BCWD Settler’s Glen 5th Addition
Iron-Enhanced Sand Filter

October 8, 2014
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Project Location
Key Elements

- Involved retrofit of an existing stormwater pond
- Harvesting and return of stormwater in a short distance
- Provides stormwater education for trail users
- Maintains existing neighborhood aesthetic
- Significant phosphorous reduction goal of about 118 lb/year
Pump Intake Harvesting Pond
Iron-Enhanced Sand Filter Bed Installation
Lift Station Pump Manhole
Lift Station Pump Manhole
Post-Project September 2013
• April 29, 2014
• 6.8” rainfall since April 1st
Post-Project 2013

- Pump Harvest Basin
- August 15, 2013
- Approximate Baseflow Conditions
April 29, 2014

3.35” rainfall in 3 days
System Start-Up

- May 2, 2014
- 7.53” rainfall since April 1st
2014 Operation

• May 12, 2014
• 9.2” rainfall since April 1st
2014 Operation

- June 19, 2014
- 5.82” rainfall since June 1st
2014 Operation

- June 19, 2014
- 10.84” rainfall since April 1\textsuperscript{st}
- Bank movement at outlet
System Repair – August 6, 2014

June 19, 2014

5.82" rainfall in June
System Operation – October 2, 2014

• June 19, 2014
• 5.82" rainfall in June
System Operation – October 2, 2014

5.82" rainfall in June
• 25.46 inches of rain since April 1st
• 68 Days with rain to date
• Pump run time 147 hours; 930 kWh
• 14 Monitored pump events (81 hours & ~2.6 Acre-Feet)
  • Only 3 actual rain events
  • 91% Ave Total P removal
  • 37% Ave TKN removal

October 3, 2014 samples at inlet and outlet
August 21, 2014 Event = 0.6 Inches

Pumped Volume = 0.3 Ac-ft
Total Phos = 0.175 mg/l
Load Estimate = 0.14 lb
Removal Efficiency = 83%
September 3, 2014 Event = 0.67 Inches

Pumped Volume = 0.7 Ac-ft
Total Phos = 0.246 mg/l
Load Estimate = 0.48 lb
Removal Efficiency = 96%
Project Challenges

- Early spring rainfall & erosion
- Filter surface repair required unique solution for permanent un-vegetated state & several rounds of input.
- Lack of rain once repaired required manual operation
- Contractor change of PM
- Technical difficulties with pump controller programming given input from analog and digital devices.
- Monitoring of erosion at outlet
- Float switch precision
2014 Remaining Items

- Re-seeding along force main route and near harvest basin
- Cut lift station slab installation loops
- Provide documentation of meter box repair
- Pump controller program customization
- Provide pump frequency (Hz) to flow rate (cfs) relationship
- System winterization
- Finalize Record Drawing
- Finalize O&M manual
Future Enhancements

- Stream monitoring into harvest basin
- Lift station staff gauge
- Street inlet monitoring & velocity monitoring at filter outlet
- Valve in discharge manhole
- Replace float switches with a pressure transducer
- Cellular remote monitoring system and flow meter
Pre-Project 2013