



Proposed Regulation Agency Background Document

Approving authority name	State Water Control Board
Virginia Administrative Code (VAC) citation	9 VAC 25 - 740
Regulation title	Water Reclamation and Reuse Regulation
Action title	Adoption of the Water Reclamation and Reuse Regulation
Document preparation date	February 8, 2007

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Orders 21 (2002) and 58 (1999), and the *Virginia Register Form, Style, and Procedure Manual*.

Brief summary

In a short paragraph, please summarize all substantive changes that are being proposed in this regulatory action.

The proposed regulation will establish requirements for the reclamation and reuse of wastewater that are protective of state waters and public health. Contained in the regulation are two sets of treatment standards and monitoring requirements for the reclamation of municipal wastewater, and provisions to develop treatment standards for the reclamation of industrial wastewater on a case-by-case basis. For six reuse categories (urban – unrestricted access, irrigation - unrestricted access, irrigation – restricted access, landscape impoundments, construction, and industrial), the regulation specifies the required treatment standards and allows for the approval of other reuses and associated treatment standards commensurate with the quality of the reclaimed water and its intended reuse. This regulation also details requirements for application and permitting; design, construction, operation and maintenance of water reclamation systems and reclaimed water distribution systems; management of pollutants from significant industrial users; access control and signage; public education and notification; management of reclaimed water in use areas; record keeping; and reporting.

Legal basis

Please identify the state and/or federal legal authority to promulgate this proposed regulation, including (1) the most relevant law and/or regulation, including Code of Virginia citation and General Assembly chapter number(s), if applicable, and (2) promulgating entity, i.e., the agency, board, or person. Describe the legal authority and the extent to which the authority is mandatory or discretionary.

The legal authority to promulgate this regulation is contained in Section 62.1-44.2 et seq. of the Code of Virginia. Specifically, Section 62.1-44.2 establishes the purpose of the State Water Control Law to, among other things, promote and encourage the reclamation and reuse of wastewater in a manner protective of the environment and public health. Further, Section 62.1-44.15(15) authorizes the State Water Control Board to promote and establish requirements for the reclamation and reuse of wastewater that are protective of state waters and public health as an alternative to directly discharging pollutants into state waters. The full texts of the referenced code can be found at the following web site address: <http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+TOC>.

Purpose

Please explain the need for the new or amended regulation by (1) detailing the specific reasons why this regulatory action is essential to protect the health, safety, or welfare of citizens, and (2) discussing the goals of the proposal, the environmental benefits, and the problems the proposal is intended to solve.

The purpose of the proposed action is to adopt the Water Reclamation and Reuse Regulation in order to satisfy the provisions of the Code of Virginia, §62.1-44.15 as mandated by the 2000 General Assembly in House Bill 1282.

Pursuant to the action of the 2000 General Assembly, the Board must promote and establish requirements for the reclamation and reuse of wastewater that are protective of state waters and public health as an alternative to directly discharging pollutants into state waters. The proposed regulation will establish technical requirements for reclamation and treatment standards for reclaimed water relative to the potential for discharge to the environment and for human contact by specific reuse categories. Therefore, the proposed regulatory action would be essential to protect the Commonwealth's environment and natural resources from pollution, impairment or destruction; and to protect the health, safety and welfare of its citizens.

Substance

Please briefly identify and explain the new substantive provisions, the substantive changes to existing sections, or both where appropriate. (More detail about these changes is requested in the "Detail of changes" section.)

The proposed regulation will establish requirements for the reclamation and reuse of wastewater that are protective of state waters and public health. Contained in the regulation are two sets of treatment standards and monitoring requirements for the reclamation of municipal wastewater, and provisions to develop treatment standards for the reclamation of industrial wastewater on a case-by-case basis. For six reuse categories (urban – unrestricted access, irrigation - unrestricted access, irrigation – restricted access, landscape impoundments, construction, and industrial), the regulation specifies the required

treatment standards and allows for the approval of other reuses and associated treatment standards commensurate with the quality of the reclaimed water and its intended reuse. This regulation also details requirements for application and permitting; design, construction, operation and maintenance of water reclamation systems and reclaimed water distribution systems; management of pollutants from significant industrial users; access control and signage; public education and notification; management of reclaimed water in use areas; record keeping; and reporting. The treatment standards and other requirements of the proposed regulation will be implemented through VPDES or VPA permits issued primarily to generators and distributors of the reclaimed water.

Issues

Please identify the issues associated with the proposed regulatory action, including:

- 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions;*
- 2) the primary advantages and disadvantages to the agency or the Commonwealth; and*
- 3) other pertinent matters of interest to the regulated community, government officials, and the public.*

If the regulatory action poses no disadvantages to the public or the Commonwealth, please so indicate.

The advantages of the proposed regulation to the public are that it will provide uniform and consistent requirements for water reclamation and reuse statewide, permitting requirements for primarily generators and distributors of reclaimed water, but rarely for end users; minimal additional permits by implementation through existing VPDES and VPA permit programs and modification of existing permits thereof; standards of reclaimed water treatment for six reuse categories that are commensurate with level of human health protection necessary for those reuses; and a process for case-by-case approval of unlisted reuses. Although the Technical Advisory Committee (TAC) that assisted the agency's effort to develop this regulation generally supported it, some TAC members felt that parts of the regulation would be excessive and overly burdensome to the public and would, therefore, discourage water reclamation and reuse. In response, the agency further refined the proposed regulation to insure that it would meet the stated purpose of State Water Control Law to promote and encourage the reclamation and reuse of wastewater in a manner protective of the environment and public health.

Although a regulatory framework for land treatment of wastewater has been established through the Sewage Collection and Treatment Regulations (9 VAC 25-790-10 et seq.), the Virginia Pollution Abatement (VPA) Permit Regulation (9 VAC 25-32-10 et seq.) and the Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation (9 VAC 25-31-10 et seq.), these regulations do not clearly distinguish reuse irrigation from land treatment irrigation and do not prescribe reclaimed water treatment standards and technical requirements for other uses of reclaimed water (e.g., industrial cooling processes, fire protection, street washing, construction, etc.). The proposed regulation will address these issues for the agency while maintaining the same permitting options used for land treatment of wastewater. The disadvantage to the agency resulting from this proposed regulation will be additional costs and labor for the review and data storage of monthly monitoring reports, inspections, enforcement and general program administration.

The proposed regulation contains requirements that will support and work in concert with the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820). The General Permit Regulation allows facilities to report a reduced waste load discharge of total nitrogen (N) and total phosphorus (P) for water reclamation and reuse. A permittee reporting this reduction must demonstrate that reuses of the reclaimed water will result in a reduced nutrient load to the Chesapeake Bay and its tributaries, and that these reuses are not alternative transport mechanisms for the nutrient load. The proposed regulation contains requirements to manage nutrients from irrigation reuse, and to track and report nutrient loads for

specific types of irrigation reuse. This information can be used by permittees, in part, to comply with demonstration requirements of the General Permit Regulation.

Depending on the type of irrigation reuse and the nutrient content of the reclaimed water, wastewater treatment facilities with the above General Permit may not be able to claim reduced waste load discharge of total N and P for all N and P diverted to irrigation reuse. For non-bulk irrigation with reclaimed water not meeting biological nutrient removal (BNR) (i.e., annual average 8 mg/l total N and 1 mg/l total P), assumed losses to state waters of annual N and P loads applied within a service area will be 30 and 20 percent, respectively. For bulk irrigation with reclaimed water not meeting BNR, the assumed losses of annual N and P loads will be 15 and 10 percent, respectively, in addition to nutrient management plan requirements.

Requirements More Restrictive Than Federal

Please identify and describe any requirement of the proposal which are more restrictive than applicable federal requirements. Include a rationale for the need for the more restrictive requirements. If there are no applicable federal requirements or no requirements that exceed applicable federal requirements, include a statement to that effect.

While the US EPA has developed guidelines for water reuse, published most recently in 2004, there are no federal requirements for water reuse. Requirements of the proposed Water Reclamation and Reuse Regulation do include many of the EPA water reuse guidelines.

Locality Particularly Affected

Please identify any locality particularly affected by the proposed regulation. Locality particularly affected means any locality which bears any identified disproportionate material impact which would not be experienced by other localities.

The proposed action is statewide in application and will not affect one locality more than another.

Public Participation

Please include a statement that in addition to any other comments on the proposal, the agency is seeking comments on the costs and benefits of the proposal and the impacts of the regulation on farm or forest land preservation.

In addition to any other comments, the Board is seeking comments on the costs and benefits of the proposal and on any impacts of the regulation on farm and forest land preservation. Also, the Board is seeking information on impacts on small businesses as defined in § 2.2-4007.1 of the Code of Virginia. Information may include 1) projected reporting, recordkeeping and other administrative costs, 2) probable effect of the regulation on affected small businesses, and 3) description of less intrusive or costly alternative methods of achieving the purpose of the regulation.

Anyone wishing to submit written comments for the public comment file may do so at the public hearing or by mail, email or fax to Valerie Rourke, Office of Water Permit Programs, Department of Environmental Quality, 629 East Main St., P.O. Box 1105, Richmond, Virginia 23218; e-mail address:

varourke@deg.virginia.gov; and fax no.: (804)698-4116. Written comments must include the name and

address of the commenter. In order to be considered, comments must be received by 5:00 p.m. on the date established as the close of the comment period.

A public hearing will be held and notice of the public hearing can be found in the Calendar of Events section of the Virginia Register of Regulations. Both oral and written comments may be submitted at that time.

Economic impact

Please identify the anticipated economic impact of the proposed regulation.

a. Projected cost to the state to implement and enforce the proposed regulation, including (a) fund source / fund detail, and (b) a delineation of one-time versus on-going expenditures.

Projected costs to the state resulting from this regulation are anticipated to be negligible as this will be a technical program that will be implemented through existing permit programs, specifically the Virginia Pollution Abatement (VPA) or Virginia Pollutant Discharge Elimination system (VPDES) permit programs. The program seeks to provide technical assistance to existing wastewater treatment facilities and/or a new reclamation systems or reclaimed water distribution system, interested in wastewater reclamation and /or reuse on a voluntary basis. The agency expects initial investment costs associated with the creation, operational implementation and management of a program to regulate facilities generating and/or distributing reclaimed water for reuse. Beyond that, however, no significant costs would be incurred by the agency to annually implement the technical regulation.

b. Projected costs of regulation on localities:

Each locality may have varying requirements and/or needs for water reuse. Thus, predicting the costs to localities could also vary widely. Estimated costs to affected individuals or businesses, as discussed below, address to some degree the projected costs of the regulation to localities (per capita costs), if the case in point (example used) was considered as a reuse facility for the entire locality.

c. Description of the individuals, businesses or other entities likely to be affected by the regulation:

The requirements of this regulation would affect water reclamation systems, reclaimed water distribution systems, and in some cases, reuses of reclaimed water that are currently or would be required to possess a VPA or VPDES permit before the effective date of this regulation. Certain categories of facilities and reuses are exempt or prohibited from the Reclamation and Reuse regulation, and these are specified in detail in the regulation's main document.

d. Agency's best estimate of the number of such entities that will be affected. Please include an estimate of the number of small businesses affected. Small businesses means a business entity, including its affiliates, that (i) is independently owned and operated and (ii) employs fewer than 500 full-time employees or has gross annual sales of less than \$6 million.

The total number of entities that have VPA permits are 270 and over 1115 entities have individual VPDES permits. Of the VPDES permit holders, only about 120 may choose to implement reclamation and reuse or roughly about 10 to 12 facilities each year. Approximately 80 percent of these facilities are small businesses; therefore the impact of the regulation on them is discussed in subsection e. below.

e. All projected costs of the regulation for affected individuals, businesses or other entities. Please be specific. Be sure to include the projected reporting, recordkeeping, and other administrative costs required for compliance by small businesses.

If wastewater treatment facilities, reclamation systems and/or reclaimed water distribution facilities intend to produce and/or distribute reclaimed water, below are the key direct costs to the affected entities:

1. Changing treatment standards of reclaimed water from Level 2 to Level 1:

Transitioning from an existing Level 2 treatment operation to a Level 1 (for an existing facility) would result in significant costs to the reclaimed water producer and/or supplier, as it calls for secondary level of treatment with filtration and higher-level disinfection. Due to varying capacities and daily operational loads of existing wastewater treatment facilities across the Commonwealth, a detailed comparison of these costs was unavailable. However, as a case in point, below is an example of an existing waste water treatment facility operating at Level 2 (supplying 0.5 MGD with additional ammonia requirements) and what the range of annual costs (i.e., construction, fitting of delivery lines, pump installation and annual overheads) would be if the facility upgraded to a Level 1 treatment facility:

Level 2 based pumping for existing effluent quality water: \$ 179,000
Level 2 to Level 1 without BNR: \$ 250,000

It must be noted that these costs are taken from a representative wastewater treatment facility to provide an estimate of the costs to the facility and thus, should not be considered the same across other facilities in Virginia. Furthermore, these costs are for an existing mid-large sized facility in good working condition. Thus, the costs for a Level 2 or Level 2 to Level 1 for smaller and/or newer facilities could be higher. However, most existing facilities already possess Level 2 standard with filtration, thus the change to Level 1 would not be an excessive investment.

2. Impacts of Compliance with technical requirements: Biological Nutrient Removal or Nutrient Management Plan (NMP) for bulk users or :

(a) BNR requirement: Reclamation systems as defined earlier in the regulation that provide BNR [annual average of 8mg/l total nitrogen (N) and 1mg/l total phosphorus (P)] will, in most cases, result in reduced nutrient management requirements for end users. BNR compliance costs can vary across reclamation systems due to their location, typical water quality of the effluents being treated and financial status of the facilities. Using the above mentioned example, the reclamation facility would incur a cost ranging between \$ 1.5 million to \$ 3 million, which includes all fixed and operational expenses. However, these costs would be recovered over time through the rates charged to customers.

(b) NMP requirement for bulk users: Bulk irrigation users are required to have a nutrient management plan (NMP) if the reclaimed water does not meet BNR treatment as described above. Costs of a NMP range from \$750 per acre (for non-manure use) to \$1,000 per acre (for manure use) for golf courses and for cropland. The average three-year NMP would cost a typical Virginia farm \$1,086 (fertilizer application based) and \$1,629 (manure application based) based on U.S. Agriculture Census 2002 data for Virginia used to get average farm size. However, these costs are split between the farmer and DCR thus the net costs to the farmer as a result of requiring a NMP to comply with the Water Reclamation and Reuse Regulation would average at total costs of \$650 with the rest being cost-shared by DCR.

According to 9 VAC 25-740-100 B.2.b., bulk irrigation with reclaimed water that does not meet BNR treatment (and requires a NMP) will have assumed losses of 15 and 10 percent of the annual N and P loads applied, respectively, to state waters. This technical requirement could make water reclamation and reuse a less cost effective option compared to the purchase of nutrient credits through the General Permit program, for wastewater treatment facilities to offset their discharge requirements or for smaller sized facilities to meet inadequate discharge allocations.

(c) Non-bulk users: According to 9 VAC 25-740-100 B.2.c., non-bulk irrigation with reclaimed water that does not meet BNR treatment (and does not require a NMP) will have assumed losses

of 30 and 20 percent of the annual N and P loads applied, respectively, to state waters. This technical requirement could make water reclamation and reuse a less cost effective option compared to the purchase of nutrient credits through the General Permit program, for wastewater treatment facilities to offset their discharge requirements or for smaller sized facilities to meet inadequate discharge allocations.

(d) Distribution costs: Distribution costs can vary across all reclamation systems and depend on the location of the facility and distance between the supplier of reclaimed water and points of delivery for the end-users. Distribution costs of the 0.5 MGD representative plant are accounted for above but still do not account for issues associated with distribution lines, congestion and river crossings.

f. Beneficial impact of the regulation: Three key benefits (cost-savings) exist to the entities that would adopt this regulation.

1. Self user of reclaimed water: The regulation allows the generators of reclaimed water to reuse the treated water on their own property as long as they follow the appropriate application guidelines. This would save generators of reclaimed water significant expenses associated with contracting out the supply of reclaimed water or investing in development of a distribution and delivery system according to the regulation's specifications.

2. Distributional system with contracts with bulk user: The regulation offers unique opportunities for a distributional system to engage in mass scale distribution of reclaimed water to various end users as long as the facility owner and/or operator has a CTC and CTO permit (as explained in the regulation). There is no fee associated with issuance of these certificates and the design standards are typical of other construction projects that need to be approved for wastewater or sewage treatment facilities. Furthermore, the regulation does not restrict the permittee from collaborating with end users and developing contracts to ensure that there is assured demand for reclaimed water. Lastly, if the end users are bulk users, the distributor could streamline his/her NMP approval process by hiring single contractor to work on all the NMPs for its bulk user clients and thereby reduce consultancy costs and possibly make the NMP approval process with DCR more efficient as well.

3. Cost-saving option over the nutrient trading strategy for newer and/or expanding facilities: The nutrient trading program being developed under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820) will require wastewater treatment facilities especially, to incur significant costs as part of their upgrades to comply with watershed based allocations. Opting to participate in a water reclamation and reuse program would provide such facilities with an economically cost-effective option. Cost estimates to support this view are unavailable due to lack of sufficient data, but the basic practicality of not requiring major investments to be undertaken in terms of infrastructural expansion, if sufficient end users of reclaimed water are available, indicates an opportunity for cost-saving.

Alternatives

Please describe any viable alternatives to the proposal considered and the rationale used by the agency to select the least burdensome or intrusive alternative that meets the essential purpose of the action. Also, include discussion of less intrusive or less costly alternatives for small businesses, as defined in §2.2-4007.1 of the Code of Virginia, of achieving the purpose of the regulation.

The Board has considered the following alternatives:

1. Promulgate a water reclamation and reuse regulation that establishes technical requirements and standards for the generation, distribution and various potential reuses of reclaimed water. The permitting mechanisms established in the VPA and VPDES Permit Regulations could be incorporated by reference.
2. Amend the VPA Permit Regulation by incorporating technical requirements and standards for the generation, distribution and various potential reuses of reclaimed water into the regulation. These requirements and standards could then be used as criteria for a VPDES permit issued to facilities that have both the option to discharge and reclaim wastewater for reuse. This option was not recommended because technical requirements and standards that would apply to and be implemented through more than one permit program (i.e., VPDES and VPA) are not conventionally included in a permit regulation; and design requirements for a reclamation system without a point source discharge will not be the same as those for a reclamation system with a point source discharge.
3. Make the technical requirements and standards for water reclamation and reuse part of the Sewage Collection and Treatment (SCAT) Regulations. This option was not recommended because the SCAT Regulations pertain only to sewage, while sources of water for reclamation may be exclusively industrial, sewage, or a combination of sewage and industrial; and the technical requirements and standards for water reclamation and reuse will not specifically address collection and treatment of sewage, the primary focus of the SCAT Regulations.
4. Take no action to adopt the regulation. Instead, develop agency guidance based on interpretation of existing regulations for use by DEQ staff to draft permits for wastewater reclamation and reuse. This option was not recommended because existing regulations do not have the technical criteria necessary to allow greater flexibility and less stringent requirements commensurate with the quality of the reclaimed water and its intended reuse. The use of agency guidance would also be less predictable or certain, and less consistent compared to regulation.

The Department has determined that alternative 1 is the most appropriate alternative available to satisfy the statutory mandates. The requirements established by the proposed regulation would apply to either of the existing permitting programs, VPDES or VPA; and would provide a predictable and certain process for the approval or denial of requests for water reclamation and reuse in Virginia.

Regulatory Flexibility Analysis

Please describe the agency's analysis of alternative regulatory methods, consistent with health, safety, environmental, and economic welfare, that will accomplish the objectives of applicable law while minimizing the adverse impact on small business. Alternative regulatory methods include, at a minimum: 1) the establishment of less stringent compliance or reporting requirements; 2) the establishment of less stringent schedules or deadlines for compliance or reporting requirements; 3) the consolidation or simplification of compliance or reporting requirements; 4) the establishment of performance standards for small businesses to replace design or operational standards required in the proposed regulation; and 5) the exemption of small businesses from all or any part of the requirements contained in the proposed regulation.

The proposed regulation provides wastewater reclamation and reuse as an alternative to directly discharging pollutants into waters of the state on a voluntary basis. Although the regulation will require generators and distributors of reclaimed water to obtain a VPDES or a VPA permit, conditions and requirements for water reclamation and distribution may be added to an existing VPDES or VPA permit. The regulation also contains provisions to consolidate permitting requirements where both the generation and distribution of the reclaimed water are under common ownership or management. Reporting requirements will utilize the existing reporting procedures established for VPDES and VPA permits.

With rare exception, end users of reclaimed water will not be required to obtain a permit, thereby eliminating the need for general permits originally proposed concurrent with the development of this regulation. However, end users will be required to enter into a service agreement or contract with the provider of the reclaimed water, specifying the proper use and handling of the reclaimed water for intended reuses. Exclusions from the requirements of the proposed regulation will also be provided for treatment works and many industries that will recirculate, recycle or reclaim and reuse water on site.

Public comment

Please summarize all comments received during public comment period following the publication of the NOIRA, and provide the agency response.

During the public comment period for the NOIRA, twenty-two persons submitted comments by electronic mail and six persons submitted comments by US Postal Service mail. The majority of written comments received by mail consisted of nominations for an Ad Hoc Advisory Committee that was assembled to develop the proposed regulation. The public meeting was attended by sixteen persons, six of whom provided oral comments. One person who spoke at the public meeting provided their oral comments in writing with two letters, one report and one position paper supporting their comments. Another person who spoke provided two technical articles supporting their comments. Comments made during the public meeting were recorded on cassette tape, which was placed in the file of the proposed regulation.

Below is a summary of comments received during the NOIRA public comment period and public meeting for the proposed regulation.

1. Current water regulations of the DEQ discourage the reuse of highly treated wastewater, giving the perception that it is really bad. The regulations should be titled "Water Reclamation and Reuse" and not "Wastewater Reclamation and Reuse" to reflect the fact that reclaimed water should be viewed as a resource that can be used in lieu of potable water and saves on cost of expanding water treatment plant capacity.
2. The underlying philosophy of the Virginia Wastewater Reclamation and Reuse Regulations should not be viewed as an alternative for disposal of treated wastewater, but as the generation of a valued resource.
3. Water reuse can provide a needed resource at less cost to the user and can offer the water provider with a potential revenue stream.
4. The need for water reuse is particularly applicable in the Tidewater area where fresh water resources are becoming scarcer. A science based approach to water reuse could play a major role in water resource planning, especially to mitigate the potential effect from drought conditions.
5. The Loudon County Service Authority (LCSA) wants to integrate an adopted water reuse regulation into their planning for a sustainable, long-term water supply and nutrient management program for Loudoun County. This will be in alignment with DEQ's new Water Supply Planning regulation.
6. Wastewater reclamation and reuse will provide an alternative to discharges that will eliminate the cost of expensive equipment needed to meet more stringent nutrient caps that are to be imposed in Virginia.
7. Virginia will not be successful in meeting waste load allocations of the Chesapeake Bay Program without an aggressive wastewater reclamation and reuse program. This would include regulations that allow reuse of reclaimed water and incentives to go to reclamation and reuse.

8. Nutrient credits for reduction of total nitrogen and total phosphorus loads that are achieved through the recycle or reuse of wastewater must be reflected in determining effluent concentration limits by the DEQ.
9. More than 2000 communities in US have adopted dual water systems (referring to dual reclaimed and potable water systems) – because they are economical and conserve potable water. Dual water systems are more economically feasible in new communities, but become less economical to install in existing communities. Virginia, like North Carolina, should provide funding to make dual water systems more affordable.
10. The use of reclaimed water can be allowed for incidental public contact (i.e., toilet water), as well as public contact, with not limitations if properly treated and monitored (i.e, continuous monitoring, pathogen reduction to 0 total coliform). Proposed regulations must establish the allowable levels of contamination in reclaimed wastewater that would not prohibit its use for any purpose.
11. There is a lot of deterioration in water distribution systems largely because potable water is being used for fire control which is very random with regard to location and frequency. Reclaimed water could be used instead for fire fighting.
12. Current water regulations discourage the use of wastewater for irrigation reuse. Although the current regulatory process in Virginia allows the use of reclaimed water for irrigation, the process is not streamlined in order to promote this reuse and lacks specific technical standards and consistency.
13. Virginia needs to address in its standards that irrigation rates of reclaimed water based on crop nitrogen demands will cause phosphorus to be over applied to irrigation sites. Because Virginia requires that irrigation rates not cause P to be overloaded (or uses P-based application rates for irrigation), much lower rates of irrigation are allowed and valuable nitrogen available in the treated wastewater is not being used. The way to address this problem is to sequester the excess phosphorus applied by adding calcium carbonate (i.e., at a ratio of 3700 lbs P to 20,000 lbs CaCO₃ per acre). This will form hydroxyl apatite, which is insoluble and immobile in soil.
14. Virginia should base P application rates on CaCO₃ sequestering capacity in the soil rather than on crop removal of P. To calculate pounds of P per acre that could be sequestered in the soil, determine pounds available CaCO₃ per acre in the soil and divide that by 5.410. To be more conservative, divide the CaCO₃ value by 10 to get a lower quantity of P to be sequestered. This would allow higher irrigation rates and more nitrogen to be applied to meet crop demands.
15. Virginia must determine how P will be sequestered because the poultry industry, which produces wastewater high in P, will not be able to dispose of its wastewater via irrigation. Poultry is a large industry in Virginia and provides many jobs. By not accounting for the sequestering of P by CaCO₃ in soils, which would allow higher irrigation rates, DEQ is essentially eliminating the poultry industry in Virginia.
16. Virginia requires that irrigation not occur until soil moisture measured according to field capacity, is at 90 percent. Virginia should account for the fact that the percent field capacity will go down with an actively growing plant in the ground and should allow irrigation during the growing season when soil moisture is greater than 90 percent field capacity.
17. Irrigation rates of reclaimed water to maintain but not exceed soil field capacity contained in the previously proposed regulation did not reflect an understanding of soil-plant systems. Soil moisture at or below field capacity makes it more difficult for plants to easily extract nutrients from the soil.
18. The original proposed regulation was overly regulated, burdensome, and costly to the end users; and was overly restrictive concerning requirements for buffers, allowable irrigation rates, bacteriological monitoring, and chlorine residual level along with the associated continuous monitoring requirement.

This effort (referring to the subject NOIRA) must provide regulations that address the shortcomings of the original proposed regulation and that truly promote and encourage wastewater reclamation and reuse.

19. To develop these regulations the DEQ should refer to the wastewater reclamation and reuse regulations of other states with successful programs, such as Florida, and to avoid wasted resources and ensure the use of proven methods.
20. The Virginia Association of Municipal Wastewater Agencies, Inc. (VAMWA) strongly recommends that an outside expert with knowledge of national reuse programs participate in the TAC.
21. Additional uses for reclaimed water must be addressed by the technical advisory committee (TAC), including wetland enhancement or restoration, stream augmentation for non-potable sources, water banking (water storage in hard rock quarries), groundwater recharge for non-potable withdrawals, aquifer storage and recovery in non-potable groundwater systems, and groundwater recharge for potable use and indirect potable reuse only when a better quality potable water source is unavailable.
22. VAMWA recommends the following procedures be implemented by the TAC to ensure effective utilization of resources, adequate documentation of changes and decisions, and that pertinent information is shared and accessible:
 - A. Furnish a copy of the last draft of the previous regulation and all comments received during the last public notice period to all TAC members;
 - B. Involve a broad spectrum of stakeholders in the development of the regulation;
 - C. Make the process of developing regulations totally transparent. This can be accomplished by the following:
 - (1) Furnish the most recent drafts of the developing regulations to all TAC members at least once week in advance of all meetings,
 - (2) All changes to the proposed regulations should be clearly noted and the reasons for each change should be clearly stated, and
 - (3) Maintain a complete record of all drafts;
 - D. Hold all discussion on the regulation in public to avoid any perception of favored constituents or catering to special interest; and
 - E. TAC or subgroup efforts should use a structured process, such as the Nominal Group Technique, to gain consensus when identifying and selecting alternative solutions.
23. Loudon County Service Authority supports the responsible use of appropriately treated reclaimed wastewater for non-potable uses and DEQ's efforts to promote and encourage the reclamation and reuse of wastewater in Virginia.
24. The Virginia Water Environment Association supports DEQ's efforts to promote and encourage the reclamation and reuse of treated wastewater for non-potable purposes.

Name of Commenter	Representing	Comment Number
Barnes Bierck	Private Consultant	1, 9, 10, 11
John Sheaffer	Sheaffer International, L. L. C.	13, 14, 15, 16
Karen Harr	Hampton Roads Sanitation District and Virginia Association of Municipal Wastewater Agencies, Inc.	8, 18, 19, 20, 21, 22
Meredith Winn	Meredith Winn, Jr., Resource International, Ltd.	1, 10, 12
Doug Frederick	Camp, Dresser & McKee, Inc.	2, 6, 7
Greg Evanylo	Va. Tech, Dept. of Crops & Soil Environmental Science	17
Timothy Coughlin	Loudon County Service Authority and Virginia Water Environment Association	5, 21, 23

Kevin C. Wood	Virginia Water Environment Association	24
Toni E. B. Small	Williamsburg Environmental Group, Inc.	12
David A. Johnson	Environmental Resources Management, Inc.	3, 4

Agency Response: A participatory approach involving an Ad Hoc Advisory Committee was used to develop the proposed regulation. The Ad Hoc Advisory Committee provided input on the draft regulation, which was developed in response to suggestions by the advisory group. The Ad Hoc Advisory Committee was provided a summary of the above NOIRA comments for review during development of the proposed regulation.

Family impact

Please assess the impact of the proposed regulatory action on the institution of the family and family stability including to what extent the regulatory action will: 1) strengthen or erode the authority and rights of parents in the education, nurturing, and supervision of their children; 2) encourage or discourage economic self-sufficiency, self-pride, and the assumption of responsibility for oneself, one’s spouse, and one’s children and/or elderly parents; 3) strengthen or erode the marital commitment; and 4) increase or decrease disposable family income.

The development of the proposed regulation is to establish technical standards and requirements for water reclamation and reuse, and has no direct impact on the family institution and stability.

Detail of changes

Please detail all changes that are being proposed and the consequences of the proposed changes. Detail all new provisions and/or all changes to existing sections.

If the proposed regulation is intended to replace an emergency regulation, please list separately (1) all changes between the pre-emergency regulation and the proposed regulation, and (2) only changes made since the publication of the emergency regulation.

For changes to existing regulations, use this chart:

Current section number	Proposed new section number, if applicable	Current requirement	Proposed change and rationale
	10		Adds definitions necessary to implement the regulation.
	20		Sets forth the purpose of the regulation as provided for in the Code.
	30		Establishes the applicability of the requirements.
	30		Provides for transition for facilities in existence at the time the regulation becomes effective.
	30		Provides that modification of a permit to include water reuse provisions is a minor modification.

	40		Requires producers and distributors of reclaimed water to obtain either a VPDES or VPA permit.
	40		Requires owners of satellite reclamation systems to obtain a permit.
	50		Establishes exclusions for activities permitted by the State Department of Health, for utilization of gray water, for non-potable water produced and utilized on-site by the same treatment works, for recycle flows within a treatment works, for industrial effluents created prior to final treatment and used for water re-circulation, recycle, or reuse systems, for land treatment systems, for indirect reuse, for existing indirect potable reuse projects, and for direct injection of reclaimed water into any underground aquifer.
	50		Establishes prohibitions for direct potable reuse; for reuse inside a residential or domestic dwelling; for filling residential swimming pools, hot tubs or wading pools; for food preparation; for bypass of untreated or partially treated wastewater from the system and for return of reclaimed water to the distribution system.
	60		Provides details on the relationship of this regulation to other State Water Control Board regulations.
	70 A		Establishes standards for Level 1 and Level 2 reclaimed water.
	70 B		Establishes the point where the reclaimed water must be the standards.
	70 C		Provides for management of reclaimed water that fails to comply with the standards
	70 D		Allows for treatment other than or in addition to the standards in A based on quality or intended reuse of the water.
	70 E		Provides for case-by-case determination of standards for industrial wastewater.
	80		Establishes monitoring requirements for reclaimed water.
	90 A		Establishes Level 1 or Level 2 requirements for categories and types of reuse.
	90 B		Provides factors for establishing monitoring requirements for uses not specifically addressed in 90 A.
	100 A		Establishes requirements for applying for a permit for a water reclamation project.
	100 B		Establishes requirements for a reclaimed water management plan.
	110		Establishes design criteria for reclamation systems and water distribution systems including storage requirements to ensure reliable operation.

	120		Establishes construction requirements including submittal of preliminary engineering reports and submittal of plans and specifications prior to issue of a certificate to construct. Also provides requirements for construction inspection prior to certificate to operate.
	130		Establishes requirements for a certified operator and for system reliability.
	140		Requires the permittee to develop and submit an operations and maintenance manual and establishes the minimum information to be included in the manual.
	150		Establishes requirements for reclaimed water provided by a facility with significant industrial users.
	160		Requires that there be no uncontrolled public access to reclamation systems and signage.
	170		Establishes use area requirements, including requirements for a permittee to develop an education program; prohibiting nuisance conditions; requirements for irrigation; prohibiting overspray; imposing setback distances; and imposing minimum separation distances for in-ground piping.
	180		Establishes a plan of action when the monthly average flow into a system reaches 95% of the design capacity authorized by the permit.
	190		Establishes requirements for recordkeeping.
	200		Establishes reporting requirements.
	210		Delegates authority to the Director.