DRAFT

REPORT ON
COST CONTROL POLICIES AND GUIDELINES
FOR THE
VIRGINIA WATER QUALITY IMPROVEMENT FUND
POINT SOURCE POLLUTION CONTROL PROGRAM

SUBMITTED BY

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DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

October 2007

COMMONWEALTH of VIRGINIA

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October 1, 2007

TO:

- House Finance Committee
- House Appropriations Committee
- House Agriculture, Chesapeake and Natural Resources Committee
- Senate Finance Committee
- Senate Agriculture, Conservation and Natural Resources Committee

FROM: David K. Paylor

SUBJECT: **Cost Control Policies and Guidelines to Ensure Efficient Use of Water Quality Improvement Fund Grants**

The 2007 Session of the General Assembly amended the Virginia Code by adding a section numbered §10.1-1186.01, which directed the Department of Environmental Quality to identify and evaluate options to ensure the efficient use grants awarded under the Water Quality Improvement Fund Point Source Pollution Control Program. The cost control policies and guidelines were to be developed no later than October 1, 2007, and included in any grants issued after that date.

This report presents the cost control policies and guidelines DEQ will apply to future grants from the Water Quality Improvement Fund. The report also includes information on the process used to develop these cost control policies and guidelines, the factors considered in evaluating the options and identifying appropriate measures for the use of the grants, and actions the Department will take to implement the measures.

This report is accessible at the following Internet website address: http://www.deq.state.va.us/bay/wqifdown.html. To receive a printed copy of the report, please contact John Kennedy at DEQ by phone (804-698-4312) or e-mail (jmkennedy@deq.virginia.gov).

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I. EXECUTIVE SUMMARY

This report is in response to a statutory requirement under §10.1-1186.01, enacted by the 2007 General Assembly (HB1710/SB771), to identify and evaluate options to ensure the efficient use of grants awarded under the Water Quality Improvement Fund (WQIF) Point Source Pollution Control Program. The process used to develop these cost control measures involved considerable public participation, through formation of a Technical Advisory Group (TAG) with representatives from local government, publicly owned wastewater treatment facilities, the conservation community and DEQ technical staff, as well as a 30-day public review and comment period. As specified in the relevant Virginia Code provision, the TAG considered the following:

(i) Evaluation of eligible and appropriate costs;
(ii) Applicability of the Virginia Public Procurement Act (VA Code § 2.2-4300);
(iii) Voluntary nutrient credit trading;
(iv) Basing grant amounts on facility optimization using full life-cycle cost evaluation;
(v) The ability to limit or exclude reimbursements based upon a comparison of costs to upgrade or build versus the purchase of credits; and,
(vi) The ability to prioritize grant agreements based on the river-basin optimization plans submitted under the Watershed General Permit for Nutrient Discharges and Trading.

In addition to these particular items, the TAG also discussed:

- Alternative procurement methods such as Design-Build and Public-Private Partnerships;
- Use of Value Engineering Analysis; and,
- Possibilities for influencing the bidding climate to reduce market "premiums".

Based on this work, DEQ has revised existing WQIF cost control measures and incorporated these new guidelines and policies in agency guidance that governs the award and use of these grants. Highlights of the revisions and additions contained in the agency guidance are:

- Consistent with the VA Clean Water Revolving Loan Fund procedures, specifically state that the Public Procurement Act applies to all WQIF grantees (no exception for localities with population less than 3,500) to assure costs are fair and competitive.
- Adding example references for anticipated costs of basic construction materials and skilled labor beyond the Engineering News Record Index, to include the Association of General Contractors and U.S. Bureau of Labor Statistics indices, as needed.
- State support for use of "Design-Build", Public-Private Partnerships, or other approved procurement methods as alternatives to competitive, sealed bidding.
- Value Engineering Analysis required when a project's capital cost estimate for the nutrient reduction technology (NRT) portion is equal to or greater than $10 million; analysis is optional for smaller projects.
- A Life Cycle Cost Evaluation required for the selected NRT system and the other feasible options considered, and also on an "as needed" basis for individual units comprising the selected NRT system.
- The criteria used to determine if nutrient credit exchange would be significantly more cost-effective than NRT installation will include the cost per pound of nutrient reduced at design flow, cost per million gallons treated, and other environmental factors such as local receiving water considerations and treatment benefits beyond nutrient reduction (e.g., treating septage to encourage proper management of on-site systems in the surrounding community).
- To aid the viability of the Nutrient Credit Exchange Program, require that a portion of any credits generated by a facility receiving WQIF funds will be made available for trading.

This report is available online from the DEQ WQIF link (www.deq.virginia.gov/bay/wqifdown.html), and the General Assembly Reports link (www.deq.virginia.gov/regulations/reports.html).

II. EVALUATION OF EXISTING COST CONTROL MEASURES AND DEVELOPMENT OF NEW POLICIES AND GUIDELINES

A. Statutory Authorization

The 2007 General Assembly enacted the following provision (HB1710/SB771) in the Virginia Code: *§10.1-1186.01.2. That the Department of Environmental Quality shall identify and evaluate options to ensure the efficient use of any grants authorized by the Water Quality Improvement Act (§10.1-2117 et seq. of the Code of Virginia). Any grant issued after October 1, 2007, shall include policies and guidelines governing the use of such grants that include the enforcement of appropriate cost control measures for the use of the grants. The Department shall work with representatives from local governments and the conservation community to evaluate the optimal use of existing and potential cost control measures, including but not limited to (i) evaluation of eligible and appropriate costs, (ii) applicability of the Virginia Public Procurement Act (§2.2-4300 et seq. of the Code of Virginia), (iii) voluntary nutrient credit trading, (iv) basing grant amounts on facility optimization using full life-cycle cost evaluation, (v) the ability to limit or exclude reimbursements based upon a comparison of costs to upgrade or build versus the purchase of credits, and (vi) the ability to prioritize grant agreements based upon the river-basin optimization plans. Such policies and procedures shall be developed no later than October 1, 2007.*

B. Purpose and Methods Used

The purpose of these guidelines and policies is to ensure that grant funds provided by the State are used in a cost-effective manner, and maximize the amount of point source nutrient load reduction in the Chesapeake Bay watershed per dollar spent. These cost control measures aid in developing the grant-eligible scope of work for each project, and compliment the Nutrient Credit Exchange Program's goal to reduce the capital cost of designing and installing nutrient reduction technology for both the localities and the State.

The process used to develop these cost control measures involved considerable public participation, through use of the TAG with representatives from local government, publicly owned wastewater treatment facilities, the conservation community and DEQ technical staff, as follows:

Table 1 – Cost Control Measures Technical Advisory Group

Name	Representing
1. Alan Pollock	DEQ-Water Quality Programs, TAG Chairman
2. Tim Castillo	Nelson Co. PSA (non-significant dischargers)
3. Mike Gerel	Chesapeake Bay Foundation
4. Walter Gills	DEQ-Construction Assistance Program
5. Mark Haley	VA Nutrient Credit Exchange Association
6. Frank Harksen	VA Assoc. of Municipal Wastewater Agencies
7. Larry Land	VA Association of Counties
8. Nathan Lott	VA Conservation Network
9. Denise Thompson	VA Municipal League
State Resource Staff	
10. John Kennedy	DEQ-Chesapeake Bay Program, Staff Lead
11. Allan Brockenbrough	DEQ-Water Permits
12. Marcia Degen	DEQ-Office of Wastewater Engineering
13. Bob Ehrhart	DEQ-Chesapeake Bay Program
14. Vijay Satyal	DEQ-Office of Policy

Note: Invited, but unable to participate - Bill Street, James River Association

TAG meetings were held on 5/30/07 and 6/29/07 to review existing cost control measures in DEQ Guidance Memorandum #06-2012, and discuss the potential new policies and guidelines listed in the statute, as well as several topics beyond that particular list which offered possibilities to aid in controlling excessive costs. Meeting summaries are accessible online at these weblinks:

- May 30, 2007 TAG Meeting: http://www.deq.virginia.gov/bay/TAGsummaryMay30.pdf
- Follow-up Questions and Action Items: http://www.deq.virginia.gov/bay/TAGfollowupQandAfromMay30.pdf
- June 29, 2007 TAG Meeting: http://www.deq.virginia.gov/bay/TAGsummaryJune29.pdf

In addition, the draft cost control policies and guidelines were made available for a 30-day public review and comment period, which ran from XX/XX/07 to XX/XX/07. Comments were received from XX individuals and groups, and are summarized in Section II.E. Also included are the DEQ staff responses to comments, and an explanation of changes made to the draft document based on those comments.

C. Evaluation of Measures Listed in §10.1-1186.01.2.

(i) Evaluation of eligible and appropriate costs: Since the beginning of the WQIF grant program, grants have been generally limited to the design and installation of nutrient reduction technology (NRT), per the Virginia Code. The TAG members agreed that continuing use of a review checklist (see Attachment B - GM #06-2012, Item #4 and App. B) by DEQ-WQIF staff is acceptable and should continue. The checklist guides eligibility determinations for multi-purpose units and expanded tankage, where the eligibility is limited only to nutrient removal requirements. This checklist is subject to change, for example as new technologies are introduced.

(ii) Applicability of the Virginia Public Procurement Act (PPA; Virginia Code § 2.2-4300): Compliance with the PPA (as well as all other applicable statutes) has always been a WQIF grant program requirement. The TAG agreed that GM #06-2012 should specifically state that, for consistency with DEQ's Virginia Clean Water Revolving Loan Fund (VCWRLF) procedural guidelines, the PPA provisions apply to all grantees, with no exception for smaller localities (population of 3,500 or less).

(iii) Voluntary nutrient credit trading: This measure was recognized by the TAG as one of the most complicated to evaluate, given the fact that pricing for nutrient credits has been initially established at a relatively low cost by the Nutrient Credit Exchange Association (NCEA) to encourage credit purchase and make it more cost-effective for willing plant owners to delay their NRT retrofits. In comparison to the low credit cost, it might be difficult to identify any NRT installation as "cost-effective", but it is certain that some number of upgrades must take place to generate credits and achieve the basin-level nutrient waste load allocations by the compliance date in the Chesapeake Bay Watershed General Permit. Therefore, the TAG agreed that evaluating use of nutrient credit trading will consider "unit values", including but not limited to the cost per pound of nutrient reduced at design flow or cost per million gallons treated, in comparison to the cost of available credits to see where "significant" cost-efficiencies can be realized. Other non-monetary factors may also apply, such as receiving water quality considerations (e.g., "hot spots" or impaired waters; areas requiring more stringent nutrient treatment than the Chesapeake Bay regulations mandate). This measure will likely have application in basins where excess nutrient credits are predicted and less cost-effective projects could be deferred without affecting compliance with the Chesapeake Bay Watershed General Permit or any individual permit requirements.

(iv) Basing grant amounts on facility optimization using full life-cycle cost evaluation: One challenge that DEQ-WQIF staff has in reviewing grant project proposals is balancing cost-effectiveness with system reliability and good nutrient reduction performance, while not dictating the means or

methods employed for treatment. System selection, as well as certifying operation to comply with the design intent and permit requirements, is the responsibility of the owner and his licensed consulting engineer. While an owner is free to choose the NRT system to be installed, cost-effectiveness from the standpoint of the grant can still be accomplished if eligibility is limited or prorated based on the least-cost feasible alternative. An owner may demonstrate that a higher cost alternative is justified, examples being compatibility with existing treatment units or benefits for operation and maintenance. A life-cycle cost analysis will be required at the stage when the Preliminary Engineering Report is prepared, for the overall NRT system selected and the feasible options considered so this evaluation can be made.

(v) The ability to limit or exclude reimbursements based upon a comparison of costs to upgrade or build versus the purchase of credits: The TAG concluded that this measure was essentially covered in discussions and recommendations for criteria (iii) above.

(vi) The ability to prioritize grant agreements based on the river-basin optimization plans submitted under the Watershed General Permit for Nutrient Discharges and Trading: Currently, the primary factor used to prioritize grant agreements for selected projects is readiness-to-proceed. This is evidenced by submission of an acceptable Preliminary Engineering Report, so that sufficient information is available to draft a grant agreement scope of work and make an eligibility determination for the NRT system to be installed. Based on applications received to-date, it appears that the major "lynch pin" projects in the Bay watershed needed to achieve the basin-level waste load allocations are moving forward with design or construction, and perhaps this additional priority consideration wasn't needed. The TAG focused on ways the grant agreements could be better integrated with the "optimization plans" (i.e., Compliance Plans required for submission by the affected owners by August 1, 2007, under the Chesapeake Bay Watershed General Permit) by aiding the generation, or ensuring the availability of nutrient credits for trading. Suggestions included:

- Using WQIF funds to reimburse owners for credit purchases, in lieu of installing NRT. This would necessitate a change in the Virginia Code, as grants are currently limited to the design and installation of nutrient reduction technology.
- Requiring that a portion of any credits generated by a grant-funded project be made available for trading. Some complications arose regarding the credit structure already created by the NCEA (i.e., Class 'A' and 'B' credits), and whether or not a WQIF grantee is a member of the NCEA. It was decided that the grant agreement should require that at least 50% of any credits generated in a calendar year by an NCEA member, or 75% for a non-member, be made available for trading. If long-term arrangements can be made for these credits, use of 5-year, renewable increments will be considered to coincide with the reissuance cycle of the Chesapeake Bay Watershed General Permit.

D. Additional Measures Considered

The TAG expressed great interest in exploring additional methods to maximize cost-effectiveness or expedite NRT project schedules beyond the list of measures in the legislation. Most notable of these were:

- Alternative procurement methods such as Design-Build and Public-Private Partnerships: Although the Public Procurement Act states that the usual (and preferred) method to secure professional services is the competitive bidding process, there are approved alternatives that are gaining acceptance. The "Design-Build" process has the potential to reduce delivery time and capital cost by overlapping the design phase and construction phase of a project. The TAG heard a presentation from the Prince William County Service Authority on the use of "Design-Build" for upgrade/expansion of their H.L. Mooney plant. The Authority has seen very positive results from this process, with proven time and cost savings such as the ability to initiate construction with partial documents (ultimately 100% complete), use of value engineering by a design team, ongoing

constructability reviews, and early equipment acquisition. A prerequisite for a public body to be eligible for use of "Design-Build" is approval from the Design-Build/Construction Management Review Board, pursuant to Virginia Code §2.2-2406.

The use of Public-Private Partnerships (under the Public-Private Education Facilities and Infrastructure Act, "PPEA"; Virginia Code §56-575.1) brings private funding and risk to public projects, helps expedite schedules for time-sensitive projects, allows for creative financing and brings innovative thinking and vision from the private sector. Prior to using this procurement method, "responsible public entities" must adopt a set of PPEA guidelines consistent with the statute; model guidelines are available from the Division of Legislative Services (DLS; see link at dls.state.va.us/ppea.htm).

The TAG agreed that these alternative procurement methods should be supported and encouraged for use on WQIF-funded projects. The cost control guidelines will express the State's support for these alternatives, and provide information about required approvals and information sources to aid the localities' understanding of these methods. Prince William County S.A. has agreed to make their presentation available to anyone interested, and DEQ staff has a presentation for distribution on use of the PPEA that was provided by DLS.

- Use of Value Engineering (VE) Analysis: The intent of VE analysis is to reduce cost without reducing product or process performance. It typically involves a VE Team in a short-term workshop setting, taking a systematic and creative approach to identify unnecessary high costs in a project that can be reduced, without sacrificing reliability or efficiency, or increasing operation and maintenance costs. The TAG received information from the Hampton Roads Sanitation District on use of VE analysis for two recent HRSD wastewater projects. The analysis yielded very positive results for HRSD, summarized as follows:
  - Chesapeake/Elizabeth STP:
    VE Workshop in 2002
    4 Team Members from Design Engineer
    2 Team Members from HRSD
    3-day workshop
    Cost for VE Workshop = $20,000
    VE Cost Savings = $473,000
    Ratio of Savings per VE dollar spent = 24:1
    Project Construction Cost = $34 million
  - Atlantic STP:
    VE Workshop in 2005
    5 Team Members from Design Engineer
    2 Team Members from HRSD
    5-day workshop
    Cost for VE Workshop = $90,000
    VE Cost Savings = $2,000,000
    Ratio of Savings per VE dollar spent = 22:1
    Project Construction Cost = $140 million

  The TAG agreed that requiring VE Analysis was justified for WQIF-funded projects where the estimated cost of the NRT portion was $10 million or greater. There is precedence for requiring VE Analysis; it was an essential part of the EPA Construction Grants Program in the 1970's and 1980's, and Virginia Code mandates its use by State agencies for capital outlay projects of $5 million or more.

- Possibilities for influencing the bidding climate to reduce market "premiums": Nutrient reduction retrofits are underway at numerous plants across Virginia's Chesapeake Bay watershed, as well as in

Maryland and Pennsylvania. The demand for professional services, including design engineers and construction contractors, along with competition for limited supplies of construction materials and skilled labor are causing significant increases in the cost of NRT projects. Another influencing factor is the reduced number of companies, due to consolidation, that bond construction projects. Recent bids received on WQIF-funded projects have exceeded engineer's estimates, in some cases by 25% or more. For these reasons, the TAG discussed options that might help contain escalating bid prices, including:

- Have localities share risk with the contractor to eliminate "fright money" (bid escalation or a premium intended to offset unknown future cost of materials). This might be accomplished by establishing a contract/commodity price index, or allowing for escalation factors, with a "not-to-exceed" cap on total project cost. Incentives could be built-in to a contract whereby the contractor shares in a percentage of any capital savings at the end of a project. Because the WQIF can only reimburse a grantee for actual costs expended on eligible items, the grant cannot be used for "cost-avoidance" incentives; however, this is an option the grantee might consider using just local funds.

- Break a project into smaller divisions or use a phased approach with third party construction management to attract more bidders and lessen the total cost. The WQIF program is already anticipating use of this approach in order to "phase" the NRT installation and will work with grantees to secure an incremental or, in some cases, a conditional Certificate to Operate for work completed. The cost control guidelines won't require subdividing a project, but it is an option for the owner to consider along with the potential trade-offs between project complexity/construction management and the benefits of enhanced competitive bidding by more/smaller contractors.

E. Summary of Public Comment and Staff Response

To be added following close of the public comment period.

III. FINAL COST CONTROL MEASURES, POLICIES AND GUIDELINES

A. **DRAFT** DEQ Guidance Memorandum #06-2012 – Section 6 Revised

GM #06-2012: Review Procedures for WQIF Grant Applications and Agreement Negotiations

6. Methods or Information to Aid in Controlling Excessive Costs:

a. To assure that costs are fair and competitive, require compliance with the VA Public Procurement Act for purchase of all grant-funded goods and services, with no exception for smaller localities (population less than 3,500).

b. Analyze and compare estimated project costs to prevailing, actual bid costs for similar project types.

c. As needed, consult information sources such as the Engineering News Record (ENR) index (http://enr.construction.com/features/conEco/), Association of General Contactors (http://www.agc.org/index.ww), and Bureau of Labor Statistics producer price index (http://www.bls.gov/ppi) for anticipated unit costs of basic construction materials and skilled labor.

d. Support alternatives to the standard procurement method of competitive sealed bidding, such as the "Design-Build" approach, public-private partnerships, or others, to aid in reducing capital costs and expediting construction schedules. For "Design-Build", make information available on the Design-Build Construction Management Review Board regulations (1VAC17-20-10), along with any guidelines, model ordinances and Department of General Services staff contact information. For public-private partnerships, make information available on the statutory requirements (VA Code §56-575.1) and model guidelines developed by the State Work Group under the Division of Legislative Services (dls.state.va.us/ppea.htm).

e. Require Value Engineer (VE) Analysis when the capital cost estimate for the nutrient reduction technology portion of a project is equal to or greater than $10 million. The VE Analysis should be performed at the end of the Preliminary Engineering Report stage and before final engineering design. The cost of the VE Analysis will be eligible for cost share reimbursement under the WQIF grant agreement. A grantee may perform a VE analysis if the NRT cost estimate is lower, but this is optional and voluntary.

f. A Life Cycle Cost Evaluation must be provided in conjunction with the Preliminary Engineering Report, for the overall NRT system selected and the feasible options considered. As needed, the evaluation should consider individual units and technology options within the selected process, to aid in determining if alternatives are available that may reduce the size of a unit, or the cost of equipment or construction, without sacrificing performance or reliability. If additional costs are incurred resulting from this extended evaluation or any pilot testing, these will be eligible for cost share reimbursement under the WQIF grant agreement. If a lower-cost alternative is shown to be viable and the grantee chooses a more costly option, grant eligibility may be prorated.

g. Review preliminary engineering report for design assumptions of unit processes associated with nutrient removal technology; receive upfront justification and negotiate cost-share limitations for overly-conservative design/sizing of any unit processes.

h. The WQIF Grant Guidelines allow nutrient removal technology systems to be sized to treat the flow in any reasonable and necessary expansion of the wastewater facility, which is generally limited to a 20-year design life. Details on the types of acceptable documentation and analyses, to substantiate expanded future design flow as reasonable and necessary, are described in Appendix B.

i. Nutrient Credit Exchange Program:

1. The DEQ Director is not required to enter into a grant agreement with an eligible facility if it is determined that using nutrient credits in accordance with the Chesapeake Bay Watershed Nutrient Credit Exchange Program (§ 62.1-44.19:12 et seq.) would be significantly more cost-effective than installing nutrient controls at the facility in question. The criteria to be evaluated in making this determination will include, but are not limited to, cost-effectiveness indicators such as the cost per pound of nutrient reduced at design flow or the cost per million gallons treated, compared to prevailing prices for available nutrient credits. Non-monetary factors may also be considered, as applicable, such as water quality conditions in receiving waters (e.g., impaired waters; areas requiring more stringent nutrient control than the Chesapeake Bay regulations mandate).
2. To aid in ensuring that nutrient credits are available for exchange, any WQIF grantee that is also a member of the Nutrient Credit Exchange Association (NCEA) shall make at least 50% of any credits generated in a calendar year available for trading; non-NCEA members shall make at least 75% of such credits available. Certain other conditions also apply, including the plant not triggering the "95% flow policy" (influent level at 95% or more of the permitted design flow for 3 consecutive months), so that the facility is operating at less than full design flow, thereby generating credits with good performance.

B. Implementation Actions

Prioritization and processing of WQIF grant applications was previously keyed to "readiness-to-proceed" when the Director was mandated to sign agreements with all eligible applicants. Now, cost-effectiveness will also be an important consideration in prioritizing applications, and an essential factor in determining the grant-eligible scope of work and grant award for selected projects. DEQ-WQIF staff will utilize the revised "Methods or Information to Aid in Controlling Excessive Costs" in GM #06-2012 when reviewing the Preliminary Engineering Report, which must include a life-cycle cost analysis of the feasible options considered and the selected NRT system. The least-cost alternative will be approved for grant funding unless the owner can justify the selection of a higher cost option, for reasons such as compatibility with existing treatment units, or benefits for operation and maintenance. Close coordination will be maintained with other DEQ units, especially:

- DEQ-Construction Assistance Program (administering the VCWRLF), for jointly funded projects to ensure consistency in making eligibility determinations;
- DEQ-Office of Wastewater Engineering, for conformity with the Sewage Collection and Treatment Regulations governing design and concentration-based performance requirements of the NRT system installed; and,
- DEQ-Water Permits, to determine each grantee's nutrient control requirements to comply with the Chesapeake Bay Watershed General Permit for Nutrient Discharges and any applicable individual VPDES permit provisions that affect NRT system selection and treatment stringency.

The full text of DEQ Guidance Memorandum #06-2012 ("Review Procedures for WQIF Grant Applications and Agreement Negotiations") is accessible online at this weblink:
http://www.deq.virginia.gov/bay/ApplicationReviewProceduresWQIF.pdf