STATE OF CALIFORNIA

DEPARTMENT OF HEALTH SERVICES

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

TO: Jack McGrory
City Manager

FINDINGS OF FACT

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

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

DISTRIBUTION RESERVOIRS

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

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

- The Bayview Concrete Covered Reservoir (CCR), Point Loma Concrete Reservoir (CR), and Soledad Precast Concrete Tank (PCT) all have serious to severe structural problems causing them to be vulnerable to collapse (see the photographs in Attachment No. 3).

- The Penasquitos PCT, Rancho Bernardo CCR, San Carlos PCT, and South San Diego CCR need to be rehabilitated with structural seismic retrofits.

- Due to coating failures at Chesterton Standpipe (SP), Emerald Hills SP, Lomita Village SP, Paradise Hills SP, and Redwood Village SP, the steel is rusting and the tanks are vulnerable to collapse.

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

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

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

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

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

ALVARADO WATER TREATMENT PLANT

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

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

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

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

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

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

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

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

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

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

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

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

a) The plant has had difficulty meeting the 0.1 NTU effluent turbidity goal for Cryptosporidium removal.

b) The plant has not been able to adequately treat raw water with high turbidity.

c) The sedimentation hydraulic capacity is inadequate based upon good engineering design practice, both currently and for future demands.

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

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

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

WATER TREATMENT PLANT OPERATIONS

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

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

PUMP PLANTS, TRANSMISSION, AND WATER MAIN PIPELINES

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

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

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

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

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

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

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

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

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

CROSS-CONNECTION CONTROL PROGRAM

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

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

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

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

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

CONCLUSIONS OF LAW

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

DISTRIBUTION RESERVOIRS

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

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

ALVARADO WATER TREATMENT PLANT

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

"The Legislature finds and declares all of the following:

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

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

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

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

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

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

- The cryptosporidium action plan also states that a water treatment plant should operate "unit treatment processes at hydraulic loading rates that will enable meeting optimization goals." The hydraulic loading rate through the flocculation and sedimentation basins is about three times the ASCE/AWWA design parameters at a peak flow of 120 MGD (see pages 27 of the DWFOB 1996 inspection report in Attachment No. 6).

- The cryptosporidium action plan also calls for "optimizing the performance of backwash water recovery systems." The backwash water from the filtration process is recycled by discharging it into Lake Murray for settling at a point approximately 400 feet from the intake tower.

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

WATER TREATMENT PLANT OPERATIONS

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

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

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

PUMP PLANTS, TRANSMISSION, AND WATER MAIN PIPELINES

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

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

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

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

CROSS-CONNECTION CONTROL PROGRAM

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

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

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

ORDER

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

1. The City shall submit a plan to provide funding to complete the items in this compliance order by April 30, 1997.

2. The plan to provide funding to complete the items in this compliance shall be approved by the City Council by June 30, 1997.

3. At least quarterly, the City shall submit a progress report on the status of each item in the compliance order.

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

RESERVOIRS

4. For Redwood Village SP, the City shall complete rehabilitation of the reservoir by April 30, 1997.

5. For Paradise Hills SP, the City shall complete demolition of the reservoir by October 10, 1997.

6. For South San Diego CCR, the City shall submit the plan for the structural rehabilitation by December 31, 1997.

7. For Point Loma CR, the City shall submit the drawings for rehabilitation of the reservoir by March 2, 1998.

8. For Rancho Bernardo CCR, the City shall submit the drawings for the structural work by May 29, 1998.

9. For Bayview CCR, the City shall submit the drawings for the construction of the new replacement reservoir by June 16, 1998.

10. For Point Loma CR, the City shall begin rehabilitation of the reservoir by September 1, 1998.

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.

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.

27. For the Alvarado WTP, College Ranch Pump Plant (currently Phase C), the City shall begin construction by April 30, 1998.

28. For the Alvarado WTP, Operations Building (currently Phase B), the City shall begin construction by November 30, 1998.

29. For the Alvarado WTP, Earl Thomas Demolition (currently Phase D), the City shall complete the work by November 30, 1999.

30. For the Alvarado WTP, Filters (currently Phase E), the City shall begin construction by November 30, 1999.

31. For the Alvarado WTP, College Ranch Pump Plant (currently Phase C), the City shall complete construction by November 30, 1999.

32. For the Alvarado WTP, Operations Building (currently Phase B), the City shall complete construction by January 23, 2001.

33. For the Alvarado WTP, New Basins (currently Phase F), the City shall open bids for the construction by October 1, 2001.

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

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

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

WATER TREATMENT PLANT OPERATIONS

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

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

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.

47. For the 65th & Herrick PP, the City shall begin construction by July 2, 1999.

48. For the San Carlos PP, the City shall complete construction by December 15, 1999.

49. For the Deerfield PP, the City shall complete construction by December 30, 1999.

50. For the 65th & Herrick PP, the City shall complete construction by May 15, 2000.

51. For the Alvarado PP, the City shall submit the drawings for construction by September 12, 2000.

52. For the Catalina PP, the City shall submit the drawings for construction by December 29, 2000.

53. For the Alvarado PP, the City shall begin construction by March 29, 2001.

54. For the Catalina PP, the City shall begin construction by June 1, 2001.

55. For the Catalina PP, the City shall complete construction by May 31, 2002.

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

TRANSMISSION PIPELINES

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

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

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

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

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

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

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

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.

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

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

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

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

79. The City shall start work on 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, 1997.

80. The City shall complete work on thirty 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.

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

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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