

STATE OF CALIFORNIA,
DEPARTMENT OF HEALTH SERVICES

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3
4 RE: THE CITY OF SAN DIEGO
5 202 "C" Street, Mail Station 9A
6 San Diego, CA 92101

7
8 TO: Jack McGrory
9 City Manager

10
11 FINDINGS OF FACT

12
13 The City of San Diego (City) operates a municipal water system
14 that supplies domestic water to approximately 241,833 service
15 connections and approximately 1.2 million people. The City's
16 primary source of water supply is from the First and Second San
17 Diego Aqueducts, which is mostly Colorado River water purchased
18 from the San Diego County Water Authority. In addition, the
19 City receives approximately ten to twenty percent of its water
20 from local runoff collected in eight of its nine lakes
21 (although Lake Hodges is owned by the City, it is only a
22 drinking water source for Santa Fe Irrigation District). The
23 City provides complete treatment of the water at the Miramar,
24 Alvarado, and Otay Water Treatment Plants (WTP). The service
25 area of the Alvarado WTP is approximately 73.8 square miles
26 delivering water to 542,000 people through 229,000 service
27 connections.

1
2 During 1993, the State of California, Department of Health
3 Services, Drinking Water Field Operations Branch (DWFOB)
4 conducted a sanitary survey of the City of San Diego Water
5 Utilities Department (WUD). The findings of the inspection are
6 found in a January 20, 1994 inspection memo report and a
7 January 25, 1994 letter to the City (see the letter in
8 Attachment No. 1). In response to the 1993 inspection report,
9 a compliance agreement between the State of California,
10 Department of Health Services, DWFOB, and the City of San Diego
11 was negotiated and signed in late 1994 by the Water Utilities
12 Department and the City Attorney and DWFOB (see Attachment No.
13 2). On November 28, 1994, it was unanimously adopted by the
14 Council of the City of San Diego as Resolution No. 284995. In
15 agreeing to these terms the City of San Diego therein made a
16 commitment to rehabilitate or replace certain distribution
17 reservoirs, and make corrections to the cross-connection
18 control program.

19
20 DISTRIBUTION RESERVOIRS

21
22 The compliance agreement between DWFOB, and the City of San
23 Diego included a schedule to address replacement or
24 rehabilitation of thirteen of the forty distribution reservoirs
25 which have structural problems. Although the reservoirs were
26 structurally sound when constructed, a lack of adequate
27 maintenance has resulted in severe structural problems with

1 some of the reservoirs. These structural problems range from
2 deteriorated coatings to severe cracks requiring complete
3 replacement of large reservoirs. Some of these reservoirs
4 could potentially have a major failure at any time and are
5 especially vulnerable to an earthquake (see the photographs in
6 Attachment No. 3). The loss of the use of a reservoir due to
7 structural damage would result in water outages in areas of the
8 City. Without these capital improvements the City cannot
9 assure a reliable and adequate supply of potable water. The
10 specific structural problems include the following work
11 remaining to be done:

- 12
- 13 • The Bayview Concrete Covered Reservoir (CCR), Point Loma
14 Concrete Reservoir (CR), and Soledad Precast Concrete Tank
15 (PCT) all have serious to severe structural problems causing
16 them to be vulnerable to collapse (see the photographs in
17 Attachment No. 3).
- 18
- 19 • The Penasquitos PCT, Rancho Bernardo CCR, San Carlos PCT,
20 and South San Diego CCR need to be rehabilitated with
21 structural seismic retrofits.
- 22
- 23 • Due to coating failures at Chesterton Standpipe (SP),
24 Emerald Hills SP, Lomita Village SP, Paradise Hills SP, and
25 Redwood Village SP, the steel is rusting and the tanks are
26 vulnerable to collapse.
- 27

1 Until recently, the WUD has done a fine job at meeting the
2 dates in the compliance agreement between DWFOB and the City of
3 San Diego. Construction has been completed on Alvarado
4 Regulating CCR, Del Cerro CCR, and University Heights CCR.
5 Chesterton SP and Paradise Hills SP will be demolished. Work
6 on the Redwood Village SP is currently under way. Per letter
7 dated October 24, 1996 (and subsequent updates) WUD committed
8 to a schedule for work on Pt. Loma CR, Penasquitos PCT, Rancho
9 Bernardo CCR, San Carlos PCT, and South San Diego CCR.

10
11 Plans for the Bayview CCR were completed in 1991; however,
12 construction has been delayed due to a lack of funding.
13 Compliance Agreement Items No. 12 and 13 require the City to
14 begin construction of the Bayview CCR by August 31, 1996 and to
15 complete construction by August 31, 1998. Compliance Agreement
16 Items No. 18 and 19 require the City to begin construction of
17 the Soledad PCT by October 5, 1998 and to complete construction
18 by September 16, 1999. The August 31, 1996 deadline has not
19 been met. Since the Bayview CCR must be completed before
20 construction of the Soledad PCT can begin, Compliance Agreement
21 Items No. 12, 13, 18, and 19 will not be met. These items will
22 be delayed at least two years because the City has not secured
23 adequate funding for the projects.

24
25 The Bayview and Soledad Reservoirs serve approximately 60,000
26 people. These reservoirs are central to the City's La Jolla
27 and Pacific Beach areas. It is essential that these important

1 components of the system be able to "provide a reliable and
2 adequate supply of pure, wholesome, healthful, and potable
3 water", per California Health and Safety Code Section 4017.

4
5 A capital improvements program (CIP) has been proposed since at
6 least 1987, to replace the Bayview CCR and the Soledad PCT.
7 Further delays are unacceptable due to the high probability
8 that the deteriorated roof of the Bayview CCR or the weakened
9 walls of the Soledad PCT could collapse at any time, and cause
10 a prolonged water outage to a significant population.

11
12 ALVARADO WATER TREATMENT PLANT

13
14 Because of recent outbreaks of Cryptosporidium in the United
15 States, the American Water Works Association (AWWA) and DWFOB
16 have recently set treatment goals which are more stringent than
17 standards contained in Title 22, Chapter 17, in order to ensure
18 that Cryptosporidium has been removed from the water (see
19 Cryptosporidium Action Plan in Attachment No. 4). Disinfection
20 with chlorine has not been proven effective for inactivation of
21 Cryptosporidium; therefore, watershed protection and the
22 removal processes (coagulation, flocculation, sedimentation,
23 and filtration) must be relied upon.

24
25 In order to meet these goals, water treatment plants should be
26 optimized to produce an effluent turbidity goal of 0.1 NTU
27 consistently (95% of the samples required every four hours,



1 determined on a monthly basis). During 1995, the plant did not
2 meet a 0.1 NTU goal, but it did meet the Title 22 standard of
3 0.5 NTU. The monthly average effluent turbidity in 1995 has
4 ranged from 0.10 to 0.18, with a 1995 median of 0.15 NTU. The
5 95th percentile turbidity for each month in 1995 ranged from
6 0.16 to 0.31, with a 1995 median of 0.24 NTU. The operators
7 are doing nearly everything possible to produce high quality
8 water given the condition of the plant and the equipment. The
9 main problem is the old and hydraulically overloaded treatment
10 processes, which are documented in a 1996 inspection report
11 produced by DWFOB (see cover letter to the Alvarado inspection
12 report in Attachment No. 5).

13
14 The Alvarado plant had a brief treatment failure on May 24,
15 1995, when the combined effluent turbidity reached 1.8 NTU.
16 Some of the individual filter effluents exceeded 2 NTU. The
17 water delivered to the system met standards because the
18 operator on duty responded quickly and appropriately by taking
19 the plant out of service. The event occurred when raw water
20 turbidity went from 2.6 to 6.0 NTU (median raw water turbidity
21 was approximately 1.7 in 1995); and the settled water turbidity
22 went from 2.6 to 10.3 NTU. This indicates that the treatment
23 processes prior to filtration were not able to adequately treat
24 the water. Based upon this incident, DWFOB has serious
25 concerns about the ability of the plant to meet standards when
26 the raw water turbidity exceeds 5 NTU.

1 The flocculation and sedimentation basins were originally
2 designed for a flow of 66 MGD, not 120 MGD. In the
3 sedimentation process, the weir overflow rates and the surface
4 loading rates are about three times above normal design
5 criteria for a conventional filtration plant (see page 27 of
6 the attached DWFOB 1996 inspection report in Attachment No. 6
7 for a detailed evaluation). Consequently, at times the filters
8 are overloaded with a significant amount of floc carry-over
9 from the sedimentation basins. In addition, the sedimentation
10 process is susceptible to short-circuiting of flow and the old
11 sludge removal equipment is a maintenance problem.

12
13 The Alvarado Water Treatment Plant is an old plant that shows
14 its age in several ways. Most of the process equipment is old
15 and deteriorating (refer to the pictures in the DWFOB 1996
16 inspection report in Attachment No. 7) and subject to frequent
17 failure. Structurally, the flocculation and sedimentation
18 basin walls, the sedimentation basin columns, and the
19 sedimentation basin upper decks have many cracks (refer to the
20 pictures in the DWFOB 1996 inspection report in Attachment No.
21 8). The structures were not built to current code and may be
22 vulnerable to a seismic event (see pages 25 and 29 of the DWFOB
23 1996 inspection report in Attachment No. 6), which would render
24 the plant useless.

25
26 The backwash water from the filtration process is recycled by
27 discharging it into Lake Murray for settling at a point



1 approximately 400 feet from the intake tower. Although water
2 is not taken from Lake Murray every day, it is used as a source
3 of raw water supply. Without adequate settling of the backwash
4 water, the intake tower could be withdrawing water with
5 increased loading of Giardia and Cryptosporidium. Since the
6 sedimentation process in the plant is overloaded, the filters
7 are totally relied upon to remove the pathogens. In other
8 words, the plant almost operates as a direct filtration plant.
9 For this reason, the filtration process should be optimized.

10
11 Anticipated future growth of the population will create a
12 higher water demand. The filtration rate is limited by Title
13 22 regulations to a maximum flow rate per surface area of the
14 filter bed. A greater water demand will further challenge the
15 capacity of the current plant to filter water adequately.

16
17 A capital improvements program has been proposed since at least
18 1989, to upgrade the plant, equalize flow, add two more rapid
19 mixers, build parallel flocculation and sedimentation basins,
20 build ozonation facilities, build new filters to replace the
21 old filters, and construct facilities to provide treatment of
22 the backwash water prior to recycling. It also proposes to
23 rehabilitate the existing flocculation and sedimentation basins
24 with vertical turbine flocculators and better baffling to
25 minimize short-circuiting. The new flocculation and
26 sedimentation basins would lessen the flow in the old basins to
27 a more reasonable rate and improve turbidity and pathogen

1 removal prior to the filters. With better pretreatment, newer
2 and better filters, and treatment of the backwash water prior
3 to recycling, the plant should be able to meet the 0.1 NTU
4 effluent goal. The new basins would also provide a redundant
5 treatment process that would be designed to current seismic
6 codes and would not be vulnerable to the same seismic event
7 that may destroy the older basins. The new basins would also
8 provide the flexibility needed to allow the operators to drain,
9 rehabilitate, and maintain the older basins and equipment.

10
11 The Alvarado WTP capital improvements program is essential from
12 both a water quality and structural viewpoint to ensure that a
13 high quality water is produced, and to address equipment and
14 structures in poor condition. The major specific reasons that
15 the capital improvements at the Alvarado Plant are needed
16 include the following deficiencies or issues:

- 17 a) The plant has had difficulty meeting the 0.1 NTU effluent
18 turbidity goal for Cryptosporidium removal.
- 19
20 b) The plant has not been able to adequately treat raw water
21 with high turbidity.
- 22 c) The sedimentation hydraulic capacity is inadequate based
23 upon good engineering design practice, both currently and
24 for future demands.
- 25
26
27



1 d) Because the plant was built prior to the current seismic
2 codes, there is a potential problem with seismic
3 vulnerability and catastrophic loss.

4 e) The backwash water is discharged into Lake Murray at a
5 point which is close to the intake tower, potentially
6 recycling Cryptosporidium and Giardia, and thereby
7 overloading the particle removal processes.
8

9 In their October 15, 1996 response to the DWFOB 1996 inspection
10 report, the WUD states, "The City has a strong commitment to
11 the continuation of the Alvarado Water Treatment Plant
12 expansion and rehabilitation project. . . However, the 90%
13 completed designs are on hold until further funding becomes
14 available." Further delays are unacceptable.
15

16 WATER TREATMENT PLANT OPERATIONS
17

18 Currently, each of the City's water treatment plants has only
19 one operator with a Grade 5 Water Treatment Operator
20 certification. There is no Grade 5 operator to supervise
21 operations if the Senior Water Operations Supervisor is on
22 vacation or otherwise unavailable. The Senior Water Operations
23 Supervisor is also often at various meetings required by the
24 job. The Water Operations Supervisor typically supervises 24-
25 hour operations. Due to the size of the plants, their age, and
26 the commitment to optimizing treatment to meet a 0.1 NTU goal,
27

1 all operators with 24 hours per day responsibility, such as the
2 Superintendent, the Senior Water Operations Supervisor, and the
3 Water Operations Supervisor are required to have a minimum
4 Grade 5 certificate.

5
6 PUMP PLANTS, TRANSMISSION, AND WATER MAIN PIPELINES

7
8 The City of San Diego has six pump plants (also called booster
9 stations) that are in critical need of rehabilitation. These
10 are included as part of the City's CIP program, but currently
11 there is no funding for completing these projects.

12
13 For instance, the 65th and Herrick Pump Plant (PP) was built in
14 1949. It still has the original pumps. These pumps are very
15 noisy and sound like they are experiencing cavitation.

16
17 The City of San Diego has several transmission pipelines that
18 are in critical need of repair or replacement. These are
19 included as part of the City's CIP program, but currently there
20 is no funding for completing these projects.

21
22 For instance, the Otay 2 Pipeline, which purveys water from the
23 Otay WTP north to the 490 pressure zone and west to Coronado
24 and Imperial Beach, was built in the 1920's. It was
25 constructed of unlined steel and is vulnerable to corrosion and
26 rupture. As recently as April 8, 1996, a 40-inch diameter
27 section ruptured. A capital improvements program has been



1 proposed since at least 1989, to replace the Otay Pipeline.
2 Further delays are unacceptable.

3
4 Another transmission pipeline, the Bonita Pipeline, which
5 purveys water from the Otay 2 Pipeline north to the 536
6 pressure zone and west to North Park and downtown, was built in
7 the 1920's. It was constructed of riveted steel and is
8 vulnerable to corrosion and rupture. As recently as April 9,
9 1993, a 28-inch diameter section ruptured.

10
11 Another transmission pipeline, the 51-inch diameter Miramar
12 Pipeline, which purveys water from the Miramar WTP west to Mira
13 Mesa and Del Mar, was built in the 1960's. It was constructed
14 of prestressed concrete steel cylinder pipe and is vulnerable
15 to corrosion and rupture. Prestressed concrete steel cylinder
16 pipe can actually explode from the water pressure if the
17 prestressing wire corrodes and snaps. Two of these failures
18 occurred on the Miramar Pipeline in the last ten years, one
19 section ruptured as recently as 1992.

20
21 Throughout many older sections of the City there are various
22 water mains 16-inch diameter and less that are in critical need
23 of replacement. These water mains were constructed 50 to 70
24 years ago of unlined cast iron pipe and are vulnerable to
25 corrosion and rupture. During 1995, there were approximately
26 300 water main breaks that required the replacement of broken
27 pipe. Numerous other repairs were also required. The City has



1 been gradually replacing unlined cast iron pipe since 1968.
2 There are still approximately 160 miles of unlined cast iron
3 pipe in the system. When funding has been available, 10 to 15
4 miles has been replaced per year. However, due to the work
5 that is needed on the distribution system reservoirs, there is
6 currently very little funding for mainline replacement.

7
8 CROSS-CONNECTION CONTROL PROGRAM

9
10 The compliance agreement (see Attachment No. 2) between DWFOB,
11 and the City of San Diego included a schedule to address the
12 deficiencies in the cross-connection control program including
13 the following:

- 14
- 15 a) The City had not completed a survey to identify water user
16 premises where cross-connections are likely to occur. In
17 response, WUD increased its cross connection control
18 program staff who perform the surveys from three to ten
19 positions. The City has made progress since 1994,
20 proactively pursuing surveys and requiring backflow
21 protection where appropriate. To date, approximately
22 11,000 of 58,000 sites have been surveyed. The City must
23 continue to make progress on this project, surveying
24 approximately 4500 connections per year. Of special
25 concern are areas of the City where recycled water will be
26 utilized by August 1997. The City WUD staff have done an
27 excellent job, and have recently stated that they have

1 surveyed all connections in the areas where recycled water
2 will be utilized. Now the City must implement whatever
3 corrections are needed to bring those sites into
4 compliance with state regulations.

5
6 b) Per the compliance agreement, WUD has also corrected
7 deficiencies with City-owned backflow prevention devices,
8 conducted surveys of all connections to City-owned
9 facilities, and installed devices where required.

10
11 c) Per the compliance agreement, WUD has also identified all
12 air/vacuum valves vents located below grade. Air/vacuum
13 valves vents located below grade could cause a cross-
14 connection due to flooding or backsiphonage. Vent
15 openings must be extended at least one foot above grade to
16 prevent surface water from being siphoned into the
17 distribution system. The 1993 inspection found air/vacuum
18 valves vents located in vaults, including some that were
19 flooded. The WUD intends to contract out a lot of the
20 work, and is currently preparing plans and bid packages.
21 To date 23 air/vacuum valves vents have been raised above
22 grade. The City has 429 more sites to correct.

23
24 CONCLUSIONS OF LAW

25
26 Based on the above Findings of Fact, the Department finds that
27 the City has violated the following:



1
2 DISTRIBUTION RESERVOIRS

3
4 Health and Safety Code, Division 5, Part 1, Chapter 7, Article
5 2, Section 4017 "Operational Requirements" states, "Any person
6 who operates a public water system shall do all of the
7 following: . . . (c) Provide a reliable and adequate supply of
8 pure, wholesome, healthful, and potable water". Due to the
9 structural problems in the reservoirs, as documented in DWFOB's
10 January 1994 inspection report, the City can not assure a
11 reliable supply of water to the potentially affected areas of
12 the city. Critical work on the Bayview and Soledad Reservoirs,
13 which serve approximately 60,000 people, has been delayed many
14 years due to a lack of funding.

15
16 California Code of Regulations (CCR), Title 22, Division 4,
17 Chapter 16, Article 2, Section 64560 (a) (1), (2), (5), and (6)
18 requires that the reservoirs be designed and constructed to "be
19 free of structural and sanitary hazards", "protect the quality
20 of the water delivered to users at all times", "withstand, with
21 ample safety factors, the physical stresses imposed during
22 normal operation", and "minimize the effects of ... structural
23 failures, earthquakes...". Although they were constructed to
24 meet these requirements, due to age, deterioration, and lack of
25 adequate maintenance, some of the City's reservoirs no longer
26 meet these basic design requirements.



1 ALVARADO WATER TREATMENT PLANT

2
3 Health and Safety Code, Division 104, Part 12, Chapter 4,
4 Article 3, Section 116300. "Legislative findings" states the
5 following,

6
7 "The Legislature finds and declares all of the following:

8 (a) Every citizen of California has the right to pure and
9 safe drinking water.

10
11 (e) This chapter is intended to ensure that the water
12 delivered by public water systems of this state shall at all
13 times be pure, wholesome, and potable. This chapter provides
14 the means to accomplish this objective."

15
16 Health and Safety Code, Division 104, Part 12, Chapter 4,
17 Article 3, Section 116360 (C) states, "To thoroughly address
18 the public health risks currently posed by cryptosporidium, in
19 particular, the department shall ensure that its initial
20 cryptosporidium action plan, that has been circulated to public
21 water systems serving more than 1,000 service connections, is
22 comprehensively implemented . . .". The cryptosporidium action
23 plan states the following: The Alvarado WTP does not meet this
24 criteria.

- 25 • "The supplier should endorse the idea that a properly
26 designed and operated plant will be able to consistently
27

1 achieve an effluent turbidity of 0.1 NTU and thereby achieve
2 an effluent quality which presents the lowest pathogen risk
3 to system customers."

4 The Alvarado plant should be optimized to produce water
5 meeting an effluent turbidity goal of 0.1 NTU consistently.
6 This goal has been set by the American Water Works
7 Association (AWWA) also. Since, the Alvarado plant was
8 built over 40 years ago, it has some serious design flaws at
9 a peak flow of 120 MGD (see the attached DWFOB 1996
10 inspection report in Attachment No. 6). As documented in
11 this report (pages 16-19), the plant did not consistently
12 meet an effluent turbidity of 0.1 NTU during 1995.

- 13
- 14 • The cryptosporidium action plan also states that a water
15 treatment plant should operate "unit treatment processes at
16 hydraulic loading rates that will enable meeting
17 optimization goals." The hydraulic loading rate through the
18 flocculation and sedimentation basins is about three times
19 the ASCE/AWWA design parameters at a peak flow of 120 MGD
20 (see pages 27 of the DWFOB 1996 inspection report in
21 Attachment No. 6).
- 22 • The cryptosporidium action plan also calls for "optimizing
23 the performance of backwash water recovery systems." The
24 backwash water from the filtration process is recycled by
25 discharging it into Lake Murray for settling at a point
26 approximately 400 feet from the intake tower.
- 27



1
2 Health and Safety Code, Division 5, Part 1, Chapter 7, Article
3 2, Section 4017 "Operational Requirements" states, "Any person
4 who operates a public water system shall do all of the
5 following: . . . (c) Provide a reliable and adequate supply of
6 pure, wholesome, healthful, and potable water". Due to the
7 deteriorated condition of the Alvarado WTP and the inability of
8 the plant to meet 0.1 NTU, as documented in DWFOB's 1996
9 inspection report (see Attachments No. 6, 7, and 8), the City
10 can not assure a reliable supply of water to the central areas
11 of the City. Critical work on the Alvarado WTP, which serves
12 approximately 542,000 people, has been delayed many years due
13 to a lack of funding.

14
15 WATER TREATMENT PLANT OPERATIONS

16
17 Section 7107, Group 2, Chapter 5, Title 17, CCR requires a
18 Grade 5 Water Treatment Operator certification for operators
19 with "24 Hours/Day Responsibility (Superintendent, Assistant
20 Superintendent, and Chief Operator)" of a 10 MGD or larger
21 plant capacity.

22
23 Currently, each of the City's water treatment plants has only
24 one operator with a Grade 5 Water Treatment Operator
25 certification. There is no Grade 5 operator to supervise
26 operations if the Senior Water Operations Supervisor is on
27 vacation or otherwise unavailable due various meetings or other



1 responsibilities required by the job. The Water Operations
2 Supervisor typically supervises 24-hour operations. In order
3 to assure compliance with these regulations a minimum of two
4 Grade V operators is needed for each of the Alvarado, Miramar,
5 and Otay water treatment plants. The City does not meet this
6 requirements.

7
8 PUMP PLANTS, TRANSMISSION, AND WATER MAIN PIPELINES

9
10 Health and Safety Code, Division 5, Part 1, Chapter 7, Article
11 2, Section 4017 "Operational Requirements" states, "Any person
12 who operates a public water system shall do all of the
13 following: . . . (c) Provide a reliable and adequate supply of
14 pure, wholesome, healthful, and potable water". Due to the
15 pipelines being vulnerable to corrosion and rupture problems,
16 as documented in the Findings of Fact above, the City can not
17 assure a reliable supply of water to the potentially affected
18 areas of the City. The City of San Diego has six pump plants,
19 several transmission pipelines, and many very old water mains
20 that are in critical need of rehabilitation, repair, or
21 replacement. This work has been delayed due to a lack of
22 funding.

23
24 CCR, Title 22, Division 4, Chapter 16, Article 2, Section 64566
25 (a) requires that "distribution systems be designed to maintain
26 an operating pressure at all service connections of not less
27 than 20 pounds per square inch gauge (psig)". Due to age and



1 deterioration, some of the pump plants may fail to provide the
2 required pressure in the distribution system.

3
4 CCR, Title 22, Division 4, Chapter 16, Article 2, Section 64560
5 (a) (5) requires that pipelines be designed and constructed to
6 "withstand, with ample safety factors, the physical stresses
7 imposed during normal operation". Although they were
8 constructed to meet these requirements, due to age, corrosion,
9 and deterioration, some of the City's pipelines no longer meet
10 these basic design requirements.

11
12 CROSS-CONNECTION CONTROL PROGRAM

13
14 Health and Safety Code, Division 5, Part 1, Chapter 7, Article
15 2, Section 4017 "Operational Requirements" states, "Any person
16 who operates a public water system shall do all of the
17 following: . . . (b) Ensure that the system will not be subject
18 to backflow under normal operating conditions". Section 7585,
19 Group 4, Chapter 5, Title 17, CCR requires that "The water
20 supplier shall evaluate the degree of potential health hazard
21 to the public water supply which may be created as a result of
22 conditions existing on a user's premises". The City has made
23 significant progress, but still has a backlog of forty-seven
24 thousand connections to survey and evaluate.

25
26 CCR, Title 22, Division 4 "Environmental Health", Chapter 16
27 "California Waterworks Standards", Article 5, Section 64636 (a)



1 (1) states, "Vent openings for air and vacuum relief and air
2 release valves shall be extended at least one foot (0.3 meters)
3 above grade and above maximum recorded high water." There are
4 currently 429 air/vacuum valve vents that are in below ground
5 vaults, which must be raised above grade because of the
6 potential for the vaults to collect rainfall.

7
8 ORDER

9
10 Pursuant to Section 116655, Article 9, Chapter 4, Part 12,
11 Division 104 of the California Health and Safety Code (H&S
12 Code), the Department hereby orders Respondents, the City of
13 San Diego, to do the following to ensure that the water
14 supplied is at all times pure, wholesome, healthful, and
15 potable:

- 16
- 17 1. The City shall submit a plan to provide funding to
18 complete the items in this compliance order by April 30,
19 1997.
 - 20
 - 21 2. The plan to provide funding to complete the items in this
22 compliance shall be approved by the City Council by June
23 30, 1997.
 - 24
 - 25 3. At least quarterly, the City shall submit a progress
26 report on the status of each item in the compliance order.
 - 27



1 A meeting with the Department may be substituted for a
2 progress report.

3
4 RESERVOIRS

- 5
- 6 4. For Redwood Village SP, the City shall complete
7 rehabilitation of the reservoir by April 30, 1997.
- 8
- 9 5. For Paradise Hills SP, the City shall complete demolition
10 of the reservoir by October 10, 1997.
- 11
- 12 6. For South San Diego CCR, the City shall submit the plan
13 for the structural rehabilitation by December 31, 1997.
- 14
- 15 7. For Point Loma CR, the City shall submit the drawings for
16 rehabilitation of the reservoir by March 2, 1998.
- 17
- 18 8. For Rancho Bernardo CCR, the City shall submit the
19 drawings for the structural work by May 29, 1998.
- 20
- 21 9. For Bayview CCR, the City shall submit the drawings for
22 the construction of the new replacement reservoir by June
23 16, 1998.
- 24
- 25 10. For Point Loma CR, the City shall begin rehabilitation of
26 the reservoir by September 1, 1998.
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11. For Bayview CCR, the City shall begin construction of the new replacement reservoir by October 20, 1998.
12. For Rancho Bernardo CCR, the City shall begin construction by November 30, 1998.
13. For Point Loma CR, the City shall complete rehabilitation of the reservoir by July 6, 1999.
14. For Rancho Bernardo CCR, the City shall complete construction of the structural work by March 31, 2000.
15. For Penasquitos PCT, the City shall submit the drawings for the structural work by May 4, 2000.
16. For San Carlos PCT, the City shall submit the drawings for the structural work by May 9, 2000.
17. For Soledad PCT, the City shall submit the drawings for the construction of the new replacement reservoir by August 1, 2000.
18. For Bayview CCR, the City shall complete construction of the new replacement reservoir by October 30, 2000.
19. For San Carlos PCT, the City shall begin construction by October 31, 2000.



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20. For Penasquitos PCT, the City shall begin construction of
by November 30, 2000.

21. For Soledad PCT, the City shall begin construction of the
new replacement reservoir by December 1, 2000.

22. For Penasquitos PCT, the City shall complete construction
of the structural work by April 30, 2001.

23. For Soledad PCT, the City shall complete construction of
the new replacement reservoir by March 1, 2002.

24. For San Carlos PCT, the City shall complete construction
of the structural work by April 19, 2002.

ALVARADO WATER TREATMENT PLANT

25. For the Alvarado WTP, the City shall submit the revised
plan to break up the construction into different phases by
February 28, 1998.

26. For the Alvarado WTP, Earl Thomas Demolition (currently
Phase D), the City shall begin the work by February 28,
1998.

- 1 27. For the Alvarado WTP, College Ranch Pump Plant (currently
2 Phase C), the City shall begin construction by April 30,
3 1998.
4
- 5 28. For the Alvarado WTP, Operations Building (currently Phase
6 B), the City shall begin construction by November 30,
7 1998.
8
- 9 29. For the Alvarado WTP, Earl Thomas Demolition (currently
10 Phase D), the City shall complete the work by November 30,
11 1999.
12
- 13 30. For the Alvarado WTP, Filters (currently Phase E), the
14 City shall begin construction by November 30, 1999.
15
- 16 31. For the Alvarado WTP, College Ranch Pump Plant (currently
17 Phase C), the City shall complete construction by November
18 30, 1999.
19
- 20 32. For the Alvarado WTP, Operations Building (currently Phase
21 B), the City shall complete construction by January 23,
22 2001.
23
- 24 33. For the Alvarado WTP, New Basins (currently Phase F), the
25 City shall open bids for the construction by October 1,
26 2001.
27

1 34. For the Alvarado WTP, New Basins (currently Phase F), the
2 City shall begin construction by November 30, 2001.

3
4 35. For the Alvarado WTP, Filters (currently Phase E), the
5 City shall complete construction by November 30, 2001.

6
7 36. For the Alvarado WTP, New Basins (currently Phase F), the
8 City shall complete construction by December 1, 2003.

9
10 WATER TREATMENT PLANT OPERATIONS

11
12 37. The City shall do everything within its power to optimize
13 treatment at all of the City's water treatment plants, in
14 order to produce an effluent turbidity goal of 0.1 NTU in
15 95% of the samples required every four hours, determined
16 on a monthly basis.

17
18 38. Due to the size of the plants, their age, and the
19 commitment to optimizing treatment to meet a 0.1 NTU goal,
20 all operators with 24 hours per day responsibility are
21 required to have a minimum Grade 5 certificate.
22 Specifically, by December 31, 1997, a minimum of two
23 operators with a Grade 5 Water Treatment Operator
24 certification shall be assigned to work full-time at each
25 water treatment plant. In addition, the superintendent
26 supervising the three water treatment plants shall possess
27 a Grade 5 Water Treatment Operator certification.

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PUMP PLANTS

- 39. For the Bayview PP, the City shall submit the drawings for construction by February 11, 1998.
- 40. For the Deerfield PP, the City shall submit the drawings for construction by March 26, 1998.
- 41. For the Bayview PP, the City shall begin construction by July 1, 1998.
- 42. For the San Carlos PP, the City shall submit the drawings for construction by July 6, 1998.
- 43. For the Deerfield PP, the City shall begin construction by September 30, 1998.
- 44. For the San Carlos PP, the City shall begin construction by December 15, 1998.
- 45. For the Bayview PP, the City shall complete construction by December 31, 1998.
- 46. For the 65th & Herrick PP, the City shall submit the drawings for construction by December 31, 1998.



- 1 47. For the 65th & Herrick PP, the City shall begin
2 construction by July 2, 1999.
- 3
- 4 48. For the San Carlos PP, the City shall complete
5 construction by December 15, 1999.
- 6
- 7 49. For the Deerfield PP, the City shall complete construction
8 by December 30, 1999.
- 9
- 10 50. For the 65th & Herrick PP, the City shall complete
11 construction by May 15, 2000.
- 12
- 13 51. For the Alvarado PP, the City shall submit the drawings
14 for construction by September 12, 2000.
- 15
- 16 52. For the Catalina PP, the City shall submit the drawings
17 for construction by December 29, 2000.
- 18
- 19 53. For the Alvarado PP, the City shall begin construction by
20 March 29, 2001.
- 21
- 22 54. For the Catalina PP, the City shall begin construction by
23 June 1, 2001.
- 24
- 25 55. For the Catalina PP, the City shall complete construction
26 by May 31, 2002.
- 27



1 56. For the Alvarado PP, the City shall complete construction
2 by June 27, 2003.

3
4 TRANSMISSION PIPELINES

5
6 57. For the Miramar Pipeline Improvement Phase II, the City
7 shall submit the drawings for construction by February 2,
8 1998.

9
10 58. For the Miramar Pipeline Improvement Phase II, the City
11 shall begin construction by July 15, 1998.

12
13 59. For the Otay 2 Pipeline, south of State Route 94, the City
14 shall submit an alignment and phasing program by July 15,
15 1998.

16
17 60. For the Otay 2 Pipeline, north of State Route 94, the City
18 shall submit the drawings by February 1, 1999.

19
20 61. For the Miramar Pipeline Improvement Phase III, the City
21 shall submit the drawings by March 16, 1999.

22
23 62. For the Miramar Pipeline Improvement Phase II, the City
24 shall complete construction by July 15, 1999.

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26 63. For the Otay 2 Pipeline north of State Route 94, the City
27 shall begin construction by July 15, 1999.



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64. For the Miramar Pipeline Improvement Phase III, the City shall begin construction by November 1, 1999.

65. For the Otay 2 Pipeline north of State Route 94, the City shall complete construction by July 14, 2000.

66. For Bonita Pipeline Phase II, the City shall submit the drawings by May 10, 2001.

67. For the Bonita Pipeline Phase II, the City shall begin construction by October 31, 2001.

68. For the Bonita Pipeline Phase II, the City shall complete construction by October 1, 2003.

69. For the Miramar Pipeline Improvement Phase IV, the City shall submit the drawings by March 17, 2004.

70. For the Miramar Pipeline Improvement Phase III, the City shall complete construction by June 30, 2004.

71. For the Miramar Pipeline Improvement Phase IV, the City shall begin construction by November 1, 2004.

72. For the Miramar Pipeline Improvement Phase IV, the City shall complete construction by June 30, 2008.



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WATER MAIN PIPELINES

73. The City shall award contracts for construction of at least ten miles of water main replacement per fiscal year, starting July 1, 1997.

74. Every six months, the City shall submit evidence of adequate progress toward compliance with item number 73.

CROSS-CONNECTION CONTROL PROGRAM

75. The City shall submit documentation to demonstrate compliance with state regulations regarding cross-connection control, in all areas of the City that will be served by recycled water, by June 30, 1997.

76. The City shall not supply recycled water within their service area, until the City's cross-connection control program is determined to be in compliance with state regulations, in all areas of the City that will be served by recycled water. "In compliance with state regulations" means the City continues implementing the six required elements of a cross-connection control program required by Section 7584, Group 4, Chapter 5, Title 17, California Code of Regulations. Nothing in this directive shall be



1 construed to deter or delay the construction of water
2 reclamation facilities.

3
4 77. To insure that there are no cross connections between the
5 reclaimed water piping and the potable water piping, a
6 shutdown test must be performed by WUD and witnessed by
7 the San Diego County Environmental Health Department or
8 DWFOB, prior to delivery of any reclaimed water to any use
9 site, and every four years thereafter. Annually, the
10 potable water purveyor must visually inspect the site and
11 review any changes in piping with the user supervisor.

12
13 78. Each recycled water use site must have an adequately
14 trained user supervisor in order to control the on-site
15 piping and prevent any cross connections. The user
16 supervisor must keep as-built plans up to date and on the
17 site.

18
19 79. The City shall start work on the remaining 429 air and
20 vacuum relief valves and air release valves in the City's
21 water system, that must have their vents raised above
22 grade, by February 28, 1997.

23
24 80. The City shall complete work on thirty percent of the
25 remaining 429 air and vacuum relief valves and air release
26 valves in the City's water system, that must have their
27 vents raised above grade, by February 28, 1999.

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81. The City shall complete work on sixty percent of the remaining 429 air and vacuum relief valves and air release valves in the City's water system, that must have their vents raised above grade, by February 28, 1999.

82. The City shall complete the cross-connection control survey in all areas of the City (to determine the need for backflow protection at all service connections) by June 30, 2007.

83. Every six months, the City shall submit documentation to demonstrate adequate progress toward compliance with item number 82.

DWFOB reserves the right to modify this Order as deemed necessary to protect public health and safety. Such modifications may be issued as amendments to this Order and shall be effective upon issuance.

All submittals to DWFOB required by this Order shall be addressed to:

Toby J. Roy, P.E.
District Engineer
Drinking/Water Field Operations Branch
1350 Front Street, Room 2050
San Diego, CA 92101

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TERM

This Order shall become effective as of the date hereof. If the City is unable to perform the tasks specified in this Order for any reason, whether within or beyond the City's control, and if the City notifies DWFOB in writing no less than ninety days in advance of the due date, DWFOB may extend the time for performance if the City demonstrates that they have made their best efforts to comply with the schedules and other requirements of this Order. If the City fails to perform any of the tasks specified in this Order by the time described herein or by the time as subsequently extended pursuant to this paragraph, the City shall be deemed to have failed to comply with the obligations of this Order and may be subject to additional judicial action, including civil penalties specified in Health and Safety Code, Section 116725.

The State of California shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by the City, its employees, agents, or contractors in carrying out activities pursuant to this Order, nor shall the State of California be held as a party to any contract entered into by the City or its agents in carrying out activities pursuant to this Order. By issuance of this Order, DWFOB does not waive any further enforcement actions.



PARTIES BOUND

This Order shall apply to and be binding upon the City, its officers, directors, agents, employees, contractors, successors, and assignees.

SEVERABILITY

The requirements of this Compliance Order are severable, and the City shall comply with each and every provision thereof notwithstanding the effectiveness of any provision. Should any part, term or provision of the Order be decided by the Courts to be illegal or in conflict with any law of the State of California, or otherwise rendered unenforceable or ineffectual, the validity of the remaining portions or provisions shall not be affected thereby.

1/17/97

Date

Gary Yamamoto

Gary Yamamoto, P.E.
Chief
South Coastal Region
Drinking Water
Field Operations Branch

Attachments:

1. January 25, 1994 letter on the 1993 DWFOB inspection
2. Compliance Agreement No. 04-14- 94CO-004
3. Photographs of distribution system reservoirs
4. Dept. of Health Services Cryptosporidium Action Plan
5. July 31, 1996 letter on the Alvarado Plant inspection
6. Alvarado Surface Water Treatment Rule Evaluation Report
7. Photographs of deteriorating equipment at Alvarado
8. Photographs of structural deficiencies at Alvarado

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