

## **CHAPTER II GENERAL REQUIREMENTS**

### **II.A OVERVIEW**

The Department has the authority to review and approve, prior to installation, construction, or entering into a financial commitment the following types of projects for all public water systems:

- new sources of groundwater and surface water
- well pumps
- surface water intake structures
- treatment processes and chemical application for ground and surface water supplies
- pump stations and pumping facilities
- potable water storage facilities
- transmission and distribution systems
- renovations, change of status or reactivation of existing sources of supply
- changes to existing treatment which involve changes in the process or chemical used
- any installation or alteration to a public water supply system of public health significance

### **II.B AUTHORITY**

CGS Sections 25-32(a) and 25-33(b), Sections 19-13-B102(d)(2), and 19-13-B80 of the PHC define the Department’s responsibility with respect to the review and approval of waterworks projects for public water systems.

- CGS 25-32(a) states in part: “The Department of Public Health shall have jurisdiction over all matters concerning the purity and adequacy of any source of water or ice supply used by any municipality, public institution or water or ice company for obtaining water or ice, the safety of any distributing plant and system for public health purposes, the adequacy of methods used to assure water purity, and other such matters relating to the construction and operation of such distributing plant and system as may affect public health.”
- CGS 25-33(b) states: “No system of water supply owned or used by a water company shall be constructed or expanded or a new additional source of water supply utilized until the plans therefore have been submitted to and approved by said department. In reviewing any proposed new source of water supply, the department shall consider the proposed water supply’s anticipated effect on nearby water supply

systems including public and private wells. Said department shall

CGS 25-32(a)  
CGS 25-33(b)  
PHC 19-13-B102(d)(2)  
PHC 19-13-B80

CGS 25-32(a)  
CGS 25-33(b)

consult with and advise any water company as to proposed sources of water supply and methods of assuring their purity and adequacy.”

PHC 19-13-B102(d)(2)  
PHC 19-13-B80  
(continued)

- Section 19-13-B102(d)(2) of the PHC states: “The state health department must be notified before entering into a financial commitment for a new public water supply system, and the approval of the state health department must be obtained before any construction is begun. This includes construction of supply and treatment works, transmission lines, storage tanks, pumping stations and other works of sanitary significance. It does not include the routine extension of laterals or tapping of new service connections.
- Section 19-13-B80 of the PHC states with regard to chemical substances in public water supplies: “Effective immediately no chemical substances other than those presently used with the approval of the commissioner of health shall be added to public water supplies designed for human consumption whether in the course of filtration, for control of plant or animal life, or for any other purpose without prior approval by the commissioner of health. Before installation of equipment for such addition, plans and specifications shall be submitted to and approved by the commissioner of health. These plans shall provide procedures necessary for the satisfactory operation of the installation, including the proper testing of the water for chemical content, which procedures shall be followed by any person, firm, corporation or municipality having jurisdiction over the supply.”

## **II.C DEPARTMENT APPROVALS AND PERMITS**

The Department issues a number of permits and approvals in association with public water system projects. These permits and approvals are issued with the protection of the public health as their primary purpose. It is important for design engineers, water system owners, operators and consumers to keep this responsibility of the Department in mind throughout the review process.

Every effort is made to conduct reviews in a timely manner. The submission of complete and pertinent information will facilitate the review process. The following is a list of some of the Department permits and approvals issued by the Water Supplies Section:

- Well Use Approval
- Well Site Approval
- Change of Use: Water Company Land Permit
- Sale of Water Company Land Permit
- Pump Station Review and Approval
- Treatment Process Review and Approval
- Filter Plant Design Review and Approval
- Water Storage Facility Review and Approval
- Distribution System/Water Main Extension Plan Review and

- Approval
- DPH/DPUC Joint Certificate of Public Convenience and Necessity
- Source Abandonment Permit

The Department also provides input to the Department of Environmental Protection (DEP) with regard to Diversion and Discharge permit applications which impact or may impact public water supplies in Connecticut.

## **II.D APPROVAL PROCESS**

### **II.D.1 Submission of Information**

One set of plans and specifications is required for review by the Water Supplies Section and should be directed to:

Water Supplies Section  
 Connecticut Department of Public Health  
 410 Capitol Avenue, MS # 51 WAT  
 P.O. Box 340308  
 Hartford, CT 06134-0308

### **II.D.2 Review Time Frame**

A sixty to ninety day review period should be anticipated for plans and specifications. Submission of complete and pertinent information will facilitate the review process. Incomplete submittals will delay the review process.

### **II.D.3 Review by Other Agencies**

Certain projects may require the review and possibly approval of the Connecticut Department of Environmental Protection (DEP) or the Connecticut Department of Public Utility Control (DPUC). The Department will notify the applicant when this becomes necessary.

### **II.D.4 Conditions of Approval**

All conditions of approval shall be reflected in the final construction or completed project. Failure to comply with the conditions of approval may result in delay of the final approval or rejection of the project.

## **II.E GENERAL SUBMITTAL REQUIREMENTS**

### **II.E.1 Plans**

Plans for waterworks improvements shall, where pertinent, provide the following:

#### **II.E.1.a General layout, including**

- suitable title,

RSWW 1.2

RSWW 1.2.1

- b. name of municipality, or other entity or person responsible for the water supply,
- c. area or institution to be served,
- d. scale,
- e. north points,
- f. datum used,
- g. boundaries of the municipality or area to be served,
- h. date, name, and address of the designing engineer,
- i. imprint of professional engineer's seal or conformance with engineering registration requirements of the individual state,
- j. legible prints suitable for reproduction,
- k. location and size of existing water mains,
- l. location and nature of existing water works structures and appurtenances affecting the proposed improvements, noted on one sheet.

**II.E.1.b Detailed plans, including**

- a. stream crossings, providing profiles with elevations of the stream bed and the normal and extreme high and low water levels,
- b. profiles having a horizontal scale of not more than 100 feet to the inch and a vertical scale of not more than 10 feet to the inch, with both scales clearly indicated.
- c. location and size of the property to be used for the groundwater development with respect to known references such as roads, streams, section lines, or streets,
- d. topographic and arrangement of present or planned wells or structures, with contour intervals not greater than two feet,
- e. elevations of the highest known flood level, floor of the structure, upper terminal of protective casings and outside surrounding grade, using United States Coast and Geodetic Survey, United States Geological Survey or equivalent elevations where applicable as reference,
- f. plan and profile drawings of well construction, showing diameter and depth of drill holes, casing and liner diameters and depths, grouting depths, elevations and designation of geological formations, water levels and other details to describe the proposed well completely,
- g. location of all existing and potential sources of pollution which may affect the water source or underground treated water storage facilities,
- h. size, length, and identity of sewers, drains, and water mains, and their locations relative to plant structures,
- i. schematic flow diagrams and hydraulic profiles showing the flow through various plant units,
- j. piping in sufficient detail to show flow through the plant, including waste lines,
- k. locations of all chemical storage areas, feeding equipment and points of chemical application (see RSWW Part 5),

RSWW 1.2.2

RSWW 1.2.2  
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- l. all appurtenances, specific structures, equipment, water plant waste disposal units and points of discharge having any relationship to the plans for water mains and/or required by the Department,
- m. locations of sanitary or other facilities, such as lavatories, showers, toilets, and lockers, when applicable or required by the Department,
- n. locations, dimensions, and elevations of all proposed plant facilities,
- o. locations of all sampling taps,
- p. adequate description of any features not otherwise covered by the specifications.

### **II.E.2 Specifications**

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Complete, detailed technical specifications shall be supplied for the proposed project, including

- a. a program for keeping existing water works facilities in operation during construction of additional facilities so as to minimize interruption of service,
- b. laboratory facilities and equipment,
- c. the number and design of chemical feeding equipment,
- d. materials or proprietary equipment for sanitary or other facilities including any necessary backflow or back-siphonage protection.

### **II.E.3 Design Criteria**

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A summary of complete design criteria shall be submitted for the proposed project, containing but not limited to the following:

- a. long-term dependable yield of the source of supply,
- b. reservoir surface area, volume, and a volume-versus-depth curve, if applicable,
- c. area of watershed, if applicable,
- d. estimated average and maximum day water demands for the design period,
- e. number of proposed services,
- f. fire fighting requirements,
- g. flash mix, flocculation and settling basin capacities,
- h. retention times,
- i. unit loadings,
- j. filter area and the proposed filtration rate,
- k. backwash rate,
- l. feeder capacities and ranges.

### **II.E.4 Revisions to Approved Plans**

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Any deviations from approved plans or specifications affecting capacity, hydraulic conditions, operating units, the functioning of water treatment processes, or the quality of water to be delivered, must be approved by

the Department before such changes are made. Revised plans or specifications should be submitted in time to permit the review and approval of such plans or specifications before any construction work, which will be affected by such changes, is begun.

**II.E.5 Additional Information Required**

The Department may require additional information which is not part of the construction drawings, such as head loss calculations, proprietary technical data, copies of deeds, copies of contracts, etc.

**II.E.6 As-built Plans**

One set of As-built plans shall be submitted upon completion of the project to the Department.

**II.F SUBMITTAL REQUIREMENTS FOR JOINT CERTIFICATES**

**II.F.1 Components of the Application Under Phase I-A**

Any application for Phase I-A shall include, but not be limited to, the following:

- (a) exact legal name, address, and telephone number of applicant and name and title of contact person; in the event the applicant is a corporation, the applicant should also provide the names and addresses of the corporate officers;
- (b) name, address, and telephone number of proposed registered professional civil engineer who will have design and supervision responsibility for the construction of the system;
- (c) a check for \$100.00 payable to the Treasurer of the State of Connecticut;
- (d) engineering data certified by a professional engineer registered in the State of Connecticut as follows:
  - (1) At a minimum, a site plan and specifications for any water sources which shall provide for adequate well location, adequate well construction procedures, and proper sanitary easements for the wells. There shall be at least two wells shown on the plan and a reserve site for additional wells, as needed.
  - (2) Plans showing the relationship of the proposed water system to the sanitary sewage and storm drainage facilities, and indicating the distances from the proposed wells; wetlands and watercourses, observation wells; contour lines, customer

RSWW 1.6

DPUC 16-262m-5

DPUC 16-262m-5  
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premises, and sanitary sewage, storm drainage and septic facilities;

- (3) A minimum 8" square location plan map showing the location and extent of service areas of any existing community water system or other water purveyor within one linear mile of any portion of the proposed system and identifying all adjacent entities or property owners; (use Scale 1" = 2000'). The map should also indicate any known probable future building areas (as filed with the Town Planning & Zoning Commission) which might reasonably be served by main extensions of the subject system;
  - (4) An evaluation of the quantity of water necessary to provide an adequate supply at required pressures to existing and projected customers, including probable future building areas, during periods of average and peak demands for at least 15 years after construction;
  - (5) Sanitary survey evaluation of pollution sources (present and past), such as, but not limited to: sanitary sewage, cemeteries, landfills, salt storage and commercial and industrial facilities, which might affect the groundwater quality;
  - (6) A description of the groundwater quality and subsurface soils as classified by the United States Geological Survey, for the project area;
  - (7) A plan for controlling pollution sources which might affect the wells;
  - (8) A description of the procedures, methods, schedule and location, for conducting required sampling, testing and reporting on yield testing and water quality;
  - (9) A topographical map showing the relationship and location of the proposed project to the surrounding area;
  - (10) A brief description of the water system project and operational layout;
- (e) A letter from the town where the project is located indicating whether or not fire protection facilities are required to be included in the design of the water system. If fire protection is to be required, the letter from the town should indicate the number of hydrants required to serve the project as well as the minimum distance allowed between hydrants;

DPUC 16-262m-5  
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- (f) letters from all regulated public service or municipal water utilities or regional water authorities within one linear mile of the applicant's project expressing willingness or unwillingness to serve as water supplier to the applicant's project. If a water utility expressed willingness to serve, the letter submitted shall include the proposed manner of service and cost, via main extension or satellite ownership. The letter shall discuss the alternative of the water utility owning and operating the system as a non-connected satellite system. The letter shall also include the linear footage, size of pipe, material, and cost of a main extension including service connections, if such extension were required to be constructed. It should also indicate whether additional supply, storage and booster facilities, and their related costs, are necessary for providing proper service;
- (g) if the applicant's project is located in an area where there is an adopted coordinated plan, in accordance with Sections 25-33c to 25-33j, inclusive, of the General Statutes of Connecticut, the water utility expressing willingness to serve the applicant's project must do so, in conformance with the established plan with full regard to exclusive service areas and satellite ownership and management stipulations. If a water utility coordinating committee has been convened for the appropriate management area, but does not yet have an approved coordinated plan, the applicant should furnish a letter from the committee indicating that the project is conceptually agreeable to it.

**II.F.2 Components of the Application Under Phase I-B**

Any application for the issuance of a certificate of public convenience and necessity under Phase I-B shall include, but not be limited to, the following:

- (a) A copy of the well drillers completion report for each well;
- (b) A copy of the yield test results for each well indicating pumping rates, certified well yields and drawdown information;
- (c) A copy of the water quality test results from samples obtained during the yield test;
- (d) A signed agreement between the developer of the water system and the existing regulated public service or municipal water utility or regional water authority indicating that the final constructed water supply facilities will be dedicated to that utility. With a regulated public service company such agreement will specify any refunds that the developer may be entitled to for each service connection made to the community water system. The utility will be expected to receive from the developer an

DPUC 16-262m-6

DPUC 16-262m-6  
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itemized breakdown of the actual costs of the water system facilities so that proper accountability and rate-making treatments (if applicable) can be afforded to the utility by the Department of Public Utility Control;

### II.F.3 Components of the Application Under Phase II

Engineering data certified by a professional engineer registered in the State of Connecticut as follows:

DPUC 16-262m-7

- (a) Plans and specifications for the project must include but not be limited to: transfer pumps, wells pumps and pump curves, hydropneumatic tanks, treatment facilities, distribution system layout, atmospheric storage facilities, metering (each source and customer), location of sample taps, on-site standby power, presence of emergency alarms, location of pressure gauges, location of gate valves and blow-offs, water level gauges on storage tank, fire protection (if necessary), and disinfection procedures;
- (b) A hydraulic gradient of the proposed system;
- (c) A detail of a typical service line, service connection, thrust block installation, hydrant installation, cross-section of trench containing pipe, and a meter installation;
- (d) A plan and profile drawing of the water main and all other underground utilities (sewer, gas, electric, telephone or cable television);
- (e) Name, address, telephone number and title of proposed operator with day-to-day responsibility for system.

## II.G GENERAL DESIGN CONSIDERATIONS

### II.G.1 Facility Location

Such as but not limited to, treatment plants, pumping stations, storage tanks, etc., but not including water intakes and connecting pipelines.

PHC 19-13-B102(d)

1. New facilities are to be located:

- (A) Above the level of the one hundred year flood.
- (B) Where chlorine gas will not be stored or used within three hundred feet of any residence.
- (C) Where the facility is not likely to be subject to fires or other natural or manmade disasters.

### II.G.2 Design Basis

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The system including the water source and treatment facilities shall be designed for maximum day demand at the design year.

### II.G.3 Location of Structures

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The appropriate regulating authority (DEP) must be consulted regarding any structure which is so located that normal or flood stream flows may

be impeded.

**II.G.4 Standby Power**

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Dedicated standby power will be required by the Department so that water may be treated and/or pumped to the distribution system during power outages to meet the average day demand. Alternatives to dedicated standby power may be considered by the Department with proper justification.

**II.G.5 Piping Color Code**

RSWW 2.14

To facilitate identification of piping in plants and pumping stations it is recommended that the following color scheme be utilized:

Water Lines

Raw	Olive Green
Settled or Clarified	Aqua
Finished or Potable	Dark Blue

Chemical Lines

Alum or Primary Coagulant	Orange
Ammonia	White
Carbon Slurry	Black
Caustic	Yellow with Green Band
Chlorine (Gas Solution)	Yellow
Fluoride	Light Blue with Red Band
Lime Slurry	Light Green
Ozone	Yellow with Orange Band
Phosphate Compounds	Light Green with Red Band
Polymers or Coagulant Aids	Orange with Green Band
Potassium Permanganate	Violet
Soda Ash	Light Green with Orange Band
Sulfuric Acid	Yellow with Red Band
Sulfur Dioxide	Light Green with Yellow Band

Waste Lines

RSWW 2.14  
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Backwash Waste	Light Brown
Sludge	Dark Brown
Sewer (Sanitary or Other)	Dark Gray

Other

Compressed Air	Dark Green
Gas	Red

Other Lines

Light Gray

In situations where two colors do not have sufficient contrast to easily differentiate between them, a six-inch band of contrasting color should be on one of the pipes at approximately 30 inch intervals. The name of the liquid or gas should also be on the pipe. In some cases it may be advantageous to provide arrows indicating the direction of flow.

## II.H DISINFECTION OF COMPLETED FACILITIES

- After November 15, 1948, in the case of construction of or repairs to any system of water supply furnished to the public, precautions shall be exercised in the handling, laying or installing of water pipe, valves or other structures through which water for potable purposes is delivered, so as to reduce to a minimum the entrance of foreign material and contamination, before such pipe, valves or other structures are placed in service. After said date no new main, standpipe, reservoir, tank or other pipe or structure through which water is delivered to consumers for potable purposes shall be put into service on any system of water supply furnished to the public, nor shall the use of any such structure or main be resumed after it has been cleaned or repaired, until such structure or main has been effectively disinfected; provided this shall not apply to mains, tanks, reservoirs or structures, the waters from which are subsequently adequately treated or purified.
- All wells, pipes, tanks, and equipment which can convey or store potable water shall be disinfected in accordance with current AWWA procedures. Plans and specifications shall outline the procedure and include the disinfectant dosage, contact time, and method of testing the results of the procedure.

PHC 19-13-B47

RSWW 2.15

## II.I OPERATION AND MAINTENANCE MANUAL

An operation and maintenance manual including a parts list and parts order form, operator safety procedures and an operational trouble-shooting section shall be supplied to the water works as part of any proprietary unit installed in the facility.

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## II.J FINAL INSPECTION

The Department, at its discretion, may require a final inspection of the project before granting final approval to use or operate the facility.