

1.0 GENERAL

For all new facility construction reports, final plans specifications, and design criteria should be submitted at least 60 days prior to the date on which action by the ~~reviewing authority~~ State Health Officer is desired. Environmental Assessments, and permits for construction, to take water, for waste discharges, for stream crossings, etc., may be required from other federal, state, or local agencies. Preliminary plans and the engineer's report should be submitted for review prior to the preparation of final plans. No approval for construction can be issued until final, complete, detailed plans and specifications have been submitted to the ~~reviewing authority~~ State Health Officer and found to be satisfactory. Submission of plans for maintenance and replacement of existing facilities in kind shall not be required. Documents submitted for formal approval ~~shall~~ should include but not be limited to:

- a. engineer's report, where pertinent;
- b. summary of the design criteria;
- c. operation requirements, where applicable;
- d. general layout;
- e. detailed plans;
- f. specifications;
- g. cost estimates;
- h. water purchase contracts between water supplies, and or inter-municipal agreements, where applicable;
- i. evaluation of technical, managerial, and financial capacity;

Public water systems are required by the USEPA and the States to demonstrate adequate capacity. The evaluation should include, as required by the ~~reviewing authority~~ State Health Officer:

1. a discussion of the system's current technical capacity along with any project related changes with respect to operator certification requirements and the operator's ability to implement any system changes that may be required upon project completion;
 2. a discussion of the system's current overall management and how the system's management will be impacted by the project including but not limited to whether the system has an asset management plan and, if so, how the project components will be incorporated into that plan;
 3. a discussion of the water system's overall financial capacity along with user projected water rates including the system's outstanding obligations combined with the anticipated debt from the current project under review and the overall operation and maintenance. If applicable, the financial capacity discussion should include details of any energy efficiency components included as part of the project along with the estimated long-term cost and energy savings associated with them.
- j. other information as required by ~~reviewing authority~~ State Health Officer.

1.1 ENGINEER'S REPORT

Where the Design/Build construction concept is to be utilized, special consideration must be given to: designation of a project coordinator; close coordination of design concepts and submission of plans

and necessary supporting information to the ~~reviewing authority~~ **State Health Officer**; allowance for project changes that may be required by the ~~reviewing authority~~ **State Health Officer**; and

reasonable time for project review by the ~~reviewing authority~~ **State Health Officer**. The engineer's report for water works improvements shall, where pertinent, present the following information:

1.1.1 General information,

Including:

- a. description of the existing water works and sewerage facilities;
- b. identification of the municipality or area served;
- c. name and mailing address of the owner or official custodian;
- d. imprint of professional engineer's seal or conformance with engineering registration requirements of the individual state or province.

1.1.2 Extent of water works system,

Including:

- a. description of the nature and extent of the area to be served;
- b. provisions for extending the water works system to include additional areas;
- c. appraisal of the future requirements for service, including existing and potential industrial, commercial, institutional, and other water supply needs.

1.1.3 Justification of project

Where two or more solutions exist for providing public water supply facilities, each of which is feasible and practicable, discuss the alternatives. Give reasons for selecting the one recommended, including financial considerations, operational requirements, operator qualifications, reliability, and water quality considerations.

1.1.4 Soil, groundwater conditions, and foundation problems,

including a description of:

- a. the character of the soil through which water mains are to be laid;
- b. foundation conditions prevailing at sites of proposed structures;
- c. the approximate elevation of ground water in relation to subsurface structures.

1.1.5 Water use data,

Including:

- a. a description of the population trends as indicated by available records, and the estimated population which will be served by the proposed water supply system or expanded system 20 years in the future in five year intervals or over the useful life of critical structures/equipment;
- b. present water consumption and the projected average and maximum daily demands, including fire flow demand (see Section 1.1.6);

- c. present and/or estimated yield of the sources of supply;
- d. unusual occurrences;
- e. current percent of unaccounted water for the system and the estimated reduction of unaccounted for water after project completion if applicable, i.e., project is to replace aged water mains, leaking storage, or other improvements that will result in reduced water loss.

1.1.6 Flow requirements,

Including:

- a. hydraulic analyses based on flow demands and pressure requirements (See Section 8.2.1)
- b. fire flows, when fire protection is provided, meeting the recommendations of the Insurance Services Office or other similar agency for the service area involved.

1.1.7 Sources of water supply

Describe the proposed source or sources of water supply to be developed, the reasons for their selection, and provide information as follows:

1.1.7.1 Surface water sources,

Including:

- a. hydrological data, stream flow and weather records;
- b. safe yield, including all factors that may affect it;
- c. maximum flood flow, together with approval for safety features of the spillway and dam from the appropriate ~~reviewing authority~~ **State Health Officer**;
- d. description of the watershed, noting any existing or potential sources of contamination (such as highways, railroads, chemical facilities, land/water use activities, etc.) which may affect water quality;
- e. summarized quality of the raw water with special reference to fluctuations in quality, changing meteorological conditions, etc.;
- f. source water protection issues or measures, including erosion and siltation control structures, that need to be considered or implemented.

1.1.7.2 Groundwater sources,

Including:

- a. sites considered;
- b. advantages of the site selected;
- c. elevations with respect to surroundings;
- d. probable character of formations through which the source is to be developed;
- e. geologic conditions affecting the site, such as anticipated interference between proposed and existing wells;

- f. summary of source exploration, test well depth, and method of construction; placement of liners or screen; test pumping rates and their duration; water levels and specific yield; water quality;
- g. sources of possible contamination such as sewers and sewage treatment/disposal facilities, highways, railroads, landfills, outcroppings of consolidated water-bearing formations, chemical facilities, waste disposal wells, agricultural uses, etc;
- h. wellhead protection measures being considered (see Section 3.2.3.2 and 3.2.3.3).

1.1.8 Proposed treatment processes

Summarize and establish the adequacy of proposed processes and unit parameters for the treatment of the specific water under consideration. Alternative methods of water treatment and chemical use should be considered as a means of reducing waste handling and disposal problems. Bench scale test, pilot studies, or demonstrations may be required to establish adequacy for some water quality standards.

1.1.9 Sewerage system available

Describe the existing sewerage system and sewage treatment works, with special reference to their relationship to existing or proposed water works structures which may affect the operation of the water supply system, or which may affect the quality of the supply.

1.1.10 Waste disposal

Discuss the various wastes from the water treatment plant, their volume, proposed treatment and points of discharge. If discharging to a sanitary sewerage system, verify that the system, including any lift stations, is capable of handling the flow to the sewage treatment works and that the treatment works is capable and will accept the additional loading.

1.1.11 Automation

Provide supporting data justifying automatic equipment, including the servicing and operator training to be provided. Manual override must be provided for any automatic controls. Highly sophisticated automation may put proper maintenance beyond the capability of the plant operator, leading to equipment breakdowns or expensive servicing. Adequate funding must be assured for maintenance of automatic equipment.

1.1.12 Project sites,

Including:

- a. discussion of the various sites considered and advantages of the recommended ones;
- b. the proximity of residences, industries, and other establishments;
- c. any potential sources of pollution that may influence the quality of the supply or interfere with effective operation of the water works system, such as sewage absorption systems, septic tanks, privies, cesspools, sink holes, sanitary landfills, refuse and garbage dumps, etc.

1.1.13 Financing,

Including:

- a. estimated cost of integral parts of the system, broken down by dollar amount or percentages for source development, storage, distribution mains, pumping, transmission mains, treatment, and planning (including all soft costs);
- b. detailed estimated annual cost of operation;
- c. proposed methods to finance both capital charges and operating expenses.

1.1.14 Future extensions

Summarize planning for future needs and services.

1.1.15 Technical, Managerial, and Financial Capacity

Including, if required by the ~~reviewing authority~~ **State Health Officer**:

- a. a discussion of the system's current technical capacity along with any project related changes with respect to operator certification requirements and the operators ability to implement any system changes that may be required upon project completion;
- b. a discussion of the system's current overall management and how the system's management will be impacted by the project including but not limited to whether the system has an asset management plan and if so how the project components will be incorporated into that plan;
- c. a discussion of the water system's overall financial capacity along with user projected water rates including the system's outstanding obligations combined with the anticipated debt from the current project under review and the overall operation and maintenance. If applicable, the financial capacity discussion should include details of any energy efficiency components included as a part of the project along with the estimated long term cost and energy savings associated with them.

1.2 PLANS

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

1.2.1 General layout,

Including:

- a. suitable title;
- 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 point;
- 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.~~

1.2.2 Detailed plans,

Including:

- a. stream crossings, providing profiles with elevations of the stream bed and the normal and extreme high and low water levels except where submarine stream crossings are to be installed by means of directional drilling then the extreme high water level may be omitted;
- 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. topography 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. plat 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. Upon completion submit record drawings reflecting geologic formations and water levels;
- 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 materials of proposed water mains;
- i. location of existing or proposed streets; water sources, ponds, lakes, and drains; storm, sanitary, combined and house sewers; septic tanks, disposal fields and cesspools;
- j. schematic flow diagrams and hydraulic profiles showing the flow through various plant units;
- k. piping in sufficient detail to show flow through the plant, including waste lines;
- l. locations of all chemical storage areas, feeding equipment and points of chemical application (see Part 5);
- m. all appurtenances, specific structures, equipment, water treatment plant waste disposal units and points of discharge having any relationship to the plans for water mains and/or water

- works structures;
- n. locations of sanitary or other facilities, such as lavatories, showers, toilets, and lockers, when applicable or required by the ~~reviewing authority~~ **State Health Officer**;
- o. locations, dimensions, and elevations of all proposed plant facilities;
- p. locations of all sampling taps;
- q. adequate description of any features not otherwise covered by the specifications.

1.3 SPECIFICATIONS

Complete, detailed technical specifications **for those applicable sanitary components** 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 **for all new plants**;
- c. the number and design of chemical feeding equipment (see Section 5.1);
- d. procedures for flushing, disinfection and testing, as needed, prior to placing the project in service;
- e. materials or proprietary equipment for sanitary or other facilities including any necessary backflow or back-siphonage protection.

1.4 DESIGN CRITERIA

A summary of complete design criteria **for those applicable sanitary components** 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. **chemical** feeder capacities and ranges;

- m. minimum and maximum chemical application rates.

1.5 REVISIONS TO APPROVED PLANS

Any substantial deviations from approved plans or specifications must be approved by the ~~reviewing authority~~ **State Health Officer** before such changes are made. These include, but are not limited to deviations in: capacity, hydraulic conditions, operating units, the functioning of water treatment processes, or the quality of water to be delivered. 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.

1.6 ADDITIONAL INFORMATION REQUIRED

The ~~reviewing authority~~ **State Health Officer** 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.