

BUILDING A WORLD OF DIFFERENCE

HANNIBAL MO CHLORAMINE REPLACEMENT EVALUATION PROJECT UPDATE

9/13/2017



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PROJECT STATUS – TASKS COMPLETED TO DATE

- BPW Approved Contract/ Notice To Proceed - *May 8, 2017*
- Plant Site Assessment- *May 12, 2017*
- Bench Scale #1 Samples - *May 12, 2017*
- GAC 1-Yr Simulation Sample - *May 15, 2017*
- Implementation Strategy Memo - *May 25, 2017*
- MDNR Meeting - *May 31, 2017*
- Pilot Aeration Testing- *July 13, 2017*
- Initial Findings Report - *July 20, 2017*
- Bench Scale #2 Samples – *July 25, 2017*
- GAC Pilot System Installed – *August 9, 2017*
- Bench-Scale #2 Results – *September 12, 2017*

BENCH-SCALE TESTING RESULTS

- Targeting a 50% reduction in organics to meet chlorine disinfection byproduct (DBP) MCL
- Doubling the chemical (coagulant) resulted in only 25 percent improvement in organics removal
 - Double the cost thought
- No quick chemical change will meet DBP MCL
- Two technically feasible approaches arose
 - Granular activated carbon
 - Ozone + in tank aeration to strip pre-formed DBPs

GRANULAR ACTIVATED CARBON TESTING

- **Rapid simulation test**

- 55 gallon water sample tested via simulation of GAC for 1 YR
- 50 percent breakthrough of organics within 100 days
- Indicated long GAC life but a snap shot of water quality
- DBP results appear favorable (replacement >1 yr)
- **BUT** must be calibrated yet to expected water quality over a year and normal operating conditions
- Calculations incomplete to verify > 1 yr replacement

- **Pilot testing**

- Better indicator of performance in regard to changing water quality
- Duration of pilot will be a minimum 6 months

GRANULAR ACTIVATED CARBON PILOT

- **Four columns of GAC**
 - Columns 1 and 2 simulate GAC in existing Filters
 - Columns 3 and 4 simulate new post filter GAC vessel
- **Parameters recorded before/after unit**
 - TOC, Flow Rate, pH, Alkalinity, Turbidity
- **Length of pilot TBD based on performance**



PROJECT REMAINING TASKS

- 3rd round of bench-testing to further solidify treatment performance and operating cost
- A second 1-yr GAC simulation with another supplier
- **Additional MDNR Discussion**
 - Comments on Initial Findings Report
 - Determine required length of GAC pilot
 - Permitting requirements
- **Submit Draft Preliminary Report – November 2017**
 - Develop alternatives with capital and operational cost estimates
 - Alternative 1: Pre-ozone + air stripping
 - Alternative 2: Post-filter GAC vessel
 - Recommended plan most likely combination of plant improvements (GAC or Ozone) plus distribution system improvements to minimize life-cycle cost
- Present final recommendation to Board– December 2017

Schedule subject to change based on length of pilot and permitting requirements

