DATE: February 10, 1997, **Revised 26 April 2012**

TO: Office of Drinking Water Technical Staff

FROM: Steven D. Pellei, PE, Acting Director SDP
Office of Drinking Water

SUBJECT: PERMITS & PROJECT REVIEW- Project Review and Permit Procedures

DELETE: WM 795, 862, 865, 879, 885, 901

REFERENCE: *Project Review and Permit Procedures Manual*

Project Leader: Susan E. Douglas SED

Revision Highlights:
This memo consolidates written guidance of 7 Working Memos into one separate *Project Review and Permit Procedures Manual* for ODW staff.

The purpose of this memorandum is to provide consolidated guidance on the project review program and permit procedures administered by the Office of Drinking Water as authorized in the *Waterworks Regulations*. It does not replace the requirements of the Regulations. The *Project Review and Permit Procedures Manual* is intended for **ODW staff use,** and should not be provided to the waterworks or consultants in lieu of technical assistance from ODW staff.

Related information for waterworks owners are posted on the VDH-ODW external website (*Information for Waterworks / Owners*), including:

- Operation Permit & Construction Permit Applications
- Waterworks Business Operations Plan
- Installing a new well (Handbook for Developing a Public Water Supply Well)

The *Project Review and Permit Procedures Manual* refers to a number of attachments. These templates, forms and letters shall standardize office procedures, improve office efficiency, and address regulatory requirements. **Permit templates should not be modified, unless approved by the ODW Director.** ODW staff is responsible for using the most current version of the *Project Review and Permit Procedures Manual*. Field Directors shall send email confirmation to the author that all staff have been notified of the revisions, and the changes reviewed by the date given in the revision notification.

The *Manual* and all attachments are available as electronic files on the ODW server location: **odwsrv1\odwshare\03-Memos\301-Active Working Memos\301.02-Forms Letters Manuals.**

END OF MEMO

PROJECT REVIEW & PERMIT PROCEDURES MANUAL FOR ODW STAFF

Version 3.2
January 5, 2016

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Office of Drinking Water
Safe Drinking Water for a Healthy Virginia

PROJECT REVIEW & PERMIT PROCEDURES MANUAL FOR ODW STAFF

FOREWARD

This manual is intended to provide procedural guidance to the Office of Drinking Water (ODW) staff for the review and approval of design engineering documents and the issuance of all permits, as prescribed in the Waterworks Regulations. It does not include the following subjects, which are covered in these Working Memos:

WM 813 – Well Development
WM 896 – Policy for Issuing Operation Permits
WM 902 – Exceptions to Surface Water Treatment Plant Loading Rates
WM 906 – Procedures for Arsenic Removal Treatment Systems

This manual will be updated as ODW procedures are modified.

REVISIONS SUMMARY

DATE	DESCRIPTION OF CHANGES
April 4, 2012 (Version 2.0)	Original Issuance
July 16, 2012 (Version 2.1)	1. Added APPENDIX 4 – Document Management Process 2. Added standard language to the EDS for DEQ withdrawal permits.
July 18, 2014 (Version 3.0)	1. Revised Section 1. Introduction: Eastern Groundwater Management Area has expanded to include new cities and counties. 2. Revised Section 2. Preliminary Engineer Conference & Report: Engineers are to submit electronic copies of final PER. 3. Revised Section 3. Waterworks Business Operations Plan: Qualifications, Resources and Procedures modified. 4. Revised Section 4. Project Review: Added plan review time expectations, electronic plan submittal requirement, and provided clarification for record drawing review requirements. 5. Revised Section 5. Construction Permit: Engineers are to submit electronic copies of final plans. “Engineering Description Sheet” has been renamed “Description Sheet of Proposed Construction”. Added new subsection “5.4. Well Data for DEQ”. 6. Revised Section 6. New or Nonconventional Methods, Processes, and Equipment: Temporary Permits will be issued in place of the former Provisional Permits. 7. Revised Section 7. General Permits and Standard Specifications: Additional guidance and templates provided. 8. Revised Section 8. Operation Permit: Temporary Permits will be issued in place of Provisional Permits. EDS will no longer be an attachment to Operation Permits. The EDS has been replaced with “Operation Permit Conditions”, attached to the Permit. A separate “Waterworks Description Sheet” will be issued. 9. Revised Section 9. Capacity Evaluation of Waterworks: ERCs will no longer be utilized in calculations. Additional guidance for estimating water demand provided. Removed alternate 24-hour well yield test procedures. Removed Q=11.4N^0.544 peak hour equation. Replaced

	example calculations in subsection 9.11. 10. Deleted Appendix 1 – MOU with DEQ 11. Revised Appendix 4(now Appendix 3) – Document Management Process 12. Revised Attachment organization and numbering. Revised content of the following Attachments: • PER Approval Letter • Operation Permit Transmittal Letter to Owner • Design Exception Memo • Construction Permit • Description Sheet of Proposed Construction • Operation Permit WDS (formerly EDS) • Transmittal Checklist – Central Office Files • Transmittal Checklist – Central Office Project Approval • Standard Operation Permit • Memorandum of Understanding for General Permit • Transmittal Checklist Operation Permit • Temporary Operation Permit Requirements 13. Added the following new Attachments: • Central Office Plan Approval Transmittal Checklist • Temporary Operation Permit • Operation Permit Conditions • Estimated Maximum Daily Water Demand • General Permit & Local Review Audit • General Permit Annual Report • General Permit - Project Summary Report • PEC Meeting Minutes Template
April 6, 2015 (Version 3.1)	1. Revised Attachment organization and numbering. Revised content of the following Attachments: • PER Approval Letter • Scope and Detail Checklist • Design Exception Memo • Record Drawings Approval Letter • Change Order / Addenda Approval Letter • Construction Permit • Transmittal –CO Approved Plans • Transmittal – FO Approved Plans • General Permit MOU • Operation Permit Conditions • Waterworks Description Sheet • Operation Permit Transmittal Letter 2. Added the following new Attachments • Summary of Final Inspection 3. Revised the following: • Figure 2 • Figure 4 • Appendix 3. ODW will no longer be scanning engineering plans 4. Revised Section 3. Waterworks Business Operations Plan: Applicability, Qualifications, Resources and Procedures 5. Added Section 5.7 Expired Construction Permits

	6. Added Section 5.8 Completed Construction Projects 7. Revised Section 7.6 to provide additional guidance for processing General Permits 8. Revised 8.5 to clarify voluntary treatment specified in Operation Permit Conditions 9. Revised 8.11 to clarify that Temporary Permit Requirements are not to be issued to TNCs for failure to submit a WBOP 10. Revised 8.12 to provide additional guidance for processing Permit Revocations 11. Revised Section 9. Capacity Evaluation of Waterworks as follows: a) permit capacity may be limited by OEHS permit limits, b) removed the 1.8 Safety Factor for wells within 2 GWMAs, c) provided clarification on DEQ's VWP permits, safe yield, and waterworks source capacity, d) revised format of multiple well capacity table, e) added capacity evaluation calculation examples, and f) provided a table of standard calculation units.
January 5, 2016 (Version 3.2)	1. Revised Section 4.8.3 to include field office approval of exceptions for non-community well lot plats and dedication documents 2. Revised Section 5.4 to include GW-2 form and "VA Hydro" database/ web portal 3. Added Section 5.10 Alternate Project Delivery 4. Revised Section 8.12 for electronic processing of Permit Revocations 5. Added Attachment A.18 Example Non-Community Well Lot Plat & Dedication Document Exception 6. Added Attachment A.19 Example of Alternate Delivery Project Construction Permit with Conditions 7. Revised Attachment C.3 Operation Permit Conditions (revised LT1 & LT2 treatment requirements, added treatment options, clarified VDH Sewage Disposal permit inclusion and added Sewage Disposal permit capacity option) 8. Revised Attachment C.5 Waterworks Description Sheet to include options for other VDH permits
May 11, 2018	1. Edited the following attachments for Field Director signature to reflect field office delegation of signature authority a. Attachment A.7 Design Exception Memo b. Attachment A.12 Construction Permit c. Attachment B.4 General Permit for Distribution Mains d. Attachment C.1 Standard Operation Permit e. Attachment C.2 Temporary Operation Permit f. Attachment C.7 Variance g. Attachment C.9 Transmittal Checklist -Op Permit for Signature h. Attachment C.11 Op Permit Revocation Letter

PROJECT REVIEW & PERMIT PROCEDURES MANUAL FOR ODW STAFF

Version 3.2
January 5, 2016

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1. INTRODUCTION

1.1. PERMIT PROCESS OVERVIEW

12VAC5-590-200 of the *Waterworks* Regulations requires an owner or authorized agent to submit an application for a permit from the Virginia Department of Health (VDH) to construct, expand, modify, and/or operate a waterworks or water supply. The complete permitting process includes the following steps:

1. Permit Application / Notification of Intent
2. Preliminary Engineering Conference (PEC)
3. Waterworks Business Operations Plan (WBOP)
4. Preliminary Engineering Report (PER)
5. Final Plans and Specifications
6. Issuance of a Construction Permit
7. Final Inspection of Construction
8. Issuance of a New or Amended Operation Permit

There is only one permit application form for construction of a new waterworks, or the modification or purchase of an existing waterworks. The application form itself, which is posted on ODW's external webpage, can be filled out on-line and printed for submission to VDH. (A signed paper copy is required).

1.2. NEW WELLS

If a new well source is proposed, the procedures listed above are modified by the inclusion of 2 additional steps:

- Well Site Approval
- Well Construction

The Department of Environmental Quality (DEQ) issues a Groundwater Withdrawal Permit for well withdrawal systems located in a Groundwater Management Area that pump 300,000 gal/month or more. There are presently two Groundwater Management Areas in Virginia:

- Eastern Shore: Accomack & Northampton Counties;

- Eastern Virginia:
  - Entire Counties of: King William, New Kent, James City, Isle of Wight, Surry, Charles City, Southampton, Caroline, King and Queen, Gloucester, Mathews, Middlesex, Essex, King George, Westmoreland, Richmond, Lancaster, and Northumberland;
  - Partial Counties East of I-95: Sussex, Prince George, Hanover, Henrico, Chesterfield, Spotsylvania, Stafford, Prince William, Fairfax, and Arlington;
  - Cities of: Williamsburg, York, Poquoson, Hampton, Norfolk, Virginia Beach, Chesapeake, Suffolk, Portsmouth, Newport News, Hopewell, Franklin, Alexandria and Fredericksburg.

A "Withdrawal system" is defined in DEQ's Groundwater Management Regulations (Code of Virginia, 9VAC5-25-610-10) as follows:

> "Withdrawal system" means (i) one or more wells or withdrawal points on the same or contiguous properties under common ownership for which the withdrawal is applied to the

same beneficial use or (ii) two or more connected wells or withdrawal points which are under common ownership but are not necessarily located on contiguous properties."

1.3 PERMIT TYPES

ODW issues 4 types of permits, summarized in the following table. A further description of these permits and their attachments is provided in this manual.

PERMIT	ATTACHMENTS
Construction	Description Sheet of Proposed Construction (not required for some projects)
General (Local Review Program for construction of water distribution mains)	Memorandum of Understanding with VDH-ODW
Operation – Standard	Operation Permit Conditions. May also have Variance
Operation – Temporary	Operation Permit Conditions, Temporary Operation Permit Requirements. May also have Variance

FIGURE 1 - CONSTRUCTION PERMIT ISSUANCE PROCESS

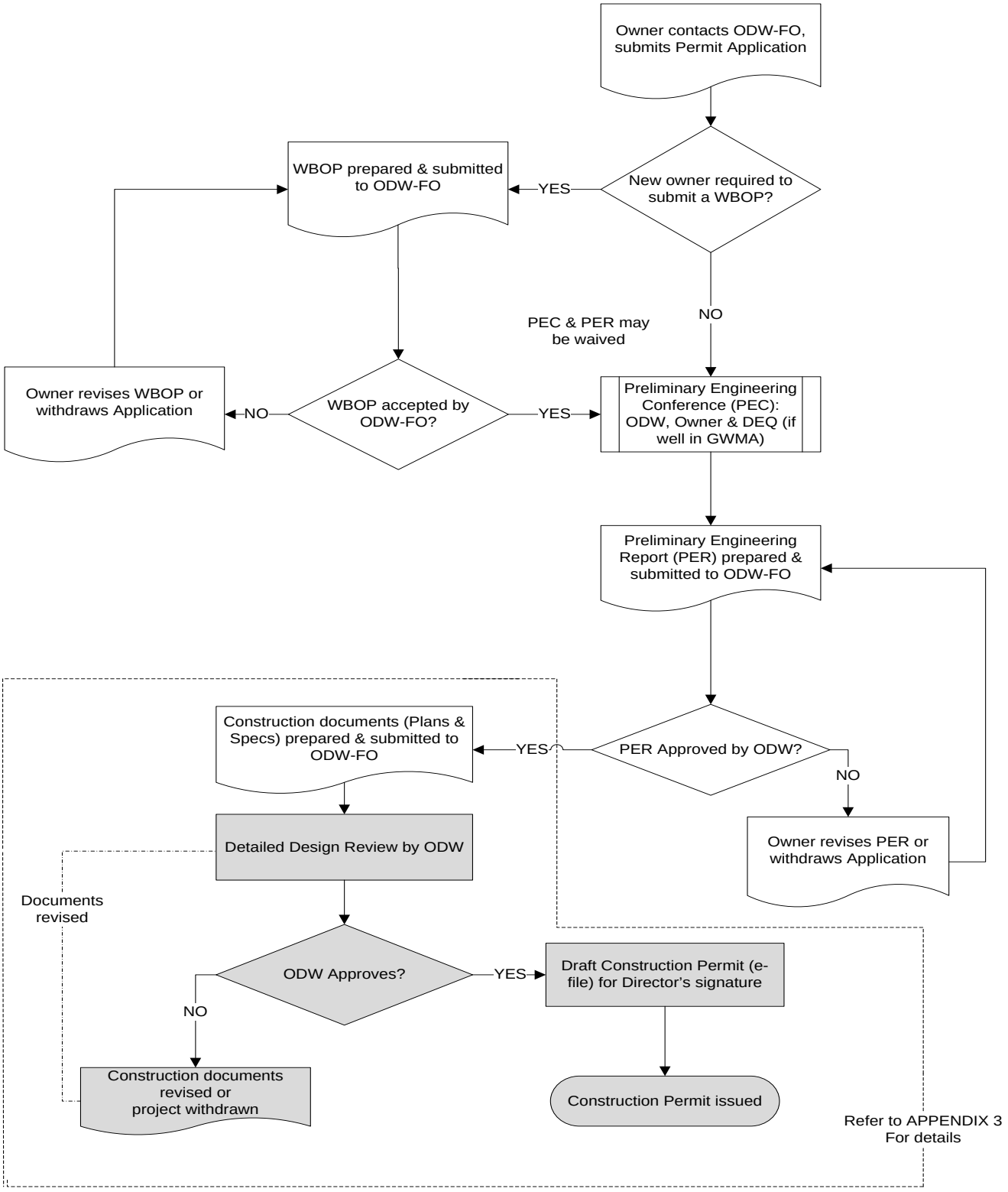
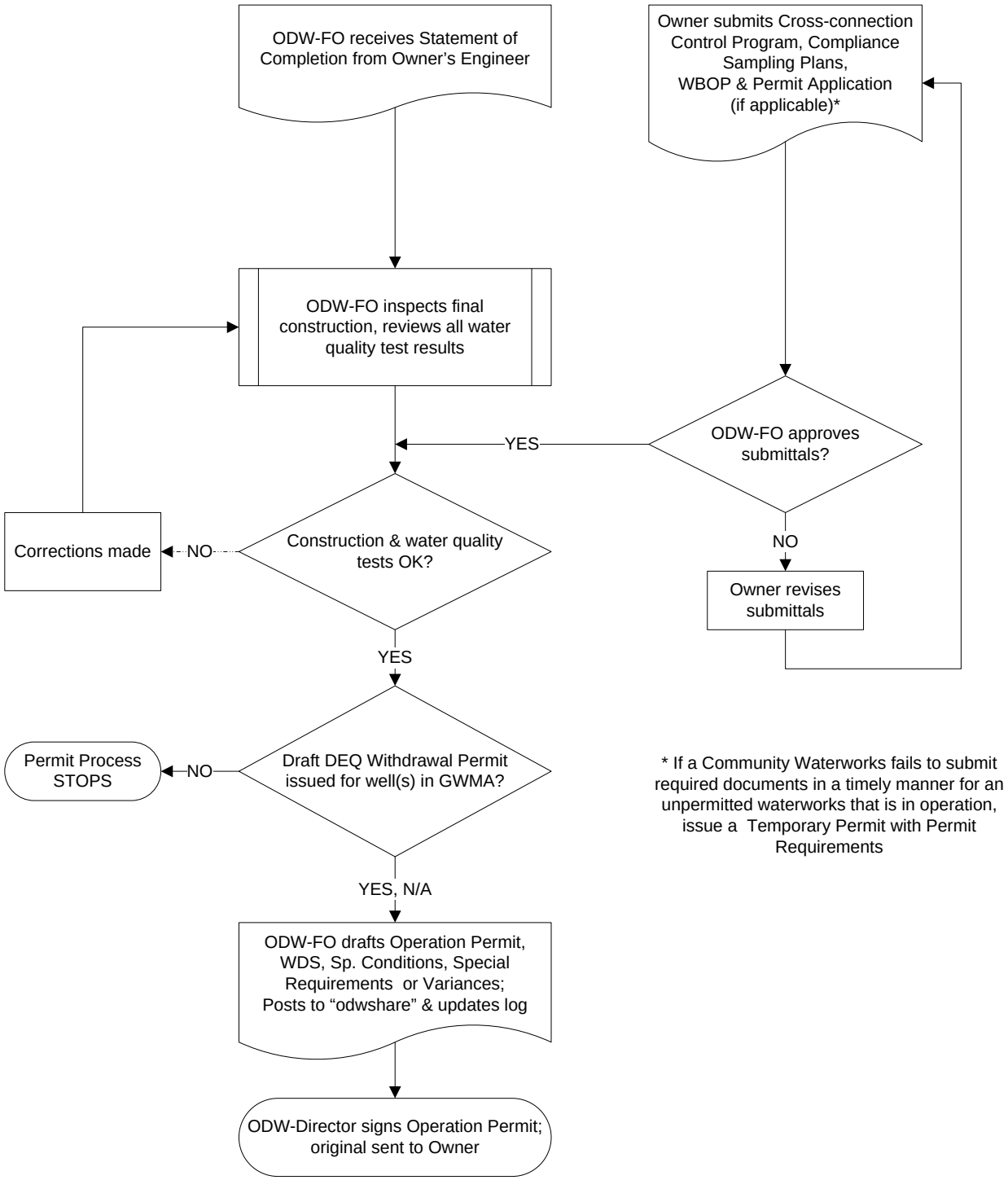


FIGURE 2 - OPERATION PERMIT ISSUANCE PROCESS



2. PRELIMINARY ENGINEERING CONFERENCE & REPORT

The Preliminary Engineering Conference (PEC) is a feasibility discussion that establishes the project's direction and scope, for construction of a new waterworks, or modification or expansion of an existing waterworks. Elements which should be included are:

- Permits and authorizations required from DEQ for surface or ground water withdrawal permits, wastewater discharge and/or disposal;
- Proposed treatment processes and complex hydraulics, particularly any potential design exceptions to the Virginia *Waterworks Regulations*;
- Impact of SDWA Rules and Regulations on waterworks operation and compliance requirements.

For prospective owners who intend to purchase an existing waterworks or develop a new one, as well as owners who are proposing an expansion or modification to an existing waterworks, a review of the owner's ongoing responsibilities and regulatory requirements after operation commences should be included in the conference. Topics may include monitoring, reporting, operator requirements, etc. At this stage, it may be useful to review a draft Waterworks Business Operations Plan for new waterworks owners. An example PEC meeting minutes template is provided in Attachment A.1.

A Preliminary Engineering Report (PER) s normally required for projects involving treatment processes (other than simple chemical solution feeders), major distribution system expansions or modifications, and those receiving State Revolving Loan Funds. A PER that includes innovative/alternative technology or design exceptions to the *Regulations* must be coordinated with the Central Office. Refer to the *Waterworks Regulations* for information required in the report. A minimum of one paper copy of the PER is required. An electronic PDF file of the final report shall also be submitted. Upon approval, the report shall be stamped approved and retained in the Field Office. If Central Office approval will be required for the project, forward an electronic copy of the final PER to the Division of Technical Services upon Field Office Approval. An example of an approval letter for a PER is provided in Attachment A.2.

The Deputy Field Director or Field Director has the discretion of waiving the requirement for a PER. This needs to be justified and documented in the project review notes, memo to the files or on the Scope and Detail checklist (Attachment A.3.).

3. WATERWORKS BUSINESS OPERATIONS PLAN (WBOP)

3.1. AUTHORITY

The requirement for a waterworks to complete a WBOP is established in § 32.1-172 of the *Code of Virginia*, which states that an application for a permit "…shall include a comprehensive business plan detailing the technical, managerial, and financial commitments to be made by the owner in order to assure that system performance requirements for providing the water supply will be met over the long term." The *Code* further states that the ODW "may require the submission of a business plan by those existing waterworks that have demonstrated significant noncompliance with the Waterworks Regulations." The term "comprehensive business plan" is synonymous with "Waterworks Business Operations Plan (WBOP)".

In addition, the *Code* allows the WBOP portion of the application to be waived if an applicant has demonstrated an acceptable history of compliance with the *Waterworks Regulations*. Waterworks owners that are governmental entities or private companies with a history of acceptable compliance with the *Regulations* will not normally be required to provide a WBOP.

3.2. APPLICABILITY

The ODW field office shall determine if a waterworks owner is required to submit a WBOP pursuant to § 32.1-172. Generally, only the following circumstances will require owners to submit a WBOP:

3.2.1. First-Time Owners

First-time owners of any new or existing waterworks are required to submit a WBOP. This also applies to transient noncommunity (TNC) waterworks owners who may need technical assistance to understand their obligations. These owners must recognize themselves as public waterworks, and have a budget (or reserve account) in place to cover the waterworks' expenses.

3.2.2. Previous or Existing Owners of Waterworks with Poor Compliance History

Any current or previous owner of a waterworks determined by the field office to be "chronically noncompliant"[1] is required to complete a WBOP when acquiring another waterworks. This requirement is to be established during the permit application process.

If an existing waterworks is determined by the field office to be chronically noncompliant, a WBOP may also be required. This will typically be part of an enforcement order issued by the Health Commissioner, and NOT part of the permit process.

3.2.3 Existing Waterworks Owners Applying for Drinking Water State Revolving Funds (DWSRF)

Applicants for DWSRF funding may be required to complete a WBOP or update an existing one prior to receiving such funds. The field office staff may be requested to review the DWSRF applications to make this recommendation. The determination should be based on a satisfactory

[1] "Chronically noncompliant" is defined in §32.1—167 of the Code of Virginia and 12VAC5-590-125 of the *Waterworks Regulations*

history of compliance (no violation notices over a 12-month period, at a minimum), and consistently good operation and maintenance practices. A review of the owner's financial capacity is needed, and will likely require assistance from the DWSRF staff. The financial review would include verification of capital improvement plans (CIPs), established reserve funds, properly set rates, etc.

3.3 PREPARER'S QUALIFICATIONS

In order to meet the intent and purpose of the WBOP, the plan must be prepared by skilled individuals who are knowledgeable in sound business practices as well as the complexity of waterworks business operations. The waterworks owner shall be responsible for the preparation, accuracy, and final certification of the WBOP. The owner may delegate this task to others having the appropriate business skills, knowledge, and expertise in waterworks operations.

3.4 RESOURCES AND ASSISTANCE

WBOP resources for the three waterworks types (Community, Nontransient Noncommunity, and Transient Noncommunity) are provided separate from this manual, and consist of handbooks, templates, worksheets, and related information. WBOP preparers should use the appropriate resources to develop the submittal for review and acceptance by the field office.

Field office staff shall provide technical assistance to direct waterworks to resource materials. This assistance should typically be offered during the PEC with prospective waterworks owners. Field office staff may recommend to the waterworks owners one-on-one technical assistance from the Capacity Development Program staff for additional assistance.

3.5 ODW REVIEW PROCEDURES

Review of the technical, managerial, and financial portions of the WBOP is required for every WBOP submitted in accordance with § 32.1-172 of the *Code of Virginia.* The Capacity Development Program staff is available to assist field office staff in reviewing the WBOP.

WBOPs that fail to demonstrate acceptable Technical, Managerial, and Financial capacities must be returned to the owner/preparer for correction.

If a new community waterworks owner fails to submit an acceptable WBOP, then a Temporary Operation Permit with a Permit Requirement to submit a WBOP will be required. Temporary Operation Permits will not be issued to 'for-profit' TNC or NTNC waterworks based solely on failure to submit a WBOP.

4. PROJECT REVIEW

4.1 PROJECT TRACKING

ODW's automated database, PTLog, shall be used to account for all activities related to the handling of reports, plans, specifications, addenda, and change orders. Projects shall be entered into the system immediately upon receipt of documents, and updated as actions are taken.

4.2 REVIEW TIME EXPECTATIONS

ODW staff will make every effort to review plans and submittals within reasonable time. The Waterworks Regulations 12VAC5-590-210 states "*All reports, plans, specifications shall be submitted to the field office at least 60 days prior to the date upon which action by the division is desired*". This implies that ODW will respond to submittals within 60 calendar days. Although the complexity of proposed projects and the available staff resources may prove the 60-day response time to be challenging or unattainable, every effort shall be made to meet this 60-day deadline.

The expectation of staff is to review new plans, specifications, and reports within 60 days. PTLog determines a Priority status for each active project. See "Project Tracking Log User's Manual" for details. In general, any new or revised submittal that has not had ODW staff action taken within 60 days will be assigned Priority 1 status. If a project is assigned a Priority 1 status, the comment section in PTLog must be completed to include dates indicating when ODW staff comments or approval are expected to be made to the waterworks. Additional information that may explain the review delay may also be included in the comment section.

4.3 SUBMITTALS

Engineering reports submitted to ODW for review and approval may include: Demonstration Studies, Treatability Studies, Alternative Design Evaluations, and Preliminary Engineering Reports. One paper copy is required from the engineer; an electronic PDF format file of the final approved report shall be provided by the engineer.

Construction drawings, record drawing, and specifications: one set of paper documents are required for initial review. For final approval, one set of paper documents and an electronic PDF format file of the final approved drawings and specifications shall be provided by the engineer. The process for document processing is presented in APPENDIX 3.

Change orders and addenda: one set of paper documents are required for initial review. For final approval, one set of paper documents and an electronic PDF format file of the final approved plan sheets shall be provided by the engineer. The process for document processing is presented in APPENDIX 3.

Final design calculations, design memoranda, and hydraulic analyses (computer model simulations) may accompany the construction plans and specifications. Only one hard copy needs to be submitted to the ODW reviewer.

Specific requirements for submittals from a licensed Professional Engineer (P.E.) are described in APPENDIX 1.

Waterworks, particularly privately-owned ones, may not always bid a project. Instead, the owner may pre-purchase equipment and include the manufacturer's literature (such as data sheets and shop drawings) in place of specifications and detailed drawings. These must be submitted together as a bound document, with the cover sheet sealed, signed and dated by a licensed professional engineer.

Maintenance activities and "replacement-in-kind" items do not generally require submission of design documents for approval.

The construction of a chemistry or biological laboratory at a waterworks requires submission of plans and specifications. However, the ODW does not issue a Construction Permit if the laboratory is a separate project. When the laboratory is included in the construction documents for a new / upgraded / modified waterworks, review this portion of the project for conformance with 12VAC5-590-760 of the *Waterworks Regulations*. Advise the owner and engineer to seek approval from DCLS for the laboratory design, if the lab will perform work that requires EPA or State certification.

4.4 SCOPE AND DETAIL REVIEW

A Scope and Detail (S&D) review is performed for all plans and specifications submitted for review, and shall be completed within 10 calendar days of receipt of submittal. A S&D is not required for Engineering Reports, Addenda, Record Drawings, or Change Orders. The form for the S&D review is provided in Attachment A.3.

If a "NO" response is given for any of the items[2] listed on the S&D checklist, the project becomes a technical "Return", and the tracking database is updated with this information. A return letter (see Attachment A.4.) is sent to the design engineer, with a copy to the project owner and funding agency, if appropriate. Project documents may be included with the return letter, or held for later review when required submittals are received.

The field office may use discretion in returning plans or proceeding with review and including scope and detail deficiencies in the first comment letter (such as a missing application). This needs to be justified and documented.

4.5 TECHNICAL REVIEW

All reviews shall include neat detailed notes and relevant calculations. All engineering calculations critical to the process shall be checked, including critical volumes, detention times, pump selection calculations and hydraulics.

No approvals will be made for water line extensions, etc. unless there is sufficient source capacity. If there is insufficient source capacity, the project should be returned unapproved, with a statement that it may be resubmitted with documented provisions of an acceptable source that meets drinking water standards.

4.6 COMMENT LETTERS

Upon completion of the review, comments on the design must be sent in writing, with a copy to the owner and funding agency, if identified. The comments should include a request for a response within 30 days. Comments should be clearly identified as requirements or

[2] Other than "permissions".

recommendations. An example of a comment letter is provided in Attachment A.5. Less significant comments or suggestions may be made verbally or by e-mail. If the engineer has not responded within the 30 days requested, then a reminder letter should be sent or a phone call made and documented in the status section of PTLog under “Reminder Sent (RS)”.

4.7. PROJECT RETURNS

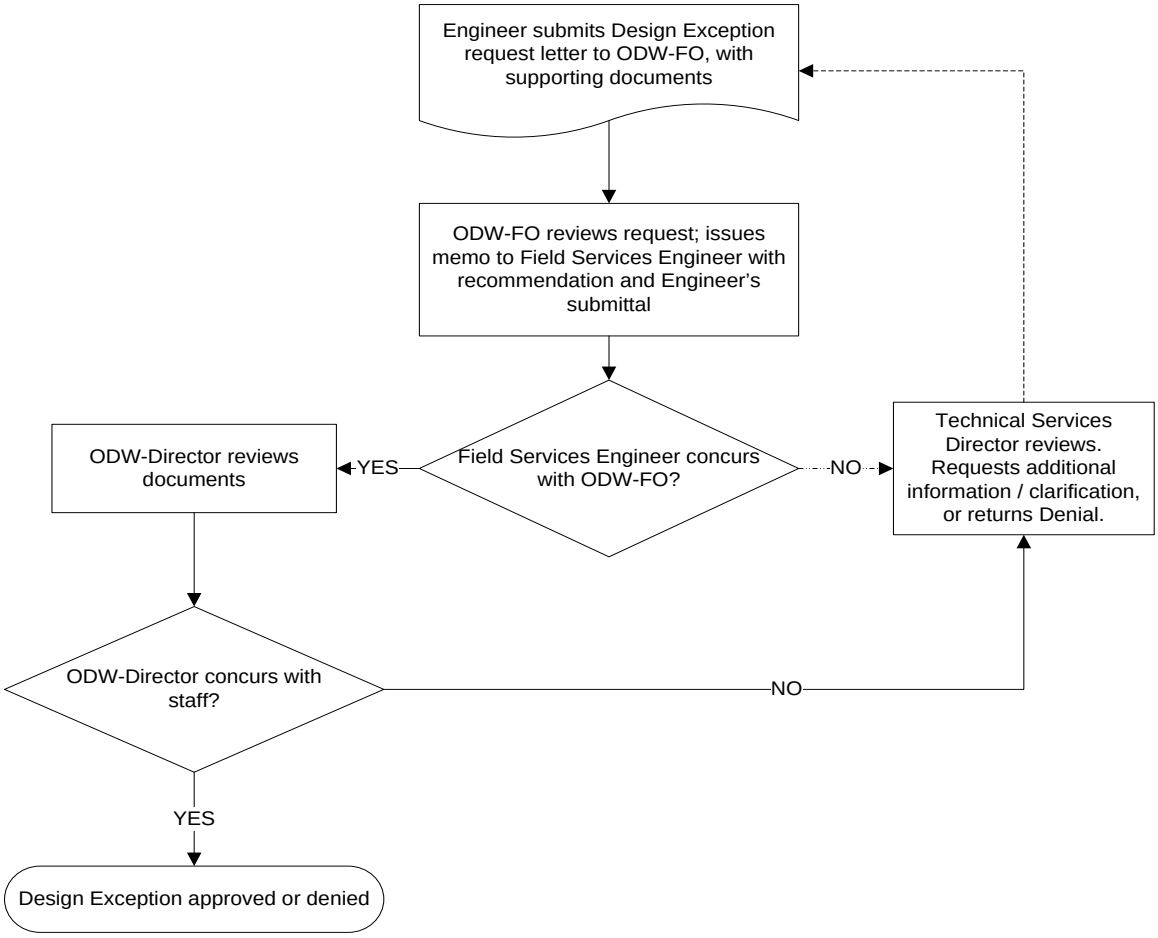
If the owner’s engineer does not address review comments within the specified time frame, the District Engineer must follow-up with telephone requests, e-mails or reminder letters. If no response is received within 10 days of one or two contacts, the documents may be returned. Use the Project Return letter format provided in Attachment A.6. Document this follow-up with the engineer in the comments section of PTLog.

4.8. DESIGN EXCEPTIONS

4.8.1. Procedure

The procedure for evaluating a design exception request is depicted in the following schematic:

FIGURE 3. Design Exception Approval / Denial Process



4.8.2. Criteria

"Exception" is defined in the Regulations as "…an approved deviation from a "shall" criteria contained in Part III (12VAC5-590-640 et seq.) of this chapter." Certain exceptions may be granted if adequate justification is provided, and the resulting nonconformity will not impact the waterworks ability to comply with the requirements for reliability specified in Part II (Operation Regulations for Waterworks) of the Regulations.

4.8.3 Approval and Documentation

Where exceptions are specifically allowed in the Regulations, a formal Design Exception Request (described subsequently) is not required, provided that the engineer submits the supporting documentation/evaluation as prescribed in the Regulations to the field office with the design submittal.

All other Design Exceptions must be documented as follows:

- Central Office approval - A Design Exception Request memorandum from the Field Office, for the Office Director's approval signature, is required. Refer to Attachment A.7 for the memo. The request must be submitted at the earliest possible time in the project review process (preferably at the PEC or PER stage), to allow the owner's engineer sufficient time to incorporate the VDH decision into the final design documents.

- Field Office approval – Until the Regulations are revised to allow the following types of design exceptions, the following may be granted by the Field Office:

    a. Air backwash of gravity filters in lieu of surface wash
    b. Reduction in maximum Cl feed capacity from Regulations' requirement of 15 mg/L
    c. Reduction in 30 day onsite supply of NaOCl
    d. Well lot plats and dedication documents for non-community waterworks (An example exception request memo is provided in Attachment A.18.)

    The Field Office approved Exceptions must also be documented with a Design Exception Request memorandum. Modify the approval signature for the Field Director's name. A copy of the design exceptions memo shall be included with the documents forwarded to the Central Office for all projects.

4.8.4. Tracking

ODW Design Exceptions granted by the Central Office will be logged into one database on "ODWSHARE" maintained by the Division of Technical Services. The Field Offices will be responsible for maintaining the datasheet for Design Exceptions originating in their respective Field Office.

4.9. EXEMPTIONS FOR TRANSIENT NONCOMMUNITY WATERWORKS

Plans for construction permits for transient non-community waterworks may be exempt from the Professional Engineer licensure requirements under the following conditions:

- The waterworks is a transient non-community waterworks with actual or proposed service to no more than 100 persons per day.
- The waterworks must be a direct delivery system without any treatment, meaning that the system consists only of one groundwater source, small pressure storage tank, and a single service connection (one structure). NOTE: Point of Entry (POE) treatment requires engineering plans and specifications.
- The single service connection consists of a structure with area less than 5,000 square feet. The determination of square footage will be performed using the outside perimeter of the single service connection.

  Example #1: Allowed Exemption: A single story structure is 80 ft long and 50ft wide
  80 ft long x 50 ft wide = 4,000 square feet

  Example #2: Not Allowed for Exemption: A 5-story structure is 80 ft long and 50 ft wide
  80 ft long x 50 ft wide x 5 (stories) = 20,000 square feet

- Construction of the well must be by a well driller with Class A contractor license. This can be verified through online access of licensed well drillers on the DPOR website.
- Construction of the remainder of the waterworks must be by a master's level plumber or Class "A" contractor.
- Information described in the checklist in Attachment A.8 must be submitted by the waterworks owner in lieu of plans, specifications, documents, and designs normally prepared by a licensed professional engineer. This information may also be better completed by the well driller or Class A contractor since they would normally be more knowledgeable in the completion of the checklist and diagram.

This exemption applies to new waterworks and modifications to existing waterworks that satisfy all the conditions listed above.

4.10. RECORD DRAWINGS (AS-BUILT PLANS)

Record drawings ("as-built" plans) are often received, but are generally not required for projects that have a Construction Permit, unless the actual construction/field conditions were substantially different from the approved plans. In this case, record drawings must accompany a fully executed change order. Record drawings cannot be approved by ODW unless the drawings are sealed by a licensed Professional Engineer.

If construction was in substantial compliance with the approved project (an engineer's letter of substantial completion was obtained which verifies this), no further action is necessary. Otherwise, review the project and modify the approval letter according to the circumstances. Projects that were constructed prior to formal approval due to emergency conditions should be reviewed, and the approval letter modified accordingly. Refer to Attachment A.9 for example letter.

Record drawings ("as-built" plans) for projects constructed illegally with no prior approvals should be reviewed as though they were for a new project. This may result in significant comments that necessitate field modifications or reconstruction. If major reconstruction is necessary, a construction permit may be appropriate. Otherwise, once an approval is possible, do NOT issue a construction permit. A new/revised Operation Permit will be required.

If ODW approval of record drawings is necessary, then final approved record drawings must be submitted in electronic PDF format and retained at the Field Office. Paper copies of the drawings should not be forwarded to Central Office. [Note: At times record drawings are submitted to ODW because the contract documents require the contractor to submit record drawings. If the project was in substantial compliance with the approved documents, then no further review is necessary.]

4.11 ADDENDA AND CHANGE ORDERS

Addenda are modifications to the construction documents after the notice to bidders is issued, but before the contract is awarded. Change orders are modifications to the documents made after the project is awarded. If these items are received prior to project approval, process them with the entire package. If received after project approval, process them as a separate project. If the changes are major, a new Construction Permit may be issued. Otherwise issue the approval without another permit and reference the original one in the approval letter.
The Field Office can approve non-technical change orders and addenda for all projects. Non-technical change orders do not typically require ODW approval, with the exception of projects funded through the Drinking Water State Revolving Fund. Technical change orders and addenda for projects originally approved in the Field Office can also be approved in the Field Office. Otherwise it must be approved by the Central Office. Refer to Attachment A.10 for the letter format. When change orders or addenda include revised drawings, these must be labeled as described in section 5.5 of this manual.

4.12. SPECIFIC EVALUATION TOPICS

4.12.1. DEQ Notification Prior to Well Abandonment

The DEQ Ground Water Characterization Program is interested in re-using former production wells for groundwater monitoring purposes under the State Observation Well (SOW) network. If a public water supply well is to be taken out of service permanently, recommend to the waterworks that they contact the DEQ Ground Water Characterization Program regional geologist to determine if the well may be of interest to them, prior to permanent well closure.

If a well is permanently abandoned, the abandonment procedure must be documented on form GW-2 and submitted to ODW and to DEQ.

4.12.2. Waste Disposal

Wastewater discharged by the water treatment plant to a receiving stream/surface water or soil adsorption system MAY require a permit from DEQ and/or EPA. Notify the DEQ Regional Office, by letter, of the proposed discharge at the earliest possible time. Refer to Attachment A.11 for the format of this letter. The waterworks owner should be informed during the Preliminary Engineering Conference to follow up with DEQ.

Disposal restrictions that may be imposed by other agencies' permits (such as spent adsorption media, particularly if radionuclide removal is performed) should be addressed by the applicant's engineer.

4.12.3. Internal Plant Recycle

The Filter Backwash Recycling Rule applies to all surface water or groundwater under the direct influence of surface water (GUDI) systems that use conventional filtration or direct filtration and

that recycle spent filter backwash water, thickener supernatant, or other dewatering process flows. Caution must be taken when considering the recycling of process waste flows within the treatment plant. When recycling is proposed, recycle flows must be returned prior to the point of primary coagulant addition, and must receive full treatment through all of the plant processes.

Recycle streams must be controlled to prevent a hydraulic surge or a hydraulic loading in excess of plant capacity. The rate of recycle return should be no greater than 10 % of the plant influent (actual flow). Additional settling of the recycle stream or recycle return to a pre-sedimentation basin is recommended, as a minimum, to obtain a more consistent influent water quality to the plant. If alternative return locations are proposed, supporting justification from the engineer is required, and the Central Office must approve the alternate location.

Lagoon water receiving flow from plant floor drains, pump drains, etc CANNOT be returned to the water treatment plant process flow stream, or upstream of a public waterworks' intake.

4.12.4. Distribution Systems

No approvals will be made for a distribution system unless an adequate source exists or is proposed.

Design fire flow (rate and duration) shall be documented by the project engineer indicating that the appropriate officials (Fire Marshall or local government building official) were consulted to establish the design fire flow.

The Code of Virginia exempts projects that consist of "the extension of water distribution pipes having a diameter of 8 inches or less and serving less than fifteen equivalent residential connections" from obtaining a Construction Permit. The 15 equivalent residential connections are the determining factor, NOT the fire flow. The exception was not intended to allow owners to phase construction of large waterline extension projects, in order to circumvent the permit requirement. A licensed engineer must design exempt projects, as stipulated in the Code of Virginia. Enforcement of the licensed engineer requirements is the responsibility of the Department of Professional and Occupational Regulation (DPOR).

The owner may obtain VDH approval for Standard Specifications and Plan Details. Thereafter, only submission of the plans is required, provided that they reference the approved standards and details.

4.12.5. AWWA Disinfection Standards

Engineering specifications for disinfection of storage tanks and waterlines may reference the applicable AWWA standards or the Regulations. Since the AWWA Standards are copyrighted, duplication of the AWWA Standards in the specifications is in violation of the copyright, and cannot be required.

5. CONSTRUCTION PERMIT

5.1. PERMIT AND DESCRIPTION SHEET OF PROPOSED CONSTRUCTION

A construction permit number is assigned in the Field Office. The construction permit number contains six (6) digits. The first digit is the assigned Field Office number (1-Abingdon, 2-Lexington, 3-Southeast, 4-East Central, 5-Danville, 6-Culpeper). The next three numbers are sequential numbers, with each new calendar year beginning a new sequence, starting at 001. The last two digits represent the calendar year in which the permit is issued.

A Construction Permit is written in accordance with the format given in Attachment A.12. Issuance and expiration dates are written on the permit at the same time that the plans and specifications are signed and dated. The expiration date will post cede the issuance date by five years. Add at least five working days to the date on which the permit (electronic document) is posted to "ODWSHARE". All construction permits must be signed by the Office Director.

Construction permits are usually accompanied by a Description Sheet of Proposed Construction, which is provided in Attachment A.13**.** The Description Sheet, when used, must contain an evaluation of the design capacity of the project only, and wording in the final paragraph that indicates to the owner that the capacity will be re-evaluated for the waterworks' Operation Permit.

Projects that require a separate Description Sheet of Proposed Construction include the following:

- Projects resulting in changes to the waterworks operation permit capacity
- Projects approved by the Central Office
- Projects that require a capacity evaluation of more than one process or component.

Projects that are approved in the Field Office and do not require a separate Description Sheet of Proposed Construction include the following:

- Waterline extensions and transmission mains
- Simple projects that do not affect waterworks capacity, such as solution-type chemical feed systems and filters without backwash features.

The projects without a separate Description Sheet of Proposed Construction must be described sufficiently in the permit. By example: "This project consists of the addition of a sodium hypochlorite feed system which includes a 50 gallon solution tank and 20 gph diaphragm metering pump."

5.2. PROJECTS APPROVED BY CENTRAL OFFICE

Projects to be approved by the Office Director must be packaged and sent to the Technical Services Division (attn: Field Services Engineer) for review and approval. Electronic files of the draft Construction Permit and Construction Description Sheet must be uploaded to "ODWSHARE". The package must include the following paper documents:

1. Transmittal Checklist – Central Office Project Approval **(**see Attachment A.14.**)**
2. Permit Application
3. One paper copy of plans, specifications, addenda and change orders
4. Copies of design notes and calculations
5. Copies of all correspondence and emails

One copy of the construction documents (plans, specifications, addenda and change orders), once approved by the Central Office, will be signed by the Director and returned to the field office, with a copy of the construction permit. The Central Office will mail the original construction permit to the waterworks owner. The Central Office will also make and mail copies of the permit to all parties listed, with addressed envelopes provided by the Field Office. Documents will not be returned to the owner with the signed Construction Permit.

5.3 PROJECTS APPROVED BY FIELD OFFICE

The following types of projects will generally be approved by the field office:

a. Water line extensions.
b. Raw water lines and transmission mains
c. Distribution system booster pump stations.
d. Distribution system storage tanks with an individual nominal volume $\leq$ 1 MG.
e. A simple groundwater system consisting of wells, transfer booster pumps, hydropneumatic tanks (including bladder tanks), and/or gravity storage tanks.
f. Metering pump and solution tank – type treatment systems, such as sodium hypochlorite for disinfection, phosphate for sequestration or corrosion control.
g. Cation exchange water softener.
h. Sodium Fluoride Upflow Saturator
i. Iron and Manganese removal filters.
j. Non-technical change orders and addenda, including those for water treatment plants originally approved in the Central Office.
k. Standard utility specifications. (Local Review Programs / General Permits must be approved by the Central Office).
l. Preliminary Engineering Reports. If a Design Exception request is included, Central Office approval is required. If the design exception was granted prior to submission of the PER, or if the design exception can be granted by the field office, then the field office may approve the PER.
m. Pilot Plant study reports. Discuss results and conclusions with Central Office Division of Technical Services and obtain concurrence prior to approval.
n. Evaluation reports of full-scale technology (demonstration studies). Discuss results and conclusions with Central Office Division of Technical Services and obtain concurrence prior to approval.
o. Record drawings (“as-builts”).

The project documents will be processed as follows:

- The field office will post the electronic document file of the draft Construction Permit on “ODWSHARE”, and update the tracking spreadsheet when the permit is ready for the Office Director’s signature.
- After the permit is signed, it will be scanned into PDF file format, and the electronic PDF file will be posted on “ODWSHARE” and the spreadsheet updated by Central Office staff.
- Central Office will mail the original signed permit to the Field Office. The Field Office will mail the original construction permit to the waterworks owner. The Field Office will also make and mail copies of the permit to all parties listed. Documents will not be returned to the owner with the signed Construction Permit.
- The field office will complete the Transmittal Checklist - Central Office Files (Attachment A.15) and mail the required documents listed on the Checklist to Central Office for the fileroom.

5.4 WELL DATA

A web-based database, VA Hydro, has been developed to serve as the main repository of Water Well Completion Reports (GW-2 forms) for all drilled, modified and abandoned wells in Virginia. It is accessible to registered Water Well System Providers (well drillers), and registered DEQ and VDH staff at http://deq2.bse.vt.edu/d.dh/?q=user. Each Field Office has a primary and alternate staff member with login credentials to VA Hydro.

DEQ will monitor VA Hydro entries and send notifications of new entries to the ODW Special Projects Engineer. The Special Projects Engineer will download electronic GW-2s, post them in the folder:

odwsrv1\odwshare\14-Permits & Project Review\02-Well Data scanned\VA Hydro GW-2s,

and send email notification of their availability to affected Field Office Directors and Deputy Directors. The Field Office Directors will share the notification with appropriate District Engineers and Inspectors.

Every completed hardcopy GW-2 form received by ODW will be scanned by the Field Office into a single PDF file (ensure well location coordinates and datum, PWSID, and SDWIS well identification number are included), and uploaded to:

odwsrv1\odwshare\14-Permits & Project Review\Well Data scanned\FO upload,

along with the following files:

- Yield and Drawdown Test (for new or modified wells),
- Well development chemical test sample results (for new or modified wells). R&R shall be utilized to create a report of all chemical sample results for the new well. Use the "Owner Report" function in R&R to produce a chemical report for the new well. (See R&R Manual). This report can be exported directly from R&R into a pdf file.

The file naming scheme will be the 7-digit PWSID number, followed by the SDWIS well identification number (i.e. 3165011WL002.pdf). The ODW Field Services Engineer will forward the uploaded well data files to DEQ on a quarterly basis, using the VITAShare file transfer service.

5.5. DOCUMENT LABELS

Paper copies of specifications, reports, addenda, change orders and field orders shall bear an approval stamp containing the following information, and retained in the field office until final inspection has been completed. (see section 5.3).

Virginia Department of Health
Office of Drinking Water
Approved by _____
Office Director
Date_____

5.6. ELECTRONIC PLAN SUBMISSION

The engineer must submit final plans and specifications in both electronic pdf format and in paper copy bearing the original PE seal. The paper copies are the official submittal for approval, and the electronic copies will serve as the archived documents. Central Office will not collect and scan plans.

The field office will also maintain paper copies of the plans and specifications until the project is complete and ODW has conducted the final inspection and approved the project for operation. At the field office director's discretion, paper copies may be retained longer, as space allows. The field office will retain electronic copies of documents on their computer server.

5.7. EXPIRED CONSTRUCTION PERMITS

Occasionally, construction of a project is delayed and the Construction Permit expires before construction is started. Construction Permits expire after 5 years, and extending the Permit expiration date is **not allowed**.

If the Owner wishes to construct the project in accordance with the previously-approved plans and specifications, then a new Construction Permit is necessary. The new Construction Permit (with a new Permit number) must reference the previously-expired Construction Permit in the first paragraph. The new Construction Permit should also indicate that the plans and specifications were previously approved on "x/y/z" date. ODW staff shall ensure that the plans and specifications have not changed and are still applicable. If the plans and specifications are still applicable, no further project review documentation is necessary.

5.8. COMPLETED CONSTRUCTION PROJECTS

Upon completion of construction, the owner shall submit a statement signed by a professional engineer licensed in Virginia certifying that the work was completed in accordance with the approved documents. Depending on the scope of the project[3], ODW staff will make a final inspection of the project to determine that the project was constructed in accordance with the approved plans. ODW staff shall not certify that the construction has been substantially completed; this is the design engineer's responsibility. A final inspection letter template is provided in Attachment A.17.

Once the engineer's letter of substantial completion has been received, ODW final inspection performed (if necessary), and all bacteriological samples are acceptable, the project may be placed into service and the Operation Permit amended, as necessary.

5.9. CHANGES TO PROJECTS UNDER CONSTRUCTION

Change orders to projects under construction will not normally require a new Construction Permit; with the possible exception of those funded by the State Revolving Loan Program. In those cases field office staff must verify whether all federal contract requirements will be met with the SRLF Project Engineer in order to make a determination.

[3] A project that may not require an ODW final inspection is a waterline that is not financed by the State Revolving Loan Fund.

5.10 ALTERNATE PROJECT DELIVERY

Alternate project delivery methods are frequently utilized for utility construction projects, and may provide the owner advantages over the traditional “design-bid-build” delivery method. These projects provide a fast track to project completion, by allowing construction to begin before the final design is complete. Common examples of alternate project delivery methods include “design-build” and public-private partnerships.

Issuance of a Construction Permit prior to beginning construction is required per *§32.1-172* of the Code of Virginia. To accommodate alternate project delivery projects, ODW will issue a Construction Permit with Conditions. This will allow for ODW staff to review and approve preliminary plans so that construction can begin. The Conditions will require the review and approval of final plans prior to completion of construction.

Alternate Project Delivery Construction Permitting Steps:

1. Preliminary Engineering Conference to establish submittal requirements and procedures, including Preliminary Engineering Report (PER), preliminary and final plans, specifications, meetings, permit issuance, field inspections, completion statements, etc.
2. PER submitted and reviewed by ODW.
3. ODW must determine submittal requirements to ensure the project will meet applicable regulations such as LT2 Rule, GWR, etc. prior to the Post-PER Conference,
4. Post-PER Review Conference to establish the requirements of the preliminary submission(s). The requirements for submission and approval of the preliminary plans, specifications, etc. must be identified and documented, since final documents will not be submitted prior to issuance of a Construction Permit. The submission requirements shall include, at a minimum: preliminary drawings (process flow schematic, site plan), draft specifications, and design calculations (design flows, loading rates for all units, hydraulic profiles), functional description of alarms controls and backup power, etc.
5. Submission and review of preliminary plans, specifications and design calculations. Preliminary documents may be 30% complete, 60% complete, or as agreed upon at the Post-PER Conference. Design Exceptions should be identified by this step, if not sooner. The preliminary documents shall be sealed by a Professional Engineer. To distinguish the preliminary from final documents, the engineer may stamp “Preliminary” on the drawings, specifications, etc.
6. Issuance of Construction Permit with Conditions. An example Construction Permit with Conditions is provided in Attachment A.19. Specific conditions will need to be establish that:
    a. Construction must adhere to *Waterworks Regulations* Part III, Manual of Practice for Waterworks Design.
    b. Failure to comply with the *Waterworks Regulations* will require corrections to achieve compliance with the *Waterworks Regulations,* regardless of construction status.
    c. At least 180 days (days may be adjusted as appropriate) prior to completion of construction, a complete set of final plans and specifications must be submitted to the ODW Field Office for review and approval. The plans and specifications

must be properly signed and sealed by a professional engineer licensed in Virginia.

d. Any deviations from the approved preliminary documents affecting capacity, hydraulic conditions, operating units, the functioning of the treatment processes, or the water quality delivered, must be approved by ODW before any such changes are made.

7. ODW staff must communicate with owner and engineer throughout the construction process to minimize the risk of construction components not meeting the requirements of the *Waterworks Regulations* Part III. This may require the attendance at construction meetings, site visits, review of progress reports, or phone conferences.
8. Approval of Final Plans (Modify Attachment A.10 for Change Order approval and replace with "Final Plans and Specifications", as appropriate)
9. Construction completed.
10. Receipt of Letter of Substantial Completion from engineer
11. Final inspection by ODW staff,
12. ODW approval letter authorizing the owner to place the constructed waterworks in service.

6. NEW OR NONCONVENTIONAL METHODS, PROCESSES, AND EQUIPMENT

Projects involving the evaluation and approval of new or nonconventional methods, processes and equipment will be issued a Temporary Operation Permit (formerly Provisional Operation Permit) upon completion of construction. All such proposals must be coordinated through the Central Office. Temporary Operation Permits and expiration dates are tracked in "R&R".

7. GENERAL PERMIT & STANDARD SPECIFICATIONS

12VAC5-590-300 of the *Waterworks Regulations* provides the basis for all approved local review and approval programs. This is a two step procedure to delegate, by General Permit, plan review authority involving water distribution mains to a waterworks owner, or their representative.

7.1. PROCEDURE

STEP ONE: The waterworks owner must first adopt, and then obtain VDH Office of Drinking Water approval of General Specifications and Plan Details (Standards) covering all aspects of water distribution mains. The requirements of these specifications must be at least as stringent as the requirements of the latest Waterworks Regulations. These Standards shall be prepared by a professional engineer licensed to practice in Virginia[4].

STEP TWO: The Waterworks owner shall enter into a Memorandum of Understanding (MOU) with the VDH Office of Drinking Water outlining waterworks-specific provisions and the owner's method of compliance. The sample MOU in Attachment B.1 provides typical language. These provisions, at a minimum, include the following:

[4] A June 2005 APELSCIDLA ruling clarified that Regional Construction Standards do not need to be sealed by a professional engineer; however, project specific documents which incorporate, in whole or in any part thereof, and/or modify such standards are required to be sealed by a professional engineer.

A. The maximum size of pipe covered by the General Permit. This is intended to only include distribution mains (as opposed to transmission mains). This has generally ranged from 12-inch to 16-inch diameter. See the definitions in the Waterworks *Regulations* if you need further clarification.

B. The procedure to amend or modify the General Specifications. This is handled differently by utilities: some update specific sections or pages, others revise their entire standards. More detailed language may be needed to define procedures.

C. The waterworks owner must maintain (or retain) adequate engineering staff to conduct plan reviews. Adequate staff means at least one individual licensed as a Professional Engineer (P.E.) in Virginia with at least two years of experience in the design and construction of water distribution systems, or an individual with a governmental exemption. The P.E. must sign their approval on all projects processed under the General Permit.

D. The MOU must require that engineering plans and specifications be prepared for each individual project prior to any construction. The General Permit does NOT allow a waterworks owner to construct water distribution mains without project specific plans. Projects where the waterworks owner acts as both design engineer AND review engineer, are not allowed when review authority has been delegated from VDH to the owner. Exceptions will only be granted when there is documented proof to VDH of a clear separation of design and review responsibilities, i.e. different departments or divisions etc.

E. The general distribution system map(s) of the waterworks must be updated annually. Records, including copies of all project documents and approvals must be available for VDH inspection.

F. The waterworks owner agrees to submit an annual report (Attachment B.2 and project summary report (Attachment B.3.) of each project approved and/or constructed under the terms of the MOU and General Permit. This would include any related or supporting documents deemed necessary.

Once Steps One and Two are successfully completed, a General Permit for Distribution Mains may be issued with the MOU attached. The General Permit template is included in Attachment B.4. A sample transmittal letter to the Waterworks' owner is given in Attachment B.5.

7.2. MULTIPLE WATERWORKS WITH SAME OWNER

A General Permit may be issued to an owner of multiple waterworks. In these cases, the General Permit shall clearly define which systems are covered, either by listing specific systems or describing the geographical jurisdiction of the owner.

7.3 FIELD OFFICE JURISDICTION

If a waterworks' service area crosses ODW field office boundaries, the General Permit shall be issued by the same field office that issued the waterworks' Operation Permit. Design standards shall be reviewed and approved by the permitting office. A copy of the approved standards shall be provided to all other field offices affected by the General Permit.

7.4. EXPIRATION DATE AND REISSUANCE OF GENERAL PERMITS

The typical duration of a General Permit is 5 years. After a review of the utility's adherence to the MOU, the General Permit may be reissued. If the *Waterworks Regulations* have been revised during the General Permit period, then the utility's standards must be reviewed and updated to comply with the regulations as it pertains to waterline extensions, prior to reissuance of the General Permit.

7.5. REPORTING AND AUDIT OF LOCAL REVIEW PROGRAMS

Prior to reissuance of the General Permit, ODW staff will inspect the utility's program records and audit at least one set of plans. The program shall be audited for conformance with the MOU. An example audit review form is included in Attachment B.6.

7.6 PROCESSING AND TRACKING GENERAL PERMITS

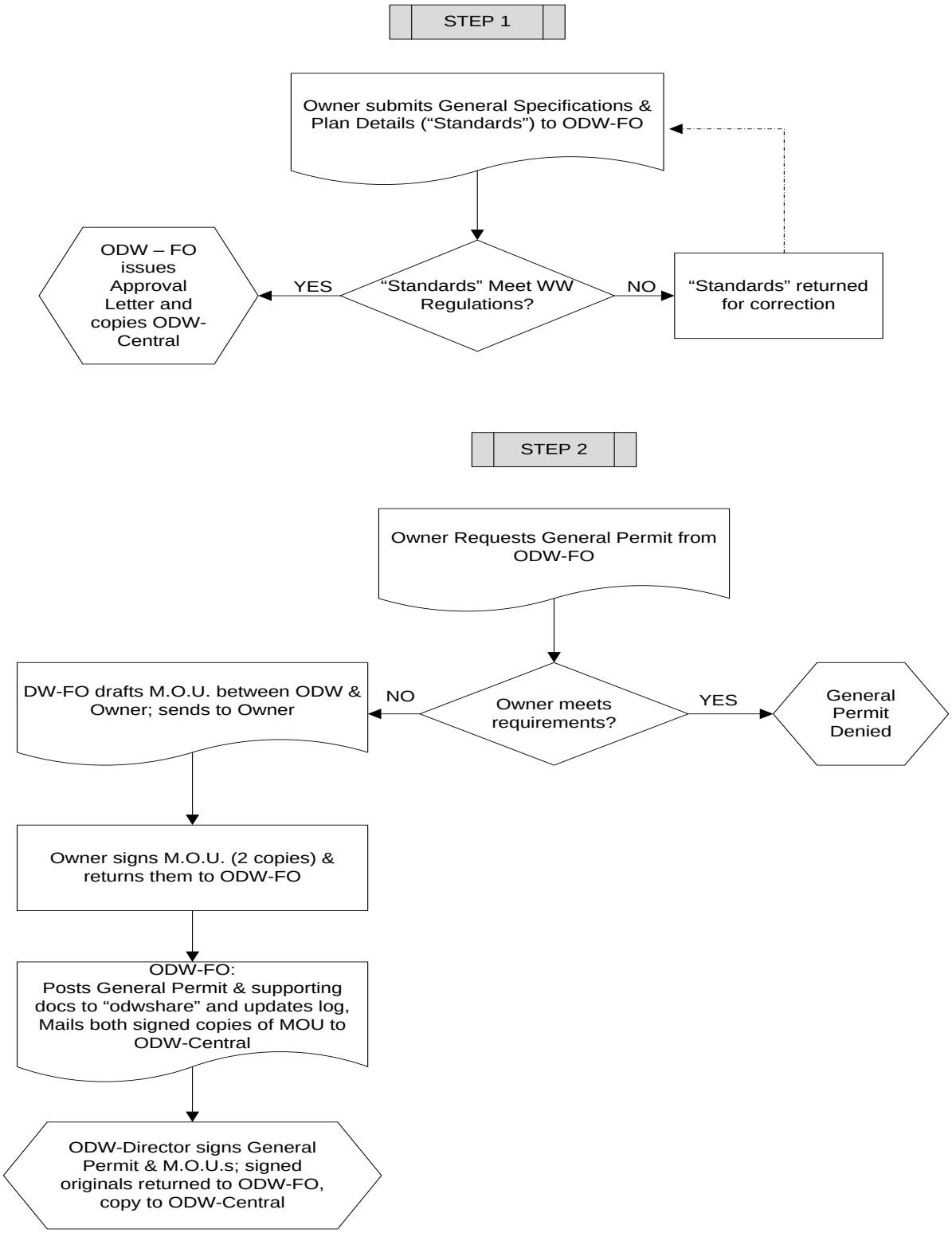
A tracking log (Excel workbook) of General Permits and Standards approved will be maintained on "ODWSHARE". Field office Directors/Deputy Directors will be responsible for updating this log for their respective field office.

General Permits are assigned permit numbers in the same manner as Construction Permits.

The field office will obtain the owner's signature on two copies of the MOU, and will mail both copies of the MOU to the Central Office (attn: Division of Technical Services) to obtain the Office Director's signature. At this time the field office will also upload electronic files of the General Permit and supporting documents (audit, project summary form, annual report form, etc.) to "ODWSHARE", and update the log.

After the General Permit and MOU are signed by the Director, the Central Office will mail the General Permit and both copies of the MOU to the field office for distribution. The Central Office will update the tracking log and retain a copy of the General Permit and the MOU.

FIGURE 4. General Permit Issuance Process



8. OPERATION PERMIT

8.1 GENERAL

12VAC5-590-190 of the Waterworks Regulations requires all public waterworks or water supplies in Virginia to be operated under the authorization of an Operation Permit issued by the Commissioner. This authority has been delegated to the Office of Drinking Water (ODW).

ODW issues new Operation Permits for the following situations:

1. New waterworks identified
2. New waterworks constructed

ODW issues Amended Operation Permits for the following situations:

1. Changes in ownership, name, waterworks classification or type
2. Changes in permit capacity
3. Changes to the treatment process or equipment
4. Changes to the storage or distribution systems[5]
5. Reactivation of existing waterworks (with or without changes in ownership, name or system type)
6. Issuance of Variances, Temporary Permit Requirements, or Operation Permit Conditions
7. Correction of previous permit errors

The legal owner (individuals, partnerships, corporations, governmental bodies, etc.) of a drinking water system shall be issued an Operation Permit. "Legal owner" is generally understood to mean the entity that owns the property where the source is located, and the waterworks' major appurtenances. If a facility owner leases the facility, the Waterworks Owner will be the facility owner (leasor) and the Operation Permit should be issued to the facility owner. [By example, John Deer is the landlord and Jill's Restaurant leases the building. The Operation Permit shall be issued to John Deer, not Jill's Restaurant.] In very limited circumstances, it is permissible to issue the permit to an entity other than the legal owner, if there is a contractual agreement between the owner and the entity to which responsibility is being assigned. ODW shall not provide legal advice to the owner, but should look for these features in the agreement:

- Address issues of access
- Identify the infrastructure (physical elements of the waterworks)
- Assign responsibility for maintenance, repair, and replacement of infrastructure
- Assign responsibility for compliance with the Regulations
- Identify the duration of the agreement

Two types of operation permits are described in section 1 of this manual: Standard and Temporary. Templates for each type of Operation Permit are given in Attachments C.1 and C.2, respectively.

Each type of Operation Permit consists of a permit plus Operation Permit Conditions. The Conditions include operator, treatment technique, operation, monitoring and reporting requirements, and the waterworks' permitted capacity. The format and content of the Operation Permit Conditions is given in Attachment C.3. Temporary Operation Permits will also have "Temporary Operation Permit Requirements", as shown in Attachment D.4.

[5] Distribution system storage, pumping, or water line extensions that have no impact on permitted capacity do not require a permit amendment.

Standard Operation Permits will NOT be issued conditionally (i.e.: an action is required first, such as the drilling of a new well, or testing of a pump to determine/verify capacity). A Temporary Permit, with Temporary Permit Requirements, will be issued to address the actions required, including provisions of permit application submittals.

8.2 INSUFFICIENT DATA FOR CAPACITY DETERMINATION

The reliability status shall be firmly established before determining whether to issue an Operation Permit, or which permit type (Standard or Temporary). Where insufficient data is available to establish hydraulic capacity, but a decision has been made to reissue the permit for the existing services, then "existing" should appear in the WDS, Operation Permit Conditions, and Operation Permit. By example,

- TNC waterworks is issued a permit with capacity stated: "One existing structure with 80 existing restaurant seats"
- NTNC waterworks is issued a permit with capacity stated: "existing service up to 950 students and staff".

8.3. FORMAT

The Standard Operation Permit appearance (layout, fonts, line spacing, etc.) must be maintained in all permits submitted for signature. The following guidelines must be followed:

1. Only general references to the Code of Virginia and the *Waterworks Regulations* are used in the operation permit, as shown in the template.
2. Designate waterworks class and operator class in Arabic numerals, or note as "unclassified". Refer to the *Waterworks Regulations* and ODW guidance for more information on this determination.
3. Designate non-transient non-community and transient non-community status without hyphens or slashes.
4. Do not include "VA" in the permit number.
   Underlines are not to be used in the fill in portions of the permit, except for an underline for the Director's signature).
5. If a city is the owner, then issue to "City of…" For a town, use "Town of…" Do not include the County name for cities and towns.
6. If the "name of the service area" is subject to change because the tenant is not the property owner (as is the case with some transient non-community systems), a property address and/or description may be substituted for a proprietary name.

8.4 OPERATION PERMIT NUMBER

All permit numbers will be assigned and maintained at the Field Offices. The PWS Identification Number will be used as the Operation Permit Number. This is a seven-digit number as follows:

1st Digit: Field/Satellite Office Number
- 1 – Abingdon
- 2 – Lexington
- 3 – Southeast
- 4 – East Central
- 5 – Danville
- 6 – Culpeper

Digits 2 – 4: Locality Code (See APPENDIX 2)

Digits 5 – 7: Sequence Number

The sequence number ranges from 000 through 999. The system will accommodate 1,000 waterworks in each city or county. Previously assigned numbers maintain an alphabetical series for each city and county. New waterworks are assigned a sequence number based on the alphabetical name, using a number halfway between two existing numbers in the alphabetical order.

Waterworks that have been inactivated, and become active with or without a change in ownership, name or waterworks classification, shall retain the previously-issued PWSID and Operation Permit number.

8.5 OPERATION PERMIT CONDITIONS

An Engineering Description Sheet will no longer be attached to new or amended Operation Permits. Instead, Operation Permits will contain an attachment titled “Operation Permit Conditions”.

The Conditions will include a Capacity Evaluation, itemizing source, treatment, storage and delivery capacities, and the waterworks overall Permitted Capacity. *All treatment* must be specified in the operation permit conditions, including treatment that was voluntarily added by the waterworks owner. In-depth descriptions of the waterworks - treatment unit details, distribution system details, and capacity calculations - will be provided in a separate Waterworks Description Sheet (see section 8.6).

The Operation Permit Conditions will contain operator and attendance requirements for the waterworks. All federal Treatment Technique requirements will also be listed in the Conditions. This could include:

- Specific log inactivation requirements (Surface Water Treatment Rule, LT2 Rule, and the Groundwater Rule);
- Turbidity removal requirements (Surface Water Treatment Rule)
- Water quality parameters (Lead & Copper Rule).

The Conditions may also include additional operation, monitoring and reporting requirements for specific treatment processes, such as UV Disinfection and Membrane Filtration (as previously listed in the former “Special Permit Requirements”. It is optional to back-populate old permit dates, but it is required for all new re-issuances.

8.6 WATERWORKS DESCRIPTION SHEET

A Waterworks Description Sheet (WDS) will be written for each Waterworks as shown in Attachment C.5. The WDS will provide important system information, including a description of the entire waterworks, all treatment processes, and a detailed capacity evaluation as described in the examples provided in this manual.

The WDS is not an attachment to the Operation Permit, but rather a stand-alone document. The WDS will be kept up-to-date by the Field Office. The Field Office must forward a copy of the updated WDS to Central Office files for record keeping.

The WDS will include the effective date of the current Operation Permit. Historical Operation Permit numbers and issuance dates should be included on all newly written WDSs, to clarify ownership, name, or classification changes, or to describe inactive periods.

If a Groundwater Withdrawal Permit has been or will be issued by DEQ, then include in the WDS a section "Other Permits" the following language:

> "The Department of Environmental Quality has issued (or intends to issue) a Groundwater Withdrawal Permit No. (*insert Permit number, if known)* for these sources." Include the permitted withdrawal values, typically a maximum annual and a maximum monthly quantity. Do NOT attempt to translate this number into a waterworks permit capacity.

Add the following language to "Other Permits":

> "Compliance with the conditions and requirements of the Groundwater Withdrawal Permit shall not limit the authority of the Health Department to assign capacity to the waterworks, based on the evaluation as follows."

8.7 PRIMARY AND CONSECUTIVE WATERWORKS

Primary waterworks own at least one active source of raw water.

Consecutive waterworks receive finished water from one or more other waterworks.

A waterworks may be considered both a primary and a consecutive waterworks, if both criteria (listed above) are satisfied.

The sum of the storage on both the primary and consecutive waterworks should be adequate for the sum of the connections, as demonstrated by computations and/or hydraulic modeling. Consecutive waterworks are NOT required to have separate storage when it is adequately provided for and can be reliably delivered by the primary waterworks. An allocation of both source and storage between the primary waterworks and consecutive waterworks shall be identified in the WDS of the primary waterworks. This allocation shall be tabulated as shown in the example WDS provided in Attachment C.5.

The District Engineer will identify and obtain a copy of any contractual agreements and limitations on water transfer between primary and each consecutive waterworks. ODW will encourage all consecutive waterworks to obtain firm gallons-per-day contracts, so that their growth will not be limited by another waterworks' service area growth. Allocations of source (production) capacity and storage should be defined in the purchase agreement.

Permitting of consecutive waterworks shall follow these procedures:

- Identify point(s) of water transfer. Identify and obtain a copy of any contractual limitations on water transfer.
- Identify any physical or design limitation on water transfer (for example, a pump station may establish the capacity at a particular connection).
- Identify water transfer limitations due to primary source capacity and primary system water use (the sum of the parts $\leq$ the whole).
- The permitted capacity of the consecutive waterworks shall be the lowest identified capacity limitation.

In cases where a waterworks does not have a contractual or written agreement (or the contract does not stipulate a quantity), but on-going receipt of water can be demonstrated, the historical

water usage shall be used as a basis for allocating waterworks capacity. The maximum monthly consumption over a period of at least 2 years is recommended as a capacity value. Background information and additional rationale shall be included in a transmittal memo with the permit to the Central Office.

When a Temporary Operation Permit for the consecutive waterworks (purchaser) is issued, the expiration date of the permit and the purchase contract shall be the same.

Verify the applicable Combined Distribution System schematic located on "ODWSHARE", and include a paper copy of any revisions with the Operation Permit to the Central Office.

8.8 OPERATION PERMIT PROCESSING AND ROUTING

The District Engineer (DE) is responsible for the permit program within the district. The DE will prepare or supervise the preparation of a permit and necessary documents for each waterworks within the district, and conduct all investigations necessary to insure that the permit is accurate. The Deputy Field Director shall provide a technical review of the Operation Permit and all attachments before forwarding to the Field Director (FD).

The FD is responsible for all aspects of the permit program within the Field Office region. The FD reviews the permit and associated documents. The procedure for processing Operation Permits shall be similar to that for Construction Permits:

- The field office will post the electronic document file of the Operation Permit, Operation Permit Conditions, WDS, Operation Permit Transmittal Form, Variance, Exemption, or Temporary Permit Requirements, and all other attachments on "ODWSHARE", and update the tracking spreadsheet.
- The effective date of the permit shall be at least five working days after the date on which the permit (electronic document) is posted to "ODWSHARE".
- After the permit is signed, it will be scanned into PDF file format, and the electronic PDF file will be posted on "ODWSHARE". Central Office staff will update the spreadsheet and mail the original signed Permit to the Field Office.
- The Field Office will mail the final operation permit and attachments to the waterworks owner.
- The Field Office will also make and mail copies of the permit to all parties listed.

When the signed permit is received back in the Field Office, the DE prepares a transmittal letter given in Attachment C.6, and mails the permit with attachments to the owner**.** The transmittal letter contains sample paragraphs that may be included for the following circumstances:

- Permit is an amended permit;
- Waterworks is "grandparented" (serves to notify the owner that the "grandparented" status may be terminated by expansion, modification, failure to maintain reliability, or future sale);
- Temporary Permit is being issued with Temporary Permit Requirements attached (described in Section 8.11 of this memo);
- Operation Permit Conditions are attached;
- Variance is included;
- Waterworks has been, or will be, issued a draft or final Withdrawal Permit by DEQ.

8.9 VARIANCES

Variances, when granted, are usually issued with an operation permit. They may be issued separately, without amending an existing permit. Variances only apply to Part II of the Regulations. When issued with the operation permit, the variance shall be transmitted with the permit, and a check mark made on the face of the operation permit to indicate that a variance is granted. No reference to a variance shall be made in the WDS or the Operation Permit Conditions.

Variances are sometimes granted for the following:
1) Operator personnel, 12VAC5-590-460 B
2) Metering of total water production, 12VAC5-590-520 B
3) Cross connection control program, 12VAC5-590-580

Waterworks may be issued a Temporary Operation Permit when additional measures are required to meet a Primary Maximum Contaminant Level or Treatment Technique requirement. Variances and Exemptions are allowed in the Regulations for this purpose, but should rarely be issued. Variances to a Secondary Maximum Contaminant Level are also permitted in the Regulations, but should not be issued.

The Office of Drinking Water may initiate temporary operational variances for waterworks that are new to our surveillance. Extraordinary circumstances will be handled on a case-by-case basis.

Current policy allows transient non-community waterworks producing less than 10,000 gpd a metering variance, which remains in effect as long as water production remains below 10,000 gpd and no treatment is provided. The water production / consumption shall be estimated in the WDS Capacity Evaluation, in order to justify the variance. However, installation of meters in all waterworks should be encouraged.

The variance format is provided in Attachment C.7. The variance should clearly and completely specify deviations from the regulatory requirements that are being granted. An expiration date, other appropriate conditions and information to support the variance request may also be included as necessary.

8.10 AMENDED PERMITS

Code of Virginia §32.1-173 authorizes the amendment of permits. There are numerous reasons to amend Operation Permits, including correction of errors in the permit, changes in major equipment, special operating conditions, and change in capacity. Refer to section 8.1 of this memo for a listing of conditions requiring a permit amendment.

8.10.1 Notification

The DE shall inform the owner of changes to the operation permit BEFORE it is issued. This notification shall be by written letter, sent by certified mail, return receipt requested, when the proposed permit amendment:

- Is a unilateral decision made by ODW (the owner did not request amendment of the permit, or apply for a construction permit), and
- Will curtail the existing rights of the permit holder (e.g. reduce capacity of the waterworks, which will reduce the owner's right to serve customers)

The letter to the permit holder shall state that it is our intention to amend the permit and the reason(s) for the amendment. The notice shall also contain a request that the permit holder notify ODW in writing if they object to the amendment of the permit. Use the letter given in Attachment C.8**,** Notice of Intent to Amend Permit.

If the permit holder objects to the amendment of the permit, then a hearing must be held, as required in 12VAC5-590-160. These situations must be referred to the Director of Hearings and Legal Services in the Central Office.

If the certified mail is returned undelivered, then the DE should make every effort to contact the permit holder in person, email or by telephone. If these attempts are unsuccessful, then the DE shall proceed to issue the amended permit.

8.10.2. Procedures

The following procedures shall be followed when amending a permit:

- Retain existing permit number
- Modify EFFECTIVE DATE of permit
- Modify date of Operation Permit Conditions
- Update the WDS Operation Permit History

When the amended permit is forwarded to the ODW Director, the Operation Permit Checklist should include a brief explanation for the permit amendment in the “Comments” section of the Transmittal Checklist (Attachment C.9).

A copy of the amended permit will sent to all entities (local governments, etc.) that received a copy of the original permit from ODW. Use the template transmittal letter provided in Attachment C.6, including an explanation that the amended permit replaces and nullifies the original, and directs the owner to destroy the original permit immediately.

8.11. TEMPORARY PERMITS

A Temporary Operation Permit allows additional time for the waterworks to achieve required reliability or performance standards, collect additional data, and perform tests and/or determinations to establish hydraulic capacity. These actions are enumerated in Temporary Permit Requirements, which are attached to the permit.

A Temporary Operation Permit may be appropriate for the following circumstances:

- Upon expiration or modification of an existing water purchase contract, where a new agreement includes a termination date which is less than 5 years from the Operation Permit issuance date (otherwise issue a standard permit);
- To support an Enforcement action (Administrative Order) requiring specific studies or improvements;
- Existing source(s) that have shown declining yield over time, as documented by sanitary surveys and monthly operation reports. Groundwater wells would require a yield and drawdown test; other sources may require special studies and evaluations. Following construction of water treatment methods, processes, or equipment which are not covered by the design criteria in Part III of the Regulations, and which in principle and/or application are new or non-conventional. A Temporary Permit allows additional time for testing and evaluation of the treatment method, process, or equipment to establish

confidence the waterworks will operate as proposed. (This was formerly addressed as a Provisional Permit);

- When a Standard Operation Permit has not been issued, and the owner has failed to submit in a timely manner the required documentation for issuance of a Standard Operation Permit. Such required documentation *may include* the WBOP[6], Cross Connection Control Plan, Permit Application, well lot plat, etc.;
- Existing but newly-discovered or reclassified waterworks having groundwater sources without well yield and drawdown test results, or with water quality test results that do not meet Maximum Contaminant Limits, and are operating without a permit. If a waterworks does not meet the requirements of the Temporary Operation Permit, then enforcement action may be necessary.

Place a "T" at the end of the permit number, and include an expiration date below the effective (issue) date. The expiration date will depend on the reason for issuance, and the date determination will be documented by the Field Office and included with the permit package sent to the Director for approval. Generally a Temporary Permit shall expire in 12 – 18 months, and should not extend more than 24 months.

Temporary Operation Permit issuance and expiration dates will be tracked in a database on "ODWSHARE".

A standard Operation Permit should be issued before the Temporary Permit expires if the Temporary Operation Permit Requirements have been completed. If not, an NOV shall be issued for Operation Permit.

8.12 PERMIT REVOCATION

A permit may be revoked pursuant to 12VAC5-590-320 of the Waterworks Regulations and VA Code §32.1-174 for:

- failure to comply with the conditions of the permit;
- violation of §32.1 of the Code or the Waterworks Regulations;
- change in ownership;
- abandonment;
- owner has failed to pay waterworks operations fee;
- waterworks has discontinued supplying water;
- waterworks is no longer classified as a waterworks;
- waterworks can no longer be depended upon to furnish pure water;
- capacity of the waterworks is inadequate;
- owner has failed to abide by an order issued by the Commissioner;
- Temporary Permit replacing a standard Operation Permit.

Justification for revocation needs to be evaluated on a case-by-case basis with input from the enforcement staff. In some situations, permit revocation may need to be pursued through the enforcement process.

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[6] SPECIAL NOTE: A Temporary Permit shall not be issued to an owner of a "for-profit" TNC or NTNC waterworks solely because a WBOP has not been submitted. Inclusion of the WBOP as a Temporary Permit Requirement is discouraged in these cases.

When the permit holder is initiating the revocation, they may request permit revocation in writing; and if applicable, should specify in the request that a hearing is not required. A letter revoking the permit is then to be prepared for the Office Director's signature.

When ODW is initiating the revocation, the DE, with concurrence of the FD, will send a notice by certified mail, return receipt requested, to the permit holder stating that it is our intention to revoke the permit and the reason for the revocation. The notice shall also contain a request that the permit holder notify ODW in writing that they do or do not object to the revocation of the permit. Use the letters given in Attachment C.10 (Notice of Intent to Revoke Permit) and C.11 (Operation Permit Revocation).

Two courses of action may be followed, depending on receipt of the certified mail:

1. If the certified mail is returned undelivered, the DE should make every effort to contact the permit holder in person, or by telephone or email. If the attempts are unsuccessful, then the DE, with concurrence from the FD, will prepare a letter of revocation for the ODW Director's signature. The letter, signed by the ODW Director, will be mailed to the permit holder at the last known address by certified mail, return receipt required. If the letter is returned undelivered, it shall be retained in the correspondence file as evidence of notification, and will serve as authorization to revoke the permit.

2. If the permit holder notifies the Office in writing that he does not object to revocation of the permit, prepare a letter for the ODW Director's signature revoking the permit. If the permit holder objects to the revocation of the permit, then a hearing must be held, in accordance with 12VAC5-590-160 of the Regulations. These situations must be referred to the Director of Hearings and Legal Services in the Central Office for further guidance.

ODW shall require the waterworks owner to notify all customers of the change in status if there are any unresolved water quality issues. If the owner is unable or unwilling to do so, the Field Director shall consult with the local Health Director regarding the need to notify customers directly. ODW shall notify the local building official of the details pursuant to permit revocation, by copy of the notification letter.

The procedure for processing a permit revocation shall be similar to that for Operation Permits:

- The field office will post the electronic document file of the permit revocation letter, scanned copy of the Notice of Intent to Revoke Permit letter, and all other attachments on "ODWSHARE", and update the tracking spreadsheet.
- The effective date of the permit revocation shall be at least five working days after the date on which the letter (electronic document) is posted to "ODWSHARE".
- After the permit revocation letter is signed, it will be scanned into PDF file format, and the electronic PDF file will be posted on "ODWSHARE". Central Office staff will update the spreadsheet and mail the original signed permit revocation letter to the Field Office.
- The Field Office will mail the original revocation letter via Certified Mail to the waterworks owner.
- The Field Office will also make and mail copies of the permit to all parties listed.

9. CAPACITY EVALUATION OF WATERWORKS

9.1 INTRODUCTION

12VAC5-590-690 of the *Regulations* requires that the waterworks' capacity exceed the maximum daily water demand of the system. The waterworks' capacity is determined through an evaluation of the major components' ability to meet that demand at a minimum 20 psi pressure.[7] (Major component categories are source, treatment, delivery and storage). The limiting value becomes the permitted capacity of the waterworks.

Water withdrawals may be limited by the Department of Environmental Quality (DEQ), through a Groundwater Withdrawal Permit, a Virginia Water Protection Permit or jointly by the DEQ, the Virginia Marine Resources Commission and the U.S. Army Corps of Engineers through a JPA Permit. These permits may affect the source capacity of the waterworks.

The overall capacity may also be limited for some TNCs and NTNCs by other VDH permits issued by the Local Health Department, such as the food permit, or on-site waste disposal permit.

9.2. ESTIMATED DEMAND

9.2.1. Water Supply Planning

The State Water Control Board's regulation 9VAC25-780 requires all local governments to submit a water supply plan for the locality, or participate in a regional plan. This plan requirement includes an evaluation of current and projected water demands and a determination of whether the existing source(s) is adequate to meet demands. The Health Department is to be given the opportunity to comment on the plan as well as drought response and contingency plans (referred to as the "local program") during a 90 day review period.

The Water Supply Plan will include existing and projected water demands for each community waterworks, determined for average and maximum daily water withdrawal, as well as an average annual and average monthly basis. Water use estimates in the Water Supply Plan will be disaggregated in categories of users, such as residential, commercial, institutional and light industrial, etc. These Regulations require all local programs to be reviewed, revised and resubmitted to DEQ every 10 years after the last approval date.

9.2.2. Water Demands

In the past, design daily water demands were based on Equivalent Residential Connections (ERC). An ERC was equivalent to 400 gpd. This often resulted in an inflated water demand, as national and state data now show that typical water usage for a single family residential connection is 100-200 gpd per residence, or less. Also, non-residential water demands are not accurately reflected in the ERC values, particularly systems with significant commercial or industrial consumers.

The estimated maximum daily water demand will be determined for each waterworks and included in the capacity evaluation section of the WDS. If actual water usage figures are

[7] The *recommended* minimum working pressure is 40 psi for all waterworks; 20 psi is the absolute minimum required in the *Regulations.*

available and reliable, they should be used to evaluate the estimated demand. Historical water use can be obtained from monthly operation reports for metered systems. A minimum of 12 months of water production data should be used. For new waterworks, the engineer must provide estimated water demands as the design basis for the system. Actual water usage measurements from similar facilities or other published references are recommended.

Daily water demands for small non-community systems without historical water use records may be estimated from AWWA's "Design and Construction of Small Systems", 1999, given in Attachment A.16. When revised data is available, it should be used instead of these values.

U.S. Census data can be used to determine average number of persons per residential connection (http://quickfacts.census.gov/qfd/states/51000.html). In the absence of representative Census data, it may be assumed each single family dwelling connection is 2.5 persons per residence.

A peaking factor should be used to establish a peak hourly demand from average or maximum monthly water consumption data. Peaking factors should be used with caution, as they will depend on the type of customers in the service area. Particular attention to commercial and industrial water users is advised. Typical peaking factors are as follows:

Reference	Maximum Day= PF * Average Day	Peak Hour = PF * Average Day
1	PF Average=1.8; PF range = 1.2 – 4.0	PF Average =2.6; PF range = 1.5 – 120.
2	PF Range = 1.5 – 3.0	PF Range = 2.5 – 5.0

Reference 1: Water and Wastewater Calculations Manual, Shyndar Lin, 2001
Reference 2: Handbook of Public Water Supply Systems, HDR Engineering, 2001

Community Waterworks

The estimated maximum daily demand is defined in gpd; for example:
1 mobile home connection = (50 gpd/person)(3.0 persons/home) = 150 gpd
1 residential connection = (50 gpd/person)(2.5 persons/residence) = 125 gpd

The capacity of a community waterworks is evaluated in terms of flowrate (gpd) in the WDS and on the Operation Permit, unless adequate information is not available to establish a permit capacity. If only one groundwater source is available, the waterworks is limited to a maximum of 49 residential connections. In this case, the permit capacity should be written "### gpd and no more than 49 residential connections". Refer to the example in this memo.

Noncommunity Waterworks:

The design basis for waterworks with non-residential water use must also be clearly defined – for example:

Factory A: 25 gpd / person / 8-hr shift
Hospital B: 300 gpd / bed
School C: 25 gpd / pupil

Regardless of whether a meter is provided, include an estimate of the water usage in flow rate units (gpd), and define the basis for the estimate in the capacity evaluation. Where a meter is not provided, define the waterworks' capacity in terms of the user characteristics, i.e. number of hospital beds, restaurant seats, students, etc.

9.3 GROUNDWATER SOURCES

9.3.1 Well Yield and Groundwater Source Capacity

Groundwater well source capacity is determined from the well yield test results and the well pump performance characteristics. The well yield is equal to the stabilized pumping rate during the test. In situations where the capacity of the test pump is the limiting factor, the measured pumping rate will be used as the well yield. The pump should be sized not to exceed the well yield test results, except under unusual circumstances.

9.3.2. Yield Test Requirements – Wells Constructed in the Coastal Plain Region

The Department of Environmental Quality (DEQ) currently regulates two Groundwater Management Areas (GWMA) in the Coastal Plain: the Eastern Virginia GWMA and the Eastern Shore GWMA. Wells in these areas may require a Groundwater Withdrawal Permit from DEQ if they withdraw 300,000 gal/month or more. In 2014, the Eastern Virginia GWMA was expanded. In the newly expanded area, well capacity may be grandparented initially, through a "historical permit". The historical permit will contain special requirements for owners to obtain well and aquifer data before the permit expiration date.

DEQ will forward all draft withdrawal permits to ODW for review and comment. See WM 878-Interagency Project and Permit Review, for coordination procedures.

When issuing a Construction Permit for a waterworks within the GWMA, the appropriate comment regarding the DEQ Withdrawal Permit must be included in the Construction Permit (see Attachment A.12).

If a DEQ groundwater withdrawal permit is issued, the DEQ permit withdrawals shall be included in the Waterworks Description Sheet (WDS). DEQ permit maximum month or maximum annual withdrawals shall not to be used to determine source capacity; instead the values shall be included for reference only.

When a DEQ withdrawal permit is NOT required, the yield and drawdown test duration will be a minimum of 48 hours, or longer if conditions warrant (12VAC5-590-840 B6). The test will be run such that at a constant flowrate a stabilized pumping water level is achieved for at least the last 6 hours of the test. Immediately following the test, the water level recovery in the well will be recorded for no less than 6 hours, or until the well returns to its static water level, whichever occurs first.

9.3.3. Yield Test Requirements – Wells Constructed in Areas Other than the Coastal Plain Region

A 48-hour yield and drawdown test will normally be run at exhaustive capacity, which is the maximum rate the pump can deliver without lowering the water level below the minimum submergence required for the pump. The pumping rate will be controlled throughout the test to maximize the production from the well during the test. The yield and drawdown test will be run such that at a constant flowrate a stabilized pumping water level is achieved for at least the last six hours of the yield test. Immediately following the yield and drawdown test, the water level recovery in the well will be recorded for no less than 6 hours, or until the well returns to its static water level, whichever occurs first.

9.3.4. Other Yield Considerations

The Regulations allow Non-community waterworks to reduce the yield test to no less than 8 hours, if source capacity requirement is 3 gpm or less. The minimum 8 hr test duration will only be considered for Transient Non-community waterworks.

Non-transient Non-community systems such as schools and commercial areas that do not operate 24 hours a day may reduce the yield test to 24 hours (or 12 hours in the Coastal Plain), provided that the well drawdown reaches equilibrium prior to the last 6 hours of the reduced test period.

When an existing well fails to deliver the yield previously established by methods described above and/or the actual yield of the well is known to vary depending on month of the year, the yield will be assigned as:

- the lowest day production rate of record if the well is the sole source for the waterworks
- the lowest average daily production rate for any month if the well is not the sole source for the waterworks

The yield will be reevaluated periodically (every three years recommended).

For community wells in consolidated rock formations, a safety factor of 1.8 will be assigned to well pump test results to determine the well's sustainable yield. Wells in unconsolidated formations (Coastal Plain aquifers designated as Eastern Virginia and Eastern Shore Groundwater Management Areas) do not require a safety factor when determining a well's sustainable yield.

Systems serving > 49 residential connections must provide at least one additional well with a capacity of ≥ 20% of the total required capacity[8].

Well Yield Calculation:

Community, in consolidated rock formations

Q gpm (over a 48 hr test) (1440 min/day) / 1.8 SF = ___ gpd

Community, in unconsolidated formation within the GWMA

Q gpm (over a 48 hr test) (1440 min/day) = ___ gpd

Non-community

Q gpm (over a 48 hr test) * 1440 min/day = ____ gpd
(conversion to gpd may be reduced, depending on system time of operation)
___gpd / ___gpd/person = ___ persons
___gpd / ___gpd/bed = ___ beds, etc.

Well Pump Calculation:

Critical capacity = Q gpm, as determined from the pump performance curve at the design head requirements, or for existing systems, by actual observed pump output when system head and pump curve data are not available.
Q gpd = (Q gpm)(1440 min/day) = ___ gpd

[8] *Note that the proposed Regulations revisions increase this value to 30%*

Wells will be evaluated individually for both *yield* and *pump capacity*, and the limiting value selected for each well. Waterworks with multiple wells are evaluated for source capacity as illustrated below:

Well #	Well Yield		Well Pump		Limiting Capacity
	gpm	gpd[1]	gpm	gpd[2]	gpd
1	10	8,000	10	14,400	8,000
2	20	16,000	10	14,400	14,400
Total	-	-	-	-	22,400

[1] gpd = gpm * 1440 min/day / 1.8 SF
{NOTE: The 1.8 SF is NOT used in Eastern Virginia & Eastern Shore GWMAs}
[2] gpd = gpm * 1440 min/day

9.4. SPRING SOURCES

The yield of new springs will be determined using actual source water flow data. Until sufficient data is available to conduct a frequency distribution analysis (the Log Pearson Type III method is recommended with a minimum of 1000 daily flow measurements) the capacity will be assigned as:

- the lowest day production rate of record if the spring is the sole source for the waterworks
- the lowest average daily production rate for any month if the spring is not the sole source for the waterworks

(Q gpm) (1440 min/day) = ___ gpd

Other unusual surface water sources, such as reclaimed mines, may be suitable to this method of determining yield. The yield of these sources will be reevaluated periodically (every three years recommended), in accordance with Temporary Permit Requirements issued with a Temporary Operation Permit.

9.5. SURFACE WATER SOURCES

9.5.1. "Safe Yield" and Sustainable Surface Water Capacity

12 VAC5-590-830 includes the definitions for "safe yield" of simple and complex intakes, with a recommendation to request assistance from the State Water Control Board to determine this value. The "safe yield" is only one of several parameters considered in the determination of allowable withdrawal by the DEQ.

Withdrawal restrictions are typically established through a Virginia Water Protection (VWP) permit, issued by the Virginia Department of Environmental Quality (DEQ). The permit is sometimes issued jointly by DEQ, the Virginia Marine Resources Commission, and the U.S. Army Corps of Engineers, and is referred to as a "Joint Permit" (JPA). The VWP permit may restrict the withdrawal rate under certain conditions and times of the year, and may specify different maximum daily, monthly, annual, and instantaneous withdrawal rates.

There are also several "grandparented" systems that do not hold a withdrawal permit from DEQ. Generally, these are withdrawals/intakes established prior to July 1, 1989 that have not undergone alterations or improvements. In grandparented cases, the source capacity was *most likely* assigned to be the "safe yield" value determined when the intake was designed.

The maximum daily withdrawal rate in the VWP permit shall be used as the limiting source water quantity, when available. If a maximum daily withdrawal rate is not stipulated in an existing VWP Permit, or if the waterworks does not hold a VWP Permit, then ODW will consider historical withdrawal rates, and the most current "safe yield" determinations of the stream or reservoir to determine source capacity.

Field office staff shall contact DEQ, Office of Water Supply, to obtain a copy of the current VWP permit. Background information on the source of the safe yield determination and the VWP permit shall be included in the “Capacity Evaluation” section of WDS (see Attachment C.5).

9.5.2. Intake Capacity

Pumps
The intake pump capacity will be determined with the largest pump out of service (the “firm” pump capacity). At least two pumps are required.

(Q gpm)(1440 min/day) = ___ gpd

Screens
Intake screen design may be restricted in the VWP permit or JPA Permit, and must be included in the capacity evaluation. Common restrictions include the maximum screen opening size and maximum screen face intake velocity. This information, evaluated with the actual intake screen design, may limit the hydraulic flowrate permissible through the intake structure.

9.6. PURCHASED SUPPLY

Waterworks may obtain all of the water supply or a portion of the supply from a wholesaler waterworks. The daily allocated volume of water supply from the wholesaler should be documented in a legal agreement. The allocated volume is to be included in the source capacity section of the WDS and Operation Permit Conditions, and the legal agreement cited.

9.7. TREATMENT

All major treatment process units will be evaluated for hydraulic capacity and documented in the design review of a project; however, only the limiting component needs to be included in the WDS capacity evaluation. For conventional surface water treatment plants, the major processes include:

- Coagulation
- Flocculation
- Sedimentation
- Filtration
- Disinfection

Example 1 – Flocculation:

Q gpm = Floc. Basin Volume (gal) / Detention Time (min)

(Q gpm)(1440 min/day) = ___ gpd

Example 2 – Filtration:

Q gpm = Surface loading rate (gpm/sf) * surface area (sf)

(Q gpm)(1440 min/day) = ___gpd

(Generally the filters are the limiting component in conventional plants.)

In nonconventional plants, major process units which will be evaluated include:

Ion Exchange:

Hydraulic capacity: Q gpm = Surface loading rate (gpm/sf) * surface area (sf)
Loading rate: Grains of filter capacity / grains/gal of constituents = ___ gal treated prior to regeneration. A realistic regeneration frequency should be established.

Membrane Filter:

Q gpm = permeate flow rate
(Q gpm)(1440 min/day) = ___ gpd
If unfiltered water is blended with permeate (for RO systems), then this amount is added to Q to determine the total capacity.

9.8. DELIVERY SYSTEMS

9.8.1. Booster Pump Capacity

This includes groundwater facilities using pressure and atmospheric storage, and consecutive in-line booster pump stations in the distribution system serving ≤ 49 connections with pressure storage only.

- At least two pumps are required.
- Capacity is the combined pump capacity with all pumps in service.

The required capacity must meet the *peak* hour demand, or the maximum day demand + fire flow (whichever is the design condition).

The *peak* hour demand must be provided by the owner's engineer.

9.8.2. Transfer Capacity

This includes groundwater well pump and hydropneumatic tank; no booster pumps.

Transfer capacity is computed for noncommunity waterworks using the Design Exception noted in 12 VAC 5-590-1250A: Transfer capacity is the capacity of the well pump output over 1 hour + effective storage of the hydropneumatic tank. For example, a TNC waterworks has a peak hourly demand of 50 gpm, a well capacity of 44 gpm, and a pressure tank with an effective storage of 360 gal.

The required transfer capacity is: (50 gpm)(60 min) = 3,000 gal

The transfer capacity provided is: (44 gpm)(60 min) =	2,640 gal
+ effective storage of the hydropneumatic tank =	360 gal
Total transfer capacity =	3,000 gal

Low Service and High Service Pumps (surface water facilities) and Distribution Booster Pumps (transfer to pressure zone with atmospheric storage) are evaluated thus:

- At least two pumps are required.
- Capacity is determined with the largest pump out of service (the "firm" pump capacity).

(Q gpm)(1440 min/day) = ___ gpd

9.9. STORAGE

9.9.1. Storage Capacity

The amount of storage capacity required is the sum of the equalizing storage, fire flows (if fire protection s provided), and sometimes a reserve for emergencies. Equalizing storage is the amount of water needed to allow the water production facilities to operate at a constant rate, since demands will vary over time during a day.[9] Traditionally, the equalization storage has been estimated to be 0.5 * maximum day demand.

Non-community systems are exempt from this minimum storage requirement, provided that sufficient delivery capacity is available to meet the peak hour demand (12VAC5-590-1250.A.).

Raw or partially treated water storage is NOT included in the evaluation of water storage capacity.

9.9.2. Storage in Primary & Consecutive Waterworks

The Operation Permit WDS of both primary and consecutive waterworks must include information on the provision of storage: whether storage is provided by the primary, by the consecutive, or a combination thereof and whether the storage arrangement is by contract.

9.9.3. Storage: Atmospheric Tanks

Total effective storage volume is the useable volume available to store water in reservoirs or tanks, measured as the difference between the overflow elevation or the normal maximum operating level, and the minimum storage elevation. For tanks that directly provide system pressure, the effective volume is the storage volume above the minimum elevation that can provide a minimum pressure of 20 psi throughout the reservoir's service area under maximum daily water demand. Ground storage tanks that serve as reservoirs for booster pumps may have a minimum water elevation determined by pump controls.

9.9.4. Storage: Pressure Tanks

When a hydropneumatic tank (or bladder tank) is fed directly by a well (or wells), the effective storage volume is typically taken as one-third of the tank gross volume. Alternatively, effective storage can be calculated directly from pump control settings (pump on and off elevations), if the resulting value is more conservative.

9.9.5. Storage: Combined Tanks

When a pressure tank is fed from a ground storage tank, the total effective storage is the sum of the effective storage from the ground storage tank(s) and the pressure tank(s).

9.10. DESIGN EXCEPTIONS AND PERMIT CAPACITY

9.10.1. Storage Design Exceptions

Waterworks may be granted an exception to the storage requirement if computer modeling demonstrates that adequate pressure will be maintained under peak demands, including fire

[9] Handbook of Public Water Systems, Culp/Wesner/Culp, 1986.

flows. An extended period simulation will be used for this purpose. The minimum requirements for the model are as follows:

a. Use a calibrated system model that accurately reflects the existing pipes, pump stations, and storage tanks and the way they are actually operated
b. Model realistic water demands: Develop Maximum Day Demand: Average Day Demand (MDD:ADD) ratios and diurnal variations from historical data. Model anticipated growth by increasing demands at existing nodes in probable locations.
c. Input set points (pump on/off, tank levels) similar to normal operating values
d. Model extended period simulation of MDD with fire flow added during the peak hour
e. Model duration of at least 30 hours (48 hours recommended).

The success criteria required to demonstrate that the waterworks has sufficient capacity to meet both existing and future water demands are as follows:

a. All nodes must be able to provide a minimum 20 psi at both MDD plus fire flow and at peak hour flow conditions.
b. Total storage volume must recover to within 5% of the initial value at the end of the simulation. Individual storage tank levels must recover to within 10% of their initial levels.
c. Tanks must not empty. The levels for elevated tanks must fluctuate less than 30 feet.

Waterworks that are permitted an exception to the storage requirement in the *Regulations* must update their computer model continuously to reflect changing facilities, demands and operating conditions. At a minimum, the model will be run every two years to verify that the waterworks is able to meet the defined success criteria at the permitted flow. This requirement will be included as a condition of the Operation Permit.

Emergency/standby power capabilities will be required to provide emergency power for all pumping needs required in the computer model. Emergency power capabilities (i.e. portable generator receptacle/hook up and manual transfer switch) shall be required at waterworks serving < 500 population. Standby power (i.e. automatically activated on-site generator) will be required for other waterworks.

9.10.2 Conventional Plant Re-rating

Refer to WM 902 for information on re-rating conventional treatment processes, including flocculation, sedimentation and gravity filters.

9.11 CONCLUSIONS

The Capacity Evaluation in the WDS will conclude with a summary sentence / paragraph. These will be different for Construction Permits and Operation Permits.

9.11.1. Construction Permits

It is important not to “promise’ an Operation Permit capacity at this stage, unless the Construction Permit is for an entire, new waterworks. In most cases, the summary in a Construction Permit WDS will contain the following language:

> “Conclusion: This project may result in change in the permitted capacity of the waterworks. After the proposed improvements are constructed and placed in operation, the permitted capacity of the entire waterworks will be re-evaluated.”

9.11.2. Operation Permits

The capacity evaluation conclusion in a WDS and the Operation Permit Conditions will state the permitted capacity of the entire waterworks, and provide an explanation for the assigned value. When information on individual components of a waterworks is insufficient, such as well yield or well pump rating, a capacity determination for the entire system may be difficult. The conclusions made in the capacity evaluation for a pre-existing system will depend on the evidence to substantiate whether the system is performing adequately. Existing systems with no evidence of inadequate performance in the past may be permitted for the capacity of the existing service(s), described in appropriate units for the waterworks (such as restaurant seats), until missing data is obtained and evaluated.

Operation Permit - Examples of common evaluation conclusions:

Waterworks' limiting hydraulic component is storage:

> "Conclusion: This waterworks is limited to a capacity of ### gpd due to limited storage."

Only one well source, waterworks' limiting hydraulic component is well yield:

> "Conclusion: This waterworks is limited to a capacity of ### gpd due to limited well yield. However, the number of connections cannot exceed 49 until an acceptable additional source is provided."
>
> NOTE: On the permit face the capacity shall read "### gpd and no more than 49 residential connections".

Existing transient non-community waterworks, hydraulic data is lacking for existing well and bladder tank, but past performance is satisfactory:

> "Conclusion: This waterworks is limited to a capacity of one existing structure with ## existing restaurant seats until information on the well yield and pump capacity is provided and the need for additional storage is evaluated."

Operation Permit - Examples of more unusual evaluation conclusions:

Waterworks has been granted a Design Exception to storage requirement after demonstrating reliable service by computer modeling; storage is no longer the limiting component. Include a statement such as:

> "Conclusion: Storage is adequate for a maximum daily water demand of ## MGD, based on the waterworks' evaluation of the distribution system using a computer model. Therefore, this waterworks is limited to a capacity of ### MGD due to limited (raw water withdrawal)(specific treatment component hydraulic capacity)(low service/high service pumping capacity)."

Consecutive waterworks without firm gallon-per-day purchase contract; source or transfer facility is limiting component:

> "Conclusion: This waterworks is limited to a capacity of ### gpd due to the ability of the water purveyor to deliver."

9.12. EXAMPLE CALCULATIONS

To estimate water demands for existing waterworks:

- Historical usage/production data is preferred.

- If historical data not available, estimate demands based on similar facilities or published references.

To estimate water demands for new waterworks:

- Use estimated demands provided by the engineer from the approved PER or project Design Calculations.
- The capacity of the waterworks must meet or exceed the maximum daily water demand of the system.

For noncommunity waterworks, if a flow rate for source, treatment, and delivery cannot be determined, then waterworks capacity will be limited by the existing facility (i.e., existing restaurant seats, students & staff, buildings, etc.).

EXAMPLE 1

Existing TNC – no historical usage data

Existing system without well yield or pump capacity information; no meter: A 30 seat restaurant is discovered; the water system consists of a well and 86-gal bladder tank serving one building. No meter or treatment is included in the waterworks. The owner states the restaurant average 120 patrons per day.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average water use = 10 gal/day/restaurant patron*
   (10 gpd/patron)(80 patrons/day) = 800 gpd
   (*per *AWWA Design and Construction of Small Water Systems, 2nd Edition, 1999)*[10]

2. Source Capacity:
   Well Yield: No information
   Well Pump Capacity: No information

3. Storage Capacity: Effective storage = 86 gal / 3 = 29 gal
   Noncommunity systems are required to provide delivery capacity to meet peak hour demand.

Conclusion: This waterworks is permitted for a capacity of one existing structure with 30 existing restaurant seats until information on the well yield and pump capacity is provided and the need for additional storage is evaluated. *{The capacity on the Operation Permit would be written as one existing structure with 30 existing restaurant seats.}*

[10] Note: This value may be out-of-date; reference publication is being revised.

EXAMPLE 2
Existing TNC – with meter data

Existing system with information on the well construction, yield and pump capacity; treatment and meter are provided:

A picnic area and visitor center is open from May 1 to October 31 every year. It averages 1500 visitors/day and has two comfort stations behind the visitor center. A 6-inch diameter well is used which yielded 51 gpm. The well is provided with a 5 hp submersible pump rated for 26 gpm. The system includes a meter, hypochlorite feed system, and 20,000 gal storage tank. Water flows by gravity from the tank through 3-inch and 4-inch diameter distribution lines.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 15,000 gpd*
   (*Per Monthly Operation Reports dated May 2013 – October 2013, the average day water production is 15,000 gpd.)

2. Source Capacity:
   Well Yield: (51 gpm)(1440 min/day) = 73,400 gpd
   Well Pump Capacity: (26 gpm)(1440 min/day) = 37,400 gpd

3. Storage Capacity: Effective storage = 20,000 gal

   Noncommunity systems are required to provide delivery capacity to meet peak hour demand.

Conclusion: This waterworks is permitted for a capacity of 37,400 gpd due to limited well pump capacity. {Since there appears to be plentiful water supply, an estimate of peak hourly demand is not included (and might be difficult to accurately predict). The capacity on the Operation Permit would be written as 37,400 gpd. Note that there was inadequate information provided on the hypochlorite feed system; if treatment is required then verify this data and check the adequacy of the treatment capacity. Simple solution-type chemical feed systems do not need to be included in the Waterworks Description Sheet Capacity Evaluation, but need to be included in the reviewer's notes.}

EXAMPLE 3
New NTNC

A school designed for 200 students is served by a groundwater well with a reported yield test of 12 gpm, furnished with a 10 gpm submersible pump. One 2.0-ft diameter manganese greensand filter is supplied with sodium hypochlorite and permanganate feed systems. One 5,000 gal atmospheric storage tank, two booster pumps with a combined capacity of 30 gpm, and one 5,000 gal hydropneumatic tank are also provided.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 4,000 gpd*
   Maximum Daily Demand = 5,000 gpd*
   Peak Hour Demand = 2,500 gal*
   (*Per the design calculations in approve Project Manual titled ****, dated ****)

2. Source Capacity:
   Well Yield: (12 gpm)(1440 min/day) = 17,280 gpd
   Well Pump Capacity: (10 gpm)(1440 min/day) = 14,400 gpd

3. Greensand Filter Capacity: (π * 4)/4 sf * 3 gpm/sf = 9.42 gpm
   (9.42 gpm)(1440 min/day) = 13,600 gpd

(*Simple solution-type chemical feed systems must be verified for feed capacity with respect to the well pump capacity, but do not need to be included in the Waterworks Description Sheet capacity evaluation.)*

4. Booster Pump Capacity: combined pump capacity = 30 gpm
   (30 gpm)(1440 min/day) = 43,200 gpd
   The pumps must be able to meet peak hour demand in conjunction with storage.

5. Storage Capacity: 5,000 gal + (5,000 gal/3) = 6,670 gal
   Noncommunity systems are required to provide delivery capacity to meet peak hour demand.

6. Estimated delivery capacity during 1 hour (including pressure storage):

Booster pumps = (43,200 gpd / 24 hr/day)(1 hr) =	1,800 gal
Hydro Tank = 5,000 gal/3=	1,700 gal
Total =	3,500 gal

   Peak hour demand = 2,500 gal < 3,500 gal provided with storage

Conclusion: This waterworks is permitted for a capacity of 13,600 gpd due to limited treatment capacity. {*The capacity on the Operation Permit would be written as 13,600 gpd.*}

EXAMPLE 4
Existing community

A 40-home subdivision is served by a simple groundwater system consisting of one drilled well with a 48-hr test yield of 30 gpm, a 20 gpm submersible well pump, 20,000 gal atmospheric storage tank, two booster pumps with a combined capacity of 120 gpm, and a 5,000 gal hydropneumatic tank. Well is drilled in consolidated bedrock. Accurate historical metering data is not available.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   1 residential connection = 75 gpd/person *(cite reference)*
   Population density: 2.4 persons/residence (*Per 2010 US Census Data for XXX County)*
   (40 residences) (2.4 persons/residence)(75 gpd/person) = 7,200 gpd

2. Source Capacity:
   Well Yield: (30 gpm)(1440 min/day / 1.8 SF) = 24,000 gpd
   Well Pump Capacity*:* (20 gpm)(1440 min/day) = 28,800 gpd

3. Booster Pump Capacity: combined capacity = 120 gpm

4. Storage Capacity:
   20,000 gal + (5,000gal/3) = 21,700 gal
   21,700 gal /0.5 day= 43,300 gpd

Conclusion: This waterworks is permitted for a capacity of 24,000 gpd due to limited well yield. However, the number of connections cannot exceed 49 until an acceptable additional source is provided.

*{Since well yield is limiting and there is only one well, the capacity should be limited on the Operation Permit to no more than 24,000 gpd or 49 connections, whichever is reached first. In the absence of well yield information the permit would be limited to 8,820 gpd (49*180 gpd/connection) or 49 connections, whichever comes first}*

EXAMPLE 5
Existing community

A community system has 50 connections and a historical maximum day water production of 8,300 gpd, 2 wells with a yield of 10 gpm and 20 gpm respectively, and individual well pump capacities of 10 gpm. The wells are located in consolidated rock formation.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 8,300 gpd*
   (*Per Monthly Operation Reports dated January 2012 – April 2014, the average day water production is 8,300 gpd.)

2. Source Capacity:

Well #	Well Yield		Well Pump		Limiting Capacity
	gpm	gpd[1]	gpm	gpd[2]	gpd
1	10	8,000	10	14,400	8,000
2	20	16,000	10	14,400	14,400
Total	-	-	-	-	22,400

[1] gpd = gpm * 1440 min/day / 1.8 SF
[2] gpd = gpm * 1440 min/day

3. Booster Pump Capacity: Combined capacity = 120 gpm

4. Storage Capacity: 20,000 gal + (5,000gal/3) = 21,700 gal
   21,700 gal /0.5 day= 43,300 gpd

Conclusion: This waterworks is permitted for a capacity of 22,400 gpd due to source capacity. *{The capacity on the Operation Permit would be written as 22,400 gpd.}*

EXAMPLE 6
Existing community

A mobile home park with 44 existing connections is provided with a well and three 86-gal bladder tanks. The well yield is reported to be 32 gpm and the pump is rated for 30 gpm. A review of the waterworks performance over the past 5 years demonstrates that the facilities have provided adequate service (quantity and pressure) to all customers. Well is drilled in consolidated bedrock.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   1 mobile home connection = 50 gpd/person *(cite reference)*
   Population density: 2.5 persons/residence (*Per 2010 US Census Data for XXX County)*
   (44 homes)(2.5 persons/residence)(50 gpd/person) = 5,500 gpd

2. Source Capacity:
   Well Yield: (32 gpm)(1440 min/day / 1.8 SF) = 25,600 gpd
   Well Pump Capacity*:* (30 gpm)(1440 min/day) = 43,200 gpd

3. Storage Capacity:
   Effective storage = 3 (86gal / 3) = 86 gal
   86 gal / 0.5 day = 172 gpd

Conclusion: This waterworks is permitted for a capacity limited to the existing mobile home connections until the need for additional storage is evaluated.

{The capacity on the Operation Permit would be written as 44 existing mobile home connections.}

EXAMPLE 7
New community

A new residential subdivision is proposed with 80 single family dwellings and a recreation center. The subdivision will be served by a groundwater consisting of two drilled wells located in consolidated rock. Well 1 has a 48-hr test yield of 50 gpm and is installed with a 45 gpm submersible well pump. Well 2 has a 48-hr test yield of 22 gpm and is installed with a 22 gpm submersible well pump. The wells pump to a 5,000 ground storage tank. The system is served by dual 10,000 gal hydropneumatic tanks and dual 50 gpm booster pumps. The approved PER lists ADD of 12,000 gpd, MDD of 18,000 gpd, and peak hour of 42 gpm.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 12,000 gpd*
   Maximum Daily Demand = 18,000 gpd*
   Peak Hour Demand = 42 gpm*
   (*Per the approved Preliminary Engineering Report titled ****, dated ****)

2. Source Capacity:

Well #	Well Yield		Well Pump		Limiting Capacity
	gpm	gpd[1]	gpm	gpd[2]	gpd
1	50	40,000	45	64,800	40,000
2	22	17,600	22	31,680	17,600
Total	-	-	-	-	57,600

[1] gpd = gpm * 1440 min/day / 1.8 SF
[2] gpd = gpm * 1440 min/day

3. Booster Pump Capacity: Combined capacity = 100 gpm

4. Storage Capacity: 5,000 gal + (20,000 gal/3) = 11,667 gal
   11,667 gal / 0.5 day= 23,333 gpd

Conclusion: This waterworks is permitted for a capacity of 23,333 gpd due to limited storage capacity. *{The capacity on the Operation Permit would be written as 23,333 gpd.}*

EXAMPLE 8
Conventional Surface Water Treatment Plant

A Waterworks containing a conventional surface water treatment plant has been issued an updated VWP Permit.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:

   Average Water Demand = 745,600 gpd*
   (*Average daily water production per monthly operation report for July 1, 2012 to June 30, 2014. Maximum day water production was 810,000 gpd.)

2. Source Capacity:

   North Fork Shenandoah River* = 46.7 cubic feet per second = 30.2 million gallons per day
   (*Per DEQ Planning Bulletin No. 345 dated March 1988, safe yield at Strasburg is 30.2 million gallons per day or 46.7 cubic feet per second.)

   Virginia Water Protection Permit (VWP) No. 07-1168:
   Maximum daily withdrawal volume = 2.5 million gallons
   Maximum annual withdrawal volume = 912 million gallons

3. Treatment Capacity:

   Raw Water Pump Station:
   Number of Pumps: 2
   Capacity (1 unit out of service) = (2300 gpm) (1440 min/day) = 3.31 MGD

   Flocculation Basins:
   Number of Basins: 3
   Basin Volume: 30,672 gallons
   Retention Time: 0.67 hrs or 40 min
   Capacity = [3 basins] [(30,672 gallons/basin)/40 min)] [1440 min/day] = 3.31 MGD

   Sedimentation Basins:
   Number of Basins: 3
   Basin Volume: 300,700 gallons
   Retention Time: 6.54 hrs or 392 min
   Capacity = [3 basins][(300,700 gal/basin)(392 min)] [1440 min/day] = 3.31 MGD

   Filtration Capacity:
   Number of Filters: 3
   Filter Surface Area: 195 square feet
   Filtration Rate: 4 gallons per minute per square foot
   Capacity = [3 filters] [195 ft^2/filter] [4 gpm/ft^2] [1440 min/day] = 3.37 MGD

   Finished Water/High Service Pump Capacity:

Number of Pumps: 3
Capacity (one unit out of service) = [2 pumps][1042 gpm/pump][1440 min/day] = 3.00 MGD

Clearwell Disinfection Treatment Capacity:
Number of Tanks: 2
Tank Volume: 270,454 gallons
Baffling Factor: 0.9
Retention Time = [(2 tanks)(0.9)(270,454 gal/tank)]/[2084 gpm] = 233 min (available)
Retention Time (required) = 61 minutes = 70,740 gals or 2 ft (min depth/tank)

4. Transfer/Booster Pump Capacity:

Aileen Avenue Booster Pump Station:
Number of Pumps: 2
Capacity (combined) = (2 pumps)(300 gpm/pump)(1440 min/day) = 0.864 MGD

Strasburg Junction Booster Pump Station:
Number of Pumps: 2
Capacity (combined) = (2 pumps)(46 gpm/pump)(1440 min/day) = 0.132 MGD

North Shenandoah Industrial Park Booster Pump Station:
Number of Pumps: 2
Capacity (combined) = (2 pumps)(412 gpm/pump)(1440 min/day) = 1.187 MGD

Fairfield Drive Booster Pump Station:
Number of Pumps: 2
Capacity (combined) = (2 pumps) (120 gpm/pump) (1440 min/day) = 0.346 MGD

5. Storage Capacity:

Tank Name	Gross Volume	Effective Volume
Banks Fort Road Elevated Tank	200,000 gal	200,000 gal
Strasburg Reservoir	1,000,000 gal	1,000,000 gal
Strasburg Junction Tank	86,000 gal	66,300 gal
Route 55 Tank	2,015,000 gal	2,105,000 gal
Total	3,301,000 gal	3,281,300 gal

Available storage capacity at 0.5 day storage = 3,281,300/0.5 = 6,562,000 gpd

CONCLUSION: This waterworks is permitted for a capacity of 2.5 MGD due to source water capacity.

EXAMPLE 9
Coastal Plain Groundwater Management Area

A Community waterworks has a well located within the coastal plain Groundwater Management Area.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 12,545 gpd*
   (*Per Monthly Operating Reports dated September 2013 – August 2014, the average day water production is 12,545 gpd.)

2. Source Capacity*:
   GWMA Well Yield: (36 gpm)(1440 min/day) = 51,840 gpd
   Well Pump Capacity: (14 gpm)(1440 min/day) = 20,160 gpd

   (*Per the DEQ Groundwater Withdrawal Permit, GW0077700, with Expiration date of January 15, 2021, the maximum annual withdrawal is 5.1 million gallons and the maximum monthly withdrawal is 440,000 gallons. The Permit has designated the maximum pump intake setting at 181 feet below the surface elevation.)

3. Booster Pump Capacity: Combined capacity = 88 gpm = 126,720 gpd

4. Storage Capacity:
   9,134 gal + (2,960gal/3) = 10,121 gal
   10,121 gal /.5 day = 20,242 gpd

Conclusion: This waterworks is permitted for a capacity of 20,160 gpd due to limited source capacity.

EXAMPLE 10
Wells in consolidated rock formation

A Community waterworks has a well located in a consolidated rock formation.

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 3,030 gpd*
   (*Per Monthly Operating Reports dated January 2013 – December 2014, the average day water production is 3,030 gpd.)

2. Source Capacity:
   Well Yield: (36 gpm)(1440 min/day/ **1.8 SF**) = 28,800 gpd
   Well Pump Capacity: (31 gpm)(1440 min/day) = 44,640 gpd

3. Booster Pump Capacity: Combined capacity = 88 gpm = 126,720 gpd

4. Storage Capacity:
   9,134 gal + (2,960gal/3) = 10,121 gal
   10,121 gal /.5 day = 20,242 gpd

Conclusion: This waterworks is permitted for a capacity of 20,242 gpd due to limited storage capacity.

EXAMPLE 11
Consecutive waterworks

CAPACITY EVALUATION OF THE WATERWORKS

1. Estimated Water Demand:
   Average Daily Demand = 90,837 gpd*
   (*Per Monthly Operating Reports dated January 2014 – December 2014, the average day water production is 90,837 gpd.)

2. Source Capacity: Per agreement with the Town of Happyville, allocated capacity is 200,000 gpd

3. Booster Pump Capacity:
   Two pumps provided, each capable of 300 gpm
   (300 gpm)(1,440 min / day) = 432,000 gpd, with one pump out of service

4. Storage Capacity:
   250,000 gal elevated storage tank
   250,000 /.5 day = 500,000 gpd

Water production and storage is allocated to the following consecutive waterworks as follows:

Waterworks Name	PWSID	Permit Capacity (gpd)	Delivered Capacity (gpd)	Total Storage Required [1] (gal)	Storage Provided-Consecutive[2] (gal)	Storage Provided – Primary[3] (gal)
XYZ Service Authority	*XXXXX*	40,000	None	20,000	None	20,000

1. Total storage required by the consecutive waterworks.
2. Total effective storage provided by the consecutive waterworks.
3. Total effective storage provided by this (primary) waterworks.

Conclusion: This waterworks is permitted for a capacity of 200,000 gpd due to limited source capacity.

EXAMPLE 12

A Community waterworks has two wells located in a consolidated rock formation. The Owner's engineer has provided a hydraulic model indicating minimum pressure requirements can be obtained throughout the distribution system during peak hour and during max-day demand plus fire flow.

1. Estimated Water Demand:
   Average Daily Demand = 140,000 gpd*
   Maximum Daily Demand = 180,000 gpd*
   (*Per Monthly Operation Reports dated January 2012 – April 2014, the average day water production is 8,300 gpd. Maximum day production was 180,000 gpd)

2. Source Capacity:

Well #	Well Yield		Well Pump		Limiting Capacity
	gpm	gpd[1]	gpm	gpd[2]	gpd
1	100	80,000	100	144,000	80,000
2	200	160,000	150	216,000	160,000
Total	-	-	-	-	240,000

[1] gpd = gpm * 1440 min/day / 1.8 SF
[2] gpd = gpm * 1440 min/day

3. Booster Pump Capacity:
   Booster Pump Station No. 1:
   Number of Pumps: 2
   Capacity = (2 pumps) (100 gpm/pump) (1440 min/day) = 200,000 gpd

4. Storage Capacity:
   The Waterworks' system-wide hydraulic model titled, "Town of Bridgewater, Hydraulic Modeling Report", dated June 4, 2014, demonstrated that adequate pressure can be maintained during peak demands (maximum day of 360,000 gpd and fire flow) with a total atmospheric storage of 500,000 gal.

Conclusion: This waterworks is permitted for a capacity of 240,000 gpd due to limited source capacity

9.13. CALCULATION UNITS

Frequently used abbreviations and symbols

C - degrees Celsius	lb – pounds
F – degrees Fahrenheit	lb/ft^2 – pounds per square foot
C – the residual disinfectant concentration, in mg/L	mg – milligrams
CU – color units	MGD – million gallons per day
ft^2 – square foot (feet) of area	mg/L – milligrams per liter
ft/min – foot (feet) per minute	min – minutes
ft/sec – foot (feet) per second	mL – milliliters
gal – gallon(s)	mm – millimeters
gpd – gallons per day	NTU – nephelometric turbidity units
gpd/ft^2 – gallons per day per square foot	pCi – picocurie(s)
gpm – gallons per minute	psi – pound(s) per square inch
gpm/ft – gallons per minute per foot	T – time, in minutes
gpm/ft^2 – gallons per minute per square foot	µm - micrometers (or microns)
in – inch(es)	µg/L - micrograms per liter

APPENDIX 1 - PROFESSIONAL ENGINEER (P.E.) SEAL

In accordance with the *Code of Virginia* §54.1-410.B, ODW is required to ensure that submittals for our approval comply with the rules and regulations adopted by the Board for Architects, Professional Engineers, Land Surveyors, and Landscape Architects (APELSLA). The Department of Professional and Occupational Regulation (DPOR) serves as staff to the Board.

The APELSLA Board has issued regulations which call for all work prepared by a licensed professional to carry that person's seal (18 VAC 10-20-760 B.4), including work that is not specifically required by the Code to bear a seal.

When electronic PDF documents are submitted, they shall bear the Professional Engineer's digital signature.

Plans and specifications:
In specific reference to the requirement for a professional engineer's seal, ODW will process the plans and specifications only if the cover sheets to all plans and specifications bear an "original" seal and signature, and are dated. The remaining plan sheets need only have facsimiles of the seal, signature, and date. Any plan sheets prepared by a licensed engineer, other than the engineer sealing the cover sheet, must bear facsimiles (as a minimum) of the seal and signature of that engineer.

Addenda:
Addenda must bear an "original seal", signature and date, or the transmittal letter must be dated and signed by the licensed engineer.

Change Orders:
No seal is required for Change Orders, but a licensed engineer's signature is required. ODW may review Change Orders that have not been executed (signed by representatives of the owner and contractor.)

Technical Reports and other documents:
The cover sheet of all preliminary engineering reports shall bear an "original" seal, signature, and date. P.E. seals are also to be required for items such as compliance sampling reports, but only if they are prepared by, or under the supervision of, a licensed professional engineer. (There is no requirement for these non-engineering documents to be prepared by a licensed professional engineer.)

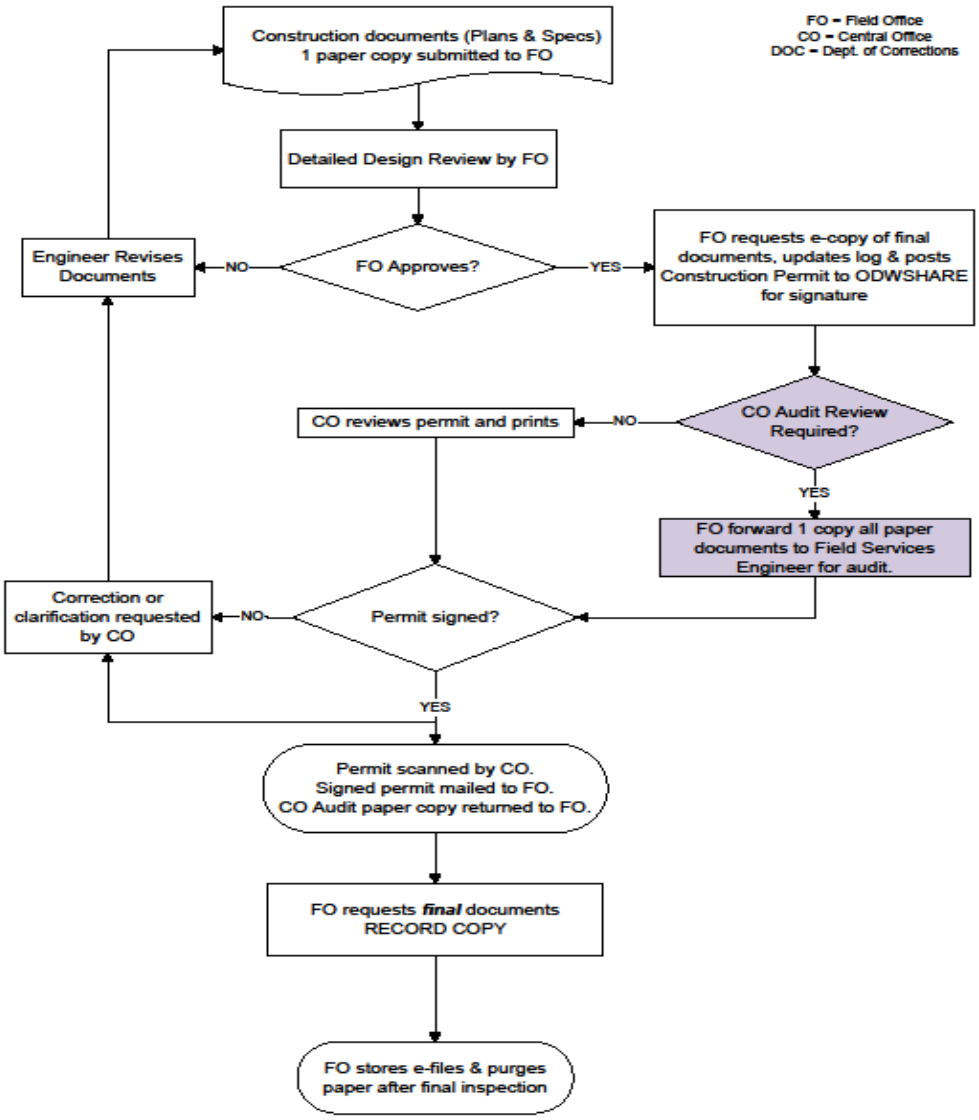
Land surveyors:
There has been significant controversy about the role of land surveyors with respect to preparation of certain types of plans and specifications. The *Code of Virginia*, at §54.1-408, authorizes land surveyors to prepare plans and profiles for (among other things) sanitary sewer extensions and waterline extensions, but only for subdivisions, site plans, and development work. The *Code* then goes on to specifically prohibit land surveyors from engaging in the design of pressure hydraulic systems, and states that the allowed work must involve the use and application of standards prescribed by local and state authorities.

Based on guidance received from staff of the Office of the Attorney General, surveyors who were licensed under the old §54.17.1(3)(b) or who have passed the appropriate exam given by APESLA may lay out the routing of a waterline on plans, but may not select the size or materials for that waterline. This work is to be done by a licensed P.E. ODW will accept plans and specifications for waterlines prepared by a licensed surveyor, as long as they are accompanied by hydraulic calculations (covering size and material selection) prepared and stamped by a licensed P.E.

APPENDIX 2 - LOCALITY CODES

CODE	COUNTY	DISTRICT	CODE	COUNTY	DISTRICT	CODE	IND. CITY	DISTRICT
001	Accomack	22	103	Lancaster	17	510	Alexandria	08
003	Albemarle	10	105	Lee	01	515	Bedford	12A
005	Alleghany	05	107	Loudoun	08	520	Bristol	01
007	Amelia	11	109	Louisa	10	530	Buena Vista	06
009	Amherst	11	111	Lunenburg	12A	540	Charlottesville	10
011	Appomattox	11	113	Madison	09	550	Chesapeake	20B
013	Arlington	08	115	Mathews	18	560	Clifton Forge	10
015	Augusta	06	117	Mecklenburg	13	570	Colonial Heights	19
017	Bath	06	119	Middlesex	18	580	Covington	05
019	Bedford	11	121	Montgomery	04	590	Danville	12B
						595	Emporia	19
021	Bland	03	125	Nelson	10			
023	Botetourt	05	127	New Kent	15B	600	Fairfax	08
025	Brunswick	13	131	Northampton	22	610	Falls Church	08
027	Buchanan	02	133	Northumberland	17	620	Franklin	20B
029	Buckingham	14	135	Nottoway	12A	630	Fredericksburg	16
						640	Galax	03
031	Campbell	13	137	Orange	09			
033	Caroline	16	139	Page	07	650	Hampton	21
035	Carroll	03	141	Patrick	14	660	Harrisonburg	06
036	Charles City	15A	143	Pittsylvania	12B	670	Hopewell	19
037	Charlotte	14				678	Lexington	06
						680	Lynchburg	11
041	Chesterfield	15B	145	Powhatan	15B			
043	Clarke	07	147	Prince Edward	14	685	Manassas	08
045	Craig	05	149	Prince George	19	687	Manassas Park	08
047	Culpeper	09	153	Prince William	08	690	Martinsville	12B
049	Cumberland	14	155	Pulaski	04			
						700	Newport News	21
051	Dickenson	02	157	Rappahannock	0	710	Norfolk	20A
053	Dinwiddie	19	159	Richmond	17	720	Norton	01
057	Essex	18	161	Roanoke	05			
059	Fairfax	08	163	Rockbridge	06	730	Petersburg	19
061	Fauquier	09	165	Rockingham	06	735	Poquoson	21
						740	Portsmouth	20A
063	Floyd	04	167	Russell	02			
065	Fluvanna	10	169	Scott	01	750	Radford	04
067	Franklin	12A	171	Shenandoah	07	760	Richmond	15A
069	Frederick	07	173	Smyth	03	770	Roanoke	05
071	Giles	04	175	Southampton	20B			
						775	Salem	05
073	Gloucester	18	177	Spotsylvania	16	780	South Boston	14
075	Goochland	15B	179	Stafford	16	790	Staunton	06
077	Grayson	03	181	Surry	19	800	Suffolk	20B
079	Greene	10	183	Sussex	19			
081	Greensville	19	185	Tazewell	02	810	Virginia Beach	20A
						820	Waynesboro	06
083	Halifax	14	187	Warren	07	830	Williamsburg	21
085	Hanover	15A	191	Washington	03	840	Winchester	07
087	Henrico	15A	193	Westmoreland	17			
089	Henry	12B	195	Wise	01			
091	Highland	06	197	Wythe	03			
093	Isle of Wight	20A	199	York	21			
095	James City	21						
097	King and Queen	18						
099	King George	16						
101	King William	18						

APPENDIX 3 – DOCUMENT MANAGEMENT PROCESS



PRELIMINARY ENGINEERING CONFERENCE

Date: _____

General Information

Applicant (or agent) to bring supporting documentation to the conference, including:

1. Preliminary land use plans, site plans, topographic maps
2. Water demand estimates
3. Description of proposed source(s), treatment, storage, distribution, including preliminary sketches, plans, specifications, manufacturer's literature

Location (County):
Owner:
Name:
New waterworks proposed: ☐ or **Expansion to existing**: ☐ **PWSID #**:

Waterworks Type: Community ☐ NTNC ☐ TNC ☐
Efforts to preserve/protect farm & forest lands:

Service Description & Water Demand (residential, commercial, mixed use; estimate population; average annual, maximum day, peak hour water demand; fire flow protection provided):

Estimated construction completion date:
Phased development (build out) time frame:

Describe impact on water demand:

VDH determination only:
Will sampling requirements need to be modified during build out?

State Corporation Commission Contacted? Yes ☐ Date: No ☐
Not Required ☐ (community system < 50 connections; non-community system)

VDH determination only:
Business Operations Plan Required? Yes ☐ No ☐
Rationale:
Recommended by:
Concurred by:

Alternatives Considered

1. Connection to existing waterworks: Identify name and distance of nearest potable water systems, capacity available; feasibility of interconnection

2. Leakage reduction

3. Other

PRELIMINARY ENGINEERING CONFERENCE
Date: _____

Construction of Public Water Supply ▪ Wells

Located in Groundwater Management Area?
Yes ☐ Groundwater Withdrawal Permit Required? Yes ☐ No ☐
DEQ Aquifer Test Plan developed/approved?
No ☐

Located in Karst Geology ?
Yes ☐ = Annual raw water MPN sampling required

No ☐

Review Well Development Procedures (handout). Comments:

Explain GUDI Determination

Well Water Characteristics (quantity, chemical, physical):
{Anticipated from nearby well water quality, test results, etc.}

Treatment Anticipated/Proposed:
Groundwater Rule requirement for 4-log inactivation of virus considered? Yes ☐ No ☐

Construction of Public Water Supply ▪ Surface Water Intakes

DEQ / VMRC / COE "Joint Permit" (Raw Water Withdrawal Permit) Yes ☐ No ☐
Permit No.:
Issuance Date:
Conditions:

DEQ Water Supply Plan
VDH Receipt Date:
VDH Review Date:
Comments:

PRELIMINARY ENGINEERING CONFERENCE

Date: _____

Construction or Modification of Treatment Facilities
{refer to specific technology Working Memo guidance as appropriate}

Construction of Storage or Distribution Facilities
½ Day Storage Provided? Yes ☐ No ☐ Pressure Tanks: Gravity Tanks: Computer Model of Distribution System? Yes ☐ No ☐ • Static Model ☐ • Extended Period Simulation ☐

Design Exceptions
{Identify all anticipated}

New Waterworks only		
Compliance Sampling Requirements	**Due Date**	**Comments**
• Bacteriological Sample Siting Plan	_____	Complete before Operation Permit issued
• Lead & Copper Sampling Plan	_____	Materials evaluation & sites; complete before Operation permit issued
• D/DBP Sampling Plan	_____	
• Phase II – V Waiver Application	_____	If site survey, SOC results support; complete before Operation permit issued
Other Requirements		
• Cross-Connection Control Program		
• Licensed Operator Required?	Yes ☐ No ☐	Class:
• Monthly Operation Reports (describe)		

PRELIMINARY ENGINEERING CONFERENCE

Date: _____

Attendees		
Name	**Affiliation**	**Signature**

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip

Dear *Waterworks Owner:*

A Preliminary Engineering Report prepared by *consultant* or *waterworks' owner* for *waterworks name* located in *city/county*, has been reviewed by this office. The report is titled "*report title*" and is dated *date*.

The report proposes to *describe project*.

The Virginia Department of Health, Office of Drinking Water, in accordance with 12 VAC 5-590-200 of the Commonwealth of Virginia *Waterworks Regulations* approves the Preliminary Engineering Report (with the following comments and/or conditions:)
1.
2….

An approved copy of this document is on file in the *(field office name).*

If applicable:
This waterworks is located in a Groundwater Management Area as declared by the State Water Control Board. You may need to obtain a Groundwater Withdrawal Permit from the Department of Environmental Quality (DEQ) in order to withdraw and use water from the proposed well. Please contact *(name)* in the DEQ's *(name)* Regional Office at (*phone number*) for further information on the Groundwater Withdrawal Permit.

If we can be of additional assistance, please contact *(District Engineer or Deputy Field Director)* at *phone number*.

Sincerely,

Director name, PE,
Engineering Field Director

Cc: *Consulting engineer*
County Administrator
ODW-Central
Funding agency

OFFICE OF DRINKING WATER
SCOPE AND DETAIL CHECKLIST

PROJECT: _____ VDH PROJECT NO.: _____
WATERWORKS: _____ RECEIPT DATE: _____
CITY/COUNTY: _____ S & D DATE: _____
DESIGN FIRM: _____ VDH ENGINEER: _____

Minimum Items Required to Initiate Plan Review

		DATE	YES	NO	N/A
I	PRELIMINARIES				
	A. Application for permit on file?	_____	☐	☐	☐
	B. Preliminary Engineering Conference held?	_____	☐	☐	☐
	C. Waterworks Business Operations Plan submitted?	_____	☐	☐	☐
	D. Preliminary Engineering Report approved?	_____	☐	☐	☐
II	PERMISSIONS (Add status comments below as needed)				
	A. DEQ Groundwater Withdrawal Permit obtained?	_____	☐	☐	☐
	B. "Joint Permit" for surface water withdrawal obtained?	_____	☐	☐	☐
	C. Waste Disposal Permit (VPDES, other) Application submitted?	_____	☐	☐	☐
III.	DESIGN CRITERIA				
	With design notes, calcs, hydraulic model certification (if req'd)		☐	☐	☐
IV.	WELL LOT				
	A. Recorded plat		☐	☐	☐
	B. Recorded Dedication Document		☐	☐	☐
V.	QUANTITY				
	A. Safe Yield documentation		☐	☐	☐
	B. Well Completion Report		☐	☐	☐
VI.	QUALITY				
	A. Chemical		☐	☐	☐
	B. Bacteriological		☐	☐	☐
	C. Radiological		☐	☐	☐
VII.	PLANS & SPECIFICATIONS				
	A. Adequate number of documents		☐	☐	☐
	B. Title Page / Cover Sheet for each document				
	1. Owner & Engineer name & address		☐	☐	☐
	2. Original PE seal with signature & date		☐	☐	☐
	C. Plan pages				
	1. Legible		☐	☐	☐
	2. Adequate size		☐	☐	☐
	3. Facsimile PE seal with signature & date		☐	☐	☐

THIS SUBMITTAL ☐ IS ☐ IS NOT SUFFICIENTLY COMPLETE TO INITIATE A FULL REVIEW

_____ _____
District Engineer (Deputy Field Director) Date

PLEASE PRINT FORM. SIGN & DATE. Include with project documents.

Additional Comments: (use reverse side if needed)

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Consulting Engineer
Address 1
Address 2
City, State, Zip

Dear *Consulting Engineer:*

This office has received *plans and specifications* prepared by your firm for *describe project or give title of project documents*. We have completed a Scope and Detail review of the documents and have determined that the documents, as submitted, are incomplete. As such, we cannot proceed with the technical evaluation of this project.

Alternate 1:
(The following information is required:
1.
2.
3.
4.
Please submit this information within thirty days, so that we may initiate a technical evaluation of the project.)

Alternate 2:
(The documents are returned with this letter. Please refer to the *Waterworks Regulations* for submittal requirements for a construction permit.)

By copy of this letter the owner is reminded that *§12VAC* 5-590-190 of the Waterworks Regulations requires that no construction or modification to the waterworks shall proceed without a written Construction Permit. If you have any questions concerning the above comments or desire further information, please do not hesitate to call.

Sincerely,

District Engineer (Deputy Field Director)

Cc: *Waterworks Owner*
ODW-Central

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Consulting Engineer
Address 1
Address 2
City, State, Zip

Dear *Consulting Engineer:*

This office has received *(plans and specifications) (change order) (addenda) (Preliminary Engineering Report) (Operation and Maintenance Manual)* prepared by your firm for *describe project or give title of document* . We have completed review of the documents and

1. in order to complete our review, we are requesting the following information:

2. the following revisions are necessary to comply with the Waterworks Regulations:

3. the following recommendations are offered:

Please submit a written response to these comments within thirty days, so that we may complete our review of the project. If you have any questions concerning the above comments or desire further information, please do not hesitate to call.

Sincerely,

District Engineer (Deputy Field Director)

Cc: *Waterworks Owner*
ODW-Central
Funding agency

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Consultant Name
Address 1
Address 2
City, State, Zip

Dear *Consulting Engineer:*

On (*date)*, this office received *describe documents* as prepared by your firm for *waterworks name*.

In our *(letter to you dated) (telephone conversation with you on) 1st comment date*, we requested clarification of and/or revisions to the project within 30 days. On *1st reminder date*, we contacted you by telephone and requested that you submit a written response and revisions, as appropriate, or a written request to delay project review for a specific time period. We contacted you again by telephone on *2nd reminder date* and requested that you submit a satisfactory response within 10 days, or formally withdraw the project from our review process.

Since we have not received notice from you and the 10 days has expired, we are returning the project documents herewith, unapproved. By copy of this letter the owner is reminded that §12VAC 5-590-190 of the Waterworks Regulations requires that no construction or modification to the waterworks shall proceed without a written Construction Permit.

Sincerely,

District Engineer (Deputy Field Director)

Cc: *Waterworks Owner*
Local Health Department, attn: Health Director
County Administrator
County Building Official
ODW-Central

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print On Field Office letterhead

COMMONWEALTH OF VIRGINIA
Department of Health
Office of Drinking Water

( ) Approved
( ) Denied

_____ _____
Date Field Director

DATE: *date*

TO: *name*
Field Director

THROUGH: Robert D. Edelman, PE
Technical Services Director

FROM: *name*, District Engineer

SUBJECT: Design Exception Request
City / County: *location name*
Project: *waterworks name & project title*

This office has received a design exception request for the subject project.

SECTION: *applicable Waterworks Regulation section(s)*

DESCRIPTION: *brief description of exception*

JUSTIFICATION: *brief explanation of special or extenuating circumstances showing that the exception is reasonable and necessary*

RECOMMENDATION: We believe that the engineer has (has not) adequately justified the request, as outlined in the enclosed engineer's letter, dated *date*.
We recommend that you approve (disapprove) the request (*add conditions as appropriate)*

TRANSIENT NON-COMMUNITY WATERWORKS DESIGN AND CONSTRUCTION CHECKLIST

Under provisions of the Code of Virginia, Title 54.1, Chapter 4, Section 54.1-402, and the Virginia Waterworks Regulations, information described by this checklist may be submitted by a waterworks owner in lieu of plans, specifications, documents, and designs prepared by a licensed professional engineer.

The following conditions apply:

1. This procedure is only available to transient non-community waterworks serving no more than 100 persons total per day.
2. Waterworks must be a direct delivery system without any treatment, meaning that system consists only of one source, small pressure storage tank, and single service connection.
3. Single service connection consists of a structure with area less than 5,000 square feet.
4. Construction of well must be by a well driller with Class A contractor license.
5. Construction of remainder of waterworks must be by a master's level plumber or Class A contractor.

Owner Name:
Owner Address:
Waterworks Name:

Fill in all blanks, check all boxes to indicate that item has been completed, and attach to this form copies of information as described.

Design Basis

Type of Business:
Total Number of Persons Served Per Day:
Water uses:
Days of operation: Hours of operation:

Water Quality

Bacteriological results – series of 20 for MPN analysis
Chemical results – inorganic, metals, nitrate/nitrite, VOCs, SOCs (if required), and radiological

Construction Information – attach sketch of well, piping, storage tank, and appurtenances.

Water Well Completion Report – attach copy signed and dated by well driller that includes the following:

1. Well depth and hole size
2. Casing material, diameter, depth, weight/thickness
3. Screen length, depth, material, size
4. ☐ Grout type, depth

Well Yield and Drawdown Test Report – attach copy signed and dated by person conducting test that includes the following:

1. ☐ Test pump size and depth
2. ☐ Pumping rates and drawdown depths
3. ☐ Recovery data
4. ☐ Well pump information, model number and pump curve – attach copy of manufacturer's literature

TNC CHECKLIST (cont.)

☐ **Well Lot Plat** - (attach a copy)
☐ **Well Lot Dedication Document –** attach a copy

☐ **Well Enclosure, if provided**

1. Dimensions:
2. Material of construction:
3. Access hatch or door:
4. Freeze protection:

☐ **Concrete pad, if provided-** Dimensions:

☐ **Pitless Adapter and Watertight Cap, if provided** – attach copy of manufacturer's information confirming certified status.

Pump Information

1. Depth of pump: feet below ground level.
2. Well drop pipe diameter (inches):
3. Type of material:

Waterline

1. Diameter (inches):
2. Type of material:
   (must be NSF approved for potable water)
3. Describe pipe joints
4. Describe trenching, bedding, and pipe installation procedures (attach separate sheet or describe below):

Waterline Appurtenances (check all provided)

☐ Check valve
☐ Gate valve
☐ Sampling tap
☐ Blowoff

Pressure Tank (check all provided)

☐ Attach copy of manufacturer's information that shows dimensions and features
☐ Pressure gauge
☐ Air relief (if needed according to manufacturer)

System Disinfection, Flushing, and Sampling (attach separate sheet or describe below)

☐ **Bacteriological Sampling** – attach Lab results (2 negative samples on consecutive days after construction completed are required)

TNC CHECKLIST (cont.)

The information provided above, plus information on any attachments, is correct to the best of my knowledge.

Owner/Agent Signature: _____

Date: _____

Construction completion statement

Owner must sign and date a second copy of this form completed in its entirety and submit it to VDH-ODW immediately following completion of construction.

Construction of the waterworks was completed in substantial compliance with the design and construction information presented in this form.

Owner Signature: _____

Date: _____

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and sides.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip

Dear *Waterworks Owner:*

Record drawings for the construction of (additions to) (modifications to) the *(name of waterworks)* (community) (nontransient noncommunity) (transient noncommunity) waterworks located in *(name)* County, prepared by (*Consulting Engineer)* have been reviewed by this Office. The plans entitled "*(title)"* (are dated) (are stamped with our receipt date of) *date* and include sheets ___ through ___. The specifications entitled "*(title)*" (are dated) (are stamped with our receipt date of) (*date)*.

The project consists of *(brief project description)* .

The plans and specifications are technically adequate and are approved by this Office, in accordance with Commonwealth of Virginia *Waterworks Regulations*, §12VAC5-590-220. A copy of these documents is on file in the *(field office name).*

CASE 1: Since these plans reflect changes to a previously-approved project, a construction permit will not be issued.

CASE 2: Since the construction of this project preceded the formal approval process due *(specify emergency condition)*, a construction permit will not be issued.

Upon completion of construction, the owner shall submit a statement signed by a professional engineer licensed in Virginia stating that the work was completed in accordance with the approved plans and specifications. [Upon receipt of this statement, (the satisfactory results of bacteriological analysis), and final inspection by an Office representative, the State Health Commissioner will (amend your present waterworks operation permit) (issue a waterworks operation permit) in accordance with the *Regulations*.]
or
[Upon final inspection by an Office representative and satisfactory results of the bacteriological analysis, the project may be put into service.]

You are reminded that § 12VAC5-590-190 of the *Waterworks Regulations* requires that no construction or modifications to a waterworks shall be made without obtaining a written Construction Permit. If we can be of additional assistance, please contact _____ ,District Engineer in this office.

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and sides.

Sincerely,

Director name, PE
Engineering Field Director

cc: *Consulting Engineer*
County Health Department, Attn: , MD, MPH, Director
County Administrator
County Building Official
ODW-Central
Funding agency

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip

Dear *Waterworks Owner:*

(Change Order) (Addendum) (Addenda) No(s). ___ and __ to the plans and specifications for the *Name of Project* project for the *waterworks name* located in *County / City name* have been reviewed by this office. The original plans and specifications were approved by Waterworks Construction Permit number *(permit number)* on *approval date*.

(Change Order) (Addendum) (Addenda) No(s). ___ and ___ provides for *brief description*.

The *(Change Order) (Addendum) (Addenda) (is) (are)* technically adequate and *is (are)* approved by this Office, in accordance with Commonwealth of Virginia *Waterworks Regulations*, §12 VAC 5-590-240. A copy of these documents is on file in the *(field office name)*.

This approval does not suspend, minimize, or otherwise alter the waterworks obligation to comply with federal, state, or local laws and regulations or permits.

If we can be of additional assistance, please contact *District Engineer or Deputy Field Director* at *phone number*.

Sincerely,

Director name, PE
Engineering Field Director

Cc: *Consulting engineer*
Local Health Department, attn: Health Director
County Administrator
County Building Official
ODW-*(Central) (Field Office)*
Funding agency

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Regional Office
Department of Environmental Quality
Address 1
Address 2
City, State, Zip

Gentlemen:

The Department of Health has received plans and specifications from *waterworks owner* for construction of a water treatment facility to serve *service area*, located in *County/City name*.

The waterworks is designed for a capacity of __ mgd. Wastewater will be generated from *describe unit treatment processes* (and treated subsequently by *describe further treatment and dewatering, if applicable*. Wastewater from these processes will be (discharged to the *receiving stream) (*disposed in a soil adsorption system located *describe*).

This information is being supplied to you for appropriate action by DEQ that you believe is necessary.

Sincerely,

District Engineer (Deputy Field Director)

Cc: *Design Engineer*
Local Health Department, attn: Health Director
ODW-Central

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font.
DO NOT REFORMAT HEADINGS (except font.) These are table format, lines removed.
Pages are 1" top, bottom, and side margins.
Post to "ODWSHARE" and complete tracking log entry.
Upon completion of QA/QC reviews, print on Field Office letterhead for signature by the Field Office Director.

WATERWORKS CONSTRUCTION PERMIT

Permit No.:	*number*	**Subject:**	*City / County*
Effective Date:	*month dd, yyyy*	**Water:**	*Waterworks Name*
Expiration Date:	*month dd, yyyy*	**PWSID:**	*Number*

Issued to:
Waterworks Owner Name
Address 1
Address 2
City, State, Zip

ATTN: *Administrative Contact*

[(Revised) Plans (and specifications) or (with specifications thereon)] or [The design and construction information] for the construction of *(additions to) (modifications to)* the *(waterworks name) (community) (nontransient noncommunity) (transient noncommunity)* waterworks located in *City / County*, prepared by *consulting engineer* have been reviewed by this Office. The plans titled "*plans title" (are dated) (are stamped with our receipt date of) date* and include sheets *sheet numbers*. The specifications titled "*specifications title*" are *(are dated) (are stamped with our receipt date of __)*.
or
The plans refer to *name of standards* approved by this office on *approval date*.

The project consists of *brief project description*. ***(Include if a Description Sheet is attached:)*** *[A Description Sheet of the proposed construction is enclosed.]*

The *[plans (and specifications) or (with specifications thereon)] or [design and construction information]* are technically adequate and are approved by this Office, in accordance with *(include with TNC systems without formal plans): the Code of Virginia, Section 54.1-402 and* 12VAC5-590 of the Commonwealth of Virginia *Waterworks Regulations*. A copy of these documents is on file in the *(field office name).*

(The next sentence is a stand-alone paragraph)
This approval does not suspend, minimize, or otherwise alter the waterworks obligation to comply with federal, state, or local laws and regulations or permits.

This Waterworks Construction Permit is issued in accordance with Title 32.1 of the *Code of Virginia*, and 12VAC5-590 *et seq*. of the *Waterworks Regulations*. This is your authorization from the State Health Commissioner to construct *(additions to) (modifications to)* the subject waterworks in accordance with the approved documents. Any deviations from the approved documents affecting capacity, hydraulic conditions, operating units, the functioning of the treatment processes, or the water quality delivered, must be approved by this Office before any such changes are made. Revised plans and specifications shall be submitted to *(the * Field Office)* in time to permit review and approval before construction.

Upon completion of construction, the owner shall submit a statement signed by a professional engineer licensed in Virginia certifying that the work was completed in accordance with the approved documents.

Upon receipt of this statement, *(if applicable): satisfactory results of bacteriological analysis* and final inspection by an Office representative, the State Health Commissioner will *(amend your current waterworks operation permit) (issue a waterworks operation permit)* in accordance with the *Regulations*.
or
Upon receipt of this statement, *(if applicable): final inspection by an Office representative* and satisfactory results of the bacteriological analysis, the project may be put into service.

If applicable:
This waterworks is located in an area designated as a Groundwater Management Area by the State Water Control Board. Therefore, a Groundwater Withdrawal Permit from the Department of Environmental Quality may be required. It is understood that you have begun the process of obtaining this permit.
or
The Department of Environmental Quality has *(drafted) (issued)* a Groundwater Withdrawal Permit for this groundwater source.

If we can be of additional assistance, please contact *District Engineer or Deputy Field Director* in our **name** field office at *phone number*.

(1 line return)

Sincerely,
(*Please leave 3 return lines between Closing and Signature Block. Closure tab is 3 ¼")*

Director name, PE
Engineering Field Director

(1 line return)

UPPERCASE initials of draftee : lowercase initials of typist or admin preparer i.e., DPF:ga

(1 line return)

Enclosure (*if Description Sheet of Proposed Construction is enclosed)*

(1 line return)

cc: *Consulting engineer (tab is ½")*
Local Health Department, attn: Health Director
County Administrator
County Building Official
Funding agency

DEQ – Office of Water Supply *(Include if in GWMA)*
ODW – Central Office

ATTACHMENT A.13. Description Sheet of Proposed Construction

VIRGINIA DEPARTMENT OF HEALTH
DESCRIPTION SHEET
of Proposed Construction

WATERWORKS NAME:

PERMIT NUMBER:

EFFECTIVE DATE:

EXPIRATION DATE:

SOURCE: *wells, springs or surface water source(s)*

PROJECT DESCRIPTION

The project consists of

- *detailed description of construction project*
- *follow water from source to distribution*
- *use subject headings for clarity*

PROJECT CAPACITY EVALUATION

Include:

- *Design Basis,*
- *capacity evaluation for each major element included in the project,*
- *Conclusion*

TRANSMITTAL CHECKLIST - CENTRAL OFFICE PROJECT APPROVAL
(Mail package to Field Services Engineer – Central Office)

DATE:	Click here to enter text.
FROM (Name & Field Office):	Click here to enter text.
WATERWORKS NAME:	Click here to enter text.
COUNTY/CITY:	Click here to enter text.
PWSID #:	Click here to enter text.
PTLOG #:	Click here to enter text.
CONSTRUCTION PERMIT #:	Click here to enter text.
PROJECT NAME:	Click here to enter text.

DOCUMENTS INCLUDED (Check all that apply):

- ☐ Construction Permit for Director's Approval — ☐ Uploaded to ODWSHARE
- ☐ Engineering Description Sheet — ☐ Uploaded to ODWSHARE
- ☐ Waterworks Permit Application
- ☐ Scope & Detail Checklist
- ☐ Paper copy of plans and specifications
- ☐ Design notes and calculations
- ☐ Correspondence, review notes, etc.
- ☐ Addressed envelope for each party listed on the Construction Permit

- ☐ Well Completion Report (Form GW -2)
- ☐ Yield & Drawdown Test; Recovery Test
- ☐ Recorded Well Lot Dedication Document
- ☐ Recorded Well Lot Plat showing access road

REQUIRED:

- ☐ Field Office has retained an electronic copy of plans

COMMENTS:

TRANSMITTAL CHECKLIST - CENTRAL OFFICE FILES

For Field Office Issued Construction Permits

(Mail package to ODW Central Office Fileroom)

DATE:	Click here to enter text.
FROM (Name & Field Office):	Click here to enter text.
WATERWORKS NAME:	Click here to enter text.
COUNTY/CITY:	Click here to enter text.
PWSID #:	Click here to enter text.
PTLOG #:	Click here to enter text.
CONSTRUCTION PERMIT #:	Click here to enter text.
PROJECT NAME:	Click here to enter text.

DOCUMENTS ATTACHED (Check all that apply):

- ☐ Signed Construction Permit / Approval Letter
- ☐ Description Sheet of Proposed Construction
- ☐ Waterworks Permit Application
- ☐ Scope & Detail Checklist
- ☐ Correspondence, review notes, etc.

- ☐ Well Completion Report (Form WG -2 with Lat. & Long included)
- ☐ Yield & Drawdown Test; Recovery Test
- ☐ Recorded Well Lot Dedication Document
- ☐ Recorded Well Lot Plat showing access road

REQUIRED:

- ☐ Field Office has retained electronic copy of plans

COMMENTS:

Estimated Maximum Daily Water Demand Table[1,2]

Table 1-3 Planning guide for water use

Type of Establishment	Water Used *gpd (L/day)*	
Airport (per passenger)	3–5	(11–19)
Apartment, multiple family (per resident)	60	(227)
Bathhouse (per bather)	10	(38)
Camp		
Construction, semipermanent (per worker)	50	(189)
Day, no meals served (per camper)	15	(57)
Luxury (per camper)	100–150	(379–568)
Resort, day and night, limited plumbing (per camper)	50	(189)
Tourist, central bath and toilet facilities (per person)	35	(132)
Cottage, seasonal occupancy (per resident)	50	(189)
Court, tourist, individual bath units (per person)	50	(189)
Club		
Country (per resident member)	100	(379)
Country (per nonresident member present)	25	(95)
Dwelling		
Boardinghouse (per boarder)	50	(189)
Additional kitchen requirements for nonresident boarders	10	(38)
Luxury (per person)	100–150	(379–568)
Multiple-family apartment (per resident)	40	(151)
Rooming house (per resident)	60	(227)
Single family (per resident)	50–75	(189–284)
Estate (per resident)	100–150	(379–568)
Factory (gallons per person per shift)	15–35	(57–132)
Highway rest area (per person)	5	(19)
Hotel		
Private baths (2 persons per room)	60	(227)
No private baths (per person)	50	(189)
Institution other than hospital (per person)	75–125	(284–473)
Hospital (per bed)	250–400	(946–1,514)
Laundry, self-serviced (gallons per washing [per customer])	50	(189)
Livestock (per animal)		
Cattle (drinking)	12	(45)
Dairy (drinking and servicing)	35	(132)
Goat (drinking)	2	(8)
Hog (drinking)	4	(15)
Horse (drinking)	12	(45)
Mule (drinking)	12	(45)
Sheep (drinking)	2	(8)
Steer (drinking)	12	(45)

[1]Additional demand may be due to fire flow, irrigation, swimming pools, or other outside uses.
[2]Copied from AWWA Design and Construction of Small Systems, 1999.

Table 1-3 Planning guide for water use (*continued*)

Type of Establishment	Water Used *gpd (L/day)*	
Motel		
Bath, toilet, and kitchen facilities (per bed space)	50	(189)
Bed and toilet (per bed space)	40	(151)
Park		
Overnight, flush toilets (per camper)	25	(95)
Trailer, individual bath units, no sewer connection (per trailer)	25	(95)
Trailer, individual baths, connected to sewer (per person)	50	(189)
Picnic		
Bathhouses, showers, and flush toilets (per picnicker)	20	(76)
Toilet facilities only (gallons per picnicker)	10	(38)
Poultry		
Chickens (per 100)	5–10	(19–38)
Turkeys (per 100)	10–18	(38–68)
Restaurant		
Toilet facilities (per patron)	7–10	(26–38)
No toilet facilities (per patron)	2½–3	(9–11)
Bar and cocktail lounge (additional quantity per patron)	2	(8)
School		
Boarding (per pupil)	75–100	(284–379)
Day, cafeteria, gymnasiums, and showers (per pupil)	25	(95)
Day, cafeteria, no gymnasiums or showers (per pupil)	20	(76)
Day, no cafeteria, gymnasiums, or showers (per pupil)	15	(57)
Service station (per vehicle)	10	(38)
Store (per toilet room)	400	(1,514)
Swimming pool (per swimmer)	10	(38)
Theater		
Drive-in (per car space)	5	(19)
Movie (per auditorium seat)	5	(19)
Worker		
Construction (per person per shift)	50	(189)
Day (school or offices per person per shift)	15	(57)

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on Field Office letterhead. Pages are 1" top, bottom, and sides.

SUMMARY OF FINAL INSPECTION

DATE: *date*

SUBJECT: *County/City*
Waterworks Name
PWSID

PROJECT: *project title*

CONSTRUCTION PERMIT NO.: *permit number* DATE ISSUED: *date*

DATE OF INSPECTION: *date*

THOSE PRESENT: *list all those present during the inspection to include ODW staff, owner, engineer, etc.*

COMMENTS:

The project consists of *brief project description*.

A letter of substantial completion dated *date* was received by this Office on *date*. Acceptable bacteriological sampling results were received on *date*.

ODW staff inspection found the construction to be in substantial conformance with approved plans and specifications. Construction appeared to meet *Waterworks Regulations* requirements and the scope of the approved Construction Permit. (*This project may be placed into operation.*) (*This project may be placed into operation now with the completion of the following incidental items to be completed by date.*) (*Following the completion of the following items, this project may be placed into operation*.)

1. *List remaining items to be completed*
2. *…*

Insert photos, as needed.

ATTACHMENT A.18. Example Non-Community Well Lot Plat & Dedication Document Exception
INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print On Field Office letterhead

DATE: *date*

TO: *name*,
Field Director

FROM: *name*, District Engineer (or Environmental Health Specialist)

COMMONWEALTH OF VIRGINIA
Department of Health
Office of Drinking Water

( ) Approved
( ) Denied

_____ _____
Date Field Director

SUBJECT: Design Exception Request
City / County: *location name*
Project: *waterworks name & project title*

This office has received a design exception request for the subject Transient Non-community waterworks.

SECTION: 12VAC5-590-840 A.1.d and 12VAC5-590-840 A.1.e

DESCRIPTION: A new well has been drilled to supply the *name*. The owner has requested an exception to the requirements for a recorded well plat and dedication document.

JUSTIFICATION: *brief explanation of special or extenuating circumstances showing that the exception is reasonable.*

- The well *(is)(will be)* constructed in accordance with 12VAC5-590-840 A.2, 12VAC5-590-840 A.4 and 12VAC5-590-840 B.
- The well lot *(is)(will be)* graded to divert surface runoff away from the well to prevent ponding.
- Land use will be restricted within *specify distance* feet surrounding the wellhead which would cause contamination of the water supply.

RECOMMENDATION: We believe that the *(engineer or owner)* *(has) (has not)* adequately justified the request, as outlined in the enclosed letter, dated *date*. We recommend that you *(approve)(disapprove)* the request.

ATTACHMENT A.19. Example Construction Permit with Conditions for Alternate Project Delivery
Project-specific information noted in *italics*.

Processing Office:
Danville Field Office
211 Nor Dan Drive, Suite 1040
Danville, Virginia 24540-1658
Phone: (434) 836-8416

SUBJECT: *Bedford County*
WATERWORKS: *Smith Mountain Lake Central Water System*
PWSID: *5019400*

WATERWORKS CONSTRUCTION PERMIT

Permit No.: *502115* **Effective Date:** *September 11, 2015* **Expiration Date:** *September 11, 2020*

Issued to:

Bedford Regional Water Authority
1723 Falling Creek Road
Bedford, Virginia 24523

Attn: *Mr. Brian M. Key, Executive Director:*

Preliminary plans and specifications for the *construction of additions to the Smith Mountain Lake Central Water System community* waterworks located in *Bedford County*, prepared by *Black & Veatch*, have been reviewed by this Office. The plans titled *"Bedford Regional Water Authority, Bedford, Virginia; Smith Mountain Lake WTP & Raw Water Pumping Station/Intake"* are dated *August 2015* and include sheets *G-00-001 through E-30-702 (157 sheets total)*. The specifications titled *"Project Manual, Bedford Regional Water Authority, Bedford, Virginia; Smith Mountain Lake Raw Water Pumping Station and Water Treatment Plant"* are dated *July 2015*.

The project consists of *the construction of a raw water intake, raw water pump station, raw water storage tank, surface water membrane treatment plant, clearwell, finish water pumps and associated appurtenances* as described on the attached engineering description sheet.

The Virginia Department of Health, Office of Drinking Water, in accordance with § 12VAC5-590 of the Commonwealth of Virginia *Waterworks Regulations* approves the preliminary plans and specifications with the following conditions:

1. Construction must adhere to Part III, Manual of Practice for Waterworks Design, of the Commonwealth of Virginia *Waterworks Regulations*.

2. Failure to comply with Part III, Manual of Practice for Waterworks Design, of the Commonwealth of Virginia *Waterworks Regulations* will require corrections to obtain compliance with the *Waterworks Regulations* regardless of construction status.

3. At least *90 days* prior to completion of construction, a complete set of final plans and specifications must be submitted to the Office of Drinking Water, *Danville* Field Office for review and approval. The plans and specifications must be properly signed and sealed by a professional engineer licensed in Virginia. The submission must include a completed *Basis of Design Report* and any associated calculations.

4. Any deviations from the approved preliminary documents affecting capacity, hydraulic conditions, operating units, the functioning of the treatment processes, or the water quality delivered, must be approved by this Office before any such changes are made.

5. *As needed: Within 90 days after the project has been placed into service, a completed Operations and Maintenance Manual must be submitted to the Office of Drinking Water, Danville Field Office for review and approval.*

A copy of these preliminary documents is on file in the *Danville* Field Office.

This approval does not suspend, minimize, or otherwise alter the waterworks obligation to comply with federal, state, or local laws and regulations or permits.

This Waterworks Construction Permit is issued in accordance with Title 32.1 of the *Code of Virginia*, and § 12VAC5-590 *et seq*. of the *Waterworks Regulations.* This is your authorization from the State Health Commissioner to construct additions to the subject waterworks in accordance with the approved preliminary documents. Any deviations from the approved preliminary documents affecting capacity, hydraulic conditions, operating units, the functioning of the treatment processes, or the water quality delivered, must be approved by this Office before any such changes are made. Revised preliminary plans and specifications shall be submitted to the *Danville* Field Office in time to permit review and approval before construction.

Upon approval of final plans and specifications, satisfactory results of bacteriological analysis and final inspection by an Office representative, the State Health Commissioner will issue a waterworks operation permit in accordance with the *Regulations*.

If we can be of additional assistance, please contact *James Reynolds, PE, Deputy Field Director* in our *Danville Field Office at 434-836-8416.*

Sincerely,

John J. Aulbach II**,** PE
Director, Office of Drinking Water

JDR:edt
Enclosure

cc: *Paul Delphos, PE, Black & Veatch*
Bedford County Health Department, Attn: Kerry W. Gateley, MD, MPH, CPE, Director
Mark K. Reeter, Bedford County Administrator
Gary McIver, Bedford County Building Official
Philip Martin, PE, Western Virginia Water Authority
ODW – Danville
ODW – Lexington
ODW – Central Office

Virginia Department of Health
Office of Drinking Water (ODW)

METERING VARIANCE APPLICATION

Waterworks Name: _____

PWSID No. _____

I request a variance to 12VAC5-590-520 of the *Waterworks Regulations*, which will allow operation of this waterworks without metering of total water production. I understand this variance will be subject to the following conditions:

1. Total water production does not exceed 10,000 gallons per day (gpd).
2. The Variance will be automatically revoked at such time that the total water production exceeds 10,000 gpd.
3. The Variance will be automatically revoked at such time that a meter is installed.
4. The Variance will be nontransferable and must be attached to the Operation Permit.
5. The Variance will be a condition of the Operation Permit and will be revoked when the Permit is revoked.

The justification for this variance is as follows (check all that apply):

- ☐ Insufficient financial and technical resources needed to install meter(s).
  Please explain (required) (attach additional sheets as necessary): _____
  _____
  _____
- ☐ No feasible location(s) to install meter(s).
- ☐ There have been no historical issues with providing adequate water capacity to meet system demands.
- ☐ No information on well yield and/or well pump capacity is/are available.
- ☐ Other: _____

Owner Signature: _____

Owner Name (printed): _____

Date: _____

(VDH Letterhead)

MEMORANDUM OF UNDERSTANDING
General Permit for Distribution Mains

Waterworks' owner
Address 1
Address 2
City, State Zip

SUBJECT: *City/County*
WATERWORKS: *waterworks name*
PWSID: *PWSID*

A waterworks owner may apply for a General Permit for Distribution Mains, if they have on record with the Department of Health, Office of Drinking Water, approved general specifications and plan details covering distribution waterline design and construction. This is allowed in accordance with Section 12VAC5-590-300 of the Commonwealth of Virginia, State Board of Health, *Waterworks Regulations*. The General Permit for Distribution Mains delegates the Health Department's review and approval authority for the construction of distribution mains to the waterworks owner. In order to receive and maintain this General Permit for Distribution Mains the waterworks owner must establish a program consisting of the following items set forth in this MEMORANDUM OF UNDERSTANDING.

1. This General Permit is limited to the review and approval of distribution main extension projects only. The maximum pipe diameter to be reviewed under this program shall be _____inches. Any project that includes transmission mains (a pipeline whose primary purpose is to move significant quantities of treated water among service areas) must be submitted to the Office of Drinking Water *Field Office Name* for review, approval, and issuance of a Waterworks Construction Permit by the State Health Commissioner.
2. Any modifications of the*(waterworks' owner)* general specifications and plan details must be approved by the Commissioner or designee and any such modification shall be at least as stringent as the latest edition of the *Waterworks Regulations*.
3. A review staff satisfactory to the Office of Drinking Water and including at least one Professional Engineer licensed to practice in Virginia shall be maintained (or retained on contract) by *(waterworks' owner)*. Any change of the licensed Professional Engineer shall be reported immediately to the *Field Office Name*.
4. All individual projects serving more than 15 service connections or consisting of pipe greater than 8 inches in diameter shall have specific engineering plans and specifications prepared and approved under the General Permit prior to construction. These plans and specifications must be prepared by a PE licensed to practice in Virginia, independent of and separate from the review staff described in Item 3 above.
5. A project summary shall be completed for each project reviewed and approved under the General Permit. The summary report shall include project location, pipe material, diameter, length, and design population (or number of connections). In addition, the report shall indicate the minimum and maximum pressures under peak hour demand, or maximum day demand plus fire flow demand (if applicable). A copy of the project summary report must be forwarded to the *Field Office Name* as each project is approved. An example project summary report is attached.
6. The *(waterworks' owner)* shall maintain and keep on file copies of the plans and all supporting documentation for each project approved under the General Permit. The Office of Drinking Water staff may perform an audit of the files.

7. The *(waterworks' owner)* shall maintain current distribution system maps showing the system layout of each waterworks covered by the General Permit, with pipe diameters and hydraulic capacities. A copy of the distribution map(s) shall be provided to the Office of Drinking Water upon request.
8. The Field Director may at any time require the submittal of any set of project plans and specifications submitted to or prepared by *(waterworks' owner)* under the General Permit.
9. The *(waterworks' owner)* shall submit an Annual Report to *(Field Office name)* no later than (*month)* 1 of each year that the General Permit is in effect. The annual Report shall include the following information:
    a. A summary of the total quantity of water pipe installed under the General Permit during the preceding 12 months, indicating the respective pipe diameter and material;
    b. the number of connections, by category, currently connected to each of the waterworks covered by the General Permit; and
    c. the average daily demand and peak daily demand for each of the preceding 12 months, unless this data has been previously reported.
    d. An example Annual Report is Attached.
10. The conditions contained in this MEMORANDUM OF UNDERSTANDING shall be adhered to throughout the duration that *(waterworks' owner)* holds a valid General Permit.
11. This MEMORANDUM OF UNDERSTANDING may be revoked by either party at any time. Revocation of the General Permit by the Commissioner automatically revokes the MEMORANDUM OF UNDERSTANDING.

_____ _____

Name & Title of Waterworks' Representative Date

The conditions as outlined above are satisfactory to allow *(waterworks' owner)* to be issued a General Permit for Distribution Systems.

_____ _____

Field Director Name Date
Engineering Field Director

WATER PROJECTS ANNUAL REPORT

MEMORANDUM TO: VDH – Office of Drinking Water – (*Field Office*)

DATE:

FROM:

WATERWORKS:

SUBJECT: Local Review Program – Annual Report

REFERENCE: General Permit Number _____

==========

Summary of water main installation projects during the period _____ through _____:

Pipe Size	Pipe Length	Pipe Material

Total Number of Projects Reviewed and Approved Under General Permit _____

Total Number of Connections as of _____: _____
date

Twelve Month Average Daily Water Use: _____

_____ **PE**
Signature

PROJECT SUMMARY REPORT

MEMORANDUM TO: VDH – Office of Drinking Water – *Field Office Name*

DATE:

FROM:

PROJECT NAME:

PROJECT LOCATION:

PLANS PREPARED BY:

==========

PROJECT SERVICE AREA DESIGN CONDITIONS:

Connection Type	Number of Connections	Average Day		Maximum Day	
		GPD/Connection	GPD	GPD/Connection	GPD
Residential					
Commercial					
Industrial					
Other (identify)					
TOTAL					

Pipe Size	Pipe Length	Pipe Material

Fire hydrants located on pipe ≥ 6-inch diameter? _____
Maximum 600 ft of 3-inch diameter water line? _____
Maximum of 300 ft of 2-inch diameter water line? _____

HYDRAULIC EVALUATION OF THIS PROJECT:

Flows		Minimum Pressure
Peak Hour Demand		
Maximum Day Demand		
Design Fire Flow		
Maximum Day + Fire Flow		
No. of Fire Hydrants		

Design Fire Flow Acceptable To Fire Official? _____ Y/N

_____ **PE**

Signature of Project Reviewer

COMMONWEALTH OF VIRGINIA

DEPARTMENT OF HEALTH
OFFICE OF DRINKING WATER

GENERAL PERMIT FOR CONSTRUCTION OF WATERWORKS DISTRIBUTION MAINS

(Waterworks name) **is hereby granted permission to construct waterline extensions located in** *(City or County)* **in accordance with § 32.1 - 172 and 173 of the *Code of Virginia* and the *Waterworks Regulations* of the Virginia Department of Health (12VAC 5-590). This permit is issued in accordance with the General Specifications and Plan Details covering water supply main design and construction, titled** *(Title of standards)***, dated** *(date of standards)***, and the attached Memorandum of Understanding.**

PERMIT NO.: *(General Permit No.)*

EFFECTIVE DATE: *(use format: January 1, 2014)*

EXPIRATION DATE: *(use format: January 1, 2014, + 5 years)*

APPROVED_____

***Director name*, PE, Engineering Field Director,**
***Field Office Name* Field Office**
for the State Health Commissioner pursuant to VA Code § 2.2-604

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip

Dear (*Waterworks Owner):*

Enclosed please find a signed General Permit for Construction of *(waterworks' name*) Distribution Mains and the associated Memorandum of Understanding (MOU) towards implementation of *(waterworks' name)* Local Review Program. Projects reviewed under this program will be constructed in accordance with the *(waterworks name)* standard specifications approved by this Office on (*date).*

Should you have any questions, please feel free to contact *(District Engineer),* or *(Field Director),* in our *(name)* Field Office at *(phone number).*

Sincerely,

District Engineer

Enclosure

Cc: *Local Health Department, attn: Health Director*
County Engineer
County Administrator
County Building Official
ODW- (Field Office)

General Permit & Local Review Program
Audit Review

Section A - General

Name of Waterworks: PWSID:

General Permit No.:
Issue Date:
Expiration Date:

Waterworks Contact:

Audit Conducted By: Date of Audit:

Section B – Standard Construction Specifications

Title of Standard Construction Specifications:

ODW Approval Date:
Are the approved Standard Construction Specifications up to date:
Date standard specifications were last amended:

Section C – Local Review Program

Person(s) responsible for project review:

Name: PE License Number
Name: PE License Number
Name: PE License Number
Name: PE License Number

1. Do all individual projects serving more than 15 connections have specific engineering plans and specifications prepared and approved?

2. Is an individual project review conducted for every project?

3. Are review notes or checklists utilized?
   If yes, is the review adequate?

4. Does the project review include an evaluation of system hydraulics, including potential impacts on the entire waterworks?

5. Does the project review include an evaluation of minimum pressures to ensure that 20 psi is maintained at all locations under all flow conditions?

6. Does the utility have a calibrated system-wide hydraulic model?
   If yes, is the model utilized to evaluate projects under the local review program?

7. Maximum pipe size per Memo of Understanding?
   Do projects comply with this maximum diameter?

8. Is a project summary sheet completed for each project?

9. Does the project summary sheet indicate the following:

   - Diameter and length of all piping?
   - Number and type of connections served?
   - Design flow and maximum flow?
   - Minimum pressure and critical point?

10. Are the summary sheets submitted to the respective ODW District Engineer for each project?

11. Does the utility do <u>ANY</u> in-house design of water line projects?

    If yes, are these projects submitted to ODW for review, approval, and issuance of a construction permit?

    If no, identify the third party professional engineer that conducts the review:
    Name: PE License Number
    Name: PE License Number

Section D – Records and Reporting

1. Does the utility maintain up-to-date distribution system maps?

2. Does the utility keep file copies of all approved projects?

3. Does the utility keep file copies of all project reviews, and approvals?

4. Does the utility submit the required annual report to ODW?

Section E – Selected Project Review Audit

Name of project selected for audit:
Date of approval:
Reviewer:

1. Were project review sheets adequate?

2. System hydraulics and minimum pressure adequately evaluated?

3. Impacts on overall distribution system evaluated?

4. Did project appear to be in accordance with *Waterworks Regulations*?

5. ODW summary sheet completed and submitted?

Virginia Department of Health
Office of Drinking Water

Waterworks Operation Permit

(Waterworks Owner) **is hereby granted permission to operate the** *(name of service area and/or name of waterworks)* **waterworks, a Class** *(1, 2, 3, 4, 5, 6 or* **an unclassified***) (community, nontransient noncommunity, transient noncommunity)* **waterworks located in** *(City, Town or County),* **in accordance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the Virginia *Waterworks Regulations*. The waterworks has a capacity of** *(flowrate in gpd, or existing units as appropriate)*. **This permit is issued with the understanding that this owner shall operate the waterworks in accordance with Part II of the Virginia *Waterworks Regulations* titled "Operation Regulations for Waterworks". This permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits. This permit may be revoked at any time upon written notice of revocation by the State Health Commissioner; if it is determined that** (*Owner*) **has failed to comply with this permit, including the Operation Permit Conditions.**

Variances or Exemptions issued: ( ) None ( ) See Attached

Operation Permit Conditions attached

PERMIT NO.: *(PWSID#)*

EFFECTIVE DATE: *(use format: January 1, 2014)*

APPROVED_____

Director name, **PE, Engineering Field Director,** ***Field Office Name*** **Field Office**
for the State Health Commissioner pursuant to VA Code § 2.2-604

Virginia Department of Health
Office of Drinking Water

Temporary Waterworks Operation Permit

(Waterworks Owner) **is hereby granted permission to operate the** *(name of service area and/or name of waterworks)* **waterworks, a Class** *(1, 2, 3, 4, 5, 6 or* **an unclassified***) (community, nontransient noncommunity, transient noncommunity)* **waterworks located in** *(City, Town or County),* **subject to the attached Temporary Permit Requirements to protect public health and demonstrate compliance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the Virginia *Waterworks Regulations*. The waterworks has a capacity of** *(flowrate in gpd, or existing units as appropriate)*. **This temporary permit is issued with the understanding that this owner shall operate the waterworks in accordance with Part II of the Virginia *Waterworks Regulations* titled "Operation Regulations for Waterworks." This temporary permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits. This temporary permit shall expire on (***January 1, 2007***) or may be revoked at any time upon written notice of revocation by the State Health Commissioner if it is determined that (***Waterworks Owner***) has failed to comply with any of the attached Temporary Permit Requirements pursuant to § 2.2-4000 *et seq.* of the *Code of Virginia*.**

Variances, Exemptions, or Temporary Permit Requirements issued: ( ) None (√) See Attached

Operation Permit Conditions attached

PERMIT NO.: (PWSID#)T

EFFECTIVE DATE: *(use format: January 1, 2007)*

EXPIRATION DATE: *(use format: January 1, 2007)*

APPROVED_____

***Director name*, PE, Engineering Field Director, *Field Office Name* Field Office**
for the State Health Commissioner pursuant to VA Code § 2.2-604

OPERATION PERMIT CONDITIONS

(1 line space)

Operation Permit No.: *(insert #)* **Permit Effective Date:** (*format: January 1, 2015)*

Waterworks Name: **Waterworks Class:** (*1, 2, 3, 4, 5, 6, or Unclassified)*

(2 line spaces)

OPERATOR REQUIREMENTS: (*insert current Operator and attendance requirements – this may change in future based on regulation revisions*)

(1 line space)

This waterworks shall be operated by a Class X or greater operator. When the operator is not in attendance, a substitute operator equal to or greater than Class X shall be in attendance.) *This is typical for Class 1-3 waterworks.*

or

A Class X operator shall be in attendance at the waterworks each day the plant is in operation for sufficient time to perform necessary monitoring and process evaluation, and to make any process adjustments*) – This is typical for Class 4 non-conventional filtration systems such as membranes.*

or

A Class (4, 5 or 6) operator shall be in attendance as necessary to perform monitoring and process evaluation, and to make any process adjustments.

or

Operating personnel shall be in attendance as necessary to perform monitoring and process evaluation, and to make any process adjustments.

(2 line spaces)

TREATMENT TECHNIQUE REQUIREMENTS:

This waterworks shall meet the following treatment techniques: *(Only include if federal or state treatment techniques are required. Select all that apply.)*

(1 line space between Rules)

Groundwater Rule *(include if required)*

Required disinfection inactivation: 4 log Virus inactivation

(1 line space between Rules)

Surface Water Treatment Rule and LT1 and LT2 Enhanced Surface Water Treatment Rules

(include if BIN 1)

Required microbial filtration removal and/or disinfection inactivation:

Virus: 4 log (*If more than one disinfection method is used to achieve disinfection credit, then this must be clearly identified in the WDS*)
Giardia: 3 log
Cryptosporidium: 2 log
Conventional filtration plants meeting the turbidity treatment technique requirements of the Surface Water Treatment Rule are credited with 3.0 log removal of Cryptosporidium and 2.5 log removal of Giardia.

Required Turbidity removal:

The combined filter effluent turbidity shall be less than or equal to 0.3 NTU in 95% of measurements recorded each month. The combined filter effluent turbidity shall not exceed 1 NTU.

(include if BIN 2)

Based on source water monitoring under the LT2 Enhanced Surface Water Treatment Rule, the *name* source has been classified as Bin "*X"* and requires 1 log additional cryptosporidium removal.

Required microbial filtration removal and/or disinfection inactivation:

Virus: 4 log (*If more than one disinfection method is used to achieve disinfection credit, then this must be clearly identified in the WDS*)
Giardia: 3 log
Cryptosporidium: 4 log

Conventional filtration plants meeting the turbidity treatment technique requirements of the Surface Water Treatment Rule are credited with 3.0 log removal of Cryptosporidium and 2.5 log removal of Giardia. To achieve a total of 4 log removal/inactivation of Cryptosporidium, an additional 1 log of removal/inactivation is required.

Required Turbidity removal: *(If waterworks is achieving LT2 additional cryptosporidium log removal though filter performance criteria):*

The combined filter effluent turbidity and all individual filter effluent turbidity shall be less than or equal to 0.15 NTU in 95% of measurements recorded each month. The combined filter effluent turbidity shall not exceed 0.3 NTU.

(1 line space between Rules)

Lead and Copper Rule Water Quality Parameters *(include if required)*

(Select the water quality parameters and limits, as determined by the Field Office)

Entry Point	Distribution System
pH > X	pH > X
calcium > X mg/l	calcium > X mg/l
conductivity > X µmhos/cm	conductivity > X µmhos/cm
orthophosphate > X mg/l as P	orthophosphate > X mg/l as P

(2 line spaces)

OPERATION, MONITORING, AND REPORTING:

(1 line space)

(If no additions to the Waterworks Regulations standard operational requirements are imposed):
Operation, monitoring, and reporting shall be in accordance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the Virginia *Waterworks Regulations.*

(Or if specific additional operational requirements are imposed and presented below):
Operation, monitoring, and reporting shall be in accordance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the Virginia *Waterworks Regulations.* The State Board of Health of the Commonwealth of Virginia has issued additional operational, monitoring, and reporting requirements. This waterworks is subject to the following additional requirements: *(Include all the "specific" requirements as necessary. Number each additional requirement.)*

(1 line space)

1. **Specific operational requirements for conventional filtration at the XXXXX water treatment plant:** *(BIN 1, include if applicable)*
    1. In order to achieve a 2.5 log removal credit of Giardia and 3 log removal credit of Cryptosporidium, the conventional filtration water treatment plant shall consistently maintain (as reported on the monthly operation report):
        a. The combined filter effluent turbidity at less than or equal to 0.3 NTU in 95% of measurements recorded each month.
        b. The combined filter effluent turbidity at less than or equal to 1 NTU in all measurements recorded each month.
    2. An additional 0.5 log inactivation of Giardia by free chlorine disinfection as reported on the monthly operation report shall be maintained.
    3. 4 log inactivation of virus by free chlorine disinfection as reported on the monthly operation report shall be maintained.
    4. The individual filter hydraulic loading rate shall not exceed *X* gpm/sf.

2. **Specific operational requirements for conventional filtration at the XXXXX water treatment plant:** *(BIN 2, include if treatment plant is achieving the additional LT2 crypto credit through filter performance)*
    1. In order to achieve a 4 log removal credit of Cryptosporidium, the conventional filtration water treatment plant shall consistently maintain (as reported on the monthly operation report):
        a. The combined filter effluent turbidity at less than or equal to 0.15 NTU in 95% of measurements recorded each month.
        b. The individual filter effluent turbidity of every filter shall be less than or equal to 0.15 NTU in 95% of measurements recorded each month.
        c. The individual filter effluent turbidity of every filter shall never exceed 0.3 NTU in two consecutive measurements taken 15 minutes apart.
    2. In order to achieve a 2.5 log removal credit of Giardia, the conventional filtration water treatment plant shall consistently maintain (as reported on the monthly operation report):
        a. The combined filter effluent turbidity at less than or equal to 0.3 NTU in 95% of measurements recorded each month.
        b. The combined filter effluent turbidity at less than or equal to 1 NTU in all measurements recorded each month.
    3. An additional 0.5 log inactivation of Giardia by free chlorine disinfection as reported on the monthly operation report shall be maintained.
    4. 4 log inactivation of virus by free chlorine disinfection as reported on the monthly operation report shall be maintained.
    5. The individual filter hydraulic loading rate shall not exceed X gpm/sf.

(1 line space)

3. **Specific operational requirements for membrane filtration:** *(include if applicable)*
    1. In order to achieve a 3 log removal credit of Giardia and 3 log removal credit of Cryptosporidium, the water treatment plant shall consistently maintain (as reported on the monthly operation report):
        a. The combined filter effluent turbidity at less than or equal to 0.3 NTU in 95% of measurements recorded each month.
        b. The combined filter effluent turbidity at less than or equal to 1 NTU in all measurements recorded each month.
    2. An additional 0.5 log inactivation of Giardia by free chlorine shall be maintained.
    3. 4 log inactivation of virus by free chlorine disinfection as reported on the monthly operation report shall be maintained.

OPERATIONAL CONTROL PARAMETER	ALARM SET POINT	SHUTDOWN SET POINT
Entry Point Free Chlorine Residual	*Not less than ____mg/L*	*Not less than ____mg/L*
Direct Integrity Test; Log Removal Value (LRV)	*___ psi/ minute; equivalent to LRV not less than ___*	*___ psi/ minute; equivalent to LRV not less than ___*
Membrane Filtrate Turbidity	*Not greater than ___ NTU*	*Not greater than ___ NTU*

(1 line space)

4. Specific operational requirements for cartridge filtration: *(include if applicable)*

1. In order to achieve a 3 log removal credit of Giardia and 3 log removal credit of Cryptosporidium, the water treatment plant shall consistently maintain (as reported on the monthly operation report):
   a. The combined filter effluent turbidity at less than or equal to 0.3 NTU in 95% of measurements recorded each month.
   b. The combined filter effluent turbidity at less than or equal to 1 NTU in all measurements recorded each month.
2. 4 log inactivation of virus by free chlorine disinfection as reported on the monthly operation report shall be maintained.

OPERATIONAL CONTROL PARAMETER	ALARM SET POINT	SHUTDOWN SET POINT
Entry Point Free Chlorine Residual	*Not less than ____mg/L*	*Not less than ____mg/L*
Differential Pressure	*Not greater than____ psi*	*Not greater than ___psi*
Filtrate Turbidity	*Not greater than ___ NTU*	*Not greater than __ NTU*

(1 line space)

5. Specific operational requirements for UV disinfection: *(include if applicable)*

The following operating conditions shall be met to achieve a (*X log*) credit for cryptosporidium inactivation.

UV REACTOR PARAMETER	MINIMUM REACTOR OPERATIONAL LIMIT (ALARM REQUIRED)
UV Intensity (those using single UV Intensity setpoint control)	_____W/m^2
UV Dose (those using calculated dose control)	_____mJ/cm^2

or

UV REACTOR PARAMETER	ALARM CRITERIA
High Flow Rate	*Gpm*
Low UV Transmittance (those using calculated dose control)	*% UVT*
Lamp/Ballast Failure	*Failure*
High Temperature	^0C
Mechanical Wiper Failure (if applicable)	*Failure*

(1 line space)

6. Specific operational, monitoring, and reporting requirements for 4 log Virus disinfection credit with Free Chlorine, as required by the Groundwater Rule: *(include if applicable)*

1. In order to consistently achieve 4 log inactivation of virus, the minimum free residual chlorine concentration, measured at the entry point sample tap for {*name of source*} must be maintained at {*insert*} mg/L.

   Waterworks service population > 3,300 or service population ≤ 3,300 choosing this option:

2. The free chlorine residual concentration must be continuously monitored and recorded at the approved entry point location to the distribution system each day that you serve water from {*name of source*} to the public. The daily lowest free chlorine residual concentration must be reported on the monthly operations report.

   Or Waterworks service population ≤ 3,300:
3. The free chlorine residual concentration must be measured and recorded on a grab sample collected at the approved entry point location to the distribution system during the hour of maximum peak flow each day that you serve water from {*name of source*} to the public. The daily grab sample chlorine residual concentration must be reported on the monthly operations report.

4. The monthly operations report must be submitted no later than the 10th day of the month following the month in which data is reported.

(2 line spaces)

WATERWORKS CAPACITY:

(1 line space)

Source Capacity: *(List each individual source capacity as calculated in the WDS, to include as needed)*

Well (*name*):	*XXX* MGD or gpd
Surface Water (*name*):	*XXX* MGD or gpd
Total source capacity:	*XXX* MGD or gpd

(Source capacity is defined as the limiting factor of either source yield, or pumping and delivery. If a DEQ VWP or Groundwater Withdrawal Permit is issued, include the Permit requirements in the Capacity Evaluation section of the WDS.)

(1 line space)

Treatment Capacity:

No treatment is provided.

or

The following treatment is provided (for the _____ treatment plant):

List all treatment processes described in the WDS for each facility. Include special conditions/qualifiers in parentheses. Processes may include the following:

(1 line space)

Rapid Mix (Coagulation)
Flocculation
Sedimentation
Superpulsators, Solids Contact Clarifiers, Absorption Clarifiers
Ozonation (treatment technique requirement) (not a treatment technique requirement)
Gravity Filtration, granular media
Pressure Filtration – *type (i.e. KMnO4-Greensand media)* (for *XX* removal) *if specific parameter known, such as iron*
Membrane Filtration, Microfiltration, Ultrafiltration (log inactivation treatment technique requirement)
Nanofiltration
Reverse Osmosis
UV Disinfection (voluntary) (log inactivation treatment technique requirement)
Granular Activated Carbon Adsorption
Ion Exchange (for *XX* removal) *if specific parameter known, such as arsenic*
Cation Exchange Softening

Oxidation – *type*
Corrosion Control, pH Adjustment chemical feed (treatment technique requirement) (not a treatment technique requirement)
Corrosion Control, orthophosphate chemical feed (treatment technique requirement) (not a treatment technique requirement)
Sequestering (Iron & Manganese treatment) chemical feed
Fluoridation
Chlorine Disinfection – [type] (voluntary) (required due to distribution water quality, but not a treatment technique requirement) (required due to source water quality, but not a treatment technique requirement) (log inactivation treatment technique requirement)
Chlorine Dioxide Disinfection (log inactivation treatment technique requirement)

(1 line space)

Limiting treatment capacity: *XXX* MGD or gpd based on *xxx* treatment process

or

The permitted capacity is not limited by the installed (chemical feed system) (treatment unit).
Use this sentence for "treatment unit" only if voluntary treatment such as water softener, UV, etc. are installed.

(1 line space)

Storage and Delivery Requirements:
For community waterworks:

The waterworks shall provide sufficient storage and distribution pumping capacity to provide a minimum working pressure of 20 psig at all service connections. *(required)*

The total available system effective storage volume is *XXX* gal which is equivalent to ½ day storage of the water demand of *XXX* gpd. (*As determined in the WDS based a minimum of ½ day storage*.)

or

Actual operation history indicates the existing finished water storage of *XXX* gal meets the system demand and minimum pressure requirements. (*Use when there is not ½ day storage, but the waterworks has acceptable operating history).*

or

The hydraulic model, titled "*xxx*", dated "*xxx"*, indicates the waterworks has sufficient storage to meet the maximum daily demand of *XXX* gpd.

For Noncommunity waterworks:

The waterworks shall provide sufficient distribution storage and pumping capacity to meet peak hourly flow demand.

(1 line space)

VDH Sewage Disposal System Operation Permit: *(Only include if sewage is limiting permitted capacity)*
___ gpd

(1 line space)

Permitted Capacity:
This waterworks is permitted for a capacity of __ gpd due to (limited source capacity) (limited treatment capacity) (limited storage capacity) (VDH Sewage Disposal System permitted capacity) (other explanation). (However, the number of connections cannot exceed 49 until an acceptable additional source is provided.)

or

If gpd capacity cannot be determined:

ATTACHMENT C.3 Operation Permit Conditions
Adhere to format shown in this document; including margins, line spacing and font.

This waterworks is permitted for a capacity limited to the existing (*X* restaurant seats/*X* building structures/*X* campsites/*other*) until (information on the well yield/pump capacity/*other* is provided) (and) (the need for additional storage is evaluated).

INSTRUCTIONS:
Complete / select items shown with _____ and italics. All Temporary Permits shall be sent certified mail (return receipt requested), AND if possible the owner shall be promptly emailed the scanned Permit with read receipt requested.

List specific action items, relevant Code or Regulation section, and include an individual deadline for each action. Place action items in order of health protection (list most critical first). Examples are given below.

TEMPORARY PERMIT REQUIREMENTS

Temporary Operation Permit No. *(insert #)*

(Waterworks Name)

(*Waterworks Owner*), owner of the (*waterworks name*) waterworks, shall comply with the temporary permit requirements below to protect public health and bring the (*waterworks name*) waterworks into compliance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the Virginia *Waterworks Regulations (Regulations)*.

Examples:

1. Hire a Professional Engineer, licensed in the Commonwealth of Virginia, to provide the information necessary to resolve _____, as required by 12VAC5-590_____ of the *Regulations*. Schedule a Preliminary Engineering Conference with the ODW _____ Field Office staff and the selected Professional Engineer. This meeting should be held in the ODW_____Field Office **no later than _____**.
2. Submit engineering documents (plans and specifications, design calculations, etc.) for appropriate upgrades to bring the waterworks into compliance with the *Regulations* **no later than _____**. Such documentation is required by 12VAC5-590-200 of the *Regulations*.
3. Collect samples for inorganic chemicals, metals, radiological, nitrate/nitrite, unpreserved nitrite, volatile organic chemicals (VOCs) and cyanide from the (*Well Name or Number)* entry point. Sample collection shall begin **no later than _____**, and all samples shall be collected **no later than _____**. Sampling requirements are specified in 12VAC5-590-370 of the *Regulations*.
4. Collect ___ (__) lead and copper samples from approved locations within the distribution system **no later than June 30, ____**. A second set of ___ (__) lead and copper samples from approved locations within the distribution system must be collected **between July 1, ____ and December 31, ____.** Sampling requirements are specified in 12VAC5-590-370 of the *Regulations*.
5. Collect a series of twenty (20) MPN-type bacteriological samples from the raw water sample tap at (*Well Name or Number*) and have them analyzed by a certified laboratory. Sample collection shall begin with one raw water sample taken **no later than _____**, with succeeding individual samples taken approximately every two weeks until all 20 samples are collected and analyzed, with all MPN samples collected **no later than _____**. A Groundwater Under the Direct Influence of Surface Water (GUDI) determination is required by 12VAC5-590-430 of the *Regulations*.
6. Submit a Bacteriological Sample Siting Plan (BSSP), required by 12VAC5-590-370 A of the *Regulations*, for approval to the ODW _____ Field Office **no later than _____**.

7. Collect *(number)* routine bacteriological sample*(s)* monthly from approved locations in the distribution system and have them analyzed by a certified laboratory. Bacteriological sampling shall begin in (***month year)*** **and continue each month** thereafter in accordance with the approved BSSP. Sampling requirements are specified in 12VAC5-590-370 of the *Regulations*.

8. Submit a Disinfectants/Disinfections Byproducts Monitoring Plan, required by 12VAC5-590-370 of the *Regulations*, for approval to the ODW _____ Field Office **no later than _____**.

9. Submit a Lead and Copper Materials Survey, as specified by 12VAC5-590-370 of the *Regulations*, for approval to the ODW _____ Field Office **no later than _____.**

10. Submit a Cross Connection and Backflow Prevention Program, as required by 12VAC5-590-600 B of the *Regulations*, for approval to the ODW _____ Field Office **no later than _____**.

11. Submit a waterworks permit application, as required by Title 32.1-172 of the *Code of Virginia*, to the ODW _____ Field Office **no later than _____**.

12. Submit a Waterworks Business Operation Plan (WBOP) to the ODW _____ Field Office for review and approval **no later than _____.** Completion of the WBOP is a requirement of Va. Code §32.1-172 and is a key element for establishing sustainable operations of the waterworks.

13. Submit a copy of a signed agreement with a waterworks operator with a Class 6 or higher Virginia license to operate a waterworks **no later than _____**. Waterworks Operator requirements are specified in 12VAC5-590-460 A of the *Regulations*.

14. Install a totalizing-type meter on the well discharge of the *(Well Name or Number)*, in accordance with 12VAC5-590-520 B of the *Regulations*, **no later than _____**. Record meter readings and number of connections monthly on the Monthly Operation Report form submitted to the ODW _____ Field Office **by the 10th of the month** following the reporting period.

15. Install a threadless raw water sample tap, pointing downward, on the discharge of the well pump, prior to [treatment and] storage, **no later than** _____. This requirement is specified in 12VAC5-590-1030A of the *Regulations*.

ATTACHMENT C.5. Waterworks Description Sheet

VIRGINIA DEPARTMENT OF HEALTH
WATERWORKS DESCRIPTION SHEET

DATE: (*format: January 1, 2015)*

WATERWORKS NAME:

WATERWORKS CLASS: *(1, 2, 3, 4, 5, 6, or Unclassified)*

COUNTY/CITY:

TYPE:

LOCATION: *provide physical address of facility or waterworks or a description of the location (in addition, may include driving directions)*

OWNER: *corporation, municipality, individual as appropriate*
Contact: *administrative contact name*
address, city, state, zip code
Phone:

OPERATOR: Licensed Class *(1, 2, 3, 4, 5, 6)* Operator Required
(Licensed Operator Not Required)

PERMIT NUMBER: *(insert #)*

TYPE OF TREATMENT: *list <u>all</u> unit treatment processes*

SOURCE: *wells, springs or surface water source(s)*

CAPACITY: _____ gpd *or other basis*

DESCRIPTION OF THE WATERWORKS

The waterworks consists of

- *Detailed narrative*
- *Follow water from source to distribution*
- *Use subject headings for clarity*

OTHER PERMITS

Select as applicable:

The Department of Environmental Quality has issued a Virginia Water Protection Permit (No. _____) to this waterworks for raw water withdrawal. *(If a final DEQ permit has been issued, then summarize the hydraulic capacity limitations of the permit here to included maximum daily withdrawal, maximum monthly withdrawal, and maximum annual withdrawal, as provided.)*

The Department of Environmental Quality has not issued a Virginia Water Protection Permit to this waterworks for raw water withdrawal. (*For waterworks with "grandfathered" surface water withdrawals).*

Name of Waterworks
Date

The Department of Environmental Quality has (*drafted*) (*issued*) a Groundwater Withdrawal Permit (No. -*XXX*) to this waterworks. *(If a final DEQ permit has been issued, then summarize the hydraulic capacity limitations of the permit here.)*

This waterworks is located in the (*Eastern / Eastern Virginia*) Groundwater Management Area. However, a groundwater withdrawal permit is not required by the Department of Environmental Quality at this time. A groundwater withdrawal permit may be required for this waterworks in the future.

Compliance with the conditions and requirements of the *(name of DEQ permit type)* permit shall not limit the authority of the Health Department to assign a capacity to the waterworks, based on the evaluation as follows.

This facility has been issued a Virginia Department of Health Sewage Disposal System Operation Permit, dated *date*, with a daily flow capacity of *xxx* gpd.
OR
This facility has been issued a Virginia Department of Health Sewage Disposal System Operation Permit, dated *date*, with an unknown capacity.

This facility has been issued a Virginia Department of Health Food Establishment Operation Permit, with expiration date of *date*, and (does not include design or operation capacity limitation) (includes a limiting capacity of *xxx* seats).

WATERWORKS CAPACITY

All calculations should consistently incorporate ODW's frequently used abbreviations and symbols, as well as use consistent mathematical expressions throughout. Do not use "x" or "" in a formula, instead use parentheses. See Chapter 9 of the Permit Manual for guidance and example waterworks capacity evaluations.*

1. Estimated Water Demand: (*Cite the actual reported production or other design reference ,* such as the *AWWA Design and Construction of Small Systems, 1999)*
2. Source Capacity: *(Include raw water sources and purchased water sources.)*
3. Treatment Capacity:
4. Storage Capacity:
5. Delivery Capacity: (*may be combined with 4. Storage Capacity for Non-community waterworks)*

Include with permits issued to wholesalers or primary waterworks that provide water to one or more consecutive waterworks:

Water production and storage is allocated to the following consecutive waterworks as follows:

Waterworks Name	PWSID	Permit Capacity (gpd)	Delivered Capacity (gpd)	Total Storage Required [1] (gal)	Storage Provided-Consecutive[2] (gal)	Storage Provided – Primary[3] (gal)
Total	-					

1. Total storage required by the consecutive waterworks.

2. Total effective storage provided by the consecutive waterworks.
3. Total effective storage provided by this (primary) waterworks.

CONCLUSION:

for community waterworks:
This waterworks is permitted for a capacity of __ gpd due to the (*limited source capacity*) (*limited storage capacity*) *(VDH Sewage Disposal System permitted capacity) (other explanation)* described above. (However, the number of connections cannot exceed 49 until an acceptable additional source is provided.)

for noncommunity waterworks:
This waterworks is permitted for a capacity of __ gpd {or *describe existing connections},* due to the (*limited source capacity*) (*limited storage capacity*) *(VDH Sewage Disposal System permitted capacity)* (*other explanation)* described above.

for grandparented waterworks (if insufficient data available to establish hydraulic capacity):
This waterworks is permitted for a capacity limited to the existing (*X* restaurant seats/*X* building structures/*X* campsites/*other*) until (information on the well yield/pump capacity/*other* is provided) (and) (the need for additional storage is evaluated).

Optional for "back-populating" old permit issuance dates. Required for amendments after July 2014:

OPERATION PERMIT HISTORY

Permit Issuance (Effective Date)	**Description / Reason**[1]

1. Description/Reason may include:

- *Original issuance;*
- *Ownership Change;*
- *Waterworks Consolidation/Merger (describe briefly);*
- *Addition or Deletion of source, treatment, storage, pumping facilities; etc. (describe briefly, and add Construction Permit #s and dates, as applicable)*

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip Code

Dear (*Waterworks Owner)*

Enclosed please find Waterworks Operation Permit No. _____with Operation Permit Conditions dated _____issued by the Commonwealth of Virginia Department of Health, Office of Drinking Water. This permit is your authorization from the State Health Commissioner to operate the subject waterworks located in (*County/ City name)* in accordance with the *Waterworks Regulations*. This permit is not transferable. This permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits.

Optional paragraph #1 (If amended permit):
This permit is an amendment of the previously issued permit dated _____, due to the *provide a brief explanation for the revision.* This revised permit replaces and nullifies the original permit which should be destroyed immediately.

You will note that the permit indicates that this waterworks has a permitted capacity of _____. This limit is based on (the existing system usage and shall not be exceeded.) (the maximum capacity of the system and shall not be exceeded.)

Optional paragraph #2 (If permit issued to a "grandparented" waterworks):
Please note that any expansion of service, modification to the waterworks, failure to maintain reliability, or future sale of the waterworks may require an engineering evaluation of the entire waterworks, and compliance with Part III of the *Waterworks Regulations*.

Optional paragraph #3 (If waterworks in violation and Temporary Permit issued):
12VAC5-590-*xxx* of the *Waterworks Regulations* states _____. The _____ waterworks may be in violation of this requirement in that _____. The Virginia Department of Health requests that you _____ so that the waterworks may operate in compliance with the *Waterworks Regulations*.

Optional paragraph #4 (If Temporary Permit Requirements are attached):
Temporary Permit Requirements are included for this waterworks. (*Add brief description).*

Optional paragraph #5 (If a Variance is included):
A variance to the *Waterworks Regulations* is included for this waterworks. (*Add brief description, including time limits, if any).*

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

Optional paragraph #6 (If well sources subject to Groundwater Withdrawal Permit by DEQ):
The enclosed Waterworks Operation Permit specifies a maximum volume that this waterworks may produce, in terms of gallons per day. This capacity is based on public health requirements and the application of engineering principles. The Department of Environmental Quality has also (issued a/developed a draft) Groundwater Withdrawal Permit covering this waterworks, based on conservation of water as a natural resource. Both permits apply to you as a waterworks, and you are responsible for complying with each permit.

Optional paragraph #7 (If waterworks has been or will be issued a Virginia Water Protection Permit or a Joint Permit from DEQ, VMRC and Corps of Engineers for surface water withdrawal):
The enclosed Waterworks Operation Permit specifies a maximum volume that this waterworks may produce, in terms of gallons per day. This capacity is based on public health requirements and the application of engineering principles. The Department of Environmental Quality (, Virginia Marine Resource Commission, and the U.S. Army Corps of Engineers) has (developed a draft) / (issued a) (Virginia Water Protection Permit) / (Joint Permit) covering this waterworks. Both permits apply to you as a waterworks, and you are responsible for complying with each permit.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days from the date you actually received this permit or the date it was mailed to you, whichever occurred first, within which to appeal this permit by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the State Health Commissioner. In the event that this permit is served on you by mail, three days are added to that period.

We look forward to your (continued) cooperation in the maintenance and operation of this waterworks.

Sincerely,

District Engineer

cc: _____County Health Department
_____County Administrator
_____County Building Official
if applicable: name, DEQ _____Regional Office
VDH – ODW, Central Office

INSTRUCTIONS: Complete / select items shown with _____ and *italics*.
Adhere to format shown in this document; including margins, line spacing and font. Print on plain paper.

OPERATION PERMIT VARIANCE

(Waterworks Name)

Permit No. _____

Select as applicable:
For Community, NTNC Systems, and TNC systems with production greater than 10,000 gpd:
This Variance is issued in accordance with Section 12VAC5-590-140 of the *Waterworks Regulations* of the Virginia Department of Health. This Variance is to Section _____ and _____ of the *Waterworks Regulations*. This Variance is issued with the following conditions:

1. Operation of this system is permitted with (a sole) operator(s) in attendance, having less than a Class __ waterworks license, provided that the operator(s) (has)/(have) reliable communication with the Operator in Responsible Charge (OIRC) having a Class __ or Class _ license. The operator must obtain confirmation from the OIRC prior to making changes in _____.

For existing (found or grandparented) TNC Systems
This Variance to 12VAC5-590-520 of the Waterworks Regulations allows operation of this waterworks without metering of total water production, subject to the following conditions:

1. Total water production does not exceed 10,000 gallons per day (gpd).

2. This Variance will be automatically revoked at such time that the total water production exceeds 10,000 gpd.

3. This Variance will be automatically revoked at such time that a meter is installed.

For All Systems:
4. This Variance is nontransferable and must be attached to the Operation Permit.

5. This Variance is a condition of the Operation Permit and is revoked when the Permit is revoked.

Approved: _____
Director name, PE, Engineering Field Director
Field Office Name Field Office
For the State Health Commissioner pursuant to VA Code § 2.2-604

Date: _____

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip Code

Dear (*Waterworks Owner)*

You are hereby notified of our intent to amend Virginia Department of Health Operation Permit Number _____ (and its associated Engineering Description Sheet) issued on _____ covering the operation of the waterworks at *(service area name)* in (*City / County name*), Virginia. This amendment is in accordance with the provisions of *Code of Virginia* §32.1-173 and 12VAC5-590-310 of the *Waterworks Regulations*. VDH proposes to amend the permit due to (the addition of _____) (the deletion of _____) (a change in the design capacity of the waterworks due to ____.) A draft of the proposed Engineering Description Sheet for the amended permit is enclosed for your review.

If you object to the amendment you have the right to a hearing, and may send a written request to schedule a hearing, no later than 30 calendar days from the date that you or your agent signs for this certified letter. Please use the attached form for this purpose and send it to this office. If VDH does not hear from you within that time frame (or if this certified letter is returned to us for non-receipt), we will immediately amend the permit and send you written confirmation of our action.

If we can be of further assistance, please contact me.

Sincerely,

District Engineer

cc: _____County Health Department
_____County Administrator
_____VDH – ODW, Central Office

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

OBJECTION AND REQUEST FOR A HEARING

This is to advise Virginia Department of Health that I, _____,

object to the amendment proposed by Virginia Department of Health dated _____

of Waterworks Operation Permit No. _____ for _____

located in _____

and request a hearing in accordance with §12 VAC 5-590-160 of the W*aterworks Regulations.*

My specific objection(s) to the proposed amendment are as follows:

_____
_____
_____
_____
_____
_____
_____
_____
_____

_____ _____

(Name) (Date)

_____

(Title)

OPERATION PERMIT CHECKLIST
for Signature

DATE:		FROM:	
PWSID #:		CITY/COUNTY:	
WATERWORKS NAME:			
WATERWORKS TYPE:	C, NTNC, TNC, CONSECUTIVE		
PERMIT TYPE:	STANDARD, TEMPORARY, PROVISIONAL		
PERMIT ACTION:	NEW AMENDED – Change in NAME, OWNERSHIP, CAPACITY, TREATMENT, REPLACE A TEMPORARY PERMIT		

ENCLOSURES: (Check all that apply)		
		OPERATION PERMIT AND OPERATION PERMIT CONDITIONS
		WATERWORKS DESCRIPTION SHEET
		VARIANCE, EXEMPTION, or SPECIAL PERMIT REQUIREMENTS
		PERMIT APPLICATION
		ENGINEER'S STATEMENT OF COMPLETION
		FINAL INSPECTION REPORT
		NEW/REVISED CDS SCHEMATIC #
		APPLICATION FOR METERING VARIANCE
		OTHER (LIST):

OTHER	NOT REQUIRED	APPROVED - DATE	NOT APPROVED - EXPLAIN
WBOP			
LICENSED OPERATOR			
CCCP			
BSSP			
DDBP SAMPLING PLAN			
LCR SAMPLING PLAN			
GUDI DETERMINATION	DATE	GUDI	NOT GUDI
WELL #			
WELL #			
WELL #			

RELIABILITY VERIFICATION	SATISFACTORY	UNSATISFACTORY[1]
WATER QUALITY		
HYDRAULIC CAPACITY (Adequate Pressure, Leakage, Water Outages, etc.)		

Field Office Document QA/QC	Operation Permit	Waterworks Description Sheet	Permit Conditions	Temporary Operation Permit Requirements	Variance
Document Author					
First Reviewer					
PE Reviewer					

COMMENTS:

[1] Temporary Permit Required.

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on VDH letterhead. Pages are 1" top, bottom, and side margins.

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip Code

Dear (*Waterworks Owner)*

You are hereby notified that it is our intent to revoke Virginia Department of Health Operation Permit Number _____ issued on _____ covering the operation of the waterworks at *(service area name)* in *(*City / *County name)*, Virginia. Revocation is in accordance with the provisions of *Code of Virginia* §32.1-174 and 12VAC5-590-320 of the *Waterworks Regulations*. VDH proposes to revoke the permit because (of the change of ownership from *(previous legal owner name)* to *(new legal owner name))* (there is less than 15 connections and less than 25 people served by this waterworks.) (the infrastructure has been connected and service has been conveyed to _*waterworks name*__ (PWSID#_____)).

If you agree to the revocation of this permit, please sign and date the statement at the bottom of this letter and return it to this office. If you object to the revocation you have the right to a hearing, and may send a written request to schedule a hearing to this Office no later than 30 calendar days from the date that you or your agent signs for this certified letter. If VDH does not hear from you within that time frame (or if this certified letter is returned to VDH for non-receipt), we will immediately revoke the permit and send you written confirmation of our action.

A copy of this letter is enclosed for your records.

If we can be of further assistance, please contact me at *(Phone number)*,.

Sincerely,

District Engineer

cc: _____County Health Department
_____County Administrator
_____County Building Official
VDH - ODW, Central Office

This is to advise VDH that I, _____, have no objection to the revocation of
(*Print Name*)
Waterworks Operation Permit No. _____, issued *(date)* **for** *(Waterworks name)*

located in *(City/County).*

_____ _____
(*Name and Title)* *(Date*

INSTRUCTIONS: Complete / select items shown with *italics*, and convert to regular font. Print on Field Office letterhead. Pages are 1" top, bottom, and side margins.

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

SUBJECT: *County/City*
Waterworks: *Waterworks Name*
PWSID No: *PWSID*

Date

Waterworks Owner
Address 1
Address 2
City, State, Zip Code

Dear *(Waterworks Owner)*

In accordance with *Code of Virginia §*32.1-174 and 12VAC5-590-320 of the *Waterworks Regulations*, you are hereby notified of the revocation of Virginia Department of Health Permit Number _____ issued on _____ covering the operation of the waterworks at *(service area name)* in *(County name or City)*, Virginia. The permit is being revoked because (the change of ownership from *(previous legal owner name)* to *(new legal owner name)* (there are fewer than 15 connections and fewer than 25 people served by this waterworks) (the waterworks has connected to _____ and no longer produces drinking water).

Revocation is to become effective upon receipt (or return for non-receipt) of this letter.

By direction of the State Health Commissioner.

Sincerely,

Director name, PE,
Engineering Field Director

cc: *Local Health Department, attn: Health Director*
County Administrator
County Building Official
VDH – ODW, Central Office