EXHIBIT HHB–1

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director
www.dnr.mo.gov

November 24, 2014

Mr. Hollis Brower
Moore Bend Utilities
P.O. Box 1080
Nixa, MO 65714

Re: Moore Bend Water Utilities, PWS ID #MO5036117, Review #5052088-14

Dear Mr. Brower:

Enclosed is the report of final inspection for Moore Bend Water Utilities water supply improvements serving the Moore Bend Subdivision in Taney County, Mo. This report pertains solely to the construction activities and is believed to be self-explanatory. These findings are being provided to the Public Drinking Water Branch Compliance and Enforcement Section for their consideration and additional action as warranted.

If you have any questions, please feel free to contact Mr. Michael Grose of this office by calling 417-891-4300 or via mail at the Southwest Regional Office, 2040 W. Woodland, Springfield, Missouri 65807-5912.

Sincerely,

SOUTHWEST REGIONAL OFFICE

Clinton J. Finn

Mark Rader, Chief
for Drinking Water Section

MDR/mgl

Enclosure

c: Mr. Wayne Diebold, P.E., Rozell Engineering
Mr. Lance Dorsey, Public Drinking Water Branch
Ms. Darlene Helmig, Water Protection Program
Mr. Maher Jaafari, P.E., Public Drinking Water Branch
Mr. Jim Merciel, Missouri Public Service Commission

213.pdwp.MooreBendWaterUtility.mo5036117.ChlorinationSystem.2014.11.24.fy15.fin.505208814.mjg.doc

DEPARTMENT OF NATURAL RESOURCES
REPORT OF FINAL INSPECTION OF PUBLIC WATER SUPPLY IMPROVEMENTS
MOORE BEND WATER UTILITIES
CHLORINATION AND DETENTION SYSTEM
TANEY COUNTY
PUBLIC WATER SUPPLY ID NUMBER MO5036117
REVIEW NO. 5052088-14

November 24, 2014

INTRODUCTION

On October 9, a final inspection was made by Mr. Michael Grose of the Missouri Department of Natural Resources (department) Southwest Regional Office.

PROJECT DESCRIPTION AS APPROVED

The approved plans and specifications for this project include the installation of chemical injection pumps, 55-gallon graduated solution tanks, and 480 gallons of pressure detention tanks installed in series at both Well #1 and Well #2 at the Moore Bend Water Utilities Company. The plans specify a 24 gallon per day chemical injection pump set at 2.7% of capacity, feeding a 5% chlorine solution to provide a free chlorine concentration of 1 part per million (milligrams per liter).

The approval to construct was originally issued to Moore Bend Utility, LLC on July 16, 2014.

PROJECT DESCRIPTION AS CONSTRUCTED

The construction was identical at both Well #1 and Well #2. The systems are provided with a 24 gpd peristaltic chemical injection pump set at 35% capacity. The pumps draw from 55-gallon semi-opaque solution tanks. The solution is prepared by mixing 10% sodium hypo-chlorate stock solution in a 20:1 ratio with softened water. The softened water is provided by a small onsite resin water softening system. The use of softened water reduces the incidence of feed line calcification but does not change the hydraulic or chemical characteristics of the system.

Detention is provided by four 120-gallon Pentair Model CT-120 detention tanks plumbed in series, in the bottom and out the top per the approved plans and specifications. The finished water chlorine concentration at Well #1 was 1.1 mg/L and at Well #2 was 0.94 mg/L the day of the inspection. The system is correctly equipped with both raw water sample tap prior to chemical injection and finished water sample tap located after detention.

The system is also equipped with a continuous monitoring system that has not yet been activated or validated.

FINAL APPROVAL

The completed water supply facilities described above were examined as to features of construction which may affect the operation of the facilities, including size, capacities of various units, and features which may affect the efficiency and ease of operation. The completed facilities, so far as could be determined, are constructed essentially in accordance with the approved plans, and final approval of the completed project is hereby granted.

In the final inspection of the facilities, the Department of Natural Resources does not examine structural features or the efficiency of mechanical equipment. This final approval does not include approval of these features.

The department reserves the right to withdraw the approval of the water supply facilities at any time they are found to be unsatisfactory, and to require alterations, additional treatment or changed methods of operation as necessary to place the facilities in satisfactory condition.

COMMENTS

The minimum free chlorine concentration to provide 4-log virus inactivation was calculated for both wells based on the worst case scenario per the attached calculations (Groundwater C-T Form (4-log): Worst Case Calculation). Per the Ground Water Rule, the minimum free chlorine concentration to provide 4-log virus deactivation 0.48 mg/L at Well #1 and 0.52 mg/L at Well #2. Under the Total Coliform Rule, a violation would occur if the chlorine concentration is less than 0.5 mg/L, therefore a TCR violation can occur even if the system is still providing 4-log virus deactivation at Well #1.

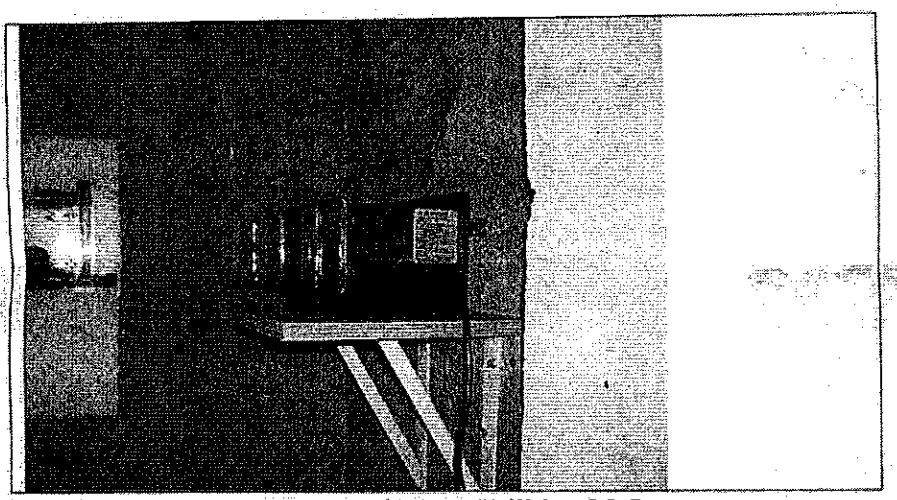
Moore Bend Water Utility does not currently conduct daily monitoring of the chlorine concentration. They expect to have their continuous monitoring system operational in the near future. The system is not 4-log compliant as daily monitoring is not conducted.

SUBMITTED BY:

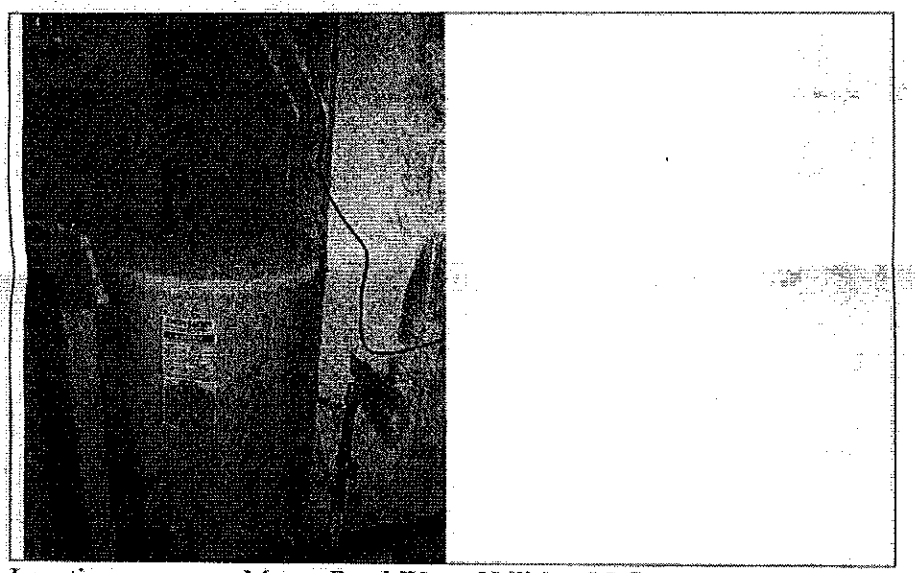
Michael J. Grose, EIT
Drinking Water Engineering and
Technical Assistance Unit

APPROVED BY:

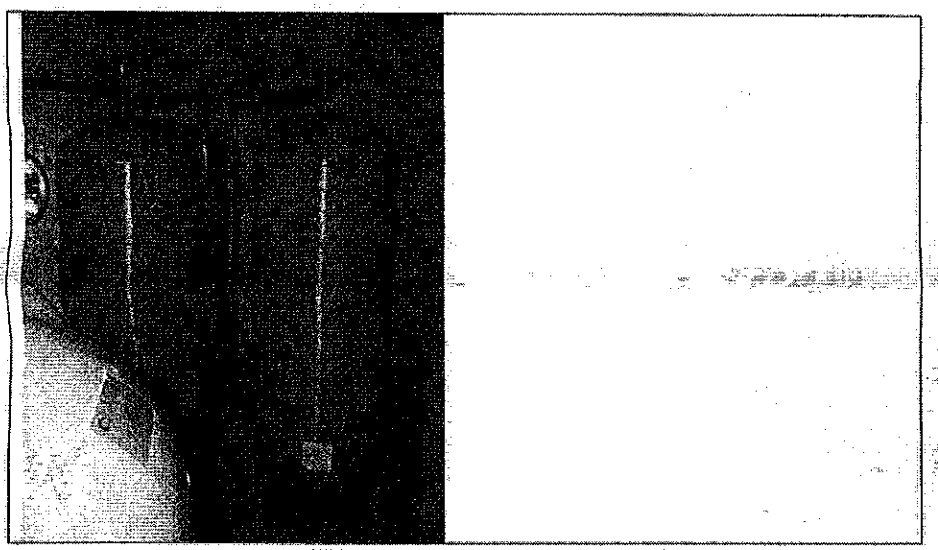
Clinton J. Finn, P.E., Chief
Drinking Water Engineering and
Technical Assistance Unit



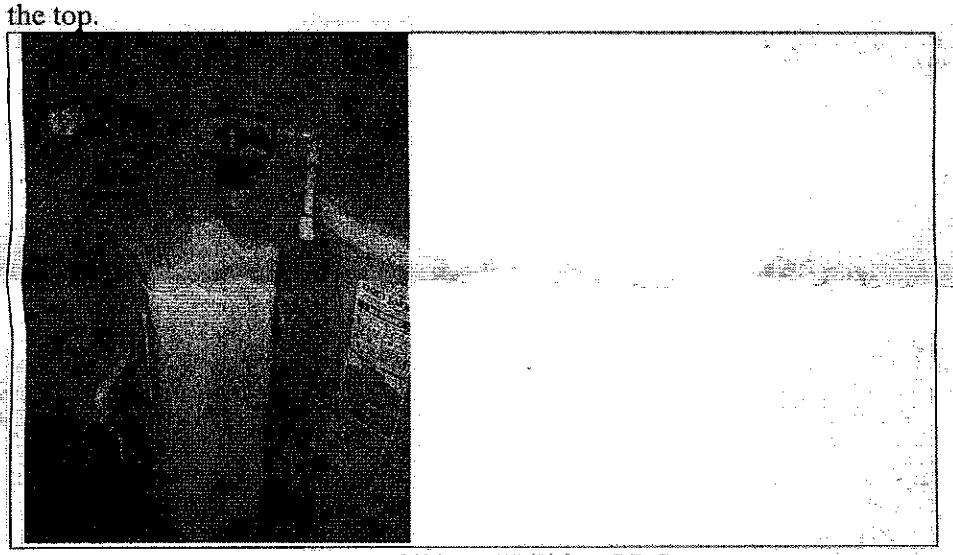
Location: Moore Bend Water Utilities, LLC
Photographer: Mike Grose
Photograph Date: October 9, 2014
Comments: Well #1 24 gpd peristaltic chemical injection pump.



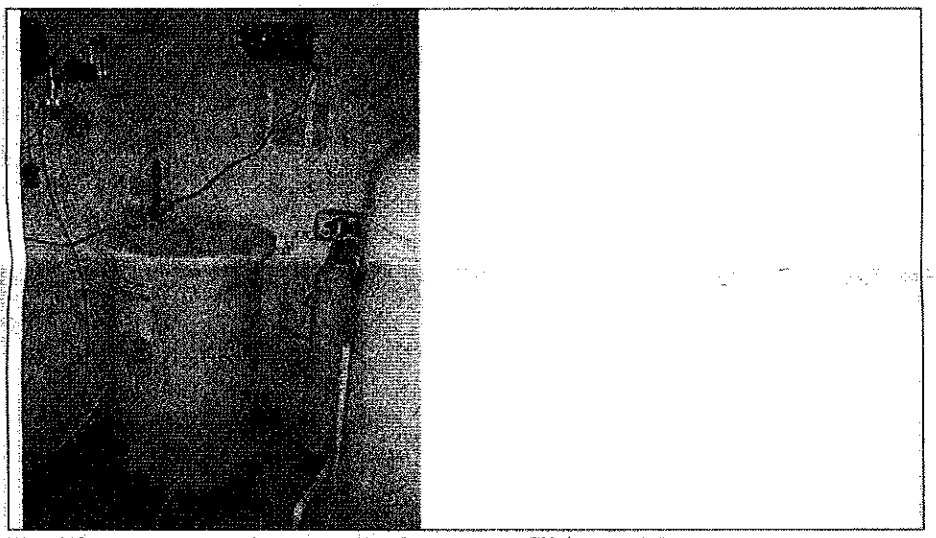
Location: Moore Bend Water Utilities, LLC
Photographer: Mike Grose
Photograph Date: October 9, 2014
Comments: Well #1 55-gallon graduated solution tank with softened water connection.



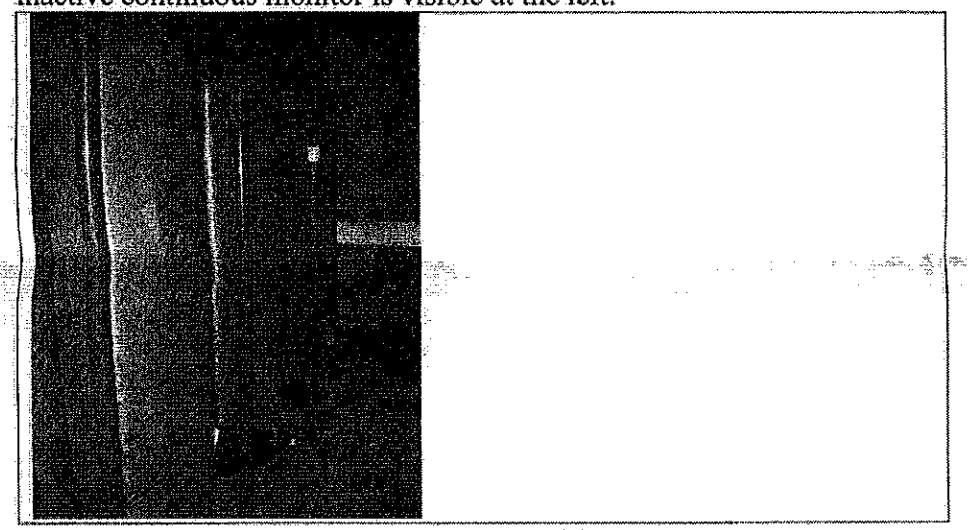
Location: Moore Bend Water Utilities, LLC
Photographer: Mike Grose
Photograph Date: October 9, 2014
Comments: Well #1 Pentair 120-gallon detention tanks plumbed in series, in the bottom and out the top.



Location: Moore Bend Water Utilities, LLC
Photographer: Mike Grose
Photograph Date: October 9, 2014
Comments: Well #1 Small resin water softening system used strictly to provide water for solution preparation.



Location: Moore Bend Water Utilities, LLC
Photographer: Mike Grose
Photograph Date: October 9, 2014
Comments: Well #2 chemical injection system with pump, solution tank, water softener. The inactive continuous monitor is visible at the left.



Location: Moore Bend Water Utilities, LLC
Photographer: Mike Grose
Photograph Date: October 9, 2014
Comments: Well #2 detention tanks.

Groundwater C-T Form (4-log): Worst Case Calculation

Type of Storage Unit (Example, clearwell/tank/basin	**Residual Conc.** (Minimum Free CL) (mg/L)	**pH**	**Temp.** (Lowest temp) (Celsius)	**Peak Flow** (GPM)	**Minimum Volume (gal)**	**Baffling Factor** Used for 4-log	**Final calculated 4-log Inactivation** (Viruses)
Well 1 pressure *	0.48	6-9	>5° C	20	480	.7	99.99
Well 2 pressure *	0.52	6-9	>5° C	22	480	.7	99.99

According to table on page 10 of the Draft Missouri Guidance Manual for Inactivation of Viruses in Groundwater; the **CT required** for 4.0 log inactivation using free chlorine as the chemical disinfectant and the worst case conditions noted above is **8 mg-min/L** (for groundwater systems with pH 6-9, and temperature 5° C).

CT_{calc} = 0.5 mg/L X xxxxxx gal X Baffling Factor / xxx gpm = xxx mg-min/L
CT_{req} = 8 mg-min/L
CT_{calc} / CT_{req} = xxx therefore Z = 4 x CT_{calc} / CT_{req} = 4 X xxx = xxxx, Percent inactivation = $100 - 100/10^{Z}$ = 100 – 0.01 = 99.99

Required Minimum Chlorine Concentration [Cl-] at Well #1 to meet 4-log Virus Deactivation;
CT_{req} = 8 mg-min/L = [Cl-](V)(BF)/Q = [Cl-](480)(0.7)/20 gpm
Therefore, [Cl-]= 0.48 mg/L

Required Minimum Chlorine Concentration [Cl-] at Well #2 to meet 4-log Virus Deactivation;
CT_{req} = 8 mg-min/L = [Cl-](V)(BF)/Q = [Cl-](480)(0.7)/22 gpm
Therefore, [Cl-]= 0.52 mg/L

MOORE BEND, TANEY COUNTY, MO5036117, NOVEMBER 24, 2014, MJG

* Four pressure vessels plumbed in series, in the bottom and out the top. 120 gallons each at both Well #1 & Well #2