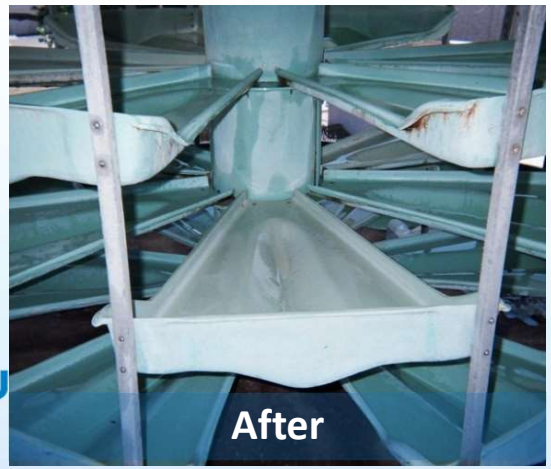




How You Do It

Air Strippers





Air Strippers

Before

After

Figure 2: Example of media segment before and after treatment.

Local Stories

- Alexander City, AL
- Cleaned all 7 dual bay filters

Before

After

Why Consider Cleaning?

- What happens when media and underdrains are fouled
- Loss of Angularity – Raisins vs Raisinets
- Turbidities

Why Consider Cleaning?

- Headloss
- Backwash frequency
- Runtimes

Why Consider Cleaning?

- Mudballs
- Channeling
- Mounding

Why Consider Cleaning?

Problems

- Filter Performance
- Headloss
- Turbidities
- Decrease run times
- High backwash frequency
- Mudballs, channeling, mounding
- Fouled underdrains
- Uneven airscour

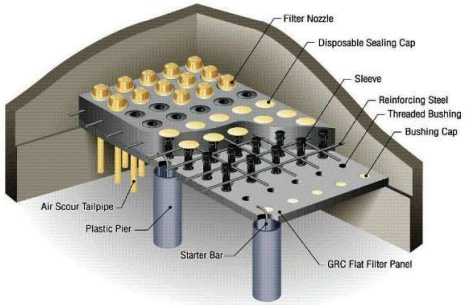
But Wait! There's Another Reason!

Why Consider Cleaning?

- Preventative Maintenance?!?!?!?!?!

Underdrains

False Floor



Nozzle Bottom

Wheeler Bottom

Lateral Type

HDPE

Clay Tile

Stainless

3.3 I.M.S® Media Retainer

1. Inspection

It is important that the I.M.S Media Retainer is inspected during regular media change out procedures. Inspection should include, but not be limited to; pore openings not clogged, screws secure and sealant intact. Should you require support from a qualified Xylem Service Representative for such inspections, please contact the Xylem Service Manager at 724-452-6300.

2. Cleaning--General

It may be necessary, after periods of unoptimized operation or process upsets, to clean the I.M.S Media Retainer of biological growth, scale or chemical fouling. Due to an unknown cause of the deposition, testing may need to be conducted to determine the best cleaning chemical.

a. In order to determine the chemical that most efficiently removes the deposition, testing must be performed on a sample of the material to be cleaned. Some chemicals that should be tested are hydrochloric, sulfuric, muriatic, acetic or citric acid, sodium hydroxide, sodium hexametaphospahte, salt, chlorine, and hydrogen peroxide. There are also a great many proprietary-cleaning

chemicals that could be tested if deemed necessary. Use the minimum percentage of cleaning chemical required to remove the deposits.

CAUTION: THERE ARE HAZARDS WITH USING MOST CHEMICALS AND APPROPRIATE PRECAUTIONS MUST BE FOLLOWED.

b. Blue Earth Labs is one company that has NSF certified chemicals that have shown success in cleaning both organic and inorganic materials.

Chemical Cleaning Results

- Restored Filter Conditions = Restored Filter Performance
  - Increase Run Times
  - Decrease Backwash Frequency
  - Reduced Headloss
  - Reduced Turbidities
  - Removed Mudballs, channeling, mounding
  - Even airscour

Concerns

- Will this damage my grout?
- Will this damage my filter?

- Over 1000 Chemical Cleanings
- Products Specifically designed for filters

Concerns

- Age? – Breaking Down & Rounding Vs. Encapsulating

Pre-Treatment

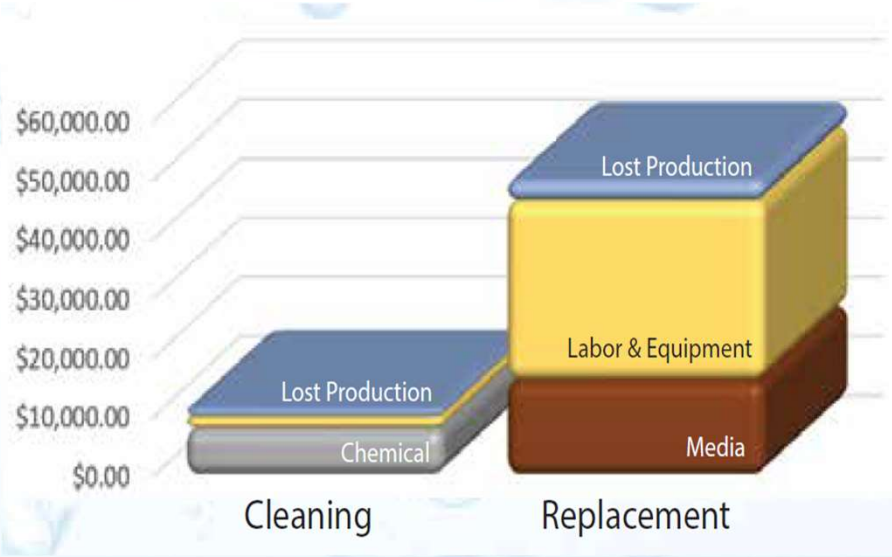
Post-Treatment

Concerns

- Leaking effluent valves?
  - Main Risk
- What to do
  - Hand tighten effluent and influent valves
  - Leak test prior
  - Blind flange
  - Filter to waste
  - Neutralization ready

Cost

- 1/3rd the Cost of Media Replacement
- 1/10th the Cost of Filter Rehabilitation
- Money for Other Projects
- Timely – Product in Stock and Ready to Ship



Questions?

- Thank You!
- Bart Kauffmann
- 678-763-9227

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