



PERMITTING & COMPLIANCE DIVISION

◆ *New Community Water Supply Well* ◆

EXPEDITED REVIEW CHECKLIST

August 8, 2014

New Community Water Supply Well Expedited Review Checklist Instructions:

This checklist procedure may be used to gain approval to drill new community water supply wells in lieu of a complete department review when the conditions listed below are met. Construction of a new well is unlawful until approval is granted by the department, typically issued in a letter to the design engineer submitting the plans and specifications. Normally, the Department will review complete submittals within 15 working days. Submittals that do not contain all of the required information are not considered complete.

Conditions for use of the New Community Water Supply Well Checklist:

1. New wells that require a deviation from the Standards of DEQ-1 are not eligible for checklist review.
2. Review and approval is limited to location and construction of the well. Appurtenances such as discharge piping, pitless adapters, well pumps and well houses are not covered. Storage, treatment and distribution are not covered.
3. Radial well collectors, infiltration lines, and dug wells are not eligible for checklist reviews.

Required Documentation: *Checklists submitted without all of the required documentation will be considered incomplete and will not be processed until all of the required information has been submitted.*

1. A completed New Community Water Supply Well Expedited Checklist Application.
2. An engineering report presenting, at a minimum, the information required in DEQ-1, Chapter 1.
3. Three sets of plans signed and stamped by the professional engineer responsible for the design of the project.
4. Three sets of well specifications signed and stamped by the professional engineer responsible for the design of the project.
5. Three copies of a PWS-6 "Source Water Protection Delineation" report. The report must meet the standards listed in Department Circular PWS-6.
6. Owner certification that a professional engineer will be retained for construction inspection and will certify completion in accordance with the approved plans and prepare as-builts for submittal to the Department within 90 days of project completion.
7. Review Fee as specified in ARM 17.38.106.

Completed checklist submittals may be mailed to: Department of Environmental Quality, Permitting & Compliance Division, Public Water and Subdivisions Bureau, Metcalf Building, P.O. Box 200901, Helena, MT 59620-0901; or for those systems served by the Kalispell Office: Department of Environmental Quality, Public Water Supply Section, 109 Cooperative Way, Suite 105, Kalispell, MT 59901; or for those systems served by the Billings Office: Department of Environmental Quality, Public Water and Subdivisions Bureau, Airport Business Park 1P-9, 1371 Rimtop Drive, Billings, MT 59105-1978. Questions can be answered by writing the above address or calling (406) 444-4400 in Helena, (406) 755-8985 in Kalispell and (406) 247-4455 in Billings.

**DEPARTMENT OF ENVIRONMENTAL QUALITY
NEW PUBLIC WATER SUPPLY WELL EXPEDITED REVIEW CHECKLIST**

Project Name _____

Nearest City _____ County _____

Public Supply Owner _____

Developer _____

Mailing Address _____

Engineer _____

Mailing Address _____

Will this well be connected to an existing system? If so, PWSID number of system: _____

Will this well be associated with a Subdivision? If so, Subdivision name: _____

REQUIRED DOCUMENTATION:

Checklists submitted without all of the required documentation will be considered incomplete and will not be processed until all of the required information is submitted.

Included?

Y No

- An engineering report presenting, at a minimum, all of the information listed below in ENGINEERING REPORT.
- Three sets of plans signed and stamped by the professional engineer responsible for the design of the project. The plans must show all of the required information listed below under PLANS.
- Three sets of well specifications signed and stamped by the professional engineer responsible for the design of the project. The specifications must meet all of the standards listed below under WELL SPECIFICATIONS.
- Two copies of a PWS-6 "Source Water Protection Delineation" report. The report must meet the standards listed in Department Circular PWS-6.
- Owner certification that a professional engineer will be retained for construction inspection and will certify completion in accordance with the approved plans and prepare as-builts for submittal to the Department within 90 days of project completion.
- Review Fee as specified in ARM 17.38.106.

Every "Yes" answer must have the page number where the information can be found listed. Every "N/A" answer must be accompanied by a written explanation of the reason the standard is not applicable.

ENGINEERING REPORT:

Included?

Y N/A Page

1.1.1 General information, including:

- _____ a. description of any existing water works and sewerage facilities,
- _____ b. identification of the municipality or area served,
- _____ c. name and mailing address of the owner and developer, and official custodian.

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, and
- _____ c. appraisal of the future requirements for service, including existing and potential industrial, commercial, institutional, and other water supply needs.

- _____ **1.1.3 Alternate plans.** Where two or more solutions exist for providing public water supply facilities, each of which is feasible and practicable, discuss the alternate plans. Give reasons for selecting the one recommended, including financial considerations, and a comparison of the minimum classification of water works operator required for operation of each alternative facility.

1.1.4 Site Conditions. Soil and groundwater conditions, including:

- _____ a. a description of the character of soil through which water mains are to be laid,

- _____ b. foundation conditions prevailing at sites of proposed structures, and
- _____ c. the approximate elevation and flow direction of groundwater 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, a minimum of 20 years in the future in five year intervals or over the useful life of the critical structures and equipment,
- _____ b. present water consumption and the projected average and maximum daily demands or peak instantaneous demand, where appropriate, including fire flow demand (see DEQ-1 Section 1.1.6),
- _____ c. present and/or estimated yield of the sources of supply, and
- _____ d. unusual occurrences.
- _____ e. current estimated 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), and
- _____ b. fire flows, when fire protection is provided, meeting the recommendations of the fire protection agency in which the water system is being developed, or in the absence of such a recommendation, the fire code adopted by the State of Montana. Documentation from the fire protection agency may be required if the flow requirements vary significantly from typical values.

1.1.7.2 Groundwater 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:

- _____ 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 through nearby well logs,
- _____ 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

1.1.9 Sewage system available. Describe the existing or proposed sewage collection 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.

1.1.12 Project sites, including:

- _____ a. discussion of the various sites considered and advantages of the recommended ones, and
- _____ b. the proximity of residences, industries, and other establishments, and
- _____ 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.

3.2.1.1 Source capacity

- _____ a. The total developed groundwater source capacity for systems utilizing gravity storage or pumped storage, unless otherwise specified by MDEQ must equal or exceed the design maximum day demand with the largest producing well out of service. Storage must comply with the requirements of Section 7.0.1.
- _____ b. The total developed groundwater source capacity for systems utilizing hydropneumatic storage tanks as the only storage facility must be sufficient to equal or exceed the peak instantaneous demand with the largest producing well out of service. For systems serving 50 or less equivalent dwelling units, MDEQ may allow a reduction in total required system capacity provided the system can maintain the minimum pressures required in section 8.2.1 with the largest producing well out of service.

3.2.1.2 Number of sources. A minimum of two sources of groundwater must be provided. Consideration

should be given to locating redundant sources in different aquifers or different locations of an aquifer.

_____ **3.2.3.1 Well location.** Wells must be located at least 100 feet from sewer lines, septic tanks, holding tanks, and any structure used to convey or retain industrial, storm or sanitary waste, and state or federal highway rights-of-way.

_____ **3.2.3.2 Continued protection.** Continued protection of the well site from potential sources of contamination must be provided either through deed notice, zoning, easements, leasing or other means acceptable to MDEQ. Easements and deed notices must be filed with the County Clerk and Recorders Office. Such protection must extend for a radius of at least 100 feet around the well (well isolation zone). Also, separation distances between proposed wells and potential sources of contamination must be defined and justified by the design engineer in accordance with DEQ-1, Section 1.1.8.2. The well isolation zone of a proposed or existing well must not be in a groundwater mixing zone as defined in ARM 17.30.517517 and also may not include easements that would conflict with the proposed use. Fencing of the site may be required.

PLANS:

Included?
Y N/A Page

_____ **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, in feet,
 _____ e. north point,
 _____ f. datum used,
 _____ g. boundaries of the municipality or area to be served,
 _____ h. date, and name of the designing engineer,
 _____ i. ink imprint of registered professional engineer's seal and signature,
 _____ j. location and size of existing water mains, and
 _____ k. location and nature of any existing water works structures and appurtenances affecting the proposed improvements noted on one sheet.

_____ **1.2.2 Detailed plans, including, where pertinent:**
 _____ 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. 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, including easements, which may affect the water source or underground treated water storage facilities,
 _____ i. location, size and length of existing or proposed streets; water sources, including ponds, lakes and drains; storm, sanitary, combined and house sewers; septic tanks, disposal fields and cesspools; and abandoned wells.

_____ **3.2.3.1 and 3.2.3.2 Well location and continued protection zone**
Plans must identify the well isolation zone and all sewer lines, septic tanks, holding tanks, groundwater mixing zones and any structure used to convey or retain industrial, storm or sanitary waste and state or federal highway rights-of-way located within 100 feet of the proposed well.

WELL SPECIFICATIONS:

Included?
Y N/A Page

_____ **3.2 Groundwater** All wells must be constructed by a licensed water well contractor in accordance with Title 37, Chapter 43, MCA and Title 36, Chapter 21, ARM, current edition, (Water Well Contractor rules) with the following additional requirements.

3.2.2.1 Microbiological quality

- _____ a. Disinfection of every new, modified or reconditioned groundwater source must be provided in accordance with ARM 36.21.662 prior to placement of permanent pumping equipment, and must be provided after placement of permanent pumping equipment.
- _____ b. More than 72 hours after disinfection, two or more water samples must be submitted to a laboratory certified by the Department of Public Health and Human Services for microbiological analysis with satisfactory results reported to MDEQ prior to placing the well into service.

3.2.2.2 Physical, chemical, and radiological quality

- _____ a. Every new, modified or reconditioned groundwater source must be examined for applicable physical and chemical characteristics by tests of a representative sample in a laboratory certified by the Department of Public Health and Human Services, with the results reported to MDEQ.
- _____ b. Samples must be collected and analyzed at the conclusion of the test pumping procedure prior to disinfection. Sample results for the constituents of ARM 17.38.216 must be submitted to MDEQ for review and approval to demonstrate compliance with Title 17, Chapter 38, Sub-Chapter 2, ARM, prior to placing the well into service.

3.2.4.1 Yield and drawdown tests

- _____ a. A test must be performed on every production well after construction or subsequent treatment and prior to placement of the permanent pump,
- _____ b. The test methods must be clearly indicated in the project specifications,
- _____ c. The test pump must have a capacity, at maximum anticipated drawdown, at least equal to the quantity required under 3.2.4.1.d, and
- _____ d. The test must provide for continuous constant rate pumping at either 1.5 times the design pump capacity for at least 24 hours or 1.0 times the design pump capacity for 72 hours. Data collection must begin at time zero. The test may be terminated if stabilized drawdown occurs for at least eight hours during the test. Stabilized drawdown is defined as a water level that does not fluctuate plus or minus 0.5 feet for every 100 feet of drawdown at the design pumping rate.
- _____ e. The following data must be submitted to DEQ: static water level, depth of test pump setting, time of starting and ending each test cycle, 3. pumping rate,
- _____ f. A report must be submitted which provides recordings and graphic evaluation of the following at one hour intervals or less as required by DEQ: pumping rate, maximum drawdown, pumping water levels taken so as to provide at least 10 evenly spaced data points per log cycle of time (in minutes) on a time-drawdown plot, and water recovery levels taken so as to provide at least 10 evenly spaced data points per log cycle of time (in minutes) on a time-drawdown plot. To demonstrate adequate water quantity, MDEQ will require that pump test results be submitted for review and approval prior to construction of the remainder of the water system. The information must be submitted electronically to MDEQ on Aquifer test data Form 633.

3.2.4.2 Plumbness and alignment requirements

- _____ a. Every well must be tested for plumbness and alignment in accordance with AWWA A100.
- _____ b. The test method and allowable tolerance must be clearly stated in the specifications.
- _____ c. If the well fails to meet these requirements, it may be accepted by the engineer if it does not interfere with the installation or operation of the pump or uniform placement of grout.

3.2.4.3 Geological data must

- _____ a. be determined in accordance with ARM 36.21.667 except that samples must be collected at intervals of five feet or less. Upon completion, a copy of the well log must be submitted to MDEQ, and
- _____ b. be supplemented with a driller's log, and accurate geological location such as latitude and longitude or GIS coordinates as determined by GPS to an accuracy of +/- 25 feet.

3.2.5.1 Drilling fluids and additives must be approved by the National Sanitation Foundation (NSF) or a similar ANSI accredited laboratory/organization.

3.2.5.2 Minimum protected depths

- _____ a. Minimum protected depths of drilled wells must provide watertight construction to such depth as may be required by MDEQ, to exclude contamination, and seal off (zones) that are, or may be, contaminated or yield undesirable water.
- _____ b. Wells must have unperforated casing to a minimum depth of 25 feet or full-time microbial treatment must be provided.
- _____ c. Full time microbial treatment is required where the water source is an aquifer with a seasonal high water

level that is within 25 feet of the ground surface.

- _____ d. Microbial treatment required under b. or c. must provide 4-log inactivation and/or removal of viruses. A deviation of this standard may be granted by MDEQ in accordance with the procedures of Section 1.7 if the applicant shows there are no existing or approved sources of viral or bacterial contamination from human or animal waste within the 200-day time of travel zone of influence for the well and that new sources of contamination will not be introduced for this area.
- _____ e. If the water source is from a confined aquifer, microbial treatment is not required. The applicant must demonstrate an aquifer is confined using the methods outlined in the Nondegradation Guidance Manual, Appendix M.

3.2.5.3 Permanent steel casing pipe must:

- _____ a. be in accordance with ARM 36.21.640,
- _____ b. when driven, be equipped with a drive shoe in accordance with ARM 36.21.644, and
- _____ c. have joints in accordance with ARM 36.21.642.

3.2.5.4 Nonferrous casing materials. Plastic well casing must be in accordance with ARM 36.21.645 and ARM 36.21.646.

- _____ **3.2.5.5 Packers.** Packers must be of material that will not impart taste, odor, toxic substance or bacterial contamination to the well water. Lead packers must not be used.

3.2.5.6 Screens must:

- _____ a. be constructed of materials resistant to damage by chemical action of groundwater or cleaning operations,
- _____ b. have size of openings based on sieve analysis of formation and/or gravel pack materials,
- _____ c. have sufficient length and diameter to provide adequate specific capacity and low aperture entrance velocity. The entrance velocity must not exceed 0.1 feet per second,
- _____ d. be installed so that the pumping water level remains above the screen under all operating conditions,
- _____ e. where applicable, be designed and installed to permit removal or replacement without adversely affecting water-tight construction of the well, and
- _____ f. be provided with a bottom plate or washdown bottom fitting of the same material as the screen.

3.2.5.7 Grouting requirements

- _____ a. All permanent well casing must be surrounded by a minimum of 1 ½ inches of grout around the outside of the casing. The grout must extend to at least 25 feet below ground surface or as specified in Standard 3.2.6 for special aquifer types. The casing must be provided with centralizers in accordance with ARM 36.21.649. Grout may be cement/sand, bentonite chips or pellets, or neat cement. Grout may be applied by gravity into an annular space where chips or pellets are used, or by tremie pipe or other conductor from the bottom up. Bentonite must be applied per the manufacturer's instructions. In no case will gravity placement of bentonite be allowed through water to achieve the minimum depth required.
- _____ b. Application. Sufficient annular opening must be provided to permit a minimum of 1 ½ inches of grout around permanent casings, including couplings. Prior to grouting through creviced or fractured formations, bentonite or similar materials may be added to the annular opening, in the manner indicated for grouting. After cement grouting is applied, work on the well must be discontinued until the cement or concrete grout has properly set in accordance with ARM 36.21.654 (1)(d). Grout placement must be sufficient to achieve proper density or percent solids throughout the annular space and must be applied in accordance with the definitions in ARM 36.21.634. The type of grout, quantity, and method of placement must be reported on the well log.

3.2.5.8 Upper terminal well construction

- _____ a. Permanent casing for all groundwater sources must be in accordance with ARM 36.21.647.
- _____ c. Sites subject to flooding must be provided with an earth mound surrounding the casing and terminating at an elevation at least two feet above the 100 year flood level or highest known flood elevation.
- _____ d. The top of the well casing at sites subject to flooding must terminate at least three feet above the 100 year flood level or the highest known flood elevation, whichever is higher.
- _____ e. Protection from physical damage must be provided.
- _____ f. The upper terminal must be constructed to prevent contamination from entering the well.
- _____ g. Where well appurtenances protrude through the upper terminal, the connections to the upper terminus must be mechanical or welded connections that are water tight.

3.2.5.9 Development

- _____ a. Every well must be developed in accordance with ARM 36.21.653.

- _____ b. Where chemical conditioning is required, the specifications must include provisions for the method, equipment, chemicals, testing for residual chemicals, and disposal of waste and inhibitors.
- _____ c. Where blasting procedures may be used, the specifications must include the provisions for blasting and cleaning. Special attention must be given to assure that the grouting and casing are not damaged by the blasting.
- _____ d. The method of well development must be described on the well log.

_____ **3.2.5.10 Capping requirements.** Temporary capping must be in accordance with ARM 36.21.661

3.2.6.1 Consolidated Formations. In drilled wells that penetrate an aquifer either within a consolidated or confining formation, sealing of the casing must conform with one of the following procedures:

- _____ 1. an upper drill hole, at least three inches greater in diameter than the nominal size of the permanent well casing, must extend from land surface to at least three feet into sound, consolidated formation. In no instance must said upper drill hole extend less than 25 feet below land surface; and
- _____ 2. unperforated permanent casing must be installed to extend to this same depth, and the lower part of the casing must be sealed into the rock formation with cement grout. The remainder of the annular space to land surface must be filled with an appropriate sealing material.
- _____ b. If temporary surface casing is used in either of the above procedures, this casing must be of sufficient diameter to conform to the upper drill hole specifications. Withdrawal of the temporary casing must take place simultaneously with proper sealing of the annular space to land surface.

3.2.6.2 Unconsolidated Formations without significant clay beds

- _____ a. In drilled wells that penetrate an aquifer overlain by unconsolidated formations such as sand and gravel without significant clay beds, an unperforated well casing must extend to at least one foot below the known seasonal low water table. An upper drill hole having a diameter at least three inches greater than the nominal size of the permanent casing must extend to at least 25 feet below land surface.
- _____ b. The annular space between the upper drill hole and the well casing must be kept at least one-half full with bentonite slurry throughout the driving of the permanent casing into the aquifer. After the permanent casing is set in its final position, the remaining annular space must be filled to land surface with appropriate sealing material.
- _____ c. If the oversized drill hole is extended to the same depth as the permanent casing, a suitable bridge must be installed between the casing and the drill hole at a position directly above the production aquifer. The remaining annular space must be completely filled and sealed to land surface with appropriate sealing material.
- _____ d. A suitable bridge is one that prevents the sealing material from dropping into the producing formations and reducing the output of the well.
- _____ e. If temporary casing is used to maintain the oversized drill hole, the annular space must be kept full with appropriate sealing material as the temporary casing is being withdrawn.

_____ **3.2.6.3 Unconsolidated Formations with clay beds.** In drilled wells that penetrate an aquifer overlain by clay or other unconsolidated deposits such as sand and gravel in which significant (at least 6 feet thick) interbeds of clay are present, the well casing must be terminated in such clay strata, provided that the casing be sealed in substantially the same manner as is required in the case of consolidated formations.

_____ **3.2.6.4. Flowing Wells.** When flowing water is encountered in the well, an unperforated well casing must extend into the confining stratum overlying the artesian zone. The casing must be adequately sealed into the confining stratum so as to prevent surface and subsurface leakage from the artesian zone. If the well flows at land surface, it must be equipped with a control valve so that the flow can be completely stopped. The well must be completed with packers or appropriate sealing material that will eliminate leakage around the well casing.

3.2.6.5 Gravel pack wells

- _____ a. Gravel pack must be well rounded particles, 95 per cent siliceous material, that are smooth and uniform, free of foreign material, properly sized, washed and then disinfected immediately prior to or during placement.
- _____ b. Gravel pack must be placed in one uniform continuous operation.
- _____ c. Protection from leakage of grout into the gravel pack or screen must be provided.
- _____ d. Permanent inner and outer casings must meet requirements of Sections 3.2.5.3 and 3.2.5.4.

Additional Comments: _____

I certify that the plans, specifications, certified checklist and supporting documentation and attachments to be in compliance with all of the applicable standards of the Department of Environmental Quality Circular DEQ 1.

(Signature of Professional Engineer)

(Date Signed)

PE Stamp

Final Source Approval

Approval to drill a new community well will be conditioned on compliance with applicable DEQ-1 requirements. In order to obtain final source approval to use the new well, the following items need to be submitted to DEQ for approval once the well has been completed:

1. A final assessment for proposed groundwater sources that may be under the direct influence of surface water, prepared in accordance with PWS-5, "Assessment of Groundwater Sources Under the Direct Influence of Surface Water" (DEQ-1, Standard 1.1.8.2.h).
2. A final Source Water Protection Plan prepared in accordance with PWS-6 if field results differ substantially from that predicted in the preliminary Source Water Protection Plan, (DEQ-1, Standard 1.1.8.2.i).
3. A description of any wellhead protection measures being considered. (DEQ-1, Standard 1.1.8.2.j)
4. Documentation that the continued protection zone has been provided through ownership, zoning, easements or leasing. Easements must be filed with the County Clerk and Records Office. (DEQ-1, Standard 3.2.3.2)
5. Test Pump results demonstrating compliance with DEQ-1, Standard 3.2.4.1.
6. Water quality sample results demonstrating compliance with DEQ-1, Standard 3.2.2.1 Microbiological quality, and DEQ-1, Standard 3.2.2.2 Physical, chemical and radiological quality.
7. A copy of the completed well log. (DEQ-1, Standard 3.2.4.3)
8. A discussion of the maximum, average day and peak instantaneous demand in relation to developed source capacity to demonstrate compliance with DEQ-1 Standard 3.2.1.1.
9. A discussion of the static water level of the well and compliance with DEQ-1, Standard 3.2.5.2.

Please note that source approval is limited to location and construction of the well. Plans and specifications for approval of well appurtenances (source sample taps, auxiliary power, discharge piping, pitless adapters, well pumps) must be submitted separately and will not be reviewed under an expedited process. If required, plans and specifications for storage, treatment, distribution, and Appendix A information must also be submitted separately and will not be reviewed under an expedited process.