Guideline for Group B

Public Water System Approval

July 1994

Environmental Health Programs

Guideline for Group B

Public Water System Approval

July 1994

For more information or
additional copies of this report contact:

Division of Drinking Water
Airdustrial Center #3
PO Box 47822
Olympia, WA 98504-7822

(360) 236-3100
SCAN 234-3466
FAX 586-5529

Bruce M. Miyahara
Secretary of Health

Dennis Campbell, Public Health Advisor
Division of Drinking Water

Richard Sarver, Environmental Planner
Division of Drinking Water

Page **Contents**

Introduction

A safe and reliable drinking water supply is of fundamental importance to our health and well being. This workbook is intended to help designers of Group B public water systems with less than 10 services ensure that the requirements of providing a safe and reliable drinking water supply and protecting public health are met. If you plan to expand your system to serve more than 9 residences or more than 24 people in the future, you are advised to proceed as if the system were a Group A public water system. Otherwise, you may find it far more difficult and expensive to meet your future system expansion plans, or even jeopardize your ability to expand at all. (See WAC 246-291-001 (3))

This workbook was designed for owners of rural residential water systems, which include most Group B applicants. If your system provides water to a business or other non-residential use, or if this is an existing non-expanding system, the requirements for approval may vary. Restaurants, small businesses, churches, schools, government agencies and resorts are examples of small public water systems with their own unique design needs. In these cases or for existing systems, contact the Department of Health (DOH) or your local health department for special instructions.

Using this workbook will help simplify water system design and analysis procedures and help ensure compliance with the appropriate standards, requirements, and regulations. Equivalent information may be submitted in a different form if you choose. **As per WAC 246-291-040, all applications submitted to DOH for approval must be submitted by a licensed professional engineer (P.E.) unless the Department has delegated the authority to a local health department to review plans and design reports or the local health department has prescreened the application for completeness prior to forwarding to DOH for review.** We encourage all water system owners to obtain professional assistance in the design of their water system.

DOH and local health departments share responsibility for administering drinking water regulations for Group B public water systems in some counties. Therefore, when the term "department" is used, it refers to whichever agency is responsible in that particular county. Also note that the DOH-Division Of Drinking Water is a fee-supported program. This means that you will be charged a fee for the review and approval of the public water system application you submit. In some cases, local health departments may provide approvals for small systems. Local requirements and fees may vary. Contact your local health department or this office for more specific information.

Owners of systems with more than nine connections or with special treatment requirements other than simple chlorine disinfection are required by ***Washington State Drinking Water Regulations (WAC 246-291-040)*** *to hire a licensed professional* engineer (P.E.) to design their systems and submit required documents to the Department of Health, and can not use this workbook.

Finally, care should be taken in the completion of this workbook/application. Prior to submittal

for approval, copies of all worksheets and forms should be made, and kept in your permanent records. Some of the information will be helpful in the maintenance and operation of your system, and may make it easier to finance and/or sell your property.

GROUP B WATER SYSTEM DEVELOPMENT CHECKLIST

DATE ______________

APPLICANT: ____
ADDRESS: ____
____
DAY PHONE:___________________ EVENING PHONE:_________________
PROPOSED WATER SYSTEM NAME:__________________________________
COUNTY: ____
LOCATION: a. Cross Roads ____
b. Quarter Section / Section / Township / Range
_____ _____ S _____ T _____ R _____
1/4 1/4
SIZE: Number of Connections _________Population to be Served ____________
****

The items or documents checked below are necessary for formal State approval of all Group B Public Water Systems ranging in size from two to nine connections. All water quality tests must be conducted by state-certified laboratories. Fees will be charged for review and approval of this application and issuance of a system identification number. Some local health departments offer approvals for small systems. Requirements and fees may vary. **If this proposal is intended to gain approval for existing services and you do not propose to add any additional services, some of the following requirements may be waived.** Contact your local health department or this office for more specific information.

__x___ Water Right Permit (if required)
__x___ Well Log
__x___ Pump/Aquifer Test of Well
__x___ Totalizing Source Meter
__x___ Site Inspection Report
__x___ Completed Group B Workbook
__x___ Financial Viability Worksheet
__x___ Vicinity and Service Area Sketch*
__x___ System Layout Sketch*
__x___ Protected Zone Sketch/Wellhead Protection Inventory*
(All sketches can be included in workbook)
__x___ Declaration of Covenant
__x___ Restrictive Covenant (Required of any neighbor £ 100 ft to the well)
__x___ Water Facilities Inventory (WFI) Form
______ Other:____
____

WATER QUALITY TESTS:

__x__ Bacteriological
__x__ Complete Inorganic
_____ Volatile Organic Chemicals (VOC)
_____ Synthetic Organic Chemicals (SOC)
_____ Radionuclides
_____ Pesticides

Remarks/Notes:____
____

GROUP B APPLICATION CHECKLIST

SECTION I

PART A: Basic Information ___

PART B: Ownership and Management ___

PART C: Source Site Information
- **Water Right Permit (If needed)** ___
- **Source Site Inspection** ___
- **Wellhead Protection Inventory** ___
- **Source Location & Protection Sketch** ___
- **Sanitary Control Covenants (Signed, but not filed)** ___

SECTION II

PART D: Water Source Construction Approval
- **Well Log** ___
- **Pump Test Results** ___
- **Water Quality Test Results:**
  - **Coliform** ___
  - **Inorganic Chemical/Nitrate** ___
    ***(Contact Local Health Department, RE: Specific Tests Required)**
  - **Volatile Organic Chemical/SOC/Pesticides/etc. *** ___
    ***(Required if vulnerable)**
- **Declaration/Restrictive Covenants-Filed** ___

PART E: Financial Viability Worksheet ___

PART F: Pump and Pumphouse Information ___

PART G: Pressure Tank/Storage Facilities ___

PART H: Treatment (If applicable) ___

PART I: Distribution System ___

PART J: Reliability Information ___

Completed Water Facilities Inventory (WFI) Form ___

Water Line, Well, Pumphouse Access Easements Recorded ___

Title Notices Recorded ___

SECTION I

For additional assistance in completing parts A through C of this workbook, refer to Appendix I, Basic System and Source Information

PART A: Basic System Information

1. **Name of Water System:** _____

2. **System Mailing Address:** _____

3. **County:** _____

4. **Well Site Tax Parcel Number:** _____

5. **Legal Description of Well Site:**__(1/4),__(1/4)
   Section__Township__Range__
   Latitude ____ Longitude ____
   Subdivision Name or Number___

6. **Year System Installed:** _____

7. **Located in Critical Water Supply Service Area:** Yes:___ No:___
   (Refer to Appendix I, Part A, #2 for additional information.)

   If yes, Name of Coordinated Water System Plan: _____
   If yes, Name of Existing System having priority for providing service:
   _____

   Note: Must submit justification for developing new independent system.

   If no, provide written verification that you have contacted each of the following to determine whether direct or satellite service could be provided:

   i. If applicable, the public water system which has a service area identified in a DOH approved water system plan was contacted regarding the possibility of service.

   ii. Each existing public water system serving property within 1000 feet of the subject property.

   iii. Available DOH-approved satellite management agencies.

8. **Number of Services:** Existing _____ Proposed _____
   Please provide Parcel Number and Address of Service: _____
   _____
   _____
   _____
   _____
   (**NOTE:** Each customer or residential connection is a service, i.e., house, lot, apartment, mobile home space, or commercial hookup)

9. **Type of Service:** (Enter the number of service connections in each appropriate blank space)
   Permanent__Temporary__Seasonal__Residential__Recreational__
   Commercial__Rural__Permanent or Daily Population Served___

10. **Vicinity and Service Area Sketch:**
    (Sketch in the space provided below, or a simple map showing directions to the site and the area to be served by this system. Include at least two crossroads).

PART B: Ownership and Management

1. **Water System Owner:** Enter name of person(s), association or corporation. If an association or corporation has been formed, attach a copy of the association by-laws, joint use & maintenance agreement, or other documents providing information regarding future financial and maintenance responsibilities. If the system is owned by one or more individuals, **the owner(s) must attach and sign a statement of responsibility or complete Item #2 below for any maintenance or repairs involved in the continuing operation of the system**. See Appendix I, Part B for additional information.

   Name _____

   Address _____

   _____

   Telephone Number (day)_____ (evening)_____

2. **Owner's Statement Of Responsibility:**

   I, the undersigned, do hereby attest that as the owner of this water system I am responsible for any maintenance or repairs involved in the continuing operation of this system

   Signature _____

   Date _____

3. **System Contact Person:** (if different than above)

   Name _____

   Address_____

   _____

   Telephone Number (day)_____ (evening)_____

4. **Contact Person For Maintenance, Water Quality Sampling, Customer Notification, And Complaint Response:** (if different than above)

   Name _____

   Address_____

   _____

   Telephone Number (day)_____ (evening)_____

NOTE: If this system is owned or operated by a Satellite Management Agency, please attach a copy of the agreement.

5. **Person Preparing This Workbook:**

Name _____

Company _____

Address _____

_____

Telephone Number (day)_____ (evening)_____

6. **Owner's Statement Of Accuracy:**

I, the undersigned, do hereby attest that I am the owner of this water system and that the information provided in this workbook is accurate to the best of my knowledge.

Signature _____

Date _____

PART C: Water Source Approval

(**NOTE:** If your water source is a spring or surface water, contact Washington Department of Health for special requirements)

1. **Water Right Permit:** (See Appendix I, Part C, #1 for requirements) Attach a copy of water right permit (if required).
   a. Is separate irrigation provided? Yes__ No__ (if yes, source of irrigation is: _____ _____

   (**NOTE:** Source could be private wells or surface water, non-district.)

2. **Well Site Inspection Report:** All Group B Water Systems **must** have a well site inspection. (See Appendix I, Part C, #2 for requirements). No inspections will be conducted until after a formal application is received. Some local health departments offer this service. *If this service is not available from your local health department*, contact your DOH regional office to schedule an inspection. Attach a copy of the inspection report. If any improvements were recommended, attach receipts, work orders or photographs to show that the work was completed.
   Answer the following:

   a. Date Of Inspection: _____

   b. Name And Department Of Inspector: _____

   c. Recommendations/Comments: _____

   _____

   _____

   _____

   _____

3. **Sanitary Control Zone:** The owner(s) of a public water system must prevent uses of the land within at least a 100 ft. radius around the well which could contaminate the water source.

   a. **Site Protection Map:** (See Appendix I, Part C,#3 b for explanation)
   Sketch in the space provided on page 7, or **attach** a detailed topographical map or plat clearly showing the well site, ground slope, a 600 ft. radius around the well, and distances from the well to property lines, buildings, roads and potential sources of contamination. **(Note: Either the sketch or the attached map should be of sufficient scale to accurately identify all of the required details noted above.)**

b. **Wellhead Protection Inventory:** Please indicate if any of the following are present within a circular area around your water source having a minimum 600 foot radius. The 600 foot radius being equivalent to the ten year ground water travel time. Please indicate these potential sources of contamination on the Site Protection Map.

	Yes	No	Unknown
Likely pesticide application (commercial agriculture & residential)	___	___	___
Stormwater injection wells or disposal areas	___	___	___
Other injection wells	___	___	___
Abandoned ground water wells	___	___	___
Landfills, dumps, disposal areas within 1000 ft.	___	___	___
Known hazardous materials site within 1000 ft.	___	___	___
Water sources with known water quality problems	___	___	___
Population density greater than 1 house/acre	___	___	___
Residential septic tanks and drainfields	___	___	___
Underground and above ground storage tanks	___	___	___
Sewer lines	___	___	___

c. **Sanitary Control Covenants:** Attach copies of any Declaration of Covenants or Restrictive Covenants that have been prepared to protect the water source from activities or practices that could cause contamination. See Appendix I, Part C-4. Covenants do not need to be filed with the County Auditor until the source has been completed.

d. Site Protection Map (Refer to Appendix I, Part C, #3b):

SECTION II

For additional assistance in completing parts D through J of this workbook, refer to Appendix II, Group B Water System Design

PART D: Water Source Information

1. **Well Construction:**
   a. Existing Well ___ New Well ___
   b. **Well Log**: Attached ___ Not Available ___
   (See Appendix II, Part D, #1 for explanation)
   c. **Well Tag Number**: _____

   If well log is not available, please provide the following information:
   1. Well Depth _____
   2. Casing Diameter ___ To What Depth? _____ Casing material? _____
   3. Normal Or Static Water Level _____
   4. Surface Seal? Yes ___ No ___ To Depth ____ Material? _____
   5. Ground Surface Elevation (above mean sea level) _____
   6. Screens or Perforations? Yes ___ No ____ Depth? ____

   d. **Totalizing Source Meter:** Attach documentation that a totalizing source meter will been installed on each source. (As an ongoing operational requirement, this meter shall be read monthly and the reading recorded.)

   e. How will water level measurements be made?
   Permanent Airline _____ Tape____ None____ Other (Specify)_____

2. **Pump Test Results:** (See Appendix II, Part D #2 for explanation)
   Attach a copy of pump test and from results answer:
   a. Source Capacity (gpm): ___
   b. Measured Drawdown From Static Water Level: ___

3. **Water Quality Tests:** (All water quality tests must be performed by state certified laboratories and results must be on state approved forms. For additional details refer to Appendix II, Part D #3.) Attach copies of the following test results:
   a. **Bacteriological** (Coliform)
   b. **Inorganic Chemical/Nitrate** (Contact local county health department for specific tests required in your area)
   c. **Volatile Organic Chemical** (VOC) (If required by the department)
   d. **Other Specific Tests/Analyses** (if in an area of special concern)

4. a. **Declaration Of Covenant:**
   Include a copy of short plat showing covenants or Auditors File No. ____
   b. **Restrictive Covenant:**
   Include a copy of short plat showing covenants or Auditors File No. ____
   c. **Well, Water-line, and Equipment Easements:**
   Include a copy of short plat showing easements or Auditors File No. ____

PART E. Financial (Viability) Worksheet

Through the development of a projected budget, the goal of the Financial Viability Worksheet is to set in place plans, policies, and procedures that will enable the system owner(s) to have the ability to obtain sufficient funds, on a continuing basis, to cover the total cost of developing, constructing, operating and maintaining the system in compliance with State and Local drinking water regulations. Proposed rates must be adequate to cover any budget deficits identified in line 16. **For more information refer to Appendix II, Part E.**

ANNUAL EXPENSES	Initial Development	After Full Development or Build-out
1. Wages & Benefits	$ _____	$ _____
2. Electricity & other utilities	$ _____	$ _____
3. Chemicals & Treatment	$ _____	$ _____
4. Monitoring Costs	$ _____	$ _____
5. Materials, Supplies, & Repairs	$ _____	$ _____
6. Taxes/Assessments	$ _____	$ _____
7. Insurance/Misc. Expenses	$ _____	$ _____
8. Subtotal - Operating Expenses	$ _____	$ _____
9. 10% Contingency	$ _____	$ _____
10. Principal and Interest Payments	$ _____	$ _____
11. System Replacement	$ _____	$ _____
12. Total Revenue Required	$ _____	$ _____
ANNUAL REVENUE FROM SOURCES OTHER THAN WATER RATES		
13. Hook Up/Other User Fees	$ _____	$ _____
14. Other Revenue	$ _____	$ _____
15. Total Non Water Rate Revenue	$ _____	$ _____
ANNUAL WATER RATE CALCULATIONS		
16. Budget Surplus/Deficit (Line 15 minus line 12)	$ _____	$ _____
17. Number of Connections	_____	_____
18. Annual Water Rate* (Line 16 divided by Line 17)	$ _____	$ _____

(*Note: If individual meters are used, this can be the average rate, with individual rates varying depending on usage.)

PART F: Pump and Pumphouse Information

1. **Source Capacity:** (See Appendix II, Part F)
   a. Number of connections ____, Maximum required peak flow ____ (gpm) from pg 5, Appendix II
   b. Required daily production ____ (gpm), ____ (gpd)
   c. Source Capacity (gpm): ___

2. **Source Pump**
   a. Pump rate ____ gpm (must be no less than required peak instantaneous demand)
   b. Required Pump Head. First determine the headloss that will be associated with the water system by using Table A below.

TABLE A - Headloss

From:	To:	Connection:	Peak Hourly Design Flow	Diameter	Headloss per 100'	Length	Total Headloss

If using Option A see either Tables 1 or 3, if using Option B refer to Tables 2 or 4 , Appendix II for values.
Headloss per 100 feet = See Table 3, Appendix II for values.

** Select the single largest total headloss of pipe to a connection and use this value where it asks for the headloss in Table B on the following page.

TABLE B - Required Pump Head

	WELL PUMP	PUMP #2 (BOOSTER PUMP IF NEEDED) ❍
DISTANCE FROM PUMPING LEVEL IN WELL TO GROUND SURFACE (WELL HEAD)*♦	___ FEET	___ FEET
ELEVATION DIFFERENCE FROM WELL HEAD TO POINT OF DELIVERY	___ FEET	___ FEET
GREATEST HEADLOSS (Note: This number from hydraulic analysis-Table A)	___ FEET	___ FEET
PRESSURE RESIDUAL HEAD (30 PSI = 70 FEET OF HEAD)**	___ FEET	___ FEET
TOTAL REQUIRED PUMP HEAD	___ FEET	___ FEET

* Provide headloss if riser pipe length is greater than 100 feet. Also provide diameter of pipe, length and type of pipe used.

♦ Distance from pumping level in well to ground surface (Static water level + Drawdown)

** If pumping to nonpressurized storage, then the residual would be zero.

Also use this method if the source pump delivers to a storage tank where repumping is necessary; then a residual of 0 or close to 0 may be considered in pump sizing.

❍ **For Booster pumps a licensed Professional Engineer is required.**

NOTE: For more than one source, repeat above calculations.

3. **Required Pump**

Total required pump head ____ ft.
Pump Rate_____ gpm
Select pump from pump catalog for ____ head and pump rate of ____ gpm.

4. **Pump Specifications:**

a. Type _____ b. Manufacturer _____
c. Model ____ d. RPM ____ e. Horsepower _____
f. Pump Rate (gpm) ___ g. Single phase/Three phase? _____
(Attach Pump Curve or Performance Chart)

5. **Booster Pump:** **(NOTE: If system design requires booster pumping, the system must be designed by a professional engineer.)**

i. Pump rate _____ gpm.
ii. Required pump head _____
iii. Select pump from catalog for ____ head and well pump rate of ____ gpm.
a. Type _____ b. Manufacturer _____
c. Model ____ d. RPM ____ e. Horsepower _____
f. Pump Rate (gpm) ___ g. Single phase/Three phase? _____
(Attach Pump Curve or Performance Chart)

6. **Pumphouse** (Complete this section if applicable. Note: The pumphouse shall be adequately designed to allow access, removal and service of equipment.)

Well located: ___ in pumphouse
___ in pit
___ outside pump house

If pitless adapter used, please note make and model #: _____
(**Note:** Pitless unit must comply with NSF or DOH standards.)

Additional information:
a. Sanitary Seal on Well Casing? Yes ___ No __
b. Pressure Gauge? Yes ___ No __
c. Does Well Casing extend a minimum 6 inches above finished floor surface?
Yes __ No ___ (extends a minimum 6 inches above finished floor surface)
d. Screened Casing Vent? Yes ___ No __
e. Insulation? Yes ___ No __
f. Heating? Yes ___ No __
(heater should be wall mounted and thermostat controlled)
g. Approved Wiring? Yes ___ No ___
(**NOTE:** Wiring must be inspected by Washington Department of Labor and Industries)
h. Concrete Flooring? Yes ___ No __
(minimum 4 inches thick and sloped away from well toward floor drain)
i. Floor Drain? Yes ___ No __
(Piping for floor drains should be daylighted away from building)
j. Sample Tap Prior To Pressure Tank? Yes __ No _
k. Pumphouse Ventilation? Yes ___ No__
l. Locks For Doors? Yes ___ No __
m. Rodent Proof? Yes ___ No ___

PART G: Pressure Tank/Storage Facilities

1. **Pressure Tank:**
a. Manufacturer _____ Model _____
b. ASME _____ or equivalent ____ (Attach specifications)
c. Is Pressure tank for Pump protection? Yes ___ No ___, Other purpose ____, or both uses _____.
d. Is Pressure tank used for other purposes? Yes ___ No ___
If yes, what purpose?_____
e. Pressure Tank Is Horizontal ___ Vertical ___
Bladder Type ___ Other ___
If *Other*, Answer:
Air Makeup By: Snifter Valve ___ Compressor __
Other _____
f. Capacity: _____ Gallons _____
g. ASME Pressure Relief Valve Installed? Yes ___ No __
h. Pressure Range Settings: Minimum ___ Maximum __

2. **Storage Tank***:

(NOTE: If system design requires nonpressurized storage, the system must be designed by a professional engineer.)

a. Manufacturer _____ Model _____
b. Capacity (In Gallons) _____
c. Dimensions: ___ L x ___ W x ___ H
d. Material: _____
e. Screened Venting Provided? Yes ___ No __
f. Tightly Sealed Access Provided? Yes ___ No __
g. Drain Provided? Yes ___ No __

* **Note:** Tanks must be approved for drinking water contact by NSF or ANSI or equivalent. In addition, if different multiple tanks are utilized, the same information for each tank must be provided.

PART H: Treatment

1. Chlorination for: Precaution ____ , Bacteriological Quality ___

   For Hypochlorinators, please attach a completed Hypochlorination Facilities For Small Systems Submittal Checklist

2. Additional Treatment: If treatment is required, please indicate what is to be treated and the treatment device that you have selected.

Note: All treatment systems other than simple chlorination must be designed by a licensed professional engineer in the State of Washington and must comply with NSF standards. For Iron/Manganese treatment, all the items on Iron and Manganese Submittal Checklist available from DOH must be addressed. For other types of treatment include all calculations, design criteria, and pilot study data with this workbook. The treatment system must be inspected by the engineer after installation and a completion of construction report signed by him/her prior to final approval.

PART I: Distribution System

1. **System Diagram:** ***Attach a detailed map or diagram including all of the following information:***
   a. Property Lines, Individual Lot Lines, and Easement Locations
   b. **Well Site** (*clearly marked*)
   c. Utility Location (electrical)
   d. Customer Services or Connections (Include parcel number and address)
   e. Distribution Lines (including pipe lengths, pipe diameters, materials, valves, blow-offs, age and condition)
   f. Elevation Differences (Provide topographic map when greater than 40 ft.)
   g. Cross Connection Control Devices (location and type)
   h. Home Irrigation/ Private wells
   i. Size Of Lots Served (usually in acres or square feet)
   j. Roads
   k. Will individual service meters be provided? Yes___ No___

PART J: Reliability

What provisions, if any, have been made to ensure system reliability during power outages, pump failures, or other system component failures (Check appropriate items below).

___ None

___ Intertie with another system (**Note**: May require revised water right)

___ Backup power source

___ Generator Disconnect (Transfer Switch)

___ Parallel Pumps

___ Stand-by storage with gravity feed

___ Other (Please List)

_____

_____

_____

_____

_____