Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Secretary of Natural and Historic Resources

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Director

SUBJECT: Virginia Pollutant Discharge Elimination System (VPDES), 9VAC25-790,
Sewage Collection and Treatment (SCAT) Advisory Committee Meeting Minutes

DATE: October 7, 2024

The Virginia Department of Environmental Quality (DEQ) held the first Sewage Collection and Treatment (SCAT) Advisory Committee meeting on September 30, 2024, to review regulation 9VAC-790 at the DEQ Piedmont Regional Office (PRO) located at 4949-A Cox Road, Glen Allen, Virginia 23060. The meeting began at 9:30 am and ended at approximately 2:40 pm. The committee met to discuss issues and standards concerning Part III, Article 7, 9VAC25-740 through 9VAC25-790-820 for regulating sewerage systems and treatment works. The committee's purpose as stated in 9VAC25-790-250, subsection D is to meet, discuss issues, and make recommendations to the director concerning policies, procedures, and programs for regulating sewerage systems and treatment works. The committee's meeting was advertised on Virginia Regulatory Town Hall and open to the public.

SCAT committee members in attendance:

SCAT Advisory Committee Members		
Charles Bott, Hampton Roads Sanitation District (HRSD)	Rob Mangrum, Mangrum Consulting	Matthew Rembold, VAMWA (AquaLaw)
Timothy Castillo, Virginia Rural Water Association (VRWA)	Brian Orrock, Spotsylvania County Utilities	Christopher Tabor, Virginia Water Environment Association (VWEA)
Rebecca Golden, Virginia Society of Professional Engineers (VSPE)	Glenn Pearson, Prince William County Service Authority (PWCSA)	

SCAT Advisory Committee Ex-Officio Members and Alternates	
Ex-Officio Member	**Alternate**
Azra Bilalagic, Guidance & Regulation Coordinator, Office of VPDES Permits, DEQ	Laura Galli, Guidance & Regulation Coordinator, VPDES, Office of VPDES Permits, DEQ
Erica Duncan, Manager, Office of VPDES Permits, DEQ	Joseph Bryan, VPDES Permit Supervisor, Office of VPDES Permits, DEQ

Jeanne Puricelli, VPA Permit Writer, Office of Land Application Programs, DEQ	
Ryder Bunce, VDH	

Staff	
Nelson Daniel, Policy Analyst, DEQ	Jeanette Ruiz, Regulatory Analyst, Water Division, DEQ
Meghan Mayfield, Director, Water Permitting Division, DEQ	Nyibe Smith, Manager, Office of Water Compliance, DEQ
Rebeccah Rochet, Deputy Director, Water Permitting Division, DEQ	Neil Zahradka, Manager, Office of Land Application Programs, DEQ

Interested Members of the Public		
L. Jordan Combs, Maury Service Authority (MSA)	Jeff McBride--BV	Kevin Parker, Hampton Roads Sanitation District (HRSD)
Richard Crouse, CSGA Group, LLC	Jeff Moran, Suffolk Sales	Derk Pinkerton, Brainerd Chemical
James Grandstaff, Henrico County, Virginia Water Reclamation Facility (WRF)	Kara Moran, Suffolk Sales	

Meeting Opening and Introductions:

DEQ staff opened the meeting with introductions, information on facilities for the meeting site at PRO, purpose and role of the committee, review of public participation guidelines, FOIA reminders, and helpful reminders for contributing to group discussions.

DEQ staff reviewed the agenda and presented overview information of Part III, Article 7 of the SCAT regulation and rulemaking timeline. DEQ also reviewed the regulation development process, tentative schedule, and the role of the Advisory Committee.

Discussion Summary (DEQ):

- Overview of SCAT Regulation, 9VAC25-790
  - Established minimum requirements for the construction and operation of facilities designed to collect and treat sewage wastewaters in Virginia.
  - Adopted by the Virginia Board of Health in 2001, subsequently transferred to the Virginia DEQ in 2003.
  - DEQ held an internal stakeholder meeting in July of 2013 and concluded the SCAT Regulation needed revisions and updates to reflect the following, at a minimum:
    - Advancements in technology.
    - Greater clarity through removing ambiguous phrases and correcting errors; and

        - Address DEQ regulatory needs.
- Known Revisions
    - Regulatory Necessity:
        - To protect human health and the environment.
        - Prevent permit noncompliance resulting in possible violations of water quality standards and costly enforcement actions.
    - Regulatory burden:
        - Are there less burdensome and less intrusive alternatives to achieve the regulation's essential purpose?
    - Improve clarity:
        - Should be clearly written and understandable by individuals affected.
    - Technological standards:
        - Update to reflect current technology in use.

Discussion Summary: (Committee Open Discussion)

The advisory discussion focused on Part III, Article 7, 9VAC25-790-740 through 9VAC25-790-820 and the following topics were considered for each section:

- 9VAC25-790-740 Disinfection.
    - Discussed removal of redundant, obsolete, or outdated language.
    - Discussed whether this section needs to be as prescriptive as it is. In other words, could the regulation be updated to include to engineering standards and/or performance requirements? (Committee members repeated these comments when they discussed other sections.)
- 9VAC25-790-750 Chlorination.
    - Discussed clarifying language to ensure greater consistency when possible, such as updating references to "EPA approved methods" with the specific Code of Federal Regulation (CFR) citation.
    - Suggested revising the definition of chlorination and replacing with a standard.
- 9VAC25-790-760 Bromochlorination
    - Discussed a clarification of the purpose for continuing to include bromochlorination.
- 9VAC25-790-770 Ultraviolet light irradiation (UV).
    - Discussed language that could be reduced or updated. Committee members also asked if the safety requirements in this section overlap with other agencies' authority (i.e., OSHA or the Virginia Department of Labor and Industry).
- 9VAC25-790-780 Ozonation.
    - Considered whether language could be reduced or updated.
- 9VAC25-790-790 Other disinfection methods.
    - Deliberated on whether a path for approving other methods or new technologies to be utilized in disinfection of wastewater could be developed. This path should consider including thresholds, limits, or requirements.
- 9VAC25-790-800 Dechlorination
    - Reviewed language for continuous monitoring and dose control.

    - Discussed language that could be reduced or updated for total residual chlorine (TRC)
    - Suggested removing dechlorination data that is obsolete, sentences that are descriptive but not relevant to regulation, and design guidance (prescriptive measures).
    - Debated removing the safety section or reference clean safety to make the language consistent with technologies being used.
- 9VAC25-790-810 Polishing ponds.
    - Discussed removing old, obsolete language and limits for polishing ponds.
    - Suggested consolidating with or referencing constructed wetlands.
    - Talked about adding the flexibility for engineer design approval.
- 9VAC25-790-820 Postaeration.
    - Discussed clarifying the purpose of postaeration.
    - Suggested removing irrelevant or redundant descriptions.

Presentation to the Committee: Peracetic Acid in Wastewater Treatment

- Presenters:
    - Richard Crouse, Consultant
    - James Grandstaff, Henrico County, Virginia WRF
    - Derk Pinkerton, Water Treatment Specialist Brainerd Chemical
- Overview of Peracetic Acid as Wastewater Treatment, including its current uses, benefits, and pilot. A copy of the presentation follows the minutes.

Action Items:

- DEQ will review the committee's suggestions, including updating language, removing language, removing sections, and adding a process for including new technologies and methods.
- DEQ VPDES program staff will work with policy analysts to prepare for further discussions at the next advisory committee meeting.

Next Meeting:

A second advisory committee meeting will be scheduled after a preliminary poll is conducted of members' availability.

CSGA Group, LLC

Peracetic Acid in Wastewater Treatment

Unlocking Virginia's Potential

Presentation for Virginia Department of Environmental Quality

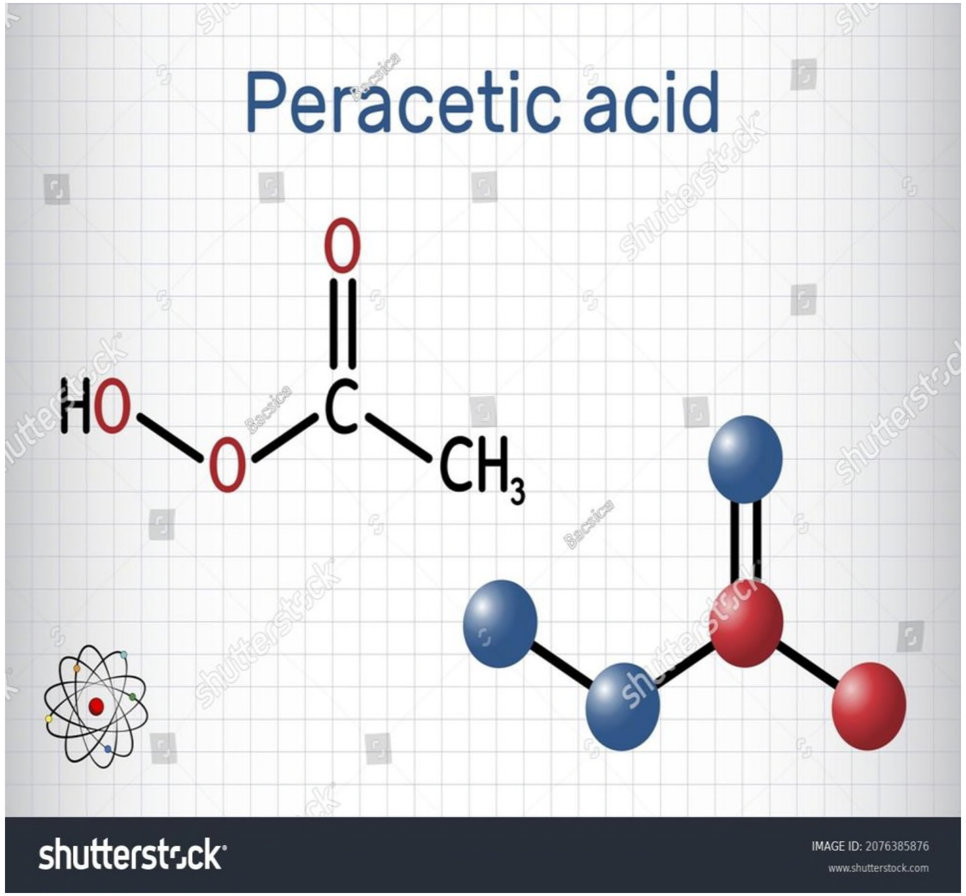
SCAT- Advisory Committee

Mr. Richard Crouse, Consultant

Mr. James Grandstaff–Henrico County VA WWTP

Mr. Derk Pinkerton, Water Treatment Specialist Brainerd Chemical

September 30th, 2024



Highlight several challenges municipalities are experiencing with Sodium Hypochlorite and show an environmentally friendly, federally and EPA approved alternative in wastewater treatment.

PAA Facts

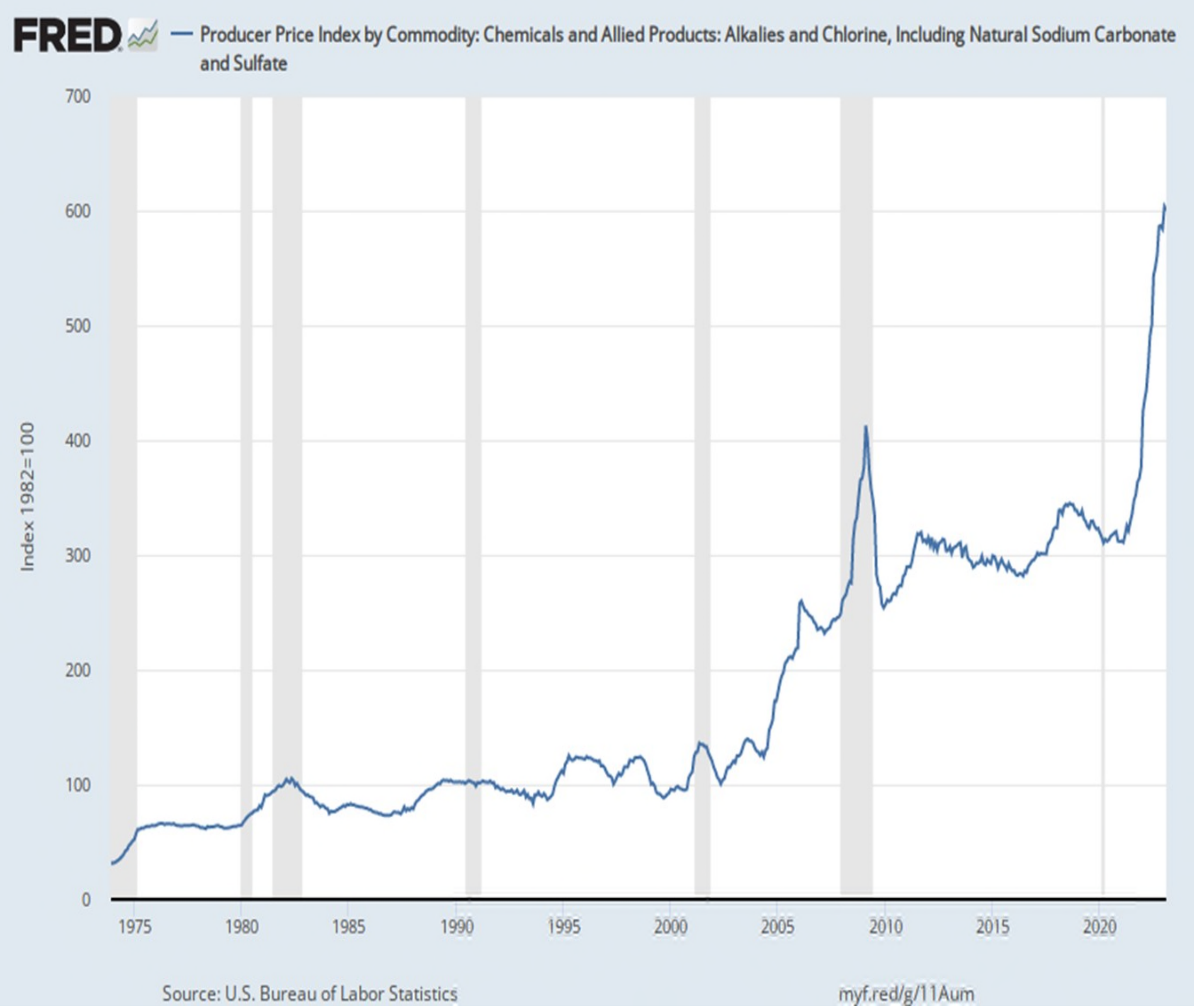
- Peracetic Acid is ***NSF approved***[12] and ***approved by the EPA***[19] as a recognized disinfectant.
- Cost of using PAA is competitive to disinfection with the combined costs of Sodium Hypochlorite and Sodium Bisulfite.
- With proper dosing, PAA does not alter the water quality, thus discharge limits are unaffected.
- PAA, in many processes, can replace chlorine, sodium hypochlorite, UV, chorine dioxide and ozone as a low capital alternative.

Bacteria and Effluent Impacts

- ***E. coli***: 60 kHz ultrasound combined with PAA (60 kHz → PAA) was found to be effective for the inactivation of E. coli in actual wastewater, and the regrowth potential of E. coli treated by 60 kHz → PAA was significantly lower than that treated only by PAA. (Bai et al. 2023)[2]
- ***Wastewater effluents***: Disinfection with peracetic acid reduced levels of fecal contamination by 97%. The process of disinfection with peracetic acid is easier to manage than other more common methods and the tests performed confirm that from the bacteriological point of view good results can be obtained for urban effluents. (Stampi et al. 2001)[16]

Overview of Sodium Hypochlorite Pricing- U.S. Bureau of Labor Statistics[7]

- Prior to the pandemic, Sodium Hypochlorite 12.5% was selling at **$0.75** a gallon.
- Current pricing is **$2.30-$3.00** a gallon.



Virginia Sodium Hypochlorite Usage

Municipality	Bleach Pricing	Estimated Annual Bleach Usage
HRSD	$2.90 a gl.	2,295,200 gallons
Chesterfield County	$2.25 a gl.	635,000 gallons
Henrico County	$2.54 a gl.	700,800 gallons
Petersburg/South Central	$2.54 a gl.	164,000 gallons
Stafford	$3.32 a gl.	220,000 gallons
AVERAGE/AVERAGE TRUCK COST	$2.71 a gl. average	

Peracetic Acid As A Viable Alternative

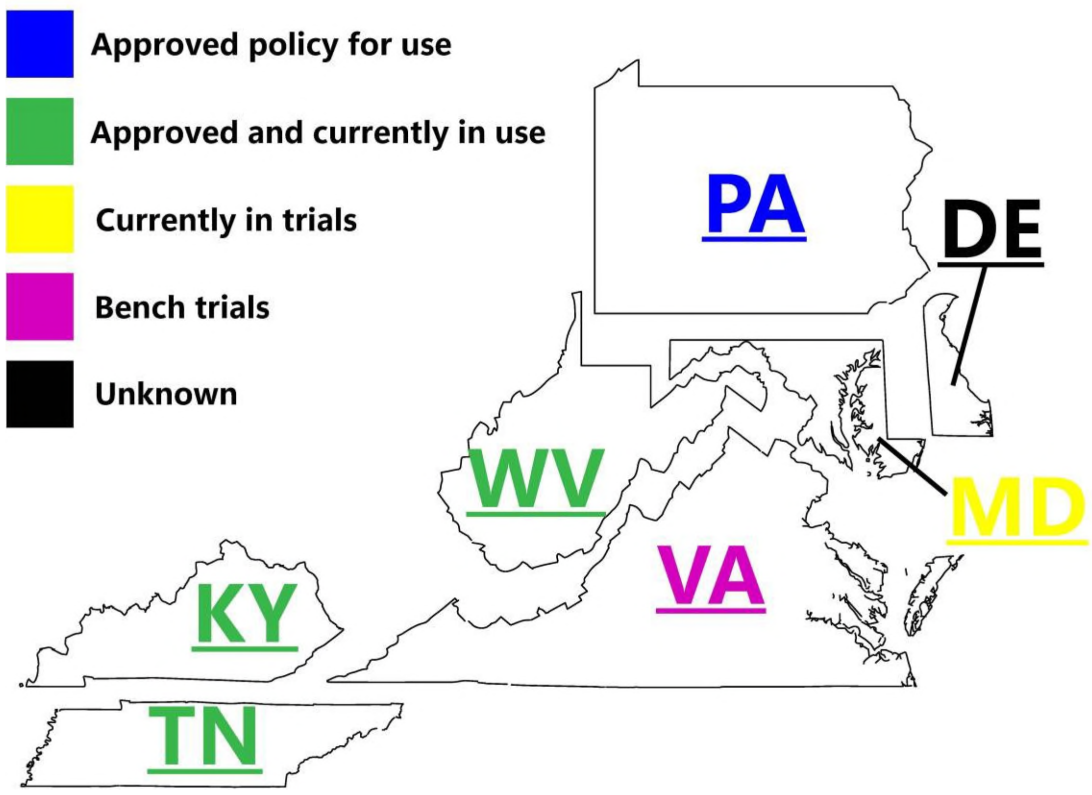
- Peracetic Acid or PAA is composed of hydrogen peroxide, acetic acid (the primary component of vinegar), and water.
- PAA breaks down into water, acetic acid, and oxygen. It has low octanol water partition coefficients (KOW) (0.3, 0.4, and 0.68, respectively) and low sediment adsorption coefficients, so bioaccumulation in aquatic organisms or in sediments is highly unlikely. (Bell and Wylie 2016)[3]
- PAA has a long history of use as a disinfectant beyond wastewater treatment applications, and is currently used in Virginia in aquaculture, food, medical and pharmaceutical industries.
- PAA is applied to wastewater the same way as Sodium Hypo, permitting a ***seamless transition*** from one chemical to another without requiring extra equipment or expenses for wastewater treatment operations.

Federal and State Regulations

- PAA is federally approved for use in wastewater disinfection and is currently permitted in approximately 19 states, with potentially several more states in the process of gaining approval.
- PAA is regulated under the Federal Insecticide, Fungicide and Rodenticide ACT (FIFRA, 7 U.S.C. Section 136)[8].
- The US EPA Alternative Disinfection Methods Fact Sheet on Peracetic acid[18] is in the supplement document.
- North Carolina, New Jersey, Tennessee, West Virginia, Oklahoma, and Texas all have current policies/permitting requirements for PAA usage.

EPA Region 3

- Tennessee - Memphis - Maynard C. Stiles WWTF
- Kentucky - Ashland, KY, Frankfort, KY, Greenville, KY
- West Virginia - North End WWTP - Falling Waters
- Virginia - Danville - NSWWTP – B*ench study*
- Maryland - WWTP - Perryman
- Pennsylvania – N/A
- Delaware - possible municipalities and industry



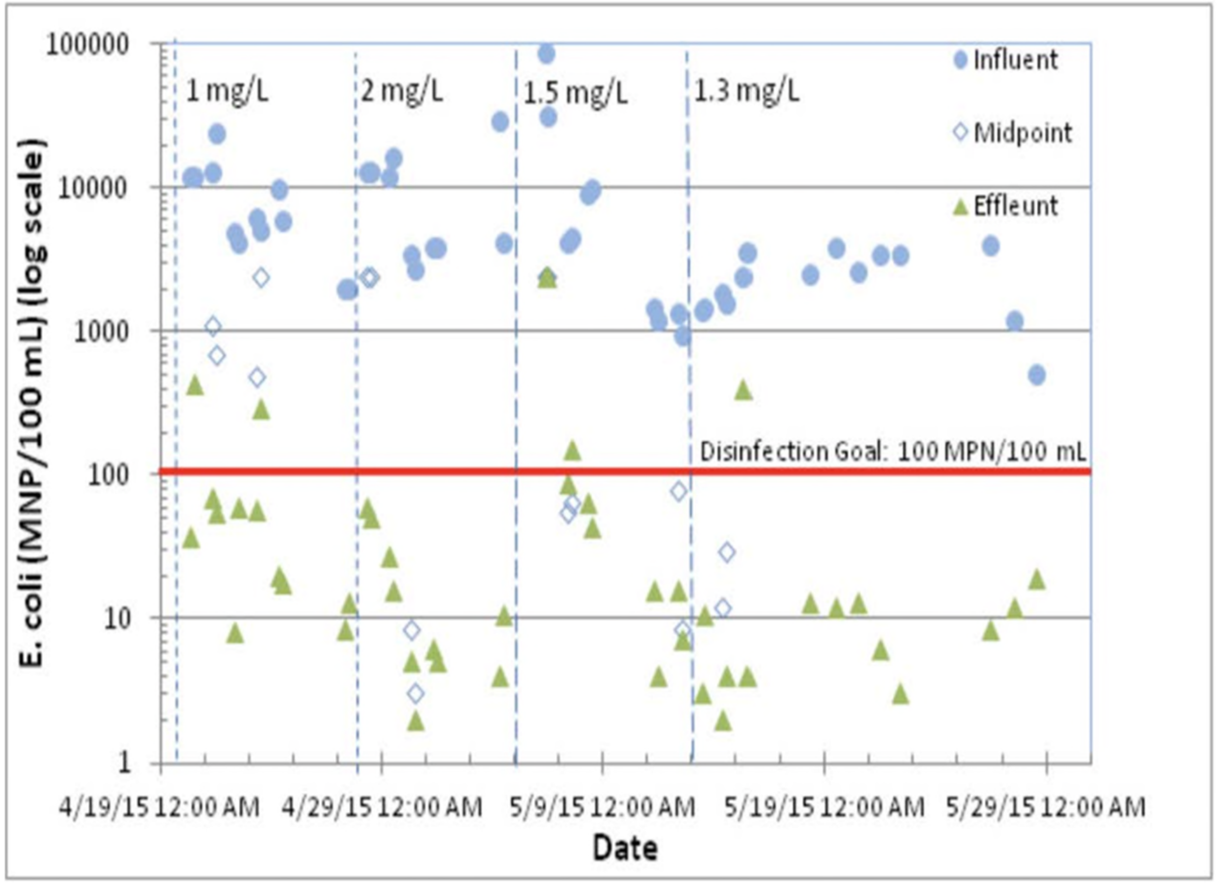
Danville, VA – Northside Wastewater Treatment Plant

DPR at the NSWWTP

- The purpose of the study was to[1]:
  - Evaluate the effectiveness of PAA as the primary disinfectant to achieve compliance with the plants National Pollutant Discharge Elimination System permit.
  - Determine the dose rate and contact time.
  - Measure the potential impact of PAA on wastewater effluent quality.

Danville, VA – Northside Water Treatment Plant

- The pilot results at NSWWTP successfully demonstrated PAA technology to be an effective disinfection process[1].
- The PAA does of 1.3 mg/L at a contact time of 33 minutes were sufficient to consistently achieve the bacterial reduction goal[1].
- PAA did not cause any adverse impacts to the effluent wastewater quality[1].



Peracetic Acid Cost Comparison September 2024

The purpose of this model is to demonstrate the potential cost savings for a municipality when using Paracetic Acid versus Sodium Hypochlorite (Bleach) and Sodium Bisulfite.

*Note, this model is based on estimated market pricing and volumes for a Richmond Area Municipality which has an average daily processing volume of 40 million gallons.

Estimated Daily Bleach Usage (Gallons)	1,920
Estimated Annual Bleach Usage (Gallons)	700,800
Estimated Bleach Cost (Per Gallon)	2.54
Estimated Annual Bleach Cost	**1,780,032**
Estimated Daily Bisulfite Usage (Gallons)	326
Estimated Annual Bisulfite Usage (Gallons)	118,990
Estimated Bisulfite Cost (Per Gallon)	2.11
Estimated Annual Bisulfite Cost	**251,068**
Estimated Annual Bleach & Bisulfite Cost	**2,031,101**
Estimated Annual PAA Usage at 25% (Gallons)	178,576
Estimated Current PAA Cost (Per Gallon)	8.71
Total Annual PAA Cost	**1,555,397**
Estimated Annual Savings for Municipality	**475,704**

Summary of Drivers for PAA in Wastewater

Driver	Description
Fewer Environmental Impacts	• Decomposes quickly into acetic acid (vinegar), oxygen, and water – no need to remove or neutralize it before treated water enters waterways • No persistent residuals & readily biodegradable in receiving water • Low aquatic toxicity compared to other chemical disinfectants
Fewer Regulatory Requirements	• No regulated disinfection by-products • No Risk Management Plan (RMP) normally required
More Effective Disinfection than Sodium Hypo	• Stronger oxidizer yielding shorter contact times • Effective in treating industrial wastewater that UV is ineffective in treating • Use less PAA than Sodium Hypo to get the same job done • Continues to work under varying influent conditions
Lower Cost	• De-chlorination not needed so save cost of Sodium Bisulfite • Longer shelf life than sodium hypo & fewer chemical deliveries • No specific storage tanks required & existing tanks likely able to be reused • No scrubber needed to mitigate leak accidents

Operation & Compliance Considerations

- PAA ***can eliminate the need*** for subsequent de-chlorination which contributes additional solids loading to the environment and can eliminate costs of handling of a second chemical.
- The by-products of PAA decomposition are also non-listed compounds, therefore no regulatory limits have been placed.
- The first full scale commercial application of PAA occurred approximately 30 years ago at the *St. Augustine Wastewater Treatment Plant, Florida*[11]. Since then, there have been other large municipalities that have adopted PAA. A few are:
  - *Cincinnati, OH* – Metropolitan Sewer District of Greater Cincinnati[9]
  - *Memphis, TN* – M.C. Stiles Wastewater Treatment Plant[4]
- No Risk Management Plan (RMP) is normally required for PAA.

Health & Safety of PAA

- PAA has similar handling, storage and transportation requirements as Sodium Hypo and Sodium Bisulfite.
- Chlorine gas has multiple safety concerns when it's no longer contained properly during transportation or storage. Accidents, safety concerns and use for terrorist attacks has been the main driver for Chlorine's replacement. PAA does not have these safety concerns.
- FDA approved as a modifier for food starch and for washing fruits and vegetables that are not raw agricultural commodities and washing and processing meat and poultry carcasses.

Technical Data Sheet
PAA 15%-20%[5]

Technical Data Sheet

TERRASTAT™ 1522-S

Applications

Used as an antimicrobial in various water treatments or in secondary systems to control bacteria in accordance to EPA (Environmental Protection Agency) registration Number 8743-19. TERRASTAT 1522-S is designed as an antimicrobial agent that may be used as a disinfectant or sanitizer in the process of water systems, Mills, fruits & vegetables, and agriculture systems.

Key applications: (1) Oil, gas and secondary oil recovery systems, drilling muds and packing fluids; and (2) antimicrobial rinse of precleaned or new returnable or non-returnable containers; and (3) reverse osmosis (RO), ultra-filtration (UF), and other membrane cleaning; and (4) biofouling control in pulp, paper and paperboard mill and water systems; and (5) control of slime forming bacteria and biofouling in once-through and recirculating cooling water (cooling towers, evaporative condensers, air washers) and ornamental or recreational water features; and (6) Microbial control in effluent treatment systems; and (7) treatment of fruit and vegetable process water systems; and (8) agriculture or horticultural uses; and (9) treatment of agricultural or irrigation water systems (sand filters, humidification systems, storage tanks, ponds, reservoirs, canals).

EPA Reg. No. **8743-19**

Chemical Composition

Chemical	Approx Concentration
Peracetic Acid	15%
Hydrogen Peroxide	22%
Acetic Acid	10 - 20%

Physical Properties

Parameter	Value
Sp. Gravity @ 22°C	1.10 – 1.125
Vapor Pressure @ 20°C (68°F)	~20 mmHg / 2.7 kPa
Viscosity (22°C)	2.360 mm²/s
Viscosity (44°C)	1.424 mm²/s
Flash Point	82°C (180°F)
Freezing Point	< -20°C (-4°F)

Conclusion

- Converting to PAA is safer for the environment, safer for operators, and municipalities will have less of a chance of not meeting their monthly permits.
- PAA removes the expense of Sodium Bisulfite and Sodium Hypo and is easier to handle. Municipal budgets could see a cost savings on chemical requirements by converting to PAA.
- PAA is a major player in disinfection, advance oxidation systems, raw-water conditioning in other states while remaining environmentally friendly. The current PAA production capacity and supply chain capabilities ensures availability for future growth demands because PAA is used daily in multiple industries.

Contact Information

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