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April 25, 2019

Kareem Adeem, Acting Director
Newark Water Department
920 Broad Street, Room B31-F
Newark, NJ 07102

**RE: Newark Water Department - PWSID: NJ0714001
Pequannock Gradient Corrosion Control Treatment Recommendation Approval
(Letter No. LCR180001) and Issuance of the Temporary Treatment Approval
(WTA190001)**

Dear Mr. Adeem:

The Bureau of Water System Engineering (Bureau) is in receipt of the Corrosion Control Treatment (CCT) Recommendation for Newark Water Department's (Newark) Pequannock Gradient as identified in the *Pequannock WTP Corrosion Control Review and Recommendations – Final Report* (Report) dated March 15, 2019. The CCT Recommendation for the Pequannock Gradient is to add **zinc orthophosphate** as a corrosion control inhibitor into the piping network to reduce lead solubility in the distribution system and ensure that corrosion control is optimized pursuant to the Lead and Copper Rule. Pursuant to 40 C.F.R. 141.81(e)(4) and 141.82(d), the Department approves the corrosion control treatment recommendations in the Report and designates the use of zinc orthophosphate as the optimal corrosion control treatment for the Pequannock Gradient. The Department is also issuing the enclosed Temporary Treatment Approval with an expiration date of July 31, 2020 to allow Newark to start using the zinc orthophosphate. At least ninety (90) days prior to the expiration of the Temporary Treatment Approval, Newark shall submit a permit application in accordance with N.J.A.C. 7:10-11.1 et seq. or Newark may seek to either extend the Temporary Treatment Approval or apply for a new Temporary Treatment Approval if corrosion control treatment is found to not be optimized at that time.

In order to avoid algal blooms caused by increased phosphorous concentrations from the zinc orthophosphate, the Report proposed dosing of zinc orthophosphate downstream of Newark's open-air Cedar Grove Finished Water Reservoir at the Valley Road Rechlorination Station located in Montclair. Water dosed with zinc orthophosphate will be distributed to Newark's

Pequannock Gradient along with three of Newark's consecutive systems which include Belleville Water Department, Bloomfield Water Department and Nutley Township.

As identified in the Report, the Pequannock Township Water Department, which supplements its own ground water supplies with water from Newark's Pequannock Water Treatment Plant (WTP), will not be receiving the zinc orthophosphate inhibitor as the system's location is upstream of the Cedar Grove Finished Water Reservoir. Newark shall evaluate all users supplied by the Newark's Pequannock WTP upstream of the Cedar Grove Finished Water Reservoir to determine if any satellite orthophosphate feed systems will be necessary in addition to the Valley Road Rechlorination Station feed system. Within 15 days of the date of this letter, Newark shall provide a proposed schedule for conducting this evaluation.

The following table indicates Newark's Immediate and Long Term CCT Recommendations for the Pequannock Gradient as identified in the Report.

Summary of CCT Recommendations for Pequannock Gradient

Factor	Immediate CCT Recommendation	Longer Term CCT Recommendation	Additional Notes
Chemical	Zinc Orthophosphate	Zinc Orthophosphate	
Dosage	0.5 mg/L as PO ₄ increasing to passivation dose of 3.0 mg/L as PO ₄	Minimum 1.0 mg/L as PO ₄ (or as determined by pipe loop study)	Evaluate dosage in pipe loop study
Feed Location	Valley Road Rechlorination Station	Valley Road Rechlorination Station	
System pH	Stabilize pH to 7.3 to 7.4	Stabilize pH to optimal pH from pipe loop study	Evaluate optimal pH in pipe loop study
Sodium Silicate	Maintain current dose	Replace with a more cost-effective pH adjustment chemical	Evaluate any negative impacts from eliminating sodium silicate addition in pipe loop study
Demonstration Study	Conduct pipe loop study in parallel with implementation of immediate addition of zinc orthophosphate	Apply results of pipe loop study to long-term CCT plan	
Monitoring	Implement representative monitoring program, including sequential sampling and pipe scale analysis	Continue monitoring program and sequential sampling until conditions are stabilized	
Public Health	Point-of-use filters and conduct public education program	CCT optimization and LSL Replacement Program	

Based on the Bureau's review of the Report and its supporting documentation and analytical results, the Bureau approves the Report's recommendation to install the zinc orthophosphate chemical feed. All timeframes for completed tasks associated with the design, permitting, construction and placing the CCTR in service shall be in accordance with the Supplemental Compliance and Agreement Order (SCAO) NEA-180002 which was executed March 29, 2019. The Bureau reserves its right to modify its optimal corrosion control treatment designation under 40 C.F.R. 141.82(h).

Prior to and following the installation and operation of the zinc orthophosphate chemical feed at the Valley Road Rechlorination Station, the following conditions are required to be met:

1. On January 31, 2019, Newark submitted a request to the Bureau of Water System Engineering (Engineering) for a Temporary Treatment Approval to install a zinc orthophosphate feed system to reduce lead solubility in the distribution system from the treated water of the Cedar Grove Reservoir at the Valley Road Rechlorination Station. Newark shall install and operate the zinc orthophosphate feed system in accordance with the enclosed Temporary Treatment Approval.
2. At least ninety (90) days prior to the expiration of the Temporary Treatment Approval, Newark shall submit a permit application in accordance with N.J.A.C. 7:10-11.1 et seq. or Newark may seek to either extend the Temporary Treatment Approval or apply for a new Temporary Treatment Approval if corrosion control treatment is found to not be optimized at that time.
3. The zinc orthophosphate chemical feed could compromise the microbiological quality of the water supply. Since Newark is operating as a community water system, disinfection is required as the last treatment process as per N.J.A.C. 7:10-11.16. Because water from the Pequannock WTP is rechlorinated at the Valley Road Rechlorination Station after the zinc orthophosphate is dosed, the requirement to have disinfection as the last treatment process is met.
4. By April 28, 2019, in accordance with paragraph 27(I) of the executed SCAO, Newark shall submit for the Bureau's review and approval a proposed testing plan, which shall include sufficient sequential monitoring, pipe scale analyses, and WQP monitoring to determine whether designated optimal CCT has been achieved and WQPs have been stabilized. The testing plan must include, but not limited to, quantity of monitoring/pipe scale locations, frequency of sampling events, and the evaluation of number and location of WQP sites. Newark must evaluate its hydraulic gradients, pressure zones, population served of the Pequannock service area to determine if additional WQP sites are necessary. Newark shall refer to *EPA's Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems*.
5. By April 28, 2019, Newark is to submit a proposed pipe loop study protocol (referenced in the Final Pequannock CCT Report) to the Bureau for its approval.
6. Newark shall notify the Bureau in writing or via e-mail to the DEP Water Supply E-mail box at watersupply@dep.nj.gov at least one week prior to the commencement or

discontinuation of the use of zinc orthophosphate at the Valley Road Rechlorination Station.

7. Newark shall continue utilizing the existing silicate feed system at the Pequannock WTP until Newark fully implements an alternative CCT for the Pequannock Township Water Department.
8. Based upon *EPA's Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems*, the optimum pH for orthophosphate effectiveness is between 7.2 and 7.8. At a pH below 7.2, zinc orthophosphate will be slower to react and will not be as effective in reducing lead solubility. As identified in the Report, the current average pH at the Valley Road Rechlorination Station is approximately 7.1 at the point of entry (POE) into the distribution system. Newark is recommending that a higher, stabilized pH (7.3 – 7.4) be achieved leaving the Valley Road Rechlorination Station. The optimum pH range for Newark's Pequannock Gradient will be evaluated in the pipe loop study (referenced in Condition # 5 above) which is to be conducted simultaneously during the duration of the Temporary Treatment Approval.
9. If pH remains low at the Pequannock WTP, the Report proposes to install a satellite sodium hydroxide chemical feed system at the Valley Road Rechlorination Station to raise pH in the distribution system for zinc orthophosphate effectiveness. If Newark determines that such installation is necessary, a separate Temporary Treatment Approval or Permit to Construct and Operate would be required from the Bureau prior to its installation.
10. The addition of the zinc orthophosphate chemical feed will not change this system's treatment license classification from its current T4. The Licensed Operator shall submit Monthly Operator Reports, as required pursuant to N.J.A.C. 7:10A-1.12(d), to the Bureau of Safe Drinking Water no later than 10 days after the end of each month for which data is collected. The Monthly Operator Report shall include, but not be limited to, daily pH readings, daily dosage of zinc orthophosphate and daily treated water pumpage.
11. Newark shall submit a completed Corrosion Control Treatment Installation Completion Certification to the Bureau within thirty (30) days following completion of the zinc orthophosphate feed system installation.
12. Newark shall update and submit its WQP Sampling Plan to the Bureau within 30 days of the Bureau approving Newark's testing plan protocols under Condition # 4 above.
13. Newark evaluated additional source and finished water of the Pequannock WTP in relation to corrosion control, including additional water quality parameters such as manganese, chloride, sulfate, chlorine residual, total dissolved solids, and calcium as outlined on page 3-3 of the Report. Newark shall continue to monitor, evaluate and provide support that these parameters are not being impacted by the addition of zinc orthophosphate.

14. Newark will be required to continue Follow-up WQP monitoring throughout the duration of SCAO.

Please be advised that remedial measures undertaken to address a particular contaminant can adversely affect other analytes within the treatment train and/or distribution system. The United States Environmental Protection Agency has prepared a guidance document, "*Simultaneous Compliance Guidance Manual for the Long Term 2 and Stage 2 DBP Rules*", to assist water systems that need to address multiple analytes within their water system. This guidance manual can be accessed at <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=60000E2Q.txt>.

Since Newark is a large system and its existing treatment is not optimized, Newark will not be permitted to cease these approved CCT steps, regardless of whether Lead and Copper sampling demonstrates compliance with Action Levels, without written approval from the Bureau.

Your prompt attention to this matter is both necessary and appreciated. However, please also note that it is possible that further information and/or action may be necessary as both the Federal and State Safe Drinking Water programs continue to assess the implementation of the Federal Lead and Copper Rule to ensure the continued protection public health.

If you have questions regarding the above, please contact myself or Joe Mattle of my staff at (609) 292-2957 or at steven.pudney@dep.nj.gov or joseph.mattle@dep.nj.gov. When contacting the Department please reference PWSID No. NJ0714001 and Letter No. LCR180001.

Sincerely,



Steven Pudney CEng., MICE.
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