

MERCHANTVILLE-PENNSAUKEN WATER COMMISSION

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July 1, 2009

Ramesh Patel
New Jersey Department of Environmental Protection
401 East State Street
P.O. Box 426
Trenton, New Jersey 08625

Re: National Highway Filter Media Project
Permit #WCP 080002

RECEIVED
2009 JUN 23 AM 9:12

Dear Mr. Patel:

On 7 August 2008, the MPWC received the approved permit referenced above. The media at the treatment plant has since been changed to Manganese Greensand Plus. The filters were tested and made operational at the end of February 2009.

Plant setup

The National Highway Plant pumps water from the Potomac-Raritan-Magothy (PRM) formation using two groundwater production wells. Each well is capable of supplying 1,000 gallons per minute to the treatment system. Raw groundwater from the production wells is pumped to one of two vertical air stripping towers for the removal of any volatile organic contaminants. From the air stripper towers, water flows by gravity to two clear wells where lime is added for pH control. The level of the clear well basin is maintained at a near constant elevation by the operation of the level controlled high service pumps. The site utilizes two 75 HP pumps. These pumps directed water to a sodium hypochlorite contact tank, through a sodium bisulfite contact tank and then through two media filters. The finished water also used Carbon Dioxide to lower the pH.

The changes made to the treatment plant eliminated the sodium bisulfite feed and the carbon dioxide feed. The media in the filter units was changed to Greensand Plus. Less sodium hypochlorite is required to disinfect the finished water and maintain an acceptable residual.

Testing Results

The current flowrates and testing period has been taking place for over three months. The iron and manganese were readily reduced to concentrations well below the respective MCL of 0.3 mg/L and 0.05 mg/L throughout the testing period. The end of the filter runs were based on time. Each unit was run for 24 hours and then backflushed for 6 minutes. Filter 2 was run at a flowrate of 250 gallons per minute (gpm) or 3.0 gpm / sq. ft. This allowed a total flow of 360,000 gallons to be treated prior to the unit backwashing. Filter 1 was run at a flowrate of 500 gallons per minute (gpm) or 6.0 gpm / sq. ft. This

allowed a total flow of 720,000 gallons to be treated prior to the unit backwashing. There was no noticeable pressure increase throughout the filter runs.

As can be seen from the testing data included in **Appendix A**, the filters are equally removing iron and manganese at their respective flowrates.

March

The influent iron concentrations to both filters ranged from 0.1 to 0.4 parts per million (ppm). The iron was completely removed during March. The influent manganese concentrations ranged from 0.118 to 0.800 ppm. The highest effluent reading taken was 0.015 ppm. As can be seen from the data included in **Appendix A**, the effluent manganese concentrations are almost identical at both flowrates and in many cases, the concentrations are lower at the higher flowrates.

April

The influent iron concentrations to both filters ranged from 0.2 to 0.4 parts per million (ppm). The iron was completely removed during April. The influent manganese concentrations ranged from 0.021 to 0.383 ppm. The highest effluent reading taken was 0.014 ppm. As can be seen from the data included in **Appendix A**, the effluent manganese concentrations are almost identical at both flowrates and in many cases, the concentrations are lower at the higher flowrates.

May

The influent iron concentrations to both filters ranged from 0.2 to 0.4 parts per million (ppm). The iron was completely removed during May. The influent manganese concentrations ranged from 0.119 to 0.416 ppm. The highest effluent reading taken was 0.015 ppm. As can be seen from the data included in **Appendix A**, the effluent manganese concentrations are almost identical at both flowrates and in many cases, the concentrations are lower at the higher flowrates.

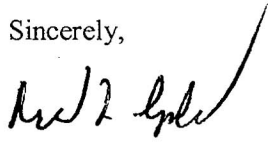
Conclusions

The filter units have been running for a period of over three months since being changed over to Greensand Plus. The removal of the other media and the installation of GreenSand Plus has allowed the filter plant to eliminate both the sodium bisulfite and carbon dioxide chemical feeds. Both the lime and sodium hypochlorite usage at the treatment plant has been reduced due to the media change. The plant runs have increased from 12 hour increments to 24 hour runs on the new Greensand Plus.

Throughout the testing period, both filter units are removing iron and manganese to concentrations well below the respective MCL of 0.3 mg/L and 0.05 mg/L. This data exactly matches the data obtained from the pilot test report dated 30 January 2008 when the pilot units tested the water at 12 gpm / sq. ft. At this time, MPWC respectively requests to increase the flowrates to the filter units to 9.0 gpm / sq. ft. and continue the testing. A second report will be generated in approximately three months time that demonstrates the effectiveness of the Greensand Plus at the higher flowrate.

Thank you for your time and attention to this matter. If you have any questions, please do not hesitate to contact me at (856) 663-0043.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard F. Spafford". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Richard F. Spafford, P.E.
MPWC Engineer

CC: Michael Saraceni, Chief Operating Officer - MPWC
Jeff Whalen, Superintendent - MPWC

For copies of the charts concerning flow rate / backwash please contact us at www.hungerfordterry.com