**Initial Statement of Reasons**
**Waterworks Standards**
**Title 22, California Code of Regulations**

All suppliers of domestic water to the public are subject to regulations adopted by the U.S. Environmental Protection Agency under the Safe Drinking Water Act (42 U.S.C. 300f et seq.) as well as by the California Department of Health Services (Department) under the California Safe Drinking Water Act (sections 116270-116751, Health and Safety Code).

The Department proposes to significantly reorganize and amend the existing Waterworks Standards regulations (section 64417, Chapter 15, and sections 64555 through 64644, Chapter 16, Title 22, California Code of Regulations). To avoid confusion, the Department proposes to completely repeal the existing standards, except for Section 64563 which is left intact, and replace them with the proposed amendments, even though some of the existing requirements are reflected in the new language.

The draft revisions to the Waterworks Standards were developed by an internal Department workgroup consisting of both field and technical branch staff. Subsequently, a group of stakeholders (see list at the end of this document), representing the drinking water industry, convened and met with the Department to discuss the proposed changes, resulting in much of their input being incorporated. The Stakeholder Group then had a second opportunity to directly comment on the draft regulations. The Department also considered input from other interested parties who commented on the draft standards as posted on the Department's website for informal comment. The Department worked very closely with stakeholders on this regulation and the majority of the proposed requirements had full Stakeholder Group concurrence.

The regulations incorporate by reference various standards:

- California Department of Water Resources (Bulletins 74-81 and 74-90);
- American Water Works Association (AWWA): A100-06, C150/A21.50-02, C150/A21.51-02, C200-97, C300-04, C301-99, C302-04, C303-02, C304-99, C512-04, C600-05, C605-05, C651-05, C652-02, C654-03, C800-05, C900-97, C906-99, C909-02, C950-01, D100-05, D102-03, D103-97, D110-04, D120-02, D130-02, and Manuals M9 (1995), M11 (2004), M25 (2000), M51 (2001), and AWWA California-Nevada Section's "Reservoir Floating Cover Guidelines" (April 1999).
- American National Standard Institute/NSF International (ANSI/NSF): 60- 2005 and ANSI/NSF 61-2005/Addendum 1.0-2006.

In summary, the proposed regulation package would:

- For ease in revision, except for Section 64563, repeal the existing Waterworks Standards as contained in sections 64417, and 64555 through 64644 of Title 22;
- Update and clarify the regulatory requirements related to distribution systems, adopt new Waterworks Standards as detailed in proposed sections 64551 through 64604;

- For purposes of integrating related requirements, move the amended sections 64700 (Direct Additives) re-numbered 64590, and 64710 (Exception) re-numbered 64593 and retitled "Use of Uncertified Chemicals, Materials or Products" from Chapter 18 to the Waterworks Standards in Chapter 16;
- Set forth requirements for the purpose of ensuring sufficient supply to meet demands, adopt a requirement for a source capacity planning study for any anticipated water system expansion; and
- Address the potential for inadvertent contamination of drinking water and adopt a new section 64591 (Indirect Additives).

The net effects of the proposed regulations are as follows:

- Greater clarity and less ambiguity in the requirements as the result of reframing and updating the existing regulations;
- Requirements for the purpose of ensuring an adequate quantity of drinking water to supply any new developments or expansions of existing water systems prior to their establishment by requiring a comprehensive evaluation of anticipated demand and available supply; and
- Requirements for the purpose of ensuring that materials with which the drinking water may come into contact during transmission, treatment, and distribution do not contaminate the water by requiring that such materials be certified to have met safety standards.

**Rationale**
The reasons for repealing the existing sections are as follows.

**Chapter 15**

**Article 2. General Requirements**

**64417. Siting Requirements.**
Although not part of Chapter 16, this section would be repealed because the proposed changes to Chapter 16 make it obsolete.

**Chapter 16**

**Article 1. Application, Responsibility and Definitions**

**64555. Definitions.**
This section would be repealed because it contains definitions of terms not used in the proposed revisions and, therefore, is no longer necessary. Proposed sections 64551.10 to 64551.70 contain definitions of terms used in the proposed revisions.

**64560. Basic Design.**
This section would be repealed because it contains ambiguous and judgmental language and does not comply with the Administrative Procedure Act (Gov. Code Sec. 11340, et seq). This

section has been confusing to the water utilities, unenforceable by the Department, and has had no regulatory benefit or effect.

**64562. Quantity of Supply.**
This entire section would be repealed due to lack of clarity and specificity. More specific language addressing source capacity and storage requirements is in proposed section 64554.

**64564. Procedures for Determining Needed Source Capacity and Needed Storage Volume.**
Section 64564 would be repealed due to lack of clarity. Subsection 64564(a) has been incorporated into the proposed section 64554. Subsection (b) sets forth procedures and criteria to be followed to determine the source capacity and storage volume needed when existing records are unavailable. The Department has determined that this method is overly conservative and too restricting since other methods of determining needed capacity are equally valid. Also, the section's language and the charts are very confusing to the regulated community. As a result, this subsection has been cumbersome and extremely limited as a regulatory tool. The requirements in subsection 64564(c) are no longer needed in view of proposed section 64554. The requirement in existing subsection 64564(d) is in proposed section 64558(a)(2).

**64566. System Pressure.**
This section would be repealed due to lack of clarity and, for subsection (c), due to an unnecessary requirement. The requirements in subsections (a) and (b) have been rewritten and included in proposed section 64602.

**64568. Conditions for Adding Service Connections.**
This section would be repealed because it is redundant and unnecessary.

**64570. Internal Combustion Engines.**
This section would be repealed because the Department has determined that it does not meet the Administrative Procedure Act (Gov. Code Sec. 11340, et seq) requirement for necessity.

**64600. Basic Design of Distribution Reservoirs.**
This section would be repealed because it does not meet the Administrative Procedure Act (Gov. Code Sec. 11340, et seq) requirements for clarity and has, therefore, been rewritten. The revised language is contained in proposed section 64585.

**64602. Subsurface Distribution Reservoirs.**
This section would be repealed because the Department has determined that more flexibility should be allowed in designing this type of reservoir. Subsurface reservoirs are addressed in proposed section 64585(b)(13).

**64604. Corrosion Protection.**
This section would be repealed because it contains obsolete references and language. Corrosion protection would be addressed under section 64585(b)(11).

**64612. Water Sealed Pumps.**

This section would be repealed because the Department has determined that it is no longer necessary.

**64622. Water Main Materials.**
This section would be repealed because it contains obsolete references that are no longer appropriate or necessary. Allowable materials with updated references would be in proposed section 64570.

**64624. Water Main Selection and Installation.**
This section would be repealed because it contains obsolete references and requirements that are no longer appropriate or necessary. New requirements would be covered in proposed section 64570.

**64626. Layout of Water Mains.**
This section would be repealed because it does not meet the Administrative Procedure Act (Gov. Code Sec. 11340, et seq) requirements for clarity due to the ambiguous language. The Department has also determined that this requirement is no longer necessary.

**64628. Minimum Water Main Diameter and Length of Run.**
This section would be repealed due to lack of necessity and/or clarity. The requirements in subsection (a) have been rewritten and proposed as section 64573.

**64630. Water Main Installation.**
This section would be repealed because the requirements have been clarified and placed in proposed sections, or were no longer necessary. The requirements in subsections (a) and (f) are in proposed sections 64574 and 64570, respectively. Those requirements in subsections (c), (d), (e) and (g) are in proposed section 64572.

**64632. Water Main Valve Locations.**
This section would be repealed because it does not comply with the Administrative Procedure Act (Gov. Code Sec. 11340, et seq) requirements for clarity. New language relating to valve locations and construction is in proposed section 64577.

**64634. Water Main Valve Construction Standards.**
This section would be repealed. The Department has determined that the requirements in subsection (a) are no longer necessary. The requirements in subsection (b) have been rewritten and proposed as section 64578.

**64636. Air and Vacuum Relief and Air Release Valves.**
This section would be repealed. The requirements in subsection (a) have been rewritten and proposed as new section 64576. The Department has determined that subsection (b) is extremely confusing due to ambiguous language.

**64638. Water Main Joints.**

This section would be repealed because the requirement is already inherent in other requirements and is, therefore, unnecessary.

**64640. Fire Hydrants.**
This section would be repealed. The requirement has been rewritten for clarity in proposed section 64577 (c).

**64642. Flushing Valves and Blowoffs.**
This section would be repealed. The requirements in subsections (a), (b) and (c) are in proposed subsections 64575 (a), (b), and (c), respectively.

**64644. Service Connection Pipe.**
This section would be repealed because it contains obsolete references and the Department has determined that it is no longer necessary in view of proposed section 64590 dealing with allowable materials.

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The Department proposes the following to replace the existing Waterworks Standards regulations.

**Article 1. Definitions**

**Sections 64551.10 - 64551.70. Definitions.**
For clarification and to avoid confusion, these sections define common terms used in the water industry that are utilized in the proposed revisions. Although the terms are used in the existing Standards, they are not defined.

**Article 1.5. Waivers and Alternatives**

**Section 64551.100 Waivers and Alternatives.**
The purpose of this section would be to establish a waiver of certain provisions in the Waterworks Standards for noncommunity water systems and to provide for alternative approaches to compliance for all public water systems.

**(a)** This provides for a waiver of specific requirements for noncommunity water systems. These may be waived by the Department, based on a review of various characteristics of the system, because the requirement that a new permit application be prepared by a licensed engineer [section 64552(b)], flushing (section 64575) and isolation valves (section 64577) may not be necessary. A major portion of the existing, as well as the proposed, Waterworks Standards relates to distribution systems. Noncommunity water systems typically do not have distribution systems in the traditional sense. This has caused serious problems in the past with implementation. The provision for a waiver can eliminate an onerous and unnecessary regulatory burden for those noncommunity systems for which it is appropriate.

**(b)** This provides for a water system to apply to the Department to use an alternative approach for compliance with the Waterworks Standards if it can demonstrate equivalent public health

protection. The Department recognizes that these Standards are necessarily very specific; however, due to local circumstances, there may be situations in which the Standards may be impractical or unachievable. For this reason, some allowance for the use of acceptable alternatives is needed. The existing Waterworks Standards contain language in numerous sections dealing with alternatives. Unfortunately, that language is ambiguous and frequently uses phrases such as "with the approval of the Department". The purpose of this subsection is to replace the existing alternative language scattered throughout the regulations with language that allows a water supplier to propose an equivalent alternative to any of the specific regulations. The applicant would have to demonstrate that the alternative being proposed does not increase the risk to public health over that of the specific proposed regulation and institute additional mitigation measures. Since there are many possible situations and alternatives, it would be impossible to cover them with regulatory language. Subsection(c) would allow the water systems and their engineering consultants maximum flexibility in designing and adapting their distribution systems to take into account unusual local conditions.

### Article 2. Permit Requirements

**Section 64552. Initial Permit for Public Water System.**
In order for the Department to issue a domestic water supply permit to a new public water system, it must make a finding that the proposed system will be able to provide a reliable and adequate supply of water at all times that is pure, wholesome, potable, and does not endanger the health of consumers (HSC section 116540). Section 116530 of the HSC mandates that a permit application include information required by the Department relating to plans and specifications, water quality information, and physical descriptions of the existing or proposed system. The Department cannot make a finding of an adequate supply of water without the type of information specified in this proposed section.

**(a)** The purpose of this subsection is to obtain the information needed by the Department to determine whether the proposed system has the capacity to provide an adequate, reliable water supply to its consumers. If a system cannot demonstrate this, the Department is precluded by law from issuing a permit. Whether the system will have the capacity to reliably meet the consumer demand for water is a primary criteria for granting a permit. For that reason, a great deal of related information is required to enable the Department to make a determination regarding a permit. The information includes details related to the area/consumers to be served, all the possible existing and past sources of water, water system facilities, estimated consumer demand, and how the water system plans to meet its responsibilities to provide a reliable potable drinking as required under the law.

Implicit in this list are certain criteria that must be met to obtain a permit, e.g., the need to demonstrate how it will reliably meet four hours of peak hourly demand (PHD) at all times and a listing of vehicles for doing so (paragraph 6). In the event of a source interruption (power outage, pump failure, broken transmission main etc.), the system must have some reserve delivery capability in order to continue to meet minimum water demands until the source can be restored to service. For most systems, this emergency backup reliability can best be met by use of a distribution storage reservoir. A distribution storage reservoir is also helpful in meeting

unexpectedly high peak hourly demands. However, auxiliary power and/or emergency source connections can also effectively meet such needs.

The following explains why the Department is proposing four hours of PHD as the criteria for determining adequate capacity. Most source interruptions, such as those described above, are of short duration. Although greater capacity would be desirable, based on its years of engineering experience, the Department's workgroup determined that, as a minimum, a capacity of 4 times the peak hourly demand using excess source capacity, distribution reservoirs, auxiliary power, and/or emergency source connections should be sufficient. The reason that the PHD requirement is necessary, in addition to the maximum day demand (MDD) requirement, is that MDD addresses only the total volume of demand for the maximum day. During that maximum day, there are peaks in demand that can only be met by the "surplus" capacity provided by the 4 hrs PHD. The diurnal curve developed by engineers based on water system demand data (Water Supply and Pollution Control by W. Viessman, Jr. and M. Hammer, 4th Edition) typically shows a 2-hour peak in the morning and another in the afternoon; based on that, the Department proposes to require that the system have the capacity to meet the total of 4 hours of PHD. Flexibility is provided for systems to use different approaches to meet this requirement since some will have excess source capacity, while others will not.

**(b)** The analysis and system design for new water systems can be technically complex, particularly for community water systems. Systems that are inadequately designed invariably create problems for subsequent owners and for consumers of the system who have to pay for repairs or replacement. It is essential for consumer protection and safety that the analyses are prepared by a competent person with experience in water system engineering. Requiring that person to be a registered civil engineer with water system experience as set forth in subsection (b) provides that assurance to some dergree.

**64554. New and Existing Source Capacity.**

The purpose of this section is to require that all systems have the source capacity to assure that an adequate quantity of water under sufficient pressure is available to serve consumers at all times, pursuant to HSC Section 116555(c). The existing practical criterion for determining if a water system has sufficient water has been whether or not the system experiences water outages. When an outage occurs, the health of the water consumers can be seriously jeopardized due to lack of water for fire and sanitary needs as well as a substantially increased risk of backflow contamination. Both the water systems and the Department need to have a means of comparing current and future water needs to the available supply in order to prevent outages from occurring. Section 10910(d) of the Water Code (effective January 1, 1997) requires a public water system to provide an assessment of its capability to supply adequate water to meet projected demands to cities and counties. This proposed subsection is consistent with the statute in that it establishes the minimum projected demand.

**(a)** If a system can meet the demand on a day of maximum demand with source capacity only, then it should be able to do so for the next day and the next. However, during the day of maximum demand, there will be periods of "peak demand" (PHD), based on diurnal curves of water usage data; these periods will vary for different systems; the system must have the

resources to meet the demand during these periods; this requires that the system have additional source capacity, storage or connections to other sources. Hence, this section also requires the capacity (through sources, storage and/or alternative connections) to meet a total of 4 hours of PHD.

As mentioned in the previous section, the Department determined that, as a minimum, a capacity of 4 times the peak hourly demand should be sufficient. The reason that the PHD requirement is necessary in addition to the MDD requirement is that MDD addresses only the total volume of demand for the maximum day. During that maximum day, there are peaks in demand that can only be met by "surplus" capacity provided by the 4 hrs PHD. MDD and PHD are important criteria for defining the water demand needs of a system. Requirements for both must be met in individual pressure zones, as well as the system as a whole, because different pressure zones may have different demands.

**(b) and (b)(1)** These provide detailed instructions for calculating the required capacity in terms of maximum daily demand (MDD) and peak hourly demand (PHD) and determining the capacity of a well. Depending on the data available, size of the system, and type of water, different procedures are appropriate. Ten years of data, if available, is required as a basis for the calculations to ensure that the data covers a range of water supply years (high precipitation, drought, etc.). The calculations are basically straightforward and reflect industry practice. The minimum peaking factor of 1.5 specified in several places is based on Department experience and was supported by the Stakeholder group as a minimum; water systems can use a larger factor if they choose, but in most cases, the minimum factor of 1.5 should provide an adequate estimate of demand to enable the system to determine needed capacity. From diurnal curves of typical water demand, it appears that the PHD is 50% greater than 1 hr in the MDD. The minimum of 1.5 is best for small systems, because they are sensitive to individual use patterns. Larger systems are more likely to have peaks beyond 50% of the MDD, but because people are on different schedules, the peaks tend to average out.

**(b)(2)** When there is no daily water usage data available resulting in the use of monthly data and the derivation of an average daily water usage, again the 1.5 factor is applied to increase the "average" to obtain an estimate of the maximum day's use. The 1.5 factor is then used to obtain the PHD for the reasons given above.

**(b)(3)** When there is no monthly data available, the factor of 2.25 (1.5 times 1.5) is used to increase by 50% the average day in the year to get the average highest day in the year and then increase it by 50% to get the highest day. To that number is again multiplied by the 1.5 factor to get the PHD for the reasons given above.

**(b)(4)** This provides for sources with no data history. Maximum day demand and peak hourly demand are used because they represent the worst cases in terms of water demand. Systems must have the ability to meet both to avoid water outages or loss of pressure during high demand periods.

**(c)** This subsection establishes that community water systems with groundwater sources must have a minimum of two approved sources of water supply and that each must be capable of supplying the system. This is necessary to ensure that the water system is able to supply water to its resident consumers who are dependent on the water system even if a source fails for one reason or another (e.g., drought, aquifer depletion, contamination).

**64556. Permit Amendments.**
**(a)** Section 116550 (HSC) clearly indicates that amendments to the domestic water supply permit should not be required except where the Department determines such an amendment is appropriate. Paragraphs (1) through (15) list a number of changes in water system facilities, operations, or supply that necessitate Department oversight via the permit amendment process to ensure that any planned change does not threaten the provision of a reliable supply of potable water to customers served by the water system. Paragraph (1) indicates that no permit amendment is needed for smaller tanks; the Department has found that smaller reservoirs are typically purchased tanks that do not need Department approval. Paragraph (2) reflects the Department's recognition that the Waterworks Standards, of necessity, are very specific and there may be situations that, due to local circumstances, may be impractical or unachievable. Hence, proposed subsection 64551(c) provides for alternatives, while paragraph 64556(a)(2) specifies that a water supplier must request a permit amendment to propose an equivalent alternative to any of the specific regulations. The associated requirement is that the applicant must demonstrate that the alternative being proposed does not increase the risk to public health over that of the specific standard stated in the proposed regulations. The need for this provision is based on extensive Department experience; the Stakeholder Group's comments and concerns were also taken into account and all agreed that a demonstration is necessary to ensure equivalent public health protection.

Paragraphs (3), (4), and (6) through (14) cover system changes for which the Department has determined that its oversight is necessary to ensure that the system's capacity to serve potable water is not compromised. Paragraph (7), "change in regulatory jurisdiction", would be applicable if a water system, for which the Department of Health Services has had regulatory oversight, were transferred to the jurisdiction of the local primacy agency, e.g., County Health Department.

Paragraph (5) addresses expansions of the distribution system. In the opinion of the Department, a major expansion of the service area, with the potential impact on the adequacy of the water supply, is the type of change in the distribution system that should require a review and amendment to the permit. Requiring a water system to obtain a permit amendment forces the system to evaluate the impact of the expansion on the existing water supply and distribution system and provides the Department the information it needs to determine whether the water system has sufficient capacity for the proposed extension. The Department proposes to use a criteria of 20% for identifying a "significant" expansion. A specific criteria is needed, because otherwise, the addition of a single service connection could be labeled as an expansion. Although 20% is a somewhat subjective number, in the judgment of the Drinking Water Program's field staff, it is a reasonable one based on their experience with system expansions

and the point at which a water system would need to be evaluated to ensure that it is not proposing to expand beyond its current capacity.

Subsection (b) is included in this list to cover any situation that the Department cannot anticipate at this point that would need the review and oversight associated with the permit amendment process and necessitate inclusion in the water system's official permit. The factors listed in paragraph (15) are those that the Department would review to determine whether the situation merited handling as a permit amendment.

**(c)** Section 116550 of the Health and Safety Code (HSC) allows modifications or additions to a distribution system to be made without an amendment to the permit provided the water system complies with the Waterworks Standards and also states that this is allowable "unless otherwise directed by the Department". This statutory provision is restated here because it is extremely important to the understanding of the full context and application of these proposed regulations and is thus helpful to the reader. The proposed Waterworks Standards are sufficient, in the opinion of the Department, to fully protect the health of consumers of the drinking water, except in those situations listed in subsection (a), some of which are not directly associated with the distribution system and, therefore, are not covered by the Waterworks Standards. Pursuant to HSC section 116550, most distribution system changes are covered by the proposed Regulations and, as long as the Regulations are adhered to, no further evaluation or review by the Department is needed.

**64558. Source Capacity Planning Study.**

A key public health feature of any water system is to assure that an adequate quantity of water under sufficient pressure is available to serve consumers at all times. Existing section 64568 provides that no service connection be added that would cause the quantity or pressure related regulations to be violated. The Department has determined that making this type of analysis every time a single new service connection is added is unreasonable and unnecessary. Instead, the Department proposes to limit this analysis to significant additions and any case the Department has identified as a potential or existing supply problem, i.e., a system has almost, or indeed, failed to meet its water supply demand. The purpose of this section, therefore, is two-fold: To assure that a major expansion of the existing service area (such as an annexation) of a water system will not result in overtaxing the available water supply or cause excessive loss of pressure and; to provide the analysis needed for a system with potential or existing supply problems on which to base appropriate remediation steps to ensure adequate supply.

Many water systems, particularly the larger ones, already have and maintain a water supply master plan to meet growth demands. Unfortunately, many of the small systems, where many of the supply problems tend to occur, do not. Correcting a water supply shortage problem generally takes time in order to determine new sources, establish the financing, obtain water rights, and undertake the necessary construction. Beginning these actions after water outages occur can leave the consumers in a serious risk situation for several years. Systems need advance warning in order to plan and undertake the necessary corrections to assure an adequate supply of drinking water and ward off outages before they occur. Therefore, in accordance with section 11346.3(c) of the Government Code, the Department has determined that it is necessary, for the health and

safety of the people of the state, to apply the requirement of a planning study to a business that owns or operates a public water system whenever such business proposes significant expansions of the public water system's service area or whenever the public water system has potential or existing water supply problems.

**(a)(1)** The information required by this paragraph is the minimum necessary for the Department to evaluate water demand and source capacity. While a growth projection period greater than 10 years would be desirable, the Department has learned from observation that it is difficult to make accurate projections beyond that timeframe; therefore, a 10-year projection is the most realistic for purposes of this section. In addition to population, it is important to also project the type of growth anticipated in terms of the types of service connections. For example, if large industrial or agricultural users are included in the projection, these types of users can create large water demands compared to residential users and could thus affect the overall water demand projection.

**(a)(2)** There are a number of acceptable ways to calculate and project water demand (e.g. using past records, comparing to a similar nearby system, using standard industry units). The purpose of this paragraph is to provide water systems the flexibility to use any reasonable method that best meets the circumstances of the individual system. The proposed regulations require the basic approach detailed in section 64554. Submission of the methods, assumptions, and calculations enables the Department to review the reasonableness of the demand projection.

**(a)(3)** The purpose of this paragraph is to establish the means for evaluating the capacity of the sources of water and the capability of the system to deliver that water. Since the ability to withdraw water may, in some cases, be restricted by legal water rights, it is essential that these rights be confirmed. Recent court decisions have held that the Department has the responsibility to verify water rights claimed by a water system. With respect to groundwater sources, information relating to the potential capacity of the aquifer is necessary to determine if the aquifer has the capacity to sustain continued or increased withdrawal. This can be established by such means as a hydrological evaluation of the physical characteristics of the aquifer, changes in groundwater levels over time, and comparison of drawdown pumping patterns. Even if the aquifer contains sufficient capacity, this capacity is not available to the water system if the yield of the well or the capacity of the pump is inadequate. This information is also essential, therefore, to complete the evaluation. In some cases, inadequate yield or pumping capacity can be partially offset by additional storage capacity which can be used to meet peak demand periods. Including this information in the report allows water systems to take this possibility into account in evaluating their supply capability.

**(b)** As indicated, the intent of this section is to provide the water system and the Department with information to evaluate the continued capability of the system to serve an adequate supply of drinking water. If the Department determines during its annual system inspection that the information in the initial (or previous) report is not current, an update would be necessary to ensure the supply is still adequate. Since water sources do not undergo frequent changes, in most cases, the update would involve only a further growth and demand projection.

**(c)** Water systems that serve more than 3,000 service connections are already required to develop and submit an Urban Water Management Plan (Water Code Part 2.6 beginning with section 10610) to the State Department of Water Resources. Some water systems have indicated to the Department that these reports contain information similar to that required pursuant to this section. Therefore, in order to minimize the burden on these systems, submission of that report for the purposes of meeting all or a portion of this section's requirements is allowed.

## Article 3. Water Sources

### 64560. New Well Siting, Construction, and Permit Application

**(a)** This subsection lists a number of steps to be taken prior to initiating well construction in order to ensure that the water system has thoroughly considered source protection in its selection of a site for the new well before it proceeds with construction; failure to conduct an adequate site review prior to construction has resulted in the development of new wells that are already contaminated or unnecessarily subject to potential contamination. The Department intends to avoid such situations in the future by requiring that a utility proposing a new well develop a comprehensive technical report to submit as part of its permit amendment application.

**(a)(1)** A Source Water Assessment includes a comprehensive site review the same as that required by the U.S. EPA on a national basis for all drinking water sources under the 1996 reauthorization of the Safe Drinking Water Act (SDWA, Title XIV, Section 132).

**(a)(2)** Based on the Department's experience, a 50-foot radius should provide a sufficient protection zone to provide some insurance against the well's contamination.

**(a)(3)** Design plans and specifications are necessary for assessing design and construction deficiencies that may lead to health hazards.

**(a)(4)** California Environmental Quality Act (CEQA) documentation is a statutory requirement (Public Resources Code, Division 13, section 21000 et seq.).

**(b)** This section would establish the basic requirements to obtain a permit or permit amendment for the new well. The documentation required by the Department is necessary to determine whether the well should be permitted as a drinking water supply. The Department of Water Resources well completion report has the full description of the construction features of the well (e.g., seal, screening levels, casing materials, and soil type). Pump tests establish the flow (volume of water that the well can contribute to the water system's supply) and the water quality data is used to ensure the well is in compliance with all applicable drinking water quality regulations (necessary to protect the public). The As-Built plans confirm how the well was constructed, in case there were any changes to the well or discharge piping since the design phase.

**(c)(1)** It is important for any well that is going to be used to supply drinking water to the public to be properly designed and constructed to avoid contamination by surface water and other

means. The Department of Water Resources (DWR) has developed statewide construction standards for all new wells in California that provide adequate safety for public water supply wells. Rather than restate these construction standards, the Department has referenced them (Bulletin 74-81 and the newer amendments in Bulletin 74-90). The DWR standards are already implemented and enforced through local ordinances, therefore, this requirement poses no additional burden on water utilities. Including these standards in the proposed regulations, however, provides the Department with an adequate reference standard that can then be enforced by the Department through its normal regulatory oversight of public water systems. It also avoids the need to duplicate those standards in these regulations.

**(c)(2)** The American Water Works Association (AWWA) provides standards that are used throughout the industry to construct facilities. Although the well construction standards were not referenced in the existing regulations, when the Department began listing design specifications for well construction, it noted that many are included in the AWWA standard referenced here and, for the sake of brevity, is requiring construction pursuant to the standard instead of including its many specifications.

**(c)(3)** The requirements in this paragraph are not specifically identified in the standards referenced in paragraphs (1) and (2); hence, they are listed here since the Department has found from experience that they contribute significantly to proper construction.

**(c)(3)(A)** This is needed to ensure proper, consistent, and reliable operation.

**(c)(3)(B) and (C)** A major contamination problem for wells is flooding by surface water. Loss of the well water supply during major floods has occurred on several occasions. Restoring these wells to useable conditions usually takes at least several days during which time the water utility and the consumers may be out of water. Anytime a water system is out of water, a variety of health hazards may be created. It is important, therefore, to try to minimize the loss of important well sources of supply. For minor inundations, the requirement to locate the surface vents above the finished grade is sufficient to protect the well from surface water entry. However, wells that are located in designated flood zones are frequently inundated, but adherence to the specifications in the reference criteria in paragraphs (b)(1) and (2), along with these requirements, should result in adequate protection.

**(c)(3)(D)** The Department has found that placing the wellhead and/or controls in a vault can result in flooding and accessibility problems and, hence, is establishing that vaults cannot be used.

**(c)(3)(E)1.** Most public water supply wells in California utilize chlorine to routinely disinfect the drinking water prior to delivery to consumers, although this is not a mandatory requirement for all wells. Properly constructed wells with no indicated presence of coliform bacteria are allowed to deliver water without disinfection. However, on many occasions it may be necessary to disinfect such a well for short periods of time to correct temporary contamination problems. This cannot be done readily if the well is not equipped with electrical and plumbing hookup

facilities. The Department has determined that these features are important to assure the ability to apply disinfection should it become necessary.

In view of the effectiveness of this safety precaution, the Department proposes to make this a standard requirement for all new public water supply wells. While not yet adopted, the Federal Environmental Protection Agency has proposed federal drinking water regulations requiring mandatory disinfection of all public water supply wells unless a waiver has been granted. One of the proposed provisions for obtaining such a waiver is that equipment be installed to allow the rapid hookup of chlorination facilities. The Department's proposed language would satisfy the proposed federal requirement should it be adopted.

**(c)(3)(E)2.** Sampling of the water derived from a drinking water well is frequently necessary. This is routinely required if the water is not disinfected. Sampling of the well water is also required following repairs to the well or any time possible contamination of the well water is indicated. Sampling of the well water is difficult if a sampling tap is not provided. Because of the convenience of having a sampling tap on the well discharge line, most water utilities routinely provide such a tap on new wells. The purpose of this section is to require a tap installation on all new wells to allow for the sampling of the well water as needed. This is essential to be able to assure that the water delivered to consumers is free of excessive contaminants.

Requiring the sampling tap to be located between the check valve and the chlorine injection port assures that the samples taken are representative of the raw water derived from the well and not water that may have been subjected to chlorine.

**(c)(3)(F)** Every new or repaired water supply well is required to demonstrate that the water from the well meets bacteriological standards before the well can be placed into service [section 64421(b) CCR and DWR Bulletin 74-81]. Since this water may be contaminated, it cannot be placed into the distribution system and must be pumped to waste. This obviously poses a significant problem for the water utilities if the well is not equipped with provisions to allow the discharge from the well to go somewhere besides into the distribution system. The Department has encountered this problem with a number of existing wells. The requirement that all new wells include the provision to pump discharge water to waste is proposed to resolve this problem. The Department has determined that imposing this requirement on existing wells, while desirable, would impose an unreasonable burden on water utilities.

The requirement that a check valve be placed on the waste discharge line is necessary to insure that backflow (which may contain contaminated water) from the waste line does not reenter the well.

**64560.5. Well Destruction.**

When wells are abandoned, if they are not properly sealed off, they can serve as conduits for contaminants to reach the groundwater. Therefore, destruction should be conducted pursuant to the specified procedures in the Department of Water Resources bulletins referenced.

**64561. Source Flow Meters.**
Existing requirements [Section 116555 (c) HSC and sections 64562 through 64564 CCR] state that each public water system must have an adequate and reliable quantity of water available at all times. Section 64564 in particular requires analysis and records of the source capacity of each source of water used. In order to ascertain the capacity and evaluate the adequacy of individual water sources it is necessary to measure the amount of water being extracted from each source. Most, but not all, water utilities already do this by means of a flow meter.

**(a)** This subsection would allow the meter to be placed at any point between the source and the entry to the distribution system so that the water utility can take advantage of any other metering (such as at a treatment plant) that is already in place or serve multiple purposes with the meter. Some water systems have inactive sources (disconnected from the water system); these do not need flow meters, since they cannot be used without a permit amendment.

**(b)** The Department has determined that in order to evaluate compliance with source capacity and reliability requirements, a flow meter needs to be installed on each source; this is particularly pertinent to systems that have multiple sources. Recording the total production of each source on a monthly basis (rather than daily or weekly) provides sufficient information to make the evaluations mentioned above and does not impose an unreasonable burden on the water utility.

## Article 4. Materials and Installation of Water Mains and Appurtenances

**64570. Materials and Installation**
**(a)** This subsection establishes the material and installation standards for newly installed water mains and is essentially the same as existing requirements (section 64622 Table 1 and section 64624 Table III), except that the AWWA references have been updated to reflect the most current AWWA standards.

**(b)** This subsection is intended to ensure that water mains are installed in a manner that prevents severe damage to the water main. Breakage of a water main can lead to water outages and/or contamination of the distribution system.

**64572. Water Main Separation.**
The purpose of existing section 64630 and this proposed section is to establish sufficient safety barriers to prevent the entry of contaminants into the water main as a result of the proximity of a line conveying water that is unsafe to drink.

**(a)** A water main may be subject to contamination if the surrounding soil becomes saturated with nonpotable water or a hazardous fluid, and the integrity of the water main is compromised by a leak or break in the main, or faulty joints. The hazard increases if the water main suffers a loss of pressure. The presence of a sewer line or other line conveying nonpotable water or hazardous fluid can significantly increase the probability of this type of hazard occurring should the sewer line break or leak.

The proposed separations contain the requirements in existing subsection 64630(c). However, existing subsection 64630(c) uses the term "sanitary sewer" which the Department feels is too broad and confusing. To provide more specificity, the Department proposes to replace this term with a more specific breakdown into the categories of untreated wastewater, and primary or secondary treated wastewater. The term "wastewater", however, does not include recycled water. For this reason, the Department has added the terms "disinfected secondary 23 recycled water (defined in section 60301.225 CCR)" since the quality of this recycled water is similar to secondary treated wastewater.

In addition, the Department is proposing to add paragraph (5) to include in the separation criteria pipes carrying hazardous fluids other than sewage. From experience in the field, staff have learned that this category of pipeline also poses a risk to water mains.

The specified distances are consistent with the existing regulations and with the 1992 California-Nevada Section American Water Works Association "Guidelines for Distribution of Nonpotable Water".

**(b)** Although disinfected tertiary recycled water and storm drainage pose a lesser health risk if contamination of the water main should occur, a risk does exist since the recycled water can contain unidentified chemicals of concern and the storm drainage is subject to all types of runoff with no subsequent treatment. Therefore, the Department believes it is necessary to specify a separation from new water mains and supply lines of four feet horizontally, and one foot vertically, consistent with the existing regulations for other separations and with the 1992 California-Nevada Section American Water Works Association "Guidelines for Distribution of Nonpotable Water".

**(c)** Although raw water being conveyed to provide a supply for drinking water would be considered low risk from a health perspective, the Department has found many raw waters to be biologically and/or chemically unsafe for drinking; therefore, while raw water contamination of water being distributed for drinking would pose a lesser risk than sewage contamination, a risk does exist. For this reason, the Department proposes to establish a separation as a safety precaution. The specified distances are consistent with those in subsection (b).

**(d)** The separation distances described in subsections (a) and (b), apply to parallel pipelines where breaks or leaks can occur at any point in the pipeline. However, it is often necessary for pipelines conveying wastewater and pipelines conveying potable water to cross (such as at intersections). Although the hazard from crossing pipelines is significantly less since there is only a single point at which contamination could occur rather than the entire pipeline, some degree of hazard still exists. Existing section 64630(c)(2) requires that water mains be installed at least one foot above sanitary sewers at crossing points. Proposed section 64572(d) retains this requirement but adds two additional requirements. First, a requirement has been added that the crossing of the two pipelines must be perpendicular. The purpose of this is to minimize the distance within which contamination could occur and prevent a crossing to be made at a narrow angle such that the hazard would be similar to that of a parallel pipeline. A second requirement has also been added that specifies that no construction joints shall be made in the water line

within 8 feet of the wastewater line. The primary entry point for contaminants to enter the water line is through joints used to connect pipeline lengths. By eliminating such joints in the vicinity of the wastewater line, this risk is substantially reduced. The 8-foot distance is as close to the required 10 feet for parallel pipeline construction as possible, because water mains generally come in 18-foot lengths, so that requiring 10 feet would entail significant additional costs.

**(e)** The purpose of this subsection is to establish that compliance with the vertical separation requirements is only necessary when the pipeline and water main are within ten feet of each other; otherwise, distance provides sufficient protection. The ten feet is consistent with other requirements.

**(f)** Existing section 64630(c)(3) requires a minimum of 10 foot and "preferably" a 25-foot separation between water mains and cesspools, septic tanks, seepage pits and sewage leach fields. This was deleted because it contained both a mandate (10 feet) and a recommendation (25 feet). Based on its experience in the field during inspections and from reviewing data from site monitoring wells, the Department has determined that the 25-foot separation provides sufficient protection against contamination in all cases. Since groundwater recharge sites also raise potential contamination issues, the Department has included these in the list requiring a 25-foot separation. However, the Department recognizes that in a few instances where special precautions are taken, a lesser separation distance could be allowed. The flexibility language set forth in section 64551.100(b) allows a water supplier to demonstrate the use of special precautions and obtain Department approval for a lesser distance in unusual situations.

Similarly, existing section 644630 (g) simply states that installation of water mains "near" waste disposal ponds, sanitary landfills etc. must be subject to obtaining written approval from the Department. This language was deleted because the word "near" was not defined. The Department agrees that many options are open to water systems to design special precautions (such as the use of special pipe or welded joints) in pipelines that pass near these type of hazardous facilities and that use of these alternatives should be subject to review and approval. The existing language requires this review in all cases. However, the Department believes that this is not necessary if an adequate buffer distance is maintained. The proposed 100-foot separation has been used as an industry recommended standard (AWWA "Guidelines for Distribution of Nonpotable Water", 1992). The Department has determined that this distance represents a safe buffer distance from these types of facilities. Due to the greater size and volume of waste inherent in ponds and landfills, which can cause saturated conditions to expand horizontally to a greater distance, a greater separation is needed than the 25 feet used for septic tanks and cesspools. The Department's experience with monitoring wells in the area of such sites has borne this out. Since storm sewers and tertiary-treated wastewater present lesser hazards, it is not necessary that any specific separation in terms of distance be provided; however, some separation is necessary since they do pose a hazard of contamination and also of breaking/leaking and thereby posing a potential risk to the structural integrity of the water main.

**(g)** This requirement is the same as in existing subsection 64630(d) and provides for consistent measurement.

**(h)** The Department recognizes that it may be overly onerous for some repairs or replacements of existing water mains, where a new main is to be installed, to meet the separation distances. Historically, the Department has allowed such installations for relatively minor main installations over short distances, provided that precautionary actions, such as upgrading or sleeving of the piping material, have been taken. Therefore, this section allows for exemptions from the separation criteria under certain circumstances. 1320 feet was chosen for consistency with section 64577 (Isolation Valves) and the exemption would only apply to new mains replacing existing mains. As previously noted, due to the greater size and volume of waste inherent in ponds and landfills, which therefore pose an even greater potential for contamination, exemption from the separation distances subsection (f) would not be allowed by this subsection. Department approval is to ensure that the remedial action chosen in place of meeting the separation criteria will adequately protect the main from contamination.

**64573. Minimum Water Main Size.**

This section is essentially the same as existing subsection 64628(a). The purpose is to preclude the use of undersized mains that would be insufficient to meet fire flow demands and peak hourly demands while sustaining the required minimum pressures. However, since in certain unusual situations use of a four-inch main may be impractical, alternatives can be considered under subsection 64551.100(b). A proposal to use smaller mains would require submittal to the Department of a special hydraulic analysis to demonstrate the ability to meet specific quantity demands.

**64575. Flushing.**

**(a)** Dead end water mains are a particular source of water contamination due to bacterial and other growths that can occur in stagnant or semi-stagnant water. Water located at the end of a dead end main is not subject to continual circulation and may remain in a stagnant condition for long periods of time. In order to prevent the growth of undesirable bacteria and other organisms, the water main should be flushed periodically to remove the stagnant water. Many water utilities conduct routine flushing programs to protect the quality of the water in their distribution systems. However, this cannot be done if the water main does not have a flushing valve or blow-off at the end of the pipe to allow the main to be flushed.

Existing section 64642(a) requires a flushing valve or blow-off to be installed at the end of each dead end water main "where stagnant conditions are likely to develop". This language is extremely ambiguous because it leaves it up to the judgment of an individual as to when a valve is necessary. Furthermore, stagnant conditions are "likely" to develop in any dead end main, so all existing dead end mains should already have a flushing valve. However, this is not the case, but the Department chose not to require a flushing valve on all existing dead end mains (even though one could argue that this is already a requirement) because the cost of installation is considerably higher and would impose an unreasonable burden on water utilities. Installation of the valve on existing dead end mains (of which there are a limited number in California that do not already have a flushing valve), therefore, will occur when the main is replaced. If installed at the time the water main is installed, the cost of providing a flushing valve is minimal in light of the water quality benefits attained. Hence, the requirement has been reframed to clarify that a flushing valve is required on only new dead end mains.

**(b)** This proposed subsection is the same as existing section 64642(c). These sections assure that sewage from the sewer cannot enter the water main as the result of a backflow condition. An air gap is the most protective backflow prevention device available; others such as a reduced pressure valve would not provide sufficient assurance against backflow given the extremely hazardous nature of sewage.

**(c)** and **(d)** The required velocity of 2.5 ft/s is the minimum velocity necessary to "scour" the main, as specified in the AWWA Standard C651-05. The purpose of flushing is to remove sediments that accumulate in the main under stagnant conditions. In order to remove these sediments, it is necessary to have adequate water flow in the pipe. This proposed subsection would require that new valves and blow offs be designed to maintain the flows specified in Table 64575-A and produce the velocity of 2.5 feet per second. Table 64575-A is the same as that in existing subsection 64662(c) except that it has been expanded to address 12, 14 and 16-inch pipe diameters since they are so commonly used in distribution systems for larger utilities.

**64576. Air Release, Air Vacuum, and Combination Valves.**
The proposed requirements would be applicable only to new installations of valves or new valves being used to replace existing valves that are subject to flooding. Existing valves with no problems would not need to be replaced, since it would be costly and unreasonable to adopt such a requirement.

**(a)** The purpose of this proposed subsection is the same as that for existing section 64636(a)(1), i.e., to ensure that flood water, which may be highly contaminated, does not enter into the well through this type of valve. The difference in the proposed requirement is that the Department's experience indicates it is not necessary to specify a minimum extension; also, in some cases, the use of a modeled 100-year flood level may be more appropriate as a basis than a maximum recorded water level due to a lack of available data on water levels.

**(b)** Accessibility for inspection, maintenance, and repair is essential for any element of the distribution system in order to ensure that it is functioning properly. This was not addressed in the existing regulations.

**(c)** This proposed subsection has the same intent as existing section 64636(a)(2), i.e., prevent contamination of the distribution system via inflow of other waters and contact with living creatures that could contaminate the system. However, the details related to meeting the stated requirement are left to the design engineer, since they might differ in different situations.

**(d)** DWR Bulletins 74-81 and 74-90 specify that wells need to be equipped with inverted screened casing vents. A domed and screened cap is an acceptable alternative. Distribution systems need to be vented and the requirements here are intended to help prevent contamination of the distribution system.

**(e)** The AWWA standard and manual are referenced because they provide industry-accepted practices for valve installation and support consistent installation throughout the state. Including

these in the proposed regulations provides the Department with an adequate reference standard that can then be enforced by the Department through its normal regulatory oversight of public water systems. It also avoids the need to duplicate those standards in the regulations.

**64577. Isolation Valves.**

A water system must have the ability to isolate a section of water main in the event of a distribution system emergency, such as a main break. This can occur for a variety of reasons including earthquakes, accidental excavation, pipe failure, or floods. If the affected water main cannot be isolated, the main cannot be readily repaired, consumers could be without water, and the possibility of backflow increases substantially. Existing section 64632 requires that "sufficient" valves be provided on water mains to minimize sanitary hazards during repairs. This language is obviously too general and vague to be of any value. The Department proposes to add three subsections to provide clarity to the location of isolation valves. Since it would be costly and unreasonable to require existing valves to be dug up and relocated, the requirement applies only to new water main construction.

**(a)** It is standard industry practice to space isolation valves on water mains throughout the distribution system and in California a distance of ¼ mile is used. The Department agrees that this represents a reasonable spacing for isolation valves and has incorporated this requirement into subsection (a). The 12-inch main size is consistent with the existing section 64632.

**(b)** Where water mains intersect and are tied together, it is important to be able to isolate any one of the three or four arms of the intersected mains. Subsection (b) simply requires that where such an intersected tie occurs, an isolation valve shall be located on each of the crossing mains (those that tie into the primary main) to eliminate the possibility of as much as a ½ mile of mains without a valve. In order to provide the water utility with some flexibility, the Department has set forth a distance of 100 feet as an acceptable distance from the actual inter-tie. This should allow the utility the opportunity to find a suitable location (such as beyond the actual street) and would allow some flexibility relating to the ¼-mile requirement in subsection (a). The 12-inch main size is consistent with the existing section 64632.

**(c)** Fire hydrants represent a particularly vulnerable aspect of the distribution system due to their exposure and the resulting likelihood of being struck by vehicles. In these instances, it is important to be able to isolate the hydrant quickly without causing major disruption of the remainder of the distribution system. Therefore, installing an isolation valve at each hydrant is necessary and is a common practice in the water industry.

**64578. Water Main Valve Construction.**

As discussed under section 64577 above, the ability to shut off or isolate sections of the distribution system is critical to effective operation and protection of the distribution system. While inclusion of sufficient valves located at key locations is important, it is equally important that authorized personnel have ready access to those valves. It does little good to have a valve if that valve is buried five feet deep or if the valve cannot be reached with a standard valve closure key. Therefore, this section requires that a valve deeper than five feet either have a riser to

enable access with a standard key or that the valve records indicate the need for a long key to ensure that one is available to close the valve if need be.

### Article 5. Disinfection Requirements

**64580. Disinfection of New or Repaired Mains.**
Newly constructed water mains or mains that have been taken out of service for repair are subject to bacterial contamination. These mains must be disinfected prior to placing them in service. This has been standard industry practice and a Departmental requirement for many years. This proposed section is identical to existing section 64630(f) except that the reference has been changed to reflect a more recent AWWA standard and a requirement has been added that the samples be total coliform negative prior to use to avoid any problems.

**64582. Disinfection of Reservoirs.**
New or repaired reservoirs that have been taken out of service are subject to contamination similar to water mains. This is the same requirement as existing section 64600(g) except that the referenced AWWA standard has been updated to reflect a more recent standard.

**64583. Disinfection of Wells.**
Similar to construction of mains and reservoirs, newly constructed or repaired wells can become contaminated with bacterial organisms during construction. If the well is put into or returned to service without disinfection, these organisms could be distributed throughout the distribution system creating a risk to consumers. For this reason, for a number of years the Department has required all new wells to be disinfected prior to use. It has also been standard industry practice to disinfect new or repaired wells prior to use. The AWWA, which represents the water works industry, has had a standardized method for disinfecting new or repaired wells since at least 1987. This standard (C654-03) has been recognized throughout the country as the standard method for disinfecting wells. While the Department has routinely recommended disinfection using this standard, it now proposes to incorporate the AWWA standard into the regulations. Before proceeding with disinfection, the well is to be sampled first for bacteriological quality to determine whether it is actually necessary to disinfect. One reason for first evaluating the well is that some consumers have strong negative feelings about adding disinfectant chemicals to wells, unless it has been specifically determined that it is necessary to protect public health.

The language for inclusion of wells that have been out of service for more than three months is a new requirement. It has been the Department's experience over the years that wells that have not been pumped for a period of time tend to reflect higher incidences of contamination by coliform bacteria. This is likely to occur as a result of stagnant water conditions in the well which allows the growth of bacteria to occur. To assure that water that may be contaminated by bacteria is not pumped into the distribution system, the Department is proposing to first sample these wells prior to use and, if necessary, require disinfection, similar to repaired wells. Many water systems already do this as a matter of practice in order to avoid violations of the coliform regulations in the distribution system. While it is difficult to establish a specific time interval that would lead to bacterial growth, the Department believes that a three-month period could create such conditions. Requiring sampling and possibly disinfection for wells that have been

out of service for less than three months would obviously provide a much higher safety factor, but would create undue hardships for many systems and does not appear to be warranted.

### Article 6. Distribution Reservoirs

**64585. Design and Construction of Distribution Reservoirs.**
Distribution reservoirs are an important element of a water distribution system. Because the water may be held in these reservoirs for some period of time and the reservoirs frequently contain atmospheric openings that could allow the entry of contaminants, the design and construction of these facilities is important to assure that the water quality is not degraded as a result of storage in the reservoir. The requirements in subsection (a) would apply to all reservoirs, new and existing, since existing reservoirs could be retrofitted at minimal cost, if necessary to comply; those in subsection (b) would apply only to new reservoirs, since it would be costly, onerous, and unreasonable to require compliance by existing reservoirs.

**(a)(1)** The interiors of most storage tanks are coated with a variety of materials to protect the interiors and the water. Some of these coatings contain materials that if leached into the water could cause the water to exceed drinking water regulations for chemical quality. The specific type of coatings that can be used is covered under proposed section 64591(a). However, even if an approved coating material is used, leaching can still occur if the coating is not properly applied (e.g. temperatures, curing time). Paragraph (1) would assure that the manufacturer's application instructions are followed. The testing and subsequent certification of a particular material is carried out in accordance with manufacturer's instructions and the certification approval is thus predicated on the presumption that the manufacturer's instructions for application will be followed.

**(a)(2)** This is essentially the same as existing section 64600(b).

**(a)(3)** Sampling of the water for coliform bacteria from a reservoir is necessary following any construction or repair (proposed section 64582). Similarly, sampling for chemicals is often necessary following recoating or certain repairs. Sampling from distribution reservoirs may also be necessary to locate the source of bacterial problems in the distribution system. To facilitate the sampling of a specific reservoir, a sampling tap must be provided. While this is generally on the outlet pipe, the Department prefers to leave it up to the water system to select the location that is most representative of the water in the tank.

**(b)** The Department proposes to require the submittal of design drawings and specifications for review prior to construction to ensure that proposed reservoirs meet the regulatory requirements.

**(1)** There is no standardized design for reservoirs due to the variability in location, elevation, type of use, materials, etc. It is necessary, therefore, to provide a great deal of latitude to the design engineer in order to meet the needs of the system.

For this reason, the Department has determined that the waterworks regulations should only set forth the minimum safety requirements that are inherent to all distribution reservoirs and allow

water systems to select the best alternative that meets the minimum requirements. The referenced AWWA standards would also provide a measure of safety for the water supply by ensuring that the reservoir is properly constructed. Including these standards in the proposed regulations, provides the Department with an adequate reference standard that can then be enforced by the Department through its normal regulatory oversight of public water systems. It also avoids the need to duplicate those standards in these regulations.

**(b)(2)** This is necessary to ensure that systems, particularly small systems, do not submit design proposals to use materials such as wood in their reservoirs.

**(b)(3)** The Department has determined that floating covers can be utilized if the requirements in the AWWA guidelines are met. Including these standards in the proposed regulations provides the Department with an adequate reference standard that can then be enforced by the Department through its normal regulatory oversight of public water systems. It also avoids the need to duplicate those standards in these regulations.

**(b)(4)** The purpose of this requirement is to ensure that water stored in the reservoir does not become stagnant due to a lack of circulation of the water inside of the tank. Having only one common inlet/outlet tends to create conditions in which the water is not forced to circulate throughout the tank before withdrawal. The Department prefers to allow the design engineers to select the exact locations of the separated inlets and outlets that would best meet the goal of minimizing short-circuiting of the water since this would vary with each individual reservoir.

**(b)(5)** This paragraph contains essentially the same requirement as existing subsections 64600(b) and (c) except that it has been rewritten for clarity.

**(b)(6)** In order to insure proper reservoir operation, the water level needs to be automatically monitored and controlled; smaller systems sometimes overlook this, so it is necessary to establish a specific requirement.

**(b)(7)** The presence of such a reservoir opening (which is usually located on the roof) provides an opportunity for unauthorized access, vandalism, or sabotage. There are also other ways that the reservoir might be inappropriately accessed. Therefore, this paragraph requires that the reservoir be equipped to prevent unauthorized access, but allows flexibility as to how that should be accomplished. Early drafts were very detailed and proscriptive; however, Stakeholder comments indicated that water utilities are involved in developing complex and, in some cases, highly individualized, approaches to security and should not be hampered in doing so by constraining regulations.

**(b)(8)** All reservoirs are subject to varying degrees of sediment buildup, interior deterioration of coatings, and possible growth of organisms. Therefore, it is necessary to periodically inspect and clean or repair reservoirs and to remove floating material as necessary to avoid water quality degradation. This paragraph would enable this maintenance to be done. A tank that has no access opening, as required by this subsection, obviously cannot be inspected or maintained.

**(b)(9)** This requirement is similar to existing section 64600(e), except that a maximum distance from the reservoir for the isolation valve has been added and a requirement specific to reservoirs used for CT credit under the Surface Water Treatment Rule, Chapter 17, Title 22; the latter was added to ensure that the use of such a reservoir to meet CT requirements would not be inadvertently compromised. This is necessary to provide clarity that the isolation valve cannot be located out in the distribution system. 100 feet was selected to give the water systems some flexibility in locating the valve while maintaining a reasonable proximity to the reservoir.

**(b)(10)** The purpose of this requirement is to ensure that surface water (e.g. rainfall) or drainage water does not enter the reservoir. This type of water can be contaminated and would affect the quality of the stored water if it were allowed to enter the reservoir. The requirement in paragraph (b)(2) for appropriate roofing combined with appropriate grading around the site would generally prevent this from occurring.

**(b)(11)** The purpose of this requirement is to ensure that the interior walls are not subject to corrosion which could affect the quality of the stored water and/or allow the entry of contamination from outside the reservoir if the corrosion resulted in small holes.

**(b)(12)** Subsurface reservoirs are a subset of reservoirs and have additional requirements to ensure against contamination of the stored water that could occur as the result of their construction. In the Department's experience, the use of subsurface reservoir roofs poses a high risk for a number of reasons. There have been instances of biological contamination and structural damage. These reservoirs are subject to flooding and the entry of groundwater and runoff if not properly constructed, so several of the requirements [subparagraphs (A), (B), and (D)] are necessary to ensure that these problems and associated contamination do not occur. Subparagraph (E) requires monitoring wells to track the groundwater levels; these are necessary since such levels can vary considerably over time for various reasons and pose a risk of reservoir contamination. Subparagraph (C) is intended to provide adequate separation from potential sources of contamination to the reservoir; the separation distances are consistent with those specified for siting wells in the California Department of Water Resources Bulletin 74-90. Subparagraph (F) is again intended to prevent contamination and/or damage to the reservoir.

### Article ~~1~~7. Additives

This article would be renumbered "7" and removed from Chapter 18 to be included with the Waterworks Standards Chapter 16 for cohesiveness. The Waterworks Standards are intended to ensure that the public is served potable water. A public water system's selection and use of additives, both direct and indirect, is integral to issues frequently arising during design, construction and repair of distribution systems. Therefore, the subject of additives is most appropriately placed in the Waterworks Standards.

**64700. Direct Additives.**
This existing section would be renumbered as 64590 to fit into Chapter 16, Waterworks Standards. The term "as part of the treatment process" would be deleted because the Department believes all additives to drinking water should meet the standard, regardless of whether it's being

added as part of a treatment process or not. It would also be amended to update the reference to the certification specifications and allow for material to be used that meets future versions of ANSI/NSF Standard 60. Additionally, although most ANSI accredited certification organizations include the annual criteria specified in the proposed section as part of their certification system, ANSI's accreditation guidance for such organizations is not yet of a level of detail that includes such criteria. Existing subsection (b) would be repealed since it is obsolete.

**64591. Indirect Additives.**
**(a)** Materials that come into contact with drinking water can be the source of contaminants (primarily chemicals) leaching into the water depending on the type of material. The purpose of proposed section 64591(a) is to prevent the use of materials that are likely to leach contaminant chemicals into the drinking water in places where such materials come into contact with the water.

Since the existing sections were adopted, a new testing and certification program for evaluating drinking water materials has come into being and is now widely recognized and used. The standard reflected in proposed section 64591 is the NSF/ANSI Standard 61. These testing standards were developed under the auspices of a joint consortium made up of industry representatives from the American Water Works Association (AWWA), state regulatory agencies, and the federal Environmental Protection Agency. These standards, and the certification programs that implement the standards, were designed specifically to protect drinking water from contaminants caused by leaching of chemicals from materials in contact with the water. This approach is essentially the same as the regulations for "direct" drinking water additives (substances that are added directly to the water). The Department has determined that this approach provides the best and most practical way of assuring that materials with known potential for degrading the quality of water are not used in the construction or repair of drinking water systems.

**(b)** This subsection would address the generation of treatment chemicals on site, both the equipment and the chemicals used, requiring certifications as appropriate, Standard 61-2005 and 60-2005 respectively. The reasons for using these standards has already been provided above.

**(c)** This subsection would be adopted to address the specifications for chemicals used to clean water treatment facilities, because these chemicals have the potential to end up in the drinking water; to protect the public, these chemicals must have been tested and certified as specified in the regulations.

**(d)** This provision is intended to allow water systems to utilize items for which contracts are in place when the proposed regulation is adopted to avoid any undue economic burden; however, the timeframe of the exemption is limited to six months to ensure that compliance with the new requirements is not unnecessarily delayed.

**64710. Exception.**
This existing section would be renumbered 64593 to fit into Chapter 16 and retitled for clarity (Use of Uncertified Chemicals, Materials or Products). The section would also be split into two

subsections for clarity and references updated to reflect the proposed changes in the section numbers.

### Article 8. Distribution System Operation

**64600. Water System Operations and Maintenance Plan.**

There are numerous activities that are important to the operation and maintenance of a distribution system. Failure to routinely perform these types of activities can often lead to degradation of the quality of the water in the distribution system and result in an increased risk to consumers of the water. For example, failure to periodically flush dead end mains can lead to stagnation and microbial growth in these mains. While these functions are important, it is difficult and impractical to specify in regulations the frequency and manner in which these functions should be performed as they tend to vary with the nature of each system and other factors.

Department staff has observed that if a system is operating with no identified deficiencies, it most likely has a plan or has otherwise managed to organize itself to address necessary operation and maintenance activities.

Most of the larger and more sophisticated systems already include an operation plan in their normal operations. Some of the smaller systems, however, may not have addressed all of the listed factors or may not have any organized plan for covering those activities. An operations plan ensures that a system's operators (many of whom may be inexperienced) are aware of the activities that need to be conducted to protect the quality of the water delivered via the distribution system. Many small systems only have one operator. While this operator may or may not be familiar with the operational functions of the distribution system, a new operator coming on board frequently has no clue as to the procedures necessary to operate and maintain the distribution system effectively. The existence of an operation plan provides the necessary guidance for persons unfamiliar with the system.

**(a)** This subsection sets forth those operations activities that the Department has determined are essential to the effective operation and maintenance of a distribution system. As noted above, many systems may have already addressed most if not all of these. However, if the Department determines that a system is not operating properly in some way that poses a risk to public health, it will inform the water system and designate those plan elements that must be submitted to the Department to ensure proper attendance to good operational practices. The importance of each of the elements is explained below:

**(a)(1) and (a)(2)** These two paragraphs require basic schedules to insure that the water treatment processes are operated and maintained regularly so that they operate optimally and reliably.

**(a)(3)** The reason for flushing dead end mains has been described under proposed section 64575. This element requires a description of the type of schedule for flushing that the system intends to follow and the procedures to be used for disposal of the flushed water to ensure that adequate flushing is being conducted and disposal is being handled properly.

**(a)(4)** As discussed under proposed section 64585, it is necessary to periodically inspect reservoirs and conduct cleaning as may be necessary. This element would serve to provide the system's schedule for routine inspection of the tanks and reservoirs and the proposed procedures to be used to clean the tanks to ensure adequate maintenance.

**(a)(5)** All water mains in a distribution system deteriorate and need repair and/or replacement over time. As water mains age, the probability of leaks increases. In addition to loss of water and pressure, leaks can create more acute distribution system failure. Repairing a main means taking that main out of service. Unless done properly, this can lead to contamination during construction or backflow due to loss of pressure. Due to the seriousness of this problem, most water systems have some form of program for inspection and repair or replacement of old or worn out water mains. This element would simply require the system to describe its program for water main inspection, repair and replacement in order to assure the continued integrity of the distribution system.

**(a)(6)** This element involves the description of a water system's plan for responding to emergencies that may occur in the distribution system. Emergencies can result from natural disasters such as an earthquake, flood or fire that may rupture water mains or storage tanks, from accidents (a vehicle knocking over a fire hydrant or a failure of a storage reservoir) or from a contamination incident (such as a backflow of contaminated water into the system). Emergencies can seriously disrupt the ability of the distribution system to supply water to consumers. Therefore, it is important to public health and safety for the system to have a response plan thought out in advance of the emergency so that all operating personnel can respond effectively and without undue delay.

**(a)(7)** Consumer complaints provide important feedback to the water system as well as the Department about possible problems in the distribution system. Consumer complaints are often the first indication of a possible contamination problem or a significant leak. Most water systems do not, and should not, take consumer complaints lightly. This element involves the description of how the system responds (e.g. handling of calls, responsibility for follow-up, procedures).

**(a)(8)** Section 7604, Title 17 of the California Code of regulations requires the installation of backflow prevention devices at premises that may pose a backflow problem. Section 7605 of that article also requires that these devices be inspected and tested annually by the water system. Since this function is an integral part of the operation of a distribution system, the Department has included this element as part of the operations plan even though it is already a requirement elsewhere.

**(a)(9)** The purpose of having a valve is to enable the system to shut off the flow of water. This is particularly important in times of emergency. Without use, a valve can become stuck or even rusted shut. The inability to close a valve during an emergency because the valve is rusted or stuck can have serious consequences for the water system and for the public. For this reason, it is important to periodically test each valve by opening and closing it several times (exercising

the valve). This subsection would require the water system to describe the manner by which it routinely intends to accomplish this task.

**(a)(10)** Proposed section 64561 requires the installation of master flow meters on all water sources and the recording of water flows. In order for a flow meter to accurately measure the flow of water, it must be maintained and periodically calibrated. Therefore, this element is to assure that the water system has a specific plan for doing this.

**(a)(11)** Because of the complexity of operating a distribution system effectively, it is important that the operator have appropriate training and qualifications. This could take many forms including experience, instructional courses, industry certifications etc. State regulations require that distribution system operators be certified, similar to the certification required for water system operators. This subsection merely requires the water system to describe the certification, qualifications and training that operators of their distribution systems have attained.

**(a)(12)** Water mains, particularly larger mains, can experience growth of biological organisms on the interior walls of the water mains. If not controlled, these growths can lead to taste and odor problems and possible increases in coliform bacteria. It was suggested by the Stakeholder Group that larger systems should be required to describe their program for controlling biofilm growth in their distribution system.

**(a)(13)** The surface above or adjacent to a subsurface reservoir with a buried roof is sometimes used for location of playgrounds or other functions. Because any such additional use increases the risk for contamination of the reservoir, a comprehensive plan that includes inspections and monitoring would be required.

**(b)** Once a water system has been directed to develop a Plan to include the elements specified by the Department and it has been approved by the Department, in order to ensure that the system operates properly, it must operate in accordance with the Plan. Specifying this clearly in the regulation precludes any ambiguity regarding the Department's intent related to the Plan's implementation.

**(c)** This subsection requires that any operations plan submitted pursuant to subsection (a) be updated every five years. This is necessary because the original plan could become obsolete if significant changes take place in the water system. Requiring an update at five-year intervals would keep the operations plan acceptably up-to-date and would not impose an unreasonable burden on the system. For systems that undergo little or no significant changes, updating the original plan would likely involve only minor changes. It is the Department's opinion that the five-year update interval is the most reasonable and appropriate time frame for updating the plan.

**64602. Minimum Pressure.**

This proposed section replaces existing section 64566 relating to minimum pressures in the distribution system. The proposed section simplifies the requirements by separating them into a design standard of 40 pounds per square inch (psi) and an operating standard of 20 psi. The Department determined that the previous pressure requirement of 20 pounds per square inch

(while perhaps adequate for an operating standard) was not adequate for a design standard for a new water system since it provided no safety margin or operational flexibility and thus could not assure a dependable supply at all times. The design standard of 40 psi was selected because it is already a commonly used industry standard for design of new systems and is consistent with standards used by the Public Utilities Commission and by the 1992 Recommended Standards for Water Works (10 State Standards).

California has had numerous incidents of backflow contamination due to pressure losses resulting from inadequate pressure. Loss of pressure in a distribution system can lead to significant contamination through backflow from unapproved sources. These proposed requirements apply to the design of all new systems or modifications [consistent with proposed section 64556(a)(5)] to existing distribution systems in which the pressure may be affected.

Even though a water system may be designed for a higher pressure, there are numerous factors that may cause reductions in pressure later. The addition of service connections, increases in water demand, excessive water leakage, aging equipment, poor operation, etc., can all contribute to reduced pressure in the water distributed to consumers. The existing section 64566(b) and 64568 attempted to address reductions in operational pressures. The Department determined that a section setting forth a single minimum operating pressure would be more easily understood and would simplify enforcement. A minimum pressure of 20 psi was determined to be the minimum pressure necessary to meet sanitary needs of consumers. Pressures below this level would likely create potential health hazards. The proposed requirement of 20 psi assures that adequate pressure can be maintained to allow proper functioning of backflow prevention devices and assures that consumers (particularly those with two story houses) will have sufficient water pressure to meet sanitary and domestic needs.

**64604. Preparation and Maintenance of Records.**
This proposed section sets forth the types of records that each water system must maintain with respect to the distribution system.

**(a)** This subsection requires that records relating to new construction be maintained. Water systems are allowed to make additions or modifications to their distribution systems without the review or approval of the Department provided the systems comply with the Waterworks Standards. Since the Department does not inspect these facilities during construction, maintenance of "as-built" plans are the only practical means by which the Department can ascertain compliance with the Waterworks Standards. Since the plans are already available, maintaining them for future inspection by the Department poses no unreasonable burden on the water system.

**(b)** Essential to the operation of any water system is some type of map or drawing that shows the location of all of the critical features of the system. Knowing the location of water mains is necessary in order to check, repair, or replace them. Similarly, it is essential during an emergency to know where the isolation valves are. Water cannot be shut off if the shutoff valves cannot be located. While most systems already have this, the Department feels that this is such an important element that it should be required of all public water systems.

**(c)** This subsection requires that the results of laboratory tests conducted pursuant to various sections of these proposed regulations be maintained for three years. Similarly, the results of any flushing or cleaning conducted by the systems should be kept for a similar period. Three years was the period that the Department felt was most appropriate since it represents the maximum time interval between routine water system inspections conducted by the Department and would thus assure that these records were available during the inspection.

**Chapter 17**

**Article 2. Treatment Requirements, Watershed Protection Requirements, and Performance Standards.**

**64654. Disinfection.**

**(c)(1)** This subsection refers to sections 64566 (System Pressure) and 64630 (Water Main Installation), two sections proposed to be repealed. Therefore, subsection (c)(1) would be amended accordingly to refer to the proposed sections (or subsections) pertaining to the same subjects.

**64658. New Treatment Plants.**

**(b)(4)** This subsection refers to sections 64562 (Quantity of Supply) and 64566 (System Pressure), two sections proposed to be repealed. Therefore, subsection (b)(4) would be amended to refer to the proposed sections pertaining to the same subjects.

Note that the Department finds that adoption of the subject regulations constitutes action by a regulatory agency, which action is expressly authorized by state statute for protection of the environment and does not involve the relaxation of any standard for protection of the environment; and is therefore categorically exempt from compliance with the California Environmental Quality Act (CEQA) as a Class 8 exemption pursuant to CEQA Guidelines, 14 CCR 15308. The Department further finds that the adoption of the subject regulations does not fall within any exception to categorically exempt projects described in Public Resources Code 21084.

## Waterworks Standards Stakeholders Group

| ***Name*** | ***Affiliation*** |
|---|---|
| Bill Gedney | Southern California Water Company |
| Chet Anderson | Association of California Water Agencies/American Water Works Association |
| Cindy Forbes | California Department of Health Services |
| Cliff Sharpe | California Department of Health Services |
| Gary Lynch | Park Water Company |
| Jean Thompson | California Rural Water Association |
| John Corella | Coachella Valley Water District |
| Jose Rios | East Bay Municipal Water District |
| Lucinda Norried | Riverside Water District |
| Manouch Boozarpour | San Francisco Public Utilities District |
| Mike Gilton | South San Joaquin Valley Irrigation District |