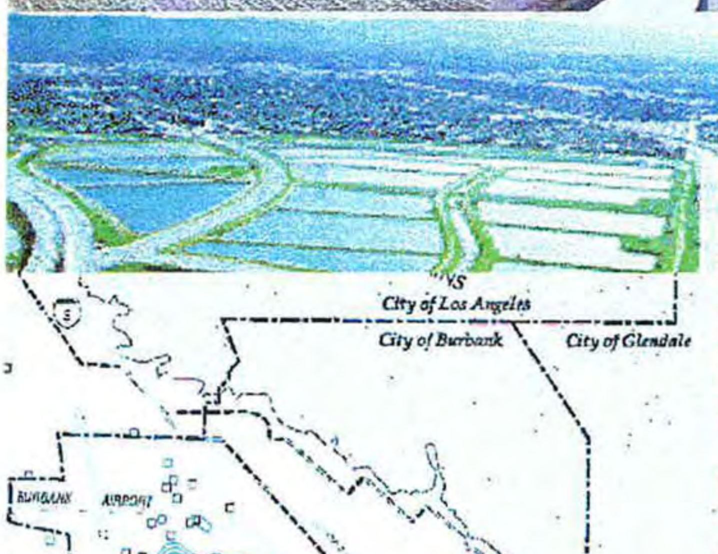
UPPER LOS ANGELES RIVER AREA WATERMASTER

CITY OF LOS ANGELES VS. CITY OF SAN FERNANDO, ET AL.,
CASE NO. 650079 – COUNTY OF LOS ANGELES

WATERMASTER SERVICE
IN THE
UPPER LOS ANGELES RIVER AREA
LOS ANGELES COUNTY

JANUARY 2003



Watermaster Special Report Concerning the History and Occurrence of Hexavalent Chromium Contamination in the San Fernando Basin

And

Related Watermaster Conclusions and Recommendations

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WATERMASTER SPECIAL REPORT CONCERNING THE HISTORY AND OCCURRENCE OF HEXAVALENT CHROMIUM CONTAMINATION IN THE SAN FERNANDO BASIN AND WATERMASTER CONCLUSIONS AND RECOMMENDATIONS

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EXECUTIVE SUMMARY

The San Fernando Basin ("Basin") is at a crossroads. Basin groundwater that has served this region for centuries is recognized as a still vital component of our drinking water supply. Basin drinking water supply wells have previously been impacted by a number of contaminants; this contamination is being cleaned up with multi-million dollar treatment facilities. Basin drinking water is also being threatened with hexavalent chromium, which existing treatment facilities cannot remove. There is still time to protect our drinking water if we act quickly. This action requires the continued involvement of many agencies including the United States Environmental Protection Agency ("EPA") which has set in motion most of the cleanup activities of this past decade, and which holds the key to how fast and how well this latest contaminant is treated.

The cities serving drinking water from the Basin have met and are meeting all drinking water standards set by the California Department of Health Services ("DHS") through the years. These cities have taken numerous measures to comply with the standards set by DHS: wells have been shut off; new wells have been drilled; treatment facilities have been installed; and Basin groundwater has been blended with more expensive imported water from the Los Angeles Aqueduct and the Metropolitan Water District ("MWD"). However, access to this imported water has become increasingly difficult due in large part to California's need to reduce its reliance on the Colorado River, a primary source of MWD water, and environmental constraints on water supplies from the Bay-Delta and Owens Valley. This limited access, together with the significant time and expense involved in remediating hexavalent chromium contamination, underscores the need for immediate attention to the threat the contaminant poses. Without a prompt response, the cities may be prohibited from fully exercising their water rights in the Basin due to contamination, while simultaneously having diminished access to imported water supplies.

In an effort to assist and promote a timely cleanup of the Basin, the Upper Los Angeles River Area ("ULARA") Watermaster prepared this report to memorialize the history and occurrence of hexavalent chromium in the San Fernando Valley by first-hand witnesses to the industrial practices, spills and accidents that caused the contamination, and to explain how those activities caused the contaminant to enter the groundwater. The report and supporting declarations also identify a number of potentially responsible parties. The ULARA Watermaster prepared this report at the request of the Los Angeles Regional Water Quality Control Board ("Regional Board"), and this report is a companion to the Regional Board's recently published report summarizing its 4-year investigation of suspected hexavalent chromium sites within ULARA.

Hexavalent chromium, also known as chromium 6, is a heavy metal used in aerospace, metal plating, and many other industries. Historic data gathered in connection with this report indicate the use and discharge of hexavalent chromium in the Basin by multiple industrial organizations. Historical test results confirm the presence of hexavalent chromium in the Basin, recording high concentrations of hexavalent chromium dating from at least the 1940s.

Extensive analysis of hydrologic conditions in the Basin has been performed. This analysis indicates that there is a significant opportunity for hexavalent chromium discharged to soil or storm drains to infiltrate the Basin's unconfined aquifer, contaminating groundwater resources in the area. This analysis further indicates that, given the solubility of hexavalent chromium in groundwater and the direction and rate of groundwater movement in the Basin, there is significant opportunity for hexavalent chromium to migrate and threaten groundwater production wells in the eastern portion of the Basin.

The Regional Board's recent investigation confirms that the hexavalent chromium contaminant plume, identified in historic test results, poses a clear and present danger to our drinking water supply. Because water delivered within ULARA is blended with other low-chromium sources, water exceeding state and federal chromium standards has not been delivered to the public. However, the contaminant plume has migrated and is now located in close proximity to wells and treatment facilities currently utilized in the eastern portion of the Basin by the Cities of Glendale, Burbank and Los Angeles. The Regional Board's investigation confirms hexavalent chromium concentrations up to 1,000,000 parts per billion ("ppb") in certain portions of the groundwater Basin, far exceeding the state and federal Maximum Contaminant Levels ("MCLs") of 50 and 100 ppb, respectively. Notably, the treatment facilities for these wells, built and operated pursuant to Consent Decrees ("Consent Decrees") entered into with the EPA and parties responsible for the pollution, are designed to remove volatile organic compounds ("VOCs"), not hexavalent chromium.

The declarations and supporting data submitted herewith indicate that unless immediate regulatory action, on both a state and federal level, is taken to remediate the hexavalent chromium contamination in the eastern portion of the Basin, the wells operated pursuant to the Consent Decrees may have to be shut down. A shutdown would result in the loss of a valuable local water supply relied upon by the Cities of Glendale, Burbank and Los Angeles; and it would render inactive groundwater production wells and treatment facilities which cost millions of dollars to construct and operate.

The attached declarations and supporting data are submitted for the purpose of: (1) preserving eyewitness testimony to hexavalent chromium contamination in the Basin; (2) preserving expert testimony concerning the Basin's hydrogeology and the impact of hexavalent chromium contamination on groundwater production wells within the Basin; and (3) preserving expert testimony concerning the historical use and discharge of hexavalent chromium within the Basin. The attached declarations and supporting data are further intended to complement the recent investigative efforts of state and federal agencies to characterize the scope of the hexavalent chromium contamination, identify potentially responsible parties, and encourage immediate state and federal remediation efforts.

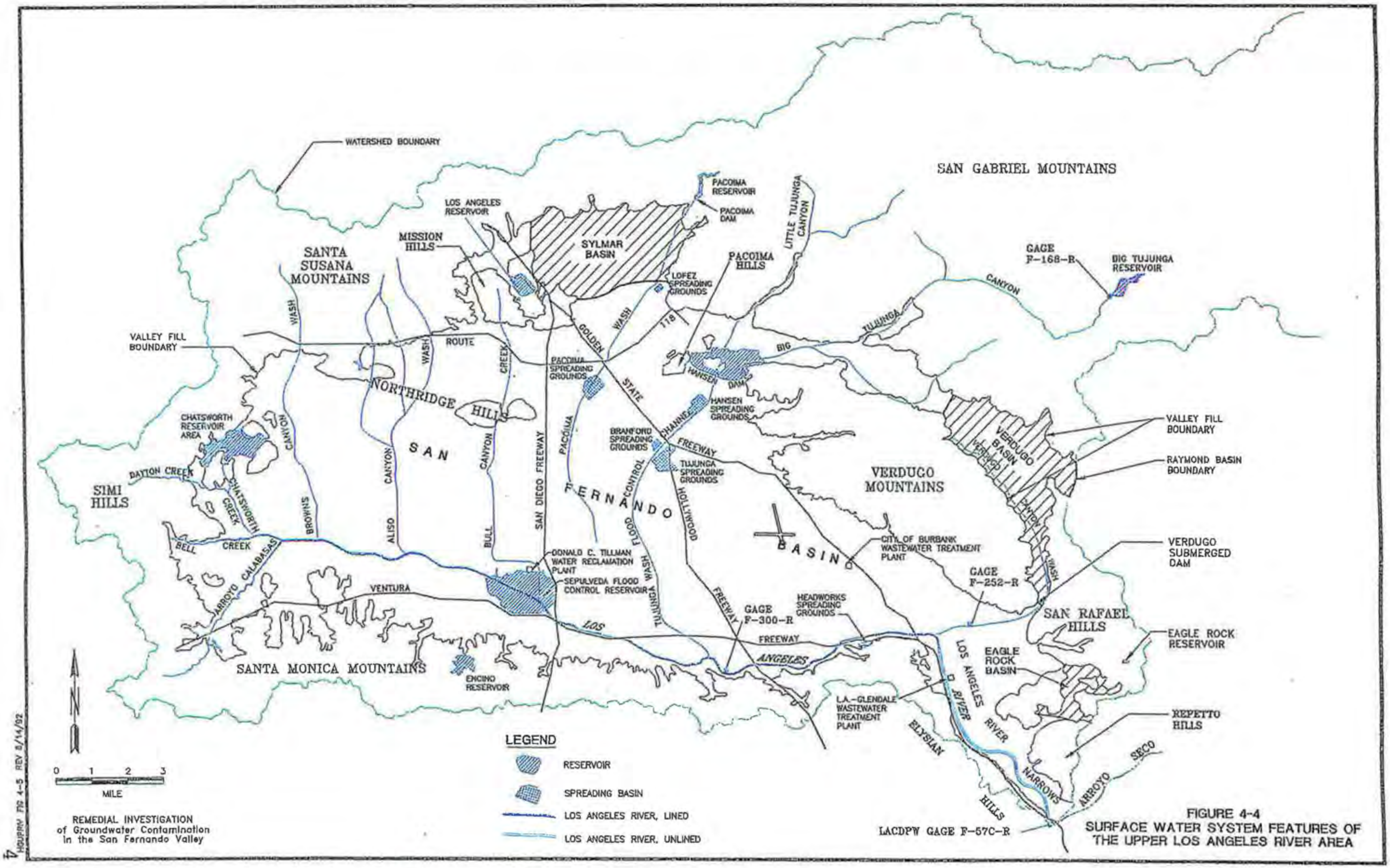


FIGURE 4-4
SURFACE WATER SYSTEM FEATURES OF THE UPPER LOS ANGELES RIVER AREA

Ref. 29

I. INTRODUCTION.

The ULARA consists of the entire watershed of the Los Angeles River ("the River") and its tributaries above Gage F-57C-R near the intersection of the Arroyo Seco. The ULARA is comprised of a total of 329,100 acres, of which 123,400 acres are alluvial valley fill deposits and 205,700 acres are hills and mountains. The 123,400 acres of valley fill include four distinct groundwater basins, namely the San Fernando, Sylmar, Verdugo and Eagle Rock Basins.

The San Fernando Basin ("Basin") is by far the largest. It consists of 112,000 acres, or approximately 91 percent of the total valley fill, and has an estimated total groundwater storage capacity of 3,200,000 acre-feet. The volume of usable stored groundwater in the Basin is estimated to be approximately 1,000,000 acre-feet.

The ULARA Watermaster ("Watermaster") is appointed by the court pursuant to the Judgment in City of Los Angeles v. City of San Fernando, et al., Los Angeles Superior Court, Case Number 650079 (the "Judgment" or "San Fernando Case"). The Watermaster is responsible for administering adjudicated groundwater rights and managing groundwater resources for the ULARA.

The Watermaster has compiled a series of interviews with engineers, hydrologists, water quality experts, and other responsible professionals who worked in the Basin during the past 60 years. These Declarations are intended to preserve their recollections regarding the history, use, testing, discharge, and release of hexavalent chromium into the soil and water of the Basin. This information provides background and context for current data respecting this contaminant and confirms the need for a prompt regulatory response to the threat it poses.

II. BACKGROUND.

In the early 1980s, volatile organic compounds ("VOCs") such as trichloroethylene ("TCE") and perchloroethylene ("PCE") were discovered in the soil and groundwater of the eastern portion of the Basin. Subsequently, numerous groundwater wells in Los Angeles, Burbank, and Glendale were shut down due to VOC contamination.

Following an extensive investigation by the EPA, the area was declared a Superfund Site. During the 1980s and 1990s, the cities of Los Angeles, Burbank, and Glendale stopped pumping groundwater from within the VOC contaminant plumes while treatment facilities were designed and constructed. Eventually, with funding and assistance provided pursuant to the Consent Decrees, these treatment facilities began operating in the North Hollywood Operable Unit ("OU"), Burbank OU, and the Glendale North and South OUs. (The North Hollywood, Burbank, and Glendale Operable Units are collectively referred to hereinafter as "the Operable Units"). These facilities have enabled the municipalities to once again use the Basin as a local, renewable, and reliable water supply by treating the groundwater to remove VOCs.

However, groundwater in the Basin is once again threatened because the existing treatment facilities were not designed to remove hexavalent chromium, which has been detected in numerous wells from which the cities of Burbank, Glendale, and Los Angeles draw water for potable use. The presence of hexavalent chromium in the Basin has affected these Cities' ability to deliver water to their customers, compromised their ability to exercise their water rights within the Basin, and increased the costs associated with providing treated potable water to their customers.

III. NATURE AND OCCURRENCE OF HEXAVALENT CHROMIUM.

Chromium is probably best known in its metallic form (Cr), where it is commonly found as chrome plating on automobile parts and plumbing fixtures. In addition to metallic chromium, there are two common ionic forms of chromium. Trivalent chromium (Cr^{+3}) is found in nutritional supplements, and is considered vital for human health in small doses. Hexavalent chromium (Cr^{+6}) is used in metal plating, aviation and aerospace parts manufacturing, leather tanning, paint and pigment manufacturing, and a variety of other industries. In addition, it was historically used in cooling towers to inhibit corrosion.

Hexavalent chromium is a known carcinogen when ingested through inhalation. However, the evidence for carcinogenicity of orally-ingested hexavalent chromium is unclear, especially at low doses. It has been proposed that hexavalent chromium is reduced to trivalent chromium by the acidic juices in the stomach before it is absorbed by the body – a process that does not occur when hexavalent chromium is inhaled. A major study by the National Toxicology Project, at the request of the Office of Environmental Health Hazard Assessment ("OEHHA") and DHS, is ongoing. This federal study is expected to provide definitive data on the cancer risks of hexavalent chromium in drinking water. This study, however, is estimated to take up to five years to complete.

The State MCL for *total* chromium in drinking water is 50 parts per billion ("ppb") and the Federal MCL is 100 ppb. These MCLs include both trivalent and hexavalent chromium. Currently, there is no separate MCL for hexavalent chromium. The State Department of Health Services has been directed to establish a new, separate MCL for hexavalent chromium by January 1, 2004. However, 50 ppb is the enforceable limit until a new MCL is adopted.

In February 1999, OEHHA established a Public Health Goal ("PHG") of 2.5 ppb for total chromium. The PHG assumed a concentration of 0.2 ppb for hexavalent chromium. PHGs consider only the potential effects on public health, and do not consider such factors as whether the technology exists to meet these goals or whether the goal is feasible and affordable. Whereas MCLs are legally enforceable limits, PHGs are advisory only.

At the request of OEHHA, the Chromate Toxicity Review Committee, a panel consisting primarily of professors from the University of California ("UC Panel"), was formed to provide guidance in the identification of an optimum level, or PHG, for hexavalent chromium in drinking water. On August 31, 2001, the UC Panel issued a report concluding that there is "no basis in either the epidemiological or animal data published in the literature for concluding that orally ingested CR(VI) is a carcinogen

. . .we would suggest that the current California MCL for total chromium of 50 ppb should be deemed protective of human health." ("UC Panel Report").

As a result, OEHHA withdrew the PHG of 2.5 ppb. Although the UC Panel concluded that "the current California MCL for total chromium of 50 ppb should be deemed protective of human health," and although OEHHA withdrew its PHG of 2.5 ppb, OEHHA recently expressed continuing concern with respect to the toxicity of hexavalent chromium in domestic water supplies due to inhalation in showers:

> "Exposure to Cr6 in respirable-size droplets in showering, providing some potential risk of cancer by the inhalation route, provides uncertainty as to safe levels of Cr6 in water. . .
>
> We conclude that there is a considerable basis for concern about carcinogenic risk from oral exposure to this chemical, although no oral cancer potency can be calculated. Cancer risk from inhalation of droplets in showering must also be considered. A proposed PHG for Cr6 is projected for posting sometime this fall, and a 'final' PHG by June 2003." (Ref. 36).

IV. HISTORIC HEXAVALENT CHROMIUM DATA.

Historical data indicate the extensive use and discharge of hexavalent chromium within the Basin. For example, the data confirm the use of hexavalent chromium in the Basin by the following industries: aircraft; metal pickling and plating operations; in anodizing aluminum; in the leather industry as a tanning agent; in the manufacture of paints, dyes, explosives, ceramics, paper, and many other substances. The data demonstrate that these industries caused releases of hexavalent chromium by spills, leaks, return wells, and discharges to storm drains.

The declarations and supporting data indicate that such releases enabled hexavalent chromium to enter the Basin's groundwaters through multiple pathways. For example, hexavalent chromium may: (1) seep directly into the soil in areas surrounding industrial facilities, then into the groundwater; (2) enter the groundwater aquifer through direct discharges from return wells; and (3) enter the groundwater via surface and storm water runoff entering the storm drains, as the storm drains discharge to the River, enabling hexavalent chromium to penetrate the Basin's unconfined groundwater aquifer by infiltration through the River's unlined portions.

Historical testing confirms the presence of hexavalent chromium in the Basin. For example, the attached test results performed by the Los Angeles Department of Water and Power ("LADWP") indicate hexavalent chromium levels of 80,000 ppb in a storm drain near the former Glendale Grand Central Air Terminal on May 24, 1961. LADWP test results further confirm hexavalent chromium concentrations of 70,000 ppb in May 1955 in the Burbank Western Wash, a storm drain that discharges to the River.

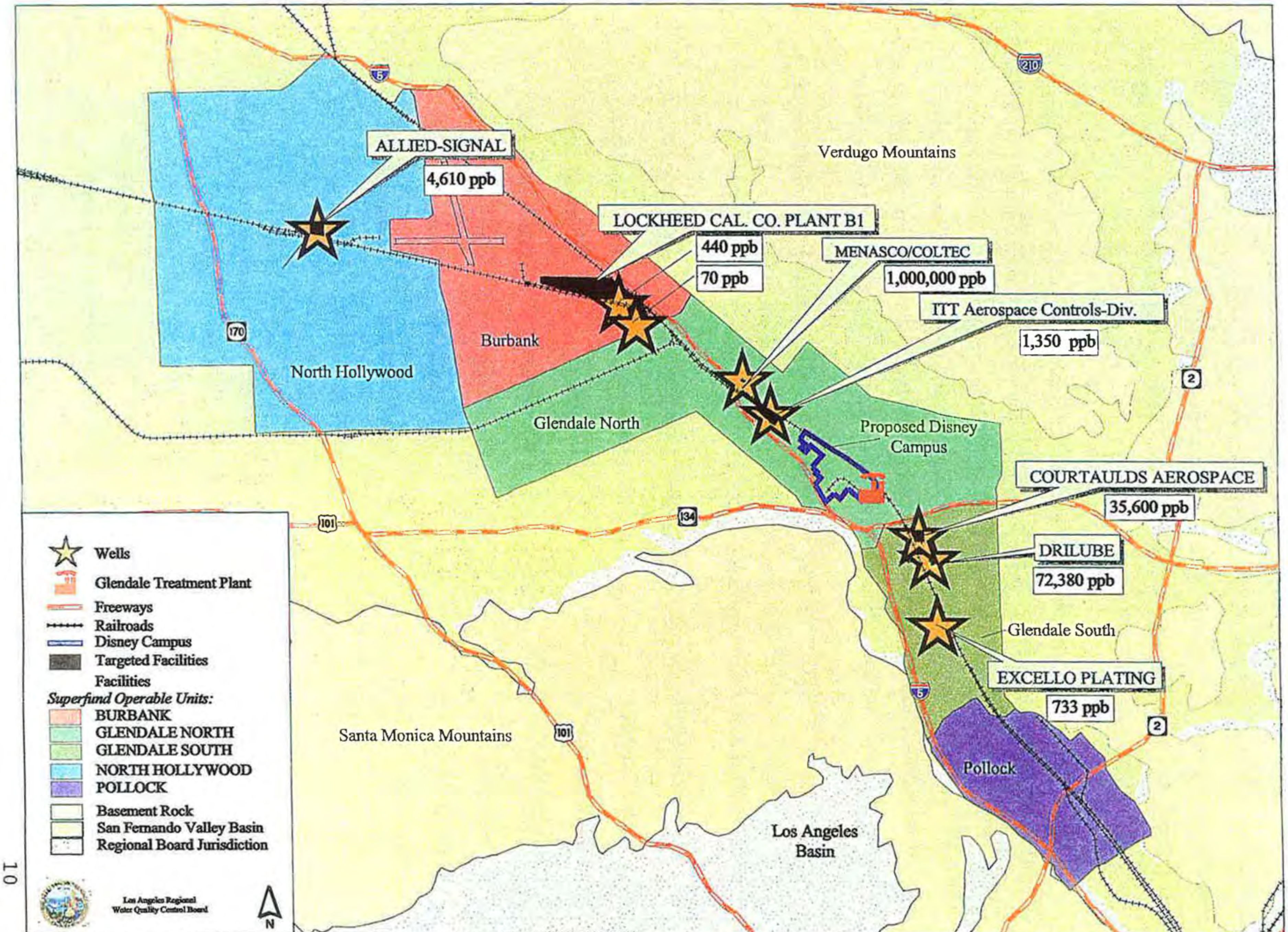
Similarly, the Regional Board's recent report on Chromium VI contamination in the San Fernando Valley ("Board Report") identifies the following historic hexavalent chromium concentrations in the Basin:

Hexavalent Chromium Concentration	Location Name	Operable Unit
1,000,000 ppb	Menasco	Glendale North
72,380 ppb	Drilube	Glendale South
35,600 ppb	Courtaulds	Glendale South
4,610 ppb	Allied-Signal	North Hollywood
1,350 ppb	ITT Aerospace	Glendale North
733 ppb	Excello Plating	Glendale South
440 ppb	Lockheed Martin	Burbank

(Ref. 39).

Hydrogeologic analysis further indicates that once hexavalent chromium enters the aquifer, it constitutes a threat to water production wells due to significant groundwater flow velocities in the eastern portion of the Basin. This threat is compounded by the chemical characteristics of hexavalent chromium. Hexavalent chromium is soluble, capable of moving with flowing groundwater in aquifers.

HISTORICAL HIGH CHROMIUM VI CONCENTRATIONS IN GROUNDWATER



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Ref. 39

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Figure 4

V. SUMMARY OF DECLARATIONS

A brief summary of each Declaration follows. The complete Declarations are contained in Appendix A through Appendix H.

A. Declaration of Melvin Blevins.

Mr. Blevins is the court-appointed Watermaster for the ULARA. As Watermaster, Mr. Blevins has administered adjudicated water rights and managed groundwater resources within ULARA for 23 years. Prior to serving as Watermaster, Mr. Blevins served as an engineer for LADWP for 22 years. Mr. Blevins' work for LADWP and as Watermaster provides him with over 45 years of experience in a wide range of groundwater studies, water management, and water rights litigation activities.

Mr. Blevins' declaration details observations and conclusions reached from numerous visits, and the supervision of visits, to sites within ULARA having groundwater wells. As a result of these visits, Mr. Blevins acquired knowledge of the use of wells, extraction data, disposal practices, industrial uses, and the chemical constituents being utilized by the various industrial parties to the Judgment. Notably, because of these visits, Mr. Blevins acquired knowledge that several companies used return wells which injected water possibly containing hexavalent chromium from cooling towers directly into the groundwaters of the ULARA. These companies included: Lockheed Martin ("Lockheed"); Andrew Jergens Company ("Jergens"); Knickerbocker Plastic Company, Inc. ("Knickerbocker"); and Sears, Roebuck and Company ("Sears").

Mr. Blevins' declaration includes an extensive discussion on the hydrogeology of the Basin. Mr. Blevins' extensive experience in the Basin leads him to conclude that there is a high potential for infiltration of chromium contaminated water into the subsurface, especially within the unlined portions of the River and tributary channels.

Mr. Blevins' declaration states that relatively high groundwater flow velocities, the direction of groundwater movement, and the solubility of hexavalent chromium enable the contaminant to migrate in the eastern portion of the Basin, threatening wells operated by the Cities of Glendale, Burbank, and Los Angeles.

B. Declaration of Glenn Brown.

Mr. Brown was an employee of the State Department of Water Resources ("DWR") from 1952-1963. Between 1958-1961, he was on loan to the State Water Resources Control Board ("SWRCB") where, as Senior Geologist, he authored several portions of the Report of Referee, prepared in connection with the San Fernando Case. Among other things, the Report of Referee contains a comprehensive analysis of all aspects of the Basin's hydrogeology.

Mr. Brown's extensive knowledge of the hydrogeology of the Basin leads him to conclude that "although historical conditions allow variations in recharge opportunity, in the eastern portion of the Basin where the chromium 6 contaminant plume exists, there is generally no significant barrier to the infiltration and migration of chromium 6. Accordingly, the high concentrations of chromium 6 detected in the eastern portion of the Basin constitute an imminent threat to the continued use of groundwater production wells in the Glendale, Burbank and North Hollywood Operable Units. The contamination is an urgent problem that must be dealt with immediately to prevent the migration of chromium 6 into water supplies utilized for domestic use, causing chromium 6 detections above state and federal MCLs."

Mr. Brown's declaration also discusses historical hexavalent chromium standards, and his personal observations of hexavalent chromium uses on aircraft during World War II.

C. Declaration of Arthur Bruington.

Mr. Bruington is the former Chief Engineer of the Los Angeles County Flood Control District. Mr. Bruington has over 40 years of experience as a Civil Engineer within ULARA. During his tenure with the Flood Control District, Mr. Bruington participated on an Inter-Agency Task Force ("IATF") to determine which chemical constituents were present in the Los Angeles River.

As Mr. Bruington worked on the IATF, he "personally observed the strange coloring in the River – a greenish/yellowish color which can be indicative of chromium 6." This strange coloring concerned Mr. Bruington, particularly since "many portions of the River were unlined at the time, and the extent of contamination and the number of different chemicals were unknown." Subsequently, he named an engineer under his supervision to lead the IATF. Mr. Bruington concludes: "[t]esting conducted in connection with the Task Force confirmed that chromium 6 was present in large concentrations in the River, particularly near the Burbank Western Wash."

D. Declaration of Wilbert Chung.

Mr. Chung served as an employee for the California State Water Rights Board from 1958-1979. During that time he served as Referee for the Superior Court in the San Fernando Case. Mr. Chung authored several appendices for the Report of Referee.

In the process of preparing the Report of Referee, Mr. Chung supervised four engineers that personally interviewed well owners within ULARA. Mr. Chung and his staff collected and compiled data from these interviews for incorporation into the Report of Referee.

Mr. Chung prepared Table 12 of the Report of Referee. Table 12 describes waste disposal practices. Notably, this table states that extractions by Lockheed, Jergens, Knickerbocker and Sears are "returned directly to groundwater without loss." "This is of particular importance because ... these companies used chromium 6 in their cooling towers to control corrosion. By directly returning groundwater used in their cooling towers without loss, each of these companies directly injected chromium 6 into the groundwaters of the ULARA."

E. Declaration of William Garber.

Mr. Garber is the former Assistant Director of the City of Los Angeles Bureau of Sanitation ("the Bureau"). Mr. Garber served as an employee for the Bureau from 1947-1985. In that capacity, he "personally performed testing in storm drains within ULARA. This testing confirmed that chromium was present in significant amounts in storm drains within ULARA."

Mr. Garber states: "I personally observed bright green/yellow coloring in the River near the Burbank Western Wash (the 'Wash'). The colors I observed are typically associated with chromium 6, and it is generally recognized that if chromium 6 can be seen in water, the chromium 6 concentrations must be 1.5 mg/l (1,500 ppb) or higher."

As part of his work at the Bureau, Mr. Garber visited a number of industrial organizations within ULARA for the purpose of assisting these companies in minimizing spills and leaks of chemical constituents. During these visits, Mr. Garber personally observed numerous spills and leaks of hexavalent chromium in the aircraft and plating industries. Mr. Garber also observed that virtually every company with a cooling system used hexavalent chromium to inhibit corrosion.

F. Declaration of Rodney Kurimoto.

Mr. Kurimoto has been an employee of LADWP from 1972-present. In his position with the Water Quality Lab, he personally collected water samples from the Los Angeles River. In addition, he personally transcribed the attached LADWP hexavalent chromium test results for approximately seven years.

These test results detail hexavalent chromium levels in storm drains and water wells in Burbank, Glendale and Los Angeles between approximately 1945 and 1988. The records indicate hexavalent chromium concentrations up to 80,000 ppb measured in the Glendale Central Air Terminal drain in 1961.

As a result of Mr. Kurimoto's sampling, transcription, and review of LADWP test results, Mr. Kurimoto concludes: "[b]ased on the large quantity of historical data, trends in chromium 6 concentrations during normal conditions can be seen. On some occasions, unusually high concentrations were found; these high concentrations were confirmed by LADWP's rigorous internal accuracy verification processes. These unusually high concentrations indicate periods in which contamination was present from some external source."

G. Declaration of William Ree.

Mr. Ree is the former LADWP Water Quality Division Head. Mr. Ree served as a LADWP employee from 1947-1980. In his capacity as a Sanitary Engineer for LADWP, he sampled surface water flows at numerous locations along the Los Angeles River from beginning to end.

In the early-mid 1950s, Mr. Ree personally observed green/yellow coloring in the Burbank Western Wash ("the Wash"). Testing in the LADWP lab confirmed that the green/yellow coloring he observed was caused by high concentrations of hexavalent chromium in the Wash. Because of the high concentrations in this area, Mr. Ree and his staff suspected industrial organizations were discharging hexavalent chromium to the Wash. Accordingly, Mr. Ree and his staff investigated the area.

Mr. Ree's declaration concludes: "I visually investigated the Wash and its surrounding areas. As I conducted this investigation, I personally observed that the waste stream flowing from Lockheed Martin's ('Lockheed') facilities contained the same green/yellow coloring I observed in the Wash. Indeed, I observed that the green/yellow coloring in the waste stream flowing from Lockheed's facilities flowed directly into the Wash."

H. Declaration of William Straub.

Mr. Straub is currently the Assistant Executive Officer/Staff Engineer for the Main San Gabriel Basin Watermaster. Mr. Straub has over 30 years of experience as a Chemist and Civil Engineer within the Los Angeles and surrounding areas.

Mr. Straub worked as a Chemist for the Los Angeles County Flood Control District ("Flood Control") where he continued the testing for chromium originally initiated in connection with the IATF described above. Mr. Straub recalls detecting hexavalent chromium within ULARA in testing he performed at Flood Control.

Mr. Straub also worked as an engineer at the Bureau, where he supervised the Bureau's "Report of the Potential Infiltration of Chlorides from the Los Angeles River Narrows into the Groundwater Aquifer," dated January 1993, prepared by Brown and Caldwell Consultants, and developed in cooperation with the ULARA Watermaster. Mr. Straub's declaration details his work on this report and notes the report's conclusion that depending on certain factors, such as groundwater levels and pumping conditions, groundwater recharge in unlined portions of the River may exceed 10,000 acre-feet per year.

Mr. Straub's declaration concludes by noting his background in chemistry. In this regard, Mr. Straub describes the solubility of hexavalent chromium, noting the chemical's capability of moving with flowing groundwater in aquifers.

VI. RECENT HEXAVALENT CHROMIUM DATA.

The ULARA Watermaster coordinated and chaired the Chromium Task Force (the "Task Force"). The Task Force included representatives from the EPA, the Regional Board, DHS, Department of Toxic Substances Control ("DTSC"), and the Cities of Burbank, Glendale and Los Angeles. The purpose of the Task Force was to gather information on chromium contamination in the Basin, examine the implications of chromium contamination upon the Basin's groundwater supply, and coordinate assessment and enforcement action.

In connection with his role as the court-appointed Watermaster and Chairman of the Task Force, the Watermaster requested that the Regional Board investigate the sources and extent of hexavalent chromium contamination in the Basin (Appendix A). Pursuant to this request, the Regional Board, in cooperation with the EPA, recently issued a report ("Board Report") identifying sites with significant hexavalent chromium contamination in the underlying soil and/or groundwater. The Board Report (Ref. 37) provides the foundation for identifying Potentially Responsible Parties ("PRPs") and forms the basis for prioritizing cleanup activities. The Regional Board initially reviewed over 4,000 companies for their use of hexavalent chromium within ULARA. After this review, 255 suspected hexavalent chromium sites were identified. The Regional Board inspected each of the 255 sites. As a result of these inspections, the Regional Board recommended closure for 150 sites and further assessment for 105 sites. In addition, the Regional Board issued cleanup and abatement orders ("CAOs") to the following four entities:

1. Lockheed Martin;
2. Menasco Aerosystems Division/Coltec Industries;
3. PRC-Desoto (formerly Courtaulds Aerospace); and
4. Drilube.

The Watermaster is informed that the Regional Board will issue additional CAOs in the near future.

Consistent with the historical findings and hydrogeologic analysis discussed above, the Board Report confirms that the hexavalent chromium contaminant plume has migrated and is currently located in close proximity to wells utilized by the Cities of Glendale, Burbank and Los Angeles pursuant to the Consent Decrees.

The Board Report indicates that water containing hexavalent chromium above state and federal MCLs has not been served to the public due to blending with other low-chromium sources.

The data further suggest, however, that immediate remedial action is necessary because the contaminant plume has migrated, placing it very close to water supply wells within the Operable Units. In addition, the need for immediate action is emphasized by the excessive concentrations of hexavalent chromium (up to 1,000,000 ppb); the migratory capability of hexavalent chromium in groundwater; the direction of groundwater flow; and the velocity/rate of groundwater movement in the eastern portion of the Basin. Without timely remediation efforts, the contaminant plume will continue to migrate, causing detections of hexavalent chromium in groundwater wells at such high levels that blending water with other sources may no longer provide a feasible solution that enables the continued delivery of water meeting state and federal standards.

The Regional Board's findings, together with the attached declarations and accompanying historical data (Board Report Table VI), support this conclusion.

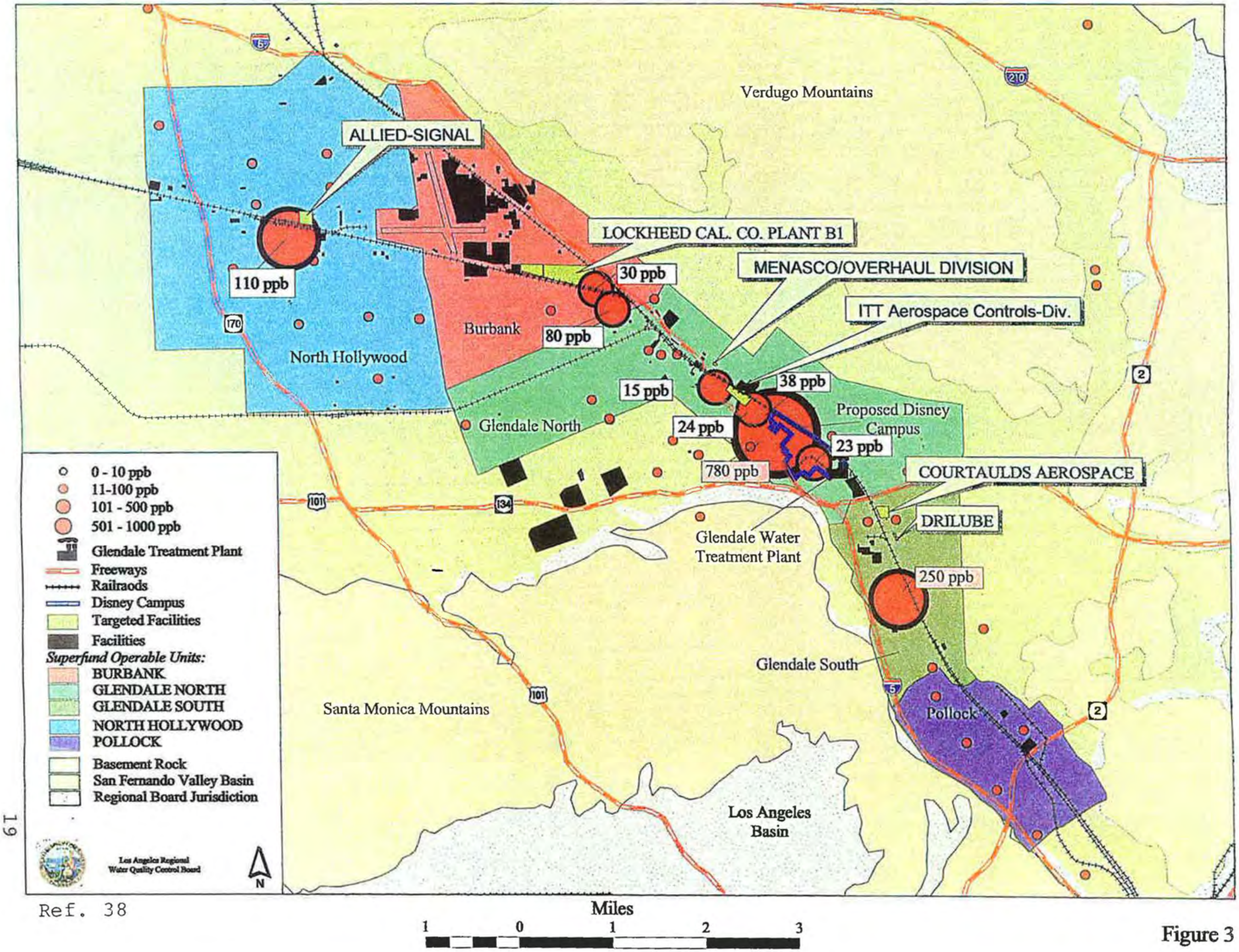
The Board Report includes maps illustrating the hexavalent chromium contaminant plume's close location to wells utilized by the Cities of Glendale, Burbank and Los Angeles for domestic use pursuant to the Consent Decrees. For example, the Report includes a map indicating present chromium 6 concentrations in groundwater up to 780 ppb in the Glendale Operable Unit, 80 ppb in the Burbank Operable Unit, and 110 ppb in the North Hollywood Operable Unit (Ref. 38).

The Board Report identifies the following total chromium concentrations in soil (in mg/kg, or parts per million within the Burbank, Glendale and North Hollywood Operable Units:

Location Name	Operable Unit	Chromium Concentration
Weber Aircraft	Burbank	156,000 mg/kg
All Metals	Burbank	9,600 mg/kg
ITT Aerospace	Glendale-North	4,600 mg/kg
Ryder Aviall	Burbank	4,030 mg/kg
Drilube	Glendale-South	3,420 mg/kg
Lockheed Martin	Burbank	2,610 mg/kg
L.A. Signs	Burbank	1,900 mg/kg
Allied Signal	North Hollywood	1,700 mg/kg
Caravan Fasbloos	North Hollywood	1,350 mg/kg
Lanco Metals	Glendale-South	1,100 mg/kg

(Ref. 40).

PRESENT CHROMIUM VI GROUNDWATER CONCENTRATIONS IN MARCH 2001



Ref. 38

Figure 3

TABLE V

SAN FERNANDO VALLEY
TOTAL CHROMIUM CONCENTRATIONS IN SOIL

NO.	FILE NO.	LOCATION NAME	OPERABLE UNIT	MAX. TOTAL CHROMIUM IN SOIL	MAX. TOTAL CHROMIUM IN SLUDGE
1	104.1132	Weber Aircraft	Burbank	156,000 mg/kg	
2	109.0076	All Metals Processing Company	Burbank	9,600 mg/kg	
3	109.0582	ITT Aerospace Controls	Glendale-North	4,600 mg/kg	
4	104.0150	Ryder Aviall (now Matthew's Studio Equipment)	Burbank	4,030 mg/kg	
5	113.0165	Drilube	Glendale-South	3,420 mg/kg	
6	104.0676	Lockheed Martin (All of Complex)	Burbank	2,610 mg/kg	
7	109.0123	LA Signs (formerArtcraft Plating)	Burbank	1,900 mg/kg (Cr VI)	
8	111.0180	Allied Signal	North Hollywood	1,700 mg/kg	
9	111.0728	Caravan Fashions (former Mercury Aerospace)	North Hollywood	1,350 mg/kg	
10	113.0207	Lanco Metals (now Zoe Fashions)	Glendale-South	1,100 mg/kg	
11	109.5378	Dynamic Plating	Burbank	900 mg/kg	
12	113.5343	Excello Plating	Glendale-South	733 mg/kg	
13	109.0885	Fiber-Resin Corporation	Burbank	216 mg/kg	
14	104.0315	Crane Company (Hydro Aire)	Burbank	208 mg/kg	
15	109.5072	KBC America (former Alert Plating)	Burbank	200 mg/kg	
16	111.2257	AAA Metals	North Hollywood	186 mg/kg	
17	109.6705	L & M Editorial (former Comet Plating)	Burbank	172 mg/kg	
18	109.6683	Burbank Gateway Center/Media Center Mall	Burbank	160 mg/kg	
19	111.2696	Price Pfister	Non-Superfund	159 mg/kg	
20	113.0373	Glendale Ready Mix	Glendale-South	155 mg/kg	
21	113.5886	PRC-Desoto (Former Courtaulds Aerospace)	Glendale-South	147 mg/kg	570 mg/L
22	111.2629	Department of Water & Power Generating Station	North Hollywood	112 mg/kg	
23	109.0656	Lawrence Engineering & Supply/City of Burbank	Burbank	93 mg/kg	
24	111.1004	Hanson Distributing Company	North Hollywood	81 mg/kg	
25	109.5913	Railchem/Burbank Depot/ Southern Pacific Transp.	Burbank	75.4 mg/kg	
26	111.2477	4-Flight Industries	North Hollywood	66 mg/kg	
27	109.0842	Menasco Aerosystems Division/Coltec Industries	Burbank	55.4 mg/kg	
28	109.0897	Burmah Technical Services/UOP Inc.	Burbank	52.7 mg/kg	
29	112.5645	Valley Plating Inc.	Pollock	45.7 mg/kg	
30	104.0182	1928 Jewelry Company (a.k.a Accesory Plating)	Burbank	41 mg/kg	
31	109.1023	B C Analytical	Glendale-South	No Data	35 mg/L
32	104.1169	KM Records (now Shades of Light)	Burbank	32 mg/kg	
33	109.0656	City of Burbank (former Lockheed Martin)	Burbank	30 mg/kg	
34	109.0528	Haskel, Inc.	Burbank	28 mg/kg	
35	104.0957	Kahr Bearing (Sargent Flectcher)	Burbank	28 mg/kg	
36	104.1093	Valley Enameling	Burbank	25 mg/kg	
37	104.0986	Sierracin/Harrison	Burbank	19 mg/kg	
38	109.0862	Saturn Fasteners	Burbank	15.3 mg/kg	
39	111.0393	Electromatic, Inc.	North Hollywood	14 mg/kg	35,590 mg/L
40	104.0122	Shine Jewelry (former Aluminum Processing Co.)	Burbank	13 mg/kg	
41	104.1121	Abbey Event Rentals	Burbank	12 mg/kg	
42	109.5562	International Electronic Research Corporation	North Hollywood	10 mg/kg	
43	111.0092	American Etching & Manufacting	North Hollywood	10 mg/kg	
44	113.5422	Former Los Angeles Piece & Dye Works	Glendale-South	9.7 mg/kg	
45	111.0817	Pacific Metal Stamping	North Hollywood	9 mg/kg	
46	113.5455	Pacer Performance Products	Glendale-South	8.8 mg/kg	
47	111.0927	Adams Rite Sabre International	Glendale-South	7.8 mg/kg	
48	111.0060	Skipower Plating Works (former Airtronic Plating)	North Hollywood	7.3 mg/kg	
49	104.0997	Capitol Hardware	Burbank	7 mg/kg	
50	111.0187	CWH Company (former Trimm Manufacturing)	North Hollywood	No Data	
51	113.0350	Former Hawkes Finishing Company	Glendale-South	No Data	
52	104.0540	L & M Black Oxide	Burbank	No Data	91.8 mg/L
53	113.1705	Pacific Radiator	Glendale-South	No Data	625 mg/L (20,115 mg/L Cr VI)

Ref. 40

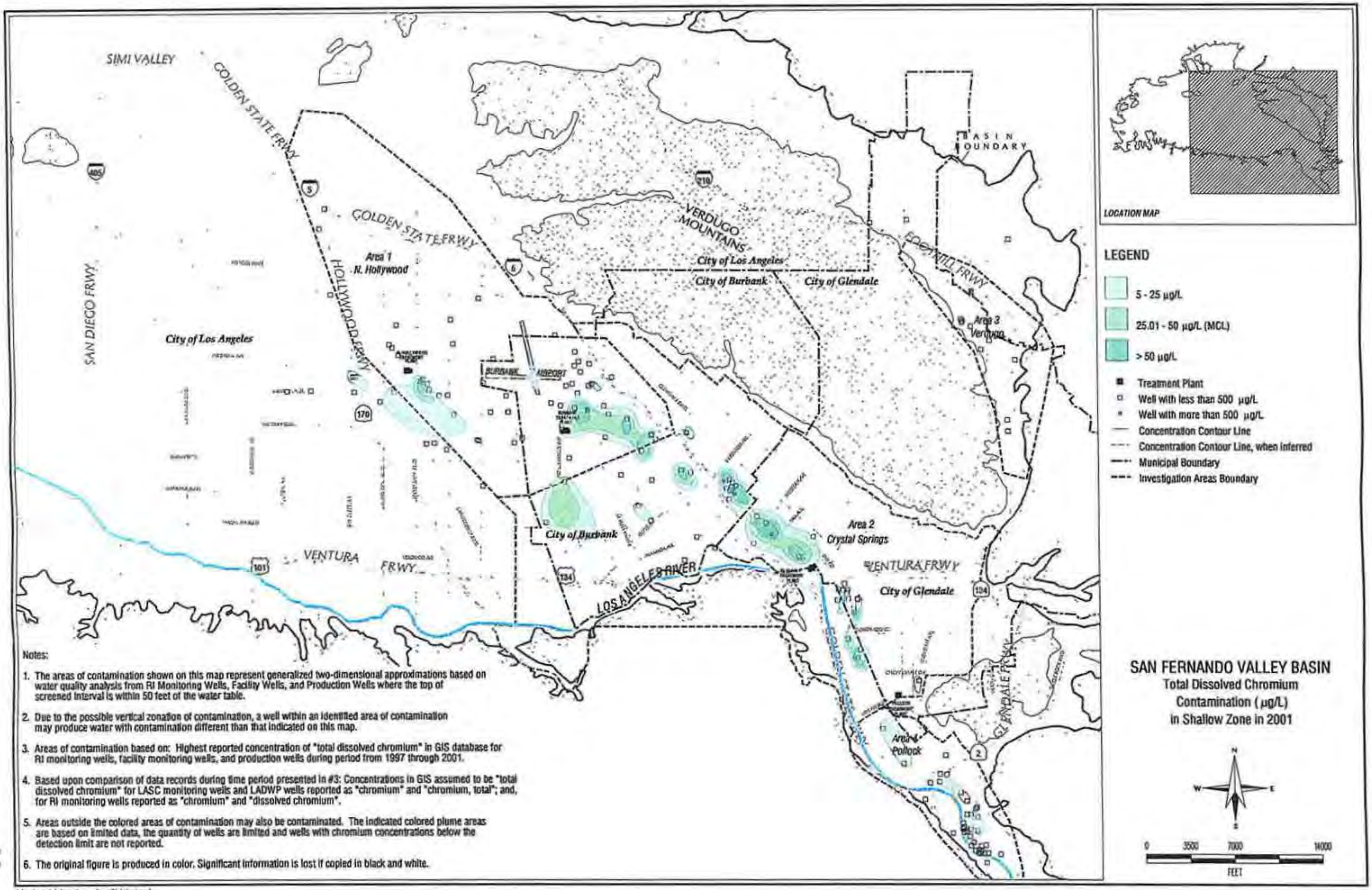
TABLE VI

SAN FERNANDO VALLEY

HEXAVALENT CHROMIUM CONCENTRATIONS IN GROUNDWATER

NO.	FILE NO.	LOCATION NAME	OPERABLE UNIT	MAXIMUM HEXAVALENT CHROMIUM
1	109.0582	ITT Aerospace Controls	Glendale-North	1,350 ug/L
2	113.0165	Drilube	Glendale-South	72,380 ug/L
3	104.0676	Lockheed Martin (All of Complex)	Burbank	440 ug/L
4	111.0180	Allied Signal	North Hollywood	4,500 ug/L
5	113.5886	PRC-Desoto (Former Courtaulds Aerospace)	Glendale-South	35,600 ug/L
6	109.0842	Menasco Aerosystems Division/Coltec Industries	Burbank	1,000,000 ug/L
7	113.5343	Excello Plating	Glendale-South	700 ug/L
		USEPA PO-VPB 02 (RI monitoring well)	Glendale_South	1,200 ug/L
		USEPA CS-VPB 04 (RI monitoring well)	Glendale-North	1,000 ug/L
	NOTE:	(No Hexavalent Chromium Standard)		
	USEPA	Drinking Water Standard: 100 ug/L of Total Chromium		
	California	Drinking Water Standard: 50 ug/L of Total Chromium		

Ref. 41



Notes:

1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells, and Production Wells where the top of screened interval is within 50 feet of the water table.
2. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with contamination different than that indicated on this map.
3. Areas of contamination based on: Highest reported concentration of "total dissolved chromium" in GIS database for RI monitoring wells, facility monitoring wells, and production wells during period from 1997 through 2001.
4. Based upon comparison of data records during time period presented in #3: Concentrations in GIS assumed to be "total dissolved chromium" for LASC monitoring wells and LADWP wells reported as "chromium" and "chromium, total"; and, for RI monitoring wells reported as "chromium" and "dissolved chromium".
5. Areas outside the colored areas of contamination may also be contaminated. The indicated colored plume areas are based on limited data, the quantity of wells are limited and wells with chromium concentrations below the detection limit are not reported.
6. The original figure is produced in color. Significant information is lost if copied in black and white.

Ref. 64

In December 2002 the USEPA released a preliminary map showing the chromium groundwater contamination in the eastern portion of the Basin (Ref. 64). Although it does not include all available data, the map clearly shows the relationship between the contaminant plume and the Operable Units.

Given the hydrology of the Basin and hexavalent chromium concentrations up to 156,000 ppm in soil and 1,000,000 ppb in groundwater, the imminent threat to the continued use of groundwater production wells in the Basin is clear. Without immediate cleanup efforts, implemented and supervised by state and federal regulatory agencies, it is only a matter of time before the hexavalent chromium contaminant plume migrates, rendering existing facilities incapable of blending the water to a level that complies with chromium MCLs. In the event that hexavalent chromium levels exceed the purveyors' ability to blend below 50 ppb, the affected wells and treatment plants will likely be shut down until additional treatment facilities can be designed and constructed.

VII. CONCLUSIONS AND RECOMMENDATIONS.

Based upon the Watermaster's review of the Board Report, and the Declarations and supporting data attached hereto, the Watermaster recommends that the Regional Board continue to issue Cleanup and Abatement Orders to appropriate facilities, and require site owners to clean up hexavalent chromium where it poses a risk to the continued use of groundwater production facilities. Reasonable goals and timetables should be developed for these activities, and strictly enforced.

In addition, EPA must consider the potential impact of hexavalent chromium on the existing Operable Units and plan accordingly. As hexavalent chromium levels in the groundwater rise, the ability of the purveyors to blend treated water becomes more difficult and expensive. Eventually, hexavalent chromium levels could rise to the point where blending is no longer feasible using existing facilities. New wells can be drilled, but they may also encounter chromium contamination, or may not be ideally located to control the VOC plume. Hexavalent chromium treatment facilities can be built as wells are shut down, but these are expensive and take a long time to design, permit, and construct. In the meantime, groundwater could continue to be pumped, treated to remove VOCs, and discharged to the storm drain. However, this is a waste of water prohibited by the California Constitution and would be legally challenged by the Watermaster. In addition, water may not be discharged to the storm drain with hexavalent chromium levels in excess of 11 ppb, far below the MCL for drinking water.

The Watermaster urges EPA's involvement in the Basin's restoration. The Watermaster believes that EPA is uniquely situated to effectively deal with the extensive scope of the hexavalent chromium contamination problem within the Basin because: (1) there are a large number of companies involved – many of which are already subject to EPA's jurisdiction under the existing Consent Decrees; (2) federal Superfund activities are already taking place in existing Operable Units designated by the EPA; (3) excessive hexavalent chromium concentrations have been detected in locations threatening the Operable Units designated by EPA; and (4) EPA's enforcement capabilities under both federal law and the Consent Decrees provide it with a unique ability to remediate the contamination. Accordingly, EPA's timely involvement is essential to: prevent a shutdown of the Operable Units; prevent the loss of local water supply wells; preserve EPA's VOC capture and mass removal goals stated in the Record of Decision; and prevent a number of exorbitant financial expenditures which can be avoided by a pro-active response.

Finally, the Watermaster notes that significant attention has been given to setting an appropriate MCL for hexavalent chromium. The Watermaster encourages and supports continued efforts in this regard. However, due to the location and excessive concentrations of hexavalent chromium in the Basin, it is not prudent to wait until a separate standard for hexavalent chromium is promulgated before implementing remediation activities. With concentrations up to 1,000,000 ppb, there is a crisis in the Basin that must be dealt with immediately, whether or not the current state standard of 50 ppb is adjusted.

Southern California has been very fortunate that hexavalent chromium contamination has not affected more facilities than it already has. Therefore, it is imperative that regulatory agencies use the limited available time to deal with the problem before a shutdown is required. It is our sincere hope that the attached Declarations and accompanying data provide support for a pro-active approach in addressing this challenge.

VIII. APPENDICES

APPENDIX A
DECLARATION OF MELVIN BLEVINS

DECLARATION OF MELVIN L. BLEVINS

I, Melvin L. Blevins, declare:

I. BACKGROUND.

A. Education.

1. I have a Bachelor of Science degree in Civil Engineering from San Jose State University and a Master of Science Degree in Civil Engineering from USC. I am a registered Civil Engineer in the State of California.

2. I have completed additional graduate work at UCLA, USC and UC Davis. In addition, I have taught graduate classes in engineering and groundwater management at USC for 28 years, and I have taught additional classes at UCLA, Loyola Marymount University, UC Davis, and Cal State Fullerton over the past 20 years. Presently, I teach an engineering class at UCLA on groundwater contamination, and a graduate engineering class at USC on groundwater management. In 1999, I received the "Award of Distinction" (Engineer of the Year) from the College of Engineering at San Jose State University.

B. Watermaster Activities.

3. Currently, I am the Watermaster for the Upper Los Angeles River Area ("ULARA"). The Watermaster is an entity appointed by the court pursuant to the Judgment in City of Los Angeles v. City of San Fernando, et al., Los Angeles Superior Court, Case Number 650079 (the "Judgment" or "San Fernando Case"). Pursuant to the Judgment, Watermaster is responsible for assisting the Court in the "administration and enforcement of the provisions of [the] Judgment and any subsequent orders of the Court entered pursuant to the Court's continuing jurisdiction."

4. As Watermaster, I administer adjudicated water rights and manage groundwater resources for the ULARA. The ULARA encompasses all the watershed of the Los Angeles River and its tributaries above a point in the river designated by the Los Angeles County Flood Control District Gaging Station F-57C-5, near the junction of the Los Angeles River and the Arroyo Seco Flood Control Channel. The ULARA encompasses a total area of 329,100 acres, which is composed of 123,400 acres of valley fill and 205,700 acres of hills and

mountains. The Cities of Los Angeles, Glendale, Burbank, San Fernando, and the Crescenta Valley Water District rely heavily on the water resources of ULARA as a primary water supply.

5. I have served as the ULARA Watermaster for 23 years. Prior to my appointment as Watermaster in January 1979, I served as an engineer for the Los Angeles Department of Water and Power ("LADWP") since early 1957. My work as an engineer for LADWP and as the ULARA Watermaster provides me with over 45 years of experience in a wide range of groundwater studies, water management and water rights litigation activities.

C. <u>San Fernando Case.</u>

6. I was involved in both the trial and appellate litigation activities for the San Fernando Case. This work provided me with extensive familiarity of the hydrogeology of ULARA.

7. I worked with all of Los Angeles' expert witnesses, and I prepared all exhibits used by Los Angeles' experts in the San Fernando Case. I met daily with engineering and technical staff, and I received drafts of and provided input into all documents prepared for the Report of Referee.

8. I prepared the findings of fact for the Judgment, which provides me with knowledge of all issues raised in the case, as well as the intent behind the Judgment.

9. I prepared modeling explaining groundwater flow, groundwater recharge, safe yield, the infiltration of contaminants into the Basin, and the effect of pumping on groundwater levels and movement. I was involved in the LADWP technical advisory committee, attending all committee meetings and providing input.

10. When the trial began in 1965, I attended daily court proceedings, taking notes, and preparing work-ups of the trial court proceedings, including testimony concerning how much water can be pumped and stored in the basin, safe yield, overdraft and recharge testimony.

11. I worked closely with George Grover, special counsel to Los Angeles, in the appeal of the trial court's decision in 1968. I provided technical data, including input from my notes and work-ups from the trial court proceedings, for inclusion in the appellate brief.

12. When the case was remanded in January of 1979, I testified as a witness in the trial court on groundwater flows, cones of depression, groundwater recharge, and the evaluation of water supply in the Basin.

13. My involvement in the San Fernando Case included field work. I worked with all parties, including the attorneys for both plaintiffs and defendants, in addressing the implications of the Judgment on the exercise of water rights in the Basin. I personally visited well owners in the Basin and discussed the amounts of water they were entitled to pump under the Judgment and alternatives for obtaining additional water supplies where needed.

14. I co-authored the Judgment with Donald Stark, special counsel for Los Angeles. After the court proceedings were concluded, the defendants requested my appointment as Watermaster. It was agreed by all parties that I should be appointed Watermaster with an independent role in assisting the court in the administration of the Judgment.

15. Because of my extensive involvement in the issues addressed by the San Fernando Case, I have knowledge of all aspects of the geology and hydrogeology of ULARA, including without limitation: groundwater flow; percolation; infiltration and migration of contaminants; velocity/rate of groundwater movement; groundwater recharge; safe yield; water rights; and the effects of pumping on water levels in the Basin.

D. Well Data.

16. My work as Watermaster and on the San Fernando Case provides me with extensive personal knowledge as to the use of groundwater wells within ULARA, including well locations, type of wells, extraction data, industry operations and discharge practices.

17. When I was first appointed Watermaster, I, or engineers under my supervision, visited every well owner within ULARA. I, or the engineers I supervised, visited each and every well within ULARA for the purpose of determining if the well owners were pumping in accordance with the Judgment, and if wells needed to be destroyed, capped, or made into monitoring wells. I, or the engineers I supervised, interviewed the well owners, took pictures, and collected data from each of the wells.

18. As a result of these visits, I have knowledge of the use of wells, extraction data, disposal practices, industrial uses, and the chemical constituents being utilized by the various industrial parties to the Judgment.

19. My involvement in assisting in the preparation of the Report of Referee for the San Fernando Case provides me with additional knowledge as to the use of water wells within ULARA. I worked directly with State Water Rights Board ("State Board") engineers responsible for preparing the Report of Referee. I worked with these engineers in connection with their interviews and data collection from well owners. I consulted, edited, reviewed and commented on all well data used in the Report of Referee, including the attached well extraction data. (Refs. 31, 46, 47, 50).

E. <u>Owens Valley.</u>

20. My involvement in the Owens Valley water rights litigation provides additional expertise in water rights adjudications, hydrology and basin management.

21. I served as the Project Engineer for Owens Valley from November 1972 until June 1997 (nearly 25 years). In this capacity, I performed detailed technical work in connection with all groundwater and water rights studies for the case, including: the location and drilling of wells and all other technical work in connection with understanding the hydrology of the Valley.

22. I chaired the technical committee charged with preparing United States Geological Service ("USGS") reports for the litigation; and I helped write and prepare the Environmental Impact Report ("EIR") for the litigation, which included, among other things, 50 different aquifer tests, drilling of wells, and e-logs.

F. <u>Mono Basin.</u>

23. My work in the Mono Lake water litigation provides further expertise in water rights adjudications, hydrogeology and basin management.

24. I was active in the Mono Lake litigation for over 10 years. This case began in March 1979 and was concluded by the State Water Resources Control Board's ("State Board") order dated September 20, 1994 (over 15 years). In this capacity, I was

involved in environmental and water rights studies involving over 100,000 acre-feet of water. Among other things, I worked with the National Academy of Science and prepared a report on hydrology and basin management with Dr. John Mann, a hydrologist actively involved with the ULARA for many years.

G. Superfund Activities.

25. My work on Superfund activities provides me with extensive knowledge of water quality, as well as the infiltration and migration of chemical constituents within ULARA.

26. When volatile organic chemical compounds ("VOCs") were discovered within the ULARA in 1979, resulting in the EPA's assertion of jurisdiction under CERCLA, LADWP was designated the lead agency for preparing a remedial investigation ("RI") of the Superfund Study Areas. Notably, I helped to prepare the RI, which relied heavily on the work I performed in connection with the Report of Referee in the San Fernando Case.

27. I helped derive the modeling methodology for the RI, and I prepared approximately 90% of the modeling data utilized in the RI, including: well log data; groundwater recharge; calculating change in storage; and the impact of pumping on water levels. Significantly, as part of the RI, a groundwater flow model was developed which simulates groundwater flow and the movement of chemical constituents in the groundwaters of the ULARA.

28. I coordinated with Glendale, Burbank and EPA in developing the Superfund remedy, including the studies and technical activity associated with the Glendale, Burbank, and North Hollywood Operable Units. Because of my involvement in this work, I developed extensive knowledge on contamination in the Basin and remediation strategies necessary to control the spread of the Basin's contaminant plume.

H. Preparation of Reports.

29. I have been involved in a number of reports and cooperative work with local, state and federal regulatory agencies which provides me with extensive knowledge relating to groundwater contamination, contaminant percolation and migration, and the impact of groundwater contamination on wells within ULARA.

30. I assisted in the preparation of the City of Los Angeles, Bureau of Sanitation, "Report of the Potential Infiltration of Chlorides from the Los Angeles River Narrows into the Groundwater Aquifer," dated January 1993, prepared by Brown and Caldwell Consultants (the "Infiltration Report"). I assisted in drafting the Infiltration Report, and I provided extensive comments for inclusion into the Infiltration Report concerning the hydrogeology of the ULARA.

31. My work on the Infiltration Report helped document the manner in which chemical constituents percolate and migrate within ULARA. The Infiltration Report assessed the potential infiltration of chemical constituents in the seven mile unlined reach, known as the Los Angeles River Narrows, from the surface water to the groundwater aquifer below. The Infiltration Report identifies a number of factors which may influence the infiltration of chemical constituents within ULARA and the potential impact of wastewater discharges on surface water and groundwater quality (Ref. 6).

32. Notably, Figure 2-4 of the Infiltration Report provides an historical analysis of the variation in recharge opportunity that may occur depending on the interplay of identified factors, including without limitation: groundwater levels, dilution, pumping conditions, and seasonal fluctuations (Ref. 6). The Infiltration Report notes that application of these factors may result in varying recharge opportunities. During significant recharge periods, the Infiltration Report notes that groundwater recharge in certain unlined portions of the River may exceed 15 cfs, or 10,000 acre-feet per year (Ref. 5).

33. I was also involved in the June 1983, 208 Area-Wide Groundwater Quality Management Plan for the San Fernando Valley Basin ("208 Report"), prepared by the Southern California Association of Governments ("SCAG"). I was involved in the Task Force for the SCAG Report. This Report contained a comprehensive analysis of the quality of drinking water sources within the Upper Los Angeles River Area and issued findings, recommendations, and implementation actions designed to carry out the goals of the Clean Water Act.

34. I was also involved in the July 1983 LADWP Groundwater Quality Management Plan for the San Fernando Basin, which elaborated on the SCAG report. This report analyzed a variety of chemical constituents within ULARA, suggested remediation options, and contains a comprehensive discussion of the hydrogeology of the ULARA. The SCAG and LADWP reports confirmed the migration capabilities of chemical constituents within ULARA and furthered my knowledge on geology, hydrogeology, and the impacts contaminants in soil and groundwater may have on production wells within ULARA.

35. This declaration is based upon the personal knowledge I acquired as a result of working as the Watermaster and a Civil Engineer within ULARA for a combined 45 years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of all aspects of the hydrogeology of the ULARA. I personally investigated water rights, water quality, geology and hydrology within ULARA, and I prepared numerous documents relating to hydrogeology, water rights, water quality, and water management within ULARA.

36. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as the court-appointed Watermaster within ULARA; my 45 years of experience as a Registered Civil Engineer, author, lecturer and consultant in the areas of hydrogeology, water rights, groundwater contamination, and groundwater management; and my preparation and review of numerous scientific reports and other technical documents reasonably relied upon by environmental and hydrologic experts regarding the ULARA. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. USES OF CHROMIUM 6.

37. Because of my work as Watermaster and my involvement in the preparation of the Report of Referee, including personal visits, or the supervision of personal visits, to each and every well owner within ULARA, I have knowledge that chromium 6 was used within ULARA by a variety of industries, including without limitation: aircraft; metal pickling and plating operations; in anodizing aluminum; in the leather industry as a tanning

agent; in the manufacture of paints, dyes, explosives, ceramics, paper, and many other substances.

38. As a result of visiting or supervising visits to well owners within ULARA, I acquired knowledge that the industries identified above discharged chromium 6 to soil, groundwater and storm drains within the Basin via spills, leaks, direct discharges and return wells.

39. I, or engineers I supervised, inspected wells at many plating shops located within ULARA. As a result of these inspections, I have knowledge that plating shops used a process that produced a bath filled with a number of constituents, including chromium 6. The plating bath and associated wash water regularly spilled to the ground. This enabled chromium 6 to enter storm drains or percolate through the soil.

40. As a result of visits, or supervising visits, to aircraft companies within ULARA, I have knowledge that the aircraft industry utilized chromium 6 to anodize aluminum. This process created a chromic acid bath, that would be washed out. The wash water regularly spilled onto the ground, enabling chromium 6 to enter storm drains or percolate into the soil.

41. As I assisted in the preparation of well data to be included in the Report of Referee, I acquired knowledge that many companies used return wells for discharging chromium 6 contaminated water directly to groundwater. These companies included Lockheed Martin ("Lockheed"), Andrew Jergens Company ("Jergens"), Knickerbocker Plastic Company, Inc. ("Knickerbocker"), and Sears, Roebuck and Company ("Sears"). These companies extracted groundwater for use in their cooling towers. The companies added chromium 6 to this water to control corrosion, then directly returned this water to the groundwater aquifer via return wells. Numerous sources I collected and reviewed during my work on the Report of Referee support this conclusion.

42. For example, with respect to Lockheed well number three, located at 1705 Victory Place, Burbank, California, the attached well log data states that this well was a "Return well for waters used for air. cond. of wind tunnel." (Ref. 46). Similarly, with respect to

Lockheed well number four, also located at 1705 Victory Place, Burbank, California, the attached well log data states:

> "Well #4 – Pump 40hr/week 52 week/yr since well was first operated. All water from this well is returned down well # 3. Water is pumped from well through air. cond. system and returned to well # 3 100' away." (Ref.46).

43. Similarly, I helped to prepare Chapter 5 (Water Utilization and Disposal), Volume 1, Table 12, footnote P, for the Report of Referee. Consistent with the notes concerning Lockheed Well Numbers 3 and 4 described above, this Table specifically provides that Lockheed's "extractions are returned directly to groundwater without loss" (Ref. 50). In addition, this Table states that extractions by Jergens, Knickerbocker, and Sears "are returned directly to groundwater without loss" (Ref. 50).

44. In addition, I helped to prepare Appendix I, Volume II, for the Report of Referee, which contains notes on each individual defendant. With respect to Lockheed, this section states that:

> "Since 1940, the defendant has operated four wells. Two of the defendant's wells are located on property owned by the Federal Government. The water from two wells was used in a closed air cooling system and the waste water discharged into return wells. Recently only one well used for air cooling was active. The remaining two wells were used as a standby water supply for fire protection. These wells are presently abandoned" (Ref. 56).

45. Similarly, Appendix I, Volume II, states that Jergens used two wells for cooling purposes. "Water was extracted from one well and the other well was used for the injection of waste water into the ground water basin" (Ref. 54).

46. With respect to Knickerbocker, Appendix I, Volume II, states that Knickerbocker used a well for "cooling machinery in a manufacturing plant. Los Angeles city water is also used in a closed air conditioning system. Waters from both sources are injected into two return wells"(Ref. 55).

47. In addition, Appendix I, Volume II, states that well water is "used in a closed cooling system at the Sears, Roebuck and Company store in Glendale. Used water is discharged into return wells" (Ref. 57).

III. LADWP TEST RESULTS/CHROMIUM 6 SURVEY.

48. The presence of chromium 6 in the waters of the ULARA has been confirmed in sampling recorded by LADWP dating back to the 1940s (Ref. 11). As a result of my work as an Engineer for LADWP for many years, I am familiar with the attached chromium 6 test results, which were compiled by LADWP's Sanitary Engineering Division, now known as the Water Quality Division (Ref. 11). These test results are true and genuine LADWP records which I reviewed during the regular course of my employment at LADWP (Ref. 11).

49. The attached LADWP records detail monthly chromium 6 levels in storm drains and water wells in Burbank, Glendale and Los Angeles between approximately 1945 and 1988 (Ref. 11). The records indicate the presence of chromium 6 far in excess of the current state and federal MCLs for total chromium (50 ppb and 100 ppb, respectively), and the historic chromium 6 standard originally established by the United States Public Health Service of .05 mg/l (50 ppb) in 1946. (State Water Quality Control Board's Water Quality Criteria, Second Edition, 1963 ("Water Quality Criteria")(Ref. 45)).

50. For example, the records show that the highest level of chromium 6 – 80,000 ppb – was found in a storm drain near the former Glendale Grand Central Air Terminal on May 24, 1961 (Ref. 11). The highest sustained concentrations of the chemical were found in the Burbank Western Wash, a storm channel that discharges into the Los Angeles River, where levels reached 70,000 ppb in May 1955 (Ref. 11). In one instance, on March 23, 1955, workers tested for chromium 6 in the Burbank storm drain every 15 minutes for two hours. (Ref. 11). The recorded levels ranged from 5,000 ppb to 17,500 ppb (Ref. 11).

IV. HYDROGEOLOGY OF THE SAN FERNANDO VALLEY BASIN.

51. The presence of chromium 6 in the Basin is of particular concern due to the hydrology of the Basin, including high infiltration rates in the Eastern portion of the Basin, the significant velocity of groundwater movement, and the location of the contaminant plume relative to groundwater wells used for production, including wells utilized for domestic use under the Consent Decrees between EPA, Glendale, Burbank and a number of industrial respondents (collectively referred to hereinafter as the "Consent Decree"). (Refs. 4-5, 13-18, 30, 37, 52, 63).

52. The western portion of the San Fernando Basin is generally composed of materials derived from the surrounding sedimentary rocks (Ref. 49). The materials are generally fine-grained with high clay content which transmit water at a relatively slow rate. In addition, the presence of extensive clay layers makes the western portion of the San Fernando Basin, for all practical purposes, a confined aquifer system (Ref. 49).

53. However, in the eastern portion of the Basin, where significant chromium 6 concentrations have been detected both in the soil and groundwater, the alluvial deposits are comprised primarily of sands and gravels with some localized lenses of silts and clays interbedded (Ref. 49). The deposits have been eroded from the granitic rocks of the San Gabriel Mountains and transmit water at a relatively rapid rate (Ref. 49). This eroded debris is generally very coarse. In places, boulders up to three feet in diameter are relatively common. (Refs. 13-18, 30, 49). The sand and gravel deposits of the eastern San Fernando Basin constitute about one-third of the surface area of the Basin and contain approximately two-thirds of the total groundwater storage capacity of the Basin (Refs. 22, 49). It is in this area that most of the San Fernando Valley's groundwater extraction and collection systems are located (Refs. 18, 30, 49).

54. Conditions in the eastern portion of the Basin are characterized by high soil permeability and groundwater production (Refs. 13-18, 30, 49). Groundwater in the eastern Basin is generally unconfined with a depth to water table from 50 to 200 feet (Ref. 13). The sand and gravel that comprise the aquifer do not have extensive clay and silt layers, or

aquitards, that separate it into confined layers (Ref. 49). As a result, chemicals such as chromium 6, which are spilled or otherwise applied to the surface or shallow subsurface within the eastern portion of the Basin, are likely to migrate through the porous sediments and into the underlying groundwater, causing detections of chromium 6 in the groundwaters of the ULARA utilized for domestic water supplies (Refs. 4-5, 13-18, 30, 49).

55. Groundwater studies in the eastern portion of the Basin confirm high infiltration rates (Ref. 16). The high infiltration rates are illustrated by the Soil Infiltration Map for the San Fernando Valley Basin attached hereto (Ref. 16). This map shows the variation in relative infiltration rates from low in the western portion of the Basin to high in the eastern portion of the Basin – with infiltration rates as high as 0.30 – 0.45 inches per hour in certain portions of the Eastern Basin, including Glendale, Burbank and North Hollywood. (Ref. 16). This high surface infiltration rate, which is also generally indicative of the rate of percolation and soil permeability in the Basin, illustrate the opportunity for chromium 6 discharged within ULARA to infiltrate and contaminate the Basin's groundwater (Refs. 13-18, 30, 49).

56. The infiltration of chromium 6 is notable in areas of the Basin which are or were unlined. The majority of the River channel was lined in concrete between 1938 and 1958. (Refs. 4-5, 13-18, 30, 52). However, there are some sections where the River channel was left unlined, such as the seven mile unlined reach, known as the Los Angeles River Narrows.

57. Detailed infiltration tests conducted by LADWP in the mid-1960s indicate significant opportunity for recharge of surface water within the Los Angeles River Narrows (Ref. 5, 27). A study performed by Brown and Caldwell consultants in January 1993 indicates that, depending upon historical conditions, the amount of recharge in the unlined reaches could be up to 10,000 acre-feet per year (Ref. 5). Estimates of transmissivity in the Narrows region range from 150 to 250 thousand gallons per day per foot of width (Ref. 9). Notably, the Burbank Western Wash, where significant chromium 6 concentrations were recorded, was unlined until the mid-1950s (Ref. 52).

58. The foregoing hydrologic data suggest that chromium 6 may have entered the groundwaters of the ULARA through multiple pathways. Chromium 6 may seep directly into the soil in areas surrounding industrial facilities, then into the groundwater. Chromium 6 may enter the aquifer through direct discharges from return wells. Chromium 6 may enter the groundwater via surface and stormwater runoff entering the storm drains, as the storm drains discharge to the River, enabling chromium 6 to penetrate the groundwaters of the ULARA by infiltration through the River's unlined portions. ("Weights of Certain Contaminants Diffused to the Ocean in Treated Wastewater and Sludge Versus Weights Added By A Separate Storm Drain System in Los Angeles," (Refs. 4-5, 13-18, 27, 30, 33, 52, 63).

59. The attached groundwater contours indicate that the general direction of groundwater flow in the Basin is from the recharge areas on the alluvial fans and along the edges of the valley fill, toward the Basin discharge area located in the Los Angeles River Narrows (Refs. 17, 23). Because of the dense grouping of wells in certain areas and the extensive pumping of groundwater, several large cones of depression have formed in the water table (Refs. 19-21). These cones of depression have caused significant changes in the natural groundwater flow patterns and generally persist throughout the year despite the highly seasonal variation in pumping activities (Ref. 12). Watermaster modeling attached here illustrates simulated capture zones and groundwater elevations near the chromium 6 contaminant plume (Ref.60).

60. Well tests and observations revealed that flow velocities in the eastern portion of the Basin are much greater than in the western portion of the Basin (Ref. 62). Horizontal groundwater velocities in the western portion of the Basin have been estimated to be between 5 and 100 feet per year, as opposed to estimates of 300 to 500 feet per year in the eastern portion of the Basin (Ref. 62). This difference is attributed primarily to much higher permeability of deposits in the eastern portion of the Basin (Refs. 13,14,17,23, 49, 62).

61. This demonstrates that once chromium 6 enters the aquifer, it constitutes a threat to water production wells due to significant groundwater flow velocities in the eastern

portion of the Basin, where the chromium 6 contaminant plume exists (Refs. 13, 14, 17, 23, 49, 62).

62. This migratory threat is compounded by the solubility and mobility of chromium 6 in groundwater. It is generally recognized that, in alluvial aquifers, chromium 6 is mobile, capable of moving with flowing groundwater in aquifers (Ref. 2). As stated in "Groundwater Geochemistry, Fundamentals and Applications to Contamination," William J. Deutsch, 1997, pp. 176: "Cr(VI) is relatively mobile in most environments because its solids are soluble and it is not strongly adsorbed. . ." (Ref. 32).

63. The foregoing data clearly indicate the opportunity for chromium 6 in the soil in the eastern portion of the Basin to infiltrate the Basin's groundwater and, after reaching the aquifer, to flow in the general direction of groundwater until it reaches and contaminates groundwater production wells (Refs. 4, 5, 13-18, 27, 30, 49, 53, 62).

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on Jan. 6, 2003, at Los Angeles, California.

M. L. Blevins

Melvin L. Blevins, P.E.
Watermaster
Upper Los Angeles River Area

APPENDIX B
DECLARATION OF GLENN BROWN

DECLARATION OF GLENN A. BROWN

I, Glenn A. Brown, declare:

I. BACKGROUND.

1. In 1951, I graduated from the University of California, Los Angeles with a Bachelor's degree in Geology. I am a California Registered Geologist, License No. 4; and I am a California Certified Engineering Geologist, License No. 3.

2. In 1968, I was appointed by then Governor Ronald Reagan to the first Board for Registration of Geologists in California. In 1995, I was one of three members selected for the Committee that prepared the first California Hydrogeology Certification examination.

3. I completed over 423 hours of continuing education in the field of hydrogeology, environmental geology and engineering geology. I also completed a four-month course at UCLA in hydraulics and pumping machinery, and another four-month course at UCLA in soil mechanics.

4. I have extensive experience in hydrogeology and the evaluation and investigation of groundwater resources. In 1952, I began work as an engineering geologist with the California Department of Water Resources ("DWR"). Between 1952 – 1953, I was the DWR geologist in charge of ground water and geological investigations in the Colorado River Basin region. Among other things, I co-authored the chapters on Geology and Hydrology for the Division of Water Resources Water Quality Investigations Report No. 4, entitled "Ground Water Occurrence and Quality, Colorado River Basin Region."

5. Between 1953 - 1954, I was responsible for delineating ground water basins in the highland area of San Diego County. My work included computing the storage capacity, determining the direction of ground water movement, sampling, and compiling water quality data for approximately 30 basins. Between 1954-1955, I served as the DWR Assistant Engineering Geologist in charge of ground water and geologic investigations in the Lahontan and Mojave Desert region. In this capacity, I determined storage capacity, direction of ground

water movement, recharge areas, and water quality for an area covering 32,000 square miles involving 80 ground water basins.

6. Between 1955-1956, I performed geologic studies relating to the ground water basins of Southern California. These studies involved computing the usable storage of ground water basins and determining the feasibility of recharge with imported water. Between 1956 – 1958, I was the Associate Engineering Geologist in charge of geologic field activities in the Glendale office of DWR. My duties included investigating alternative conduit routes for the Feather River Project and formulating the data collection and operation of the Lower Old Creek ground water basin with respect to water supply and prevention of sea water intrusion.

7. Between 1958 – 1961, I was placed on loan from DWR to the State Water Rights Board, now the California State Water Resources Control Board ("State Board"), where I served as the Senior Geologist on the water rights litigation involving the Upper Los Angeles River Area ("ULARA"), Los Angeles Superior Court Case Number 650079, City of Los Angeles v. City of San Fernando et al., Los Angeles Superior Court. In this capacity, I obtained extensive personal knowledge of all aspects of the hydrogeology of the ULARA. I conducted all geologic ground water pump tests and water quality studies in connection with the litigation, and I assisted engineers in the determination of the safe yield of the San Fernando Valley. In addition, I evaluated soil texture, characteristics of groundwater underflow and outflow, soil infiltration, storage characteristics, groundwater recharge, specific yield and retention. I authored or collaborated on the following appendices for the Report of Referee prepared in connection with the litigation:

- Appendix A: Geology
- Appendix B: Soils
- Appendix C: Characteristics of Soils and Water Use
- Appendix D: Specific Yield Values
- Appendix H: Water Quality
- Appendix P: Underflow at Boundaries
- Appendix Q: Change in Storage

- Appendix R: Groundwater Recharge and Safe Yield

8. After completing my work on the Report of Referee, I returned to DWR, where I worked until mid-1963. Among other things, I served as the DWR Senior Engineering Geologist in charge of geologic activities for the Southern District of DWR. In this capacity, I supervised over 20 geologists in various groundwater investigations throughout Los Angeles, San Bernardino and Ventura counties.

9. In 1963, I entered the consulting field, where I provided consulting engineering geology services to a variety of clients, including the Orange County Water District on the Santa Ana River water rights litigation. In this case, I evaluated the extent of sea water intrusion in coastal Orange County, as well as ground water conditions in Upper Basins above Prado Dam.

10. In 1966, I formed Glenn A. Brown and Associates. This firm provided consulting services for a wide range of domestic and foreign projects involving engineering geology, environmental geology, and hydrogeology. The firm's clients included the State Division of Highways, California Attorney General's Office, Beaumont Irrigation District, Central and West Basin Water Replenishment District, Mojave Public Utilities District, Big Bear City Community Services District, and others.

11. I continued to provide consulting services for Glenn A. Brown and Associates and its successors-in-interests until 1993, when I retired and entered private practice, serving as a private consultant on groundwater related matters such as water well siting and construction, water rights, groundwater seepage, and sources of water related to landslide problems. My clients include Newhall County Water District, Las Virgenes Water District, CalMat Co., Law/Crandall, Riverside Highland Water Company, Rancho Las Flores, Los Angeles County Sanitation Districts, City of Rancho Palos Verdes and Pepperdine University.

12. In addition, I currently serve as the City of Burbank Representative to the Metropolitan Water District of Southern California Board of Directors; and as of May 2002, I have served as the Neutral Member of the San Gabriel River Watermaster Team.

13. My background also includes extensive trial expert witness experience. I have served as an expert witness in over 20 water-related actions. I have also provided expert witness services before various Regional Water Quality Control Boards and numerous local governmental agencies.

14. I have been active in a variety of professional service organizations. Among other positions, I have served as: the National Chairman for the Association of Engineering Geologists Committee on Continuing Education; the National Chairman for the Association of Engineering Geologists Committee on Ground Water; the President for the Association of Engineering Geologists; and the Chairman for the Los Angeles Section of the Association of Engineering Geologists.

15. I have presented lectures before numerous national and international hydrologic organizations and institutions, and I have authored numerous publications including: "Ground Water Geology of San Fernando Valley," Chapter 4 of California Division of Mines Geology, Bulletin 196, 1975; and "Ground Water and its Management in Southern California," Association of Engineering Geologists, Special Publication No. 4, 1992.

16. I also worked on aircraft in WWII from 1943-1946. I worked in a transport squadron and as a gunner on Navy patrol bombers, where I observed that it was common to use chromium 6 in undercoats for aircraft to control corrosion.

17. This declaration is based upon the personal knowledge I acquired as a result of working as a Registered Geologist and Certified Engineering Geologist within ULARA for a number of years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of all aspects of the hydrogeology of the ULARA. I personally investigated water rights, water quality, geology and hydrology within ULARA, and I prepared numerous documents relating to hydrogeology and water management within ULARA.

18. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as a Registered Geologist and Certified Engineering Geologist within ULARA for a number of years; my 51 years of experience as a Registered

Geologist, Certified Engineering Geologist, author, lecturer and consultant in the areas of hydrogeology, water rights, engineering geology, and environmental geology; and my preparation and review of numerous scientific reports and other technical documents reasonably relied upon by environmental and hydrologic experts regarding the ULARA.

19. My work concerning the geology and hydrology of the ULARA has been cited and relied upon in numerous investigations by the ULARA Watermaster; Dr. John Mann – a hydrologist actively involved within ULARA for many years; local, state and federal agencies; the Remedial Investigation prepared in connection with the EPA's assertion of jurisdiction under CERCLA for VOC contamination in the San Fernando Valley; the Los Angeles Bureau of Sanitation's Report on the Infiltration of Chlorides in the Los Angeles River Narrows; and the Los Angeles Department of Water and Power's Groundwater Quality Management Plan. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. HYDROGEOLOGY OF THE SAN FERNANDO VALLEY BASIN.

20. The San Fernando Valley Basin is part of the hydrologic region known as the Upper Los Angeles River Area (ULARA). The ULARA encompasses all the watershed of the Los Angeles River and its tributaries above a point in the river designated by the Los Angeles County Flood Control District Gaging Station F-57C-5, near the junction of the Los Angeles River and the Arroyo Seco Flood Control Channel. The ULARA encompasses a total area of 329,100 acres, which is composed of 123,400 acres of valley fill and 205,700 acres of hills and mountains. The ULARA is bounded on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains; on the east by the San Rafael Hills, which separate it from the San Gabriel Basin; on the south by the Santa Monica Mountains, which separate it from the Los Angeles Basin; and on the west by the Simi Hills. (Ref. 47).

21. The valley fill area of the ULARA is divided into four groundwater basins: San Fernando, Sylmar, Verdugo, and Eagle Rock. The San Fernando Basin is the largest of the four basins, comprising approximately 91 percent of the total valley fill area Ref. 51).

22. The alluvial deposits in the western portion of the San Fernando Basin generally consist of fine sediments and clays exhibiting low permeability and low water yields (Ref. 49).

23. However, the eastern portion of the Basin is generally composed of coarse deposits of sand and gravel. The deposits have been eroded from the granitic rocks of the San Gabriel Mountains and transmit water at a relatively rapid rate. In places, boulders up to three feet in diameter are relatively common. The sand and gravel deposits of the eastern San Fernando Basin constitute about one-third of the surface area of the Basin and contain approximately two-thirds of the total groundwater storage capacity of the Basin (Ref. 49).

24. The general direction of groundwater flow in the Basin is from the recharge areas on the alluvial fans and along the edges of the valley fill, toward the Basin discharge area located in the Los Angeles River Narrows. Groundwater velocities in the eastern portion of the Basin are much greater than in the western portion of the Basin (Ref. 62). Estimates of horizontal groundwater velocities in the western portion of the Basin range from 5 to 100 feet per year, whereas estimates in the eastern portion of the Basin range from 300 to 500 feet per year (Refs. 13, 15, 17, 23, 49, 62).

25. The sources of groundwater recharge in the Basin include percolation of rainfall in the valley fill and surface runoff from hill and mountain areas, spread waters, return flows of imported waters, and underground flow of water from the mountains to the alluvium. (DWP Groundwater Quality Management Plan for the San Fernando Basin, p. A-5 (Ref. 22)). Notably, deep percolation of water from the Los Angeles River at the unlined reaches allows significant opportunity for the infiltration of chemical constituents into the aquifer (Refs. 4-5, 52). Testing in May 1955 at the Burbank Western Wash, which was unlined until the mid-50s, revealed chromium 6 concentrations of 70,000 ppb (Refs. 11, 52). Tests performed at the Burbank Western Wash in March 1955 recorded chromium 6 levels ranging from 5,000 ppb to 17,500 ppb (Ref. 11). These results suggest there was ample opportunity for the infiltration of chromium 6 in unlined portions of the River.

26. High concentrations of chromium 6 – 80,000 ppb – were also recorded in a storm drain near the former Glendale Grand Central Air Terminal on May 24, 1961 (Ref. 11). Chemical constituents entering the storm drains have an opportunity to infiltrate and contaminate the Basin's groundwater. The storm drains in this area discharge to the River, allowing the infiltration of chemical constituents in the River's unlined portions (Ref. 52).

27. Because of the significant groundwater velocity in the eastern portion of the Basin, chemical constituents are capable of migrating in the general direction of groundwater flow constituting a threat to groundwater production wells in the area (Refs. 4-5,13-18, 30, 37, 53, 62)

28. I have reviewed the Regional Board's findings attached hereto concerning the high concentrations of chromium 6 in groundwater and soil in the eastern portion of the Basin (Ref. 37). These documents disclose test data indicating the presence of chromium 6 in levels well above all state and federal maximum contaminant levels ("MCLs") in soil and groundwater upgradient from groundwater production wells utilized for domestic purposes by the Cities of Glendale, Burbank and Los Angeles (Ref. 37).

29. Based upon my review of the Regional Board's chromium 6 test data, and based upon my extensive work in analyzing the hydrology of the Basin, including my work in preparing the Report of Referee, it is my professional opinion that, although historical conditions allow variations in recharge opportunity, in the eastern portion of the Basin where the chromium 6 contaminant plume exists, there is generally no significant barrier to the infiltration and migration of chromium 6. Accordingly, the high concentrations of chromium 6 detected in the eastern portion of the Basin constitute an imminent threat to the continued use of groundwater production wells in the Glendale, Burbank and North Hollywood Operable Units. The contamination is an urgent problem that must be dealt with immediately to prevent the migration of chromium 6 into water supplies utilized for domestic use, causing chromium 6 detections above state and federal MCLs (Refs. 4, 5, 13-18, 30, 37, 53, 62).

III. CHROMIUM 6 STANDARD.

30. During my tenure at DWR, I worked directly with water quality standards. I was regularly provided with literature concerning water quality standards, and I am familiar with the application of water quality standards to the use of water within California.

31. During the regular course of my employment at DWR, I was provided with the State Water Quality Control Board's Water Quality Criteria, Second Edition, 1963 ("Water Quality Criteria"). The Water Quality Criteria was generally considered by water quality experts as the most comprehensive and authoritative treatise on water quality issues within California at the time. The primary author of the Water Quality Criteria was a leading professor in the field of environmental health engineering – Jack Edward McKee, Professor of Environmental Health Engineering, W.M. Keck Laboratory of Environmental Health Engineering, California Institute of Technology. Among other things, the Water Quality Criteria traces the evolution of the historical standards for chromium 6 in domestic water supplies.

32. According to the Water Quality Criteria, a separate standard for chromium 6 was originally set at zero in 1942 by the United States Public Health Service ("USPHS"). (Ref. 45). This standard was amended, however, in 1946 to allow certain groundwater supplies that were slightly affected by chromium 6 to qualify (Ref. 45). Also, at that time, according to the Water Quality Criteria, a concentration of .05 mg/l (50 ppb) was the lowest amount that was analytically determinable (Ref. 45).

33. In 1946, the USPHS chromium 6 standard was amended to .05 mg/l (50 ppb), and there was no standard for trivalent chromium (Ref. 45). These standards were established because of concerns of water quality in interstate commerce.

34. A substantially similar chromium 6 standard was implemented in 1962 by the USPHS (Ref. 45). The standard was revisited primarily to broaden the applicability of the 1946 standard beyond interstate commerce.

35. There was also an international standard specifically for chromium 6. This standard was established by the World Health Organization International ("WHO"). These European drinking water standards also prescribed a limit of .05 mg/l (50 ppb) for chromium 6. (Ref. 45).

IV. **USES OF CHROMIUM 6**

36. My experience provides me with personal knowledge of the use of chromium 6 in a variety of contexts. As I worked on aircraft in WWII, I observed the use of chromium 6 in undercoats for aircraft. A primer was used which included chromium 6 in the form of zinc chromate. The zinc chromate was used to help control corrosion. The zinc chromate was sprayed on, and the excess spray could spill onto the ground, where it could percolate into the soil or enter storm drains.

37. At DWR, I was timely provided with scientific literature concerning the use, disposal, testing, toxicological evaluations, treatment methods and regulatory enforcement options for a variety of chemical constituents, including chromium 6. Based upon my review of the documents attached hereto and numerous scientific literature provided to me during the regular course of my employment at DWR, I am aware of the use of chromium 6 in variety of industries, including: aircraft; metal pickling and plating operations; in anodizing aluminum; in the leather industry as a tanning agent; in the manufacture of paints, dyes, explosives, ceramics, paper, and many other substances (Ref. 45). My review of this literature further confirms the use of chromium 6 as a corrosion inhibitor in cooling systems (Ref. 45).

38. I am familiar with the DWR well logs attached hereto. These well logs are true and genuine DWR records which were provided to me during the regular course of my employment at DWR. These well logs were the standard forms utilized by DWR at the time for collecting and maintaining well data.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on January 14, 2003, at Burbank, California.

Glenn A. Brown

Glenn A. Brown

APPENDIX C

DECLARATION OF ARTHUR BRUINGTON

DECLARATION OF ARTHUR BRUINGTON

I, Arthur Bruington, declare:

I. BACKGROUND.

1. In 1949, I obtained a Bachelor of Science Degree in Civil Engineering at the California Institute of Technology ("Caltech"); and in 1950, I obtained a Master of Science Degree in Civil Engineering from Caltech. I was licensed as a Registered Civil Engineer in the State of California in 1953.

2. I have over 40 years of experience in the field of environmental engineering, water management and water pollution control. In July 1950, I began work as an engineer in the groundwater section of the Los Angeles County Flood Control District ("Flood Control"), now known as the Los Angeles County Department of Public Works. In this position, I monitored, mapped and collected hydrologic and water quality data for groundwater wells in the Los Angeles area. In addition, I was involved in a number of water conservation and water quality control projects concerning sea water intrusion, sewage treatment and reclaimed water. As a result of this work, I acquired significant knowledge about the groundwater hydrology and water quality challenges facing Los Angeles region, including the Upper Los Angeles River Area ("ULARA").

3. In approximately 1958, I became the Section Chief for the groundwater section of Flood Control, which section was later changed to the Water Conservation Division. In this position, I had management responsibility for all groundwater management and water conservation activities of the section.

4. In the Water Conservation Division, I served as Division Head. My responsibilities in this position included management authority, and developing and implementing solutions to minimize seawater intrusion and augmentation of local water supplies through spreading grounds.

5. In 1959, I became the Division Head for Flood Control's Water Conservation Division; and in 1962, I became an Assistant Chief Deputy Engineer for Flood

Control. In this capacity, I supervised three divisions within Flood Control, including the Water Conservation Division, and I had responsibility for many aspects of Flood Control's operations. In this position, I developed programs to maximize beneficial use of water involving the use of reclaimed water and the diversion of storm water to groundwater basins for later beneficial use.

6. In 1965, I became the Chief Deputy Engineer for Flood Control; and in 1970, I became the Chief Engineer for Flood Control. In this capacity, I was in charge of all aspects of Flood Control's operations. My responsibilities included: providing for the control and conservation of the flood, storm and other waste waters within the district; conserving water for beneficial use by spreading, storing, retaining or causing such water to percolate into the soil within the district; protecting the harbors, waterways, public highways and property in the district from water damage; and acquiring and conserving imported and reclaimed water for beneficial use within the district.

7. In 1979, I became the General Manager for the Irvine Ranch Water District, a public agency that provides domestic water service, sewage collection, and water reclamation for the City of Irvine and portions of surrounding communities. As the General Manager, I was responsible for all aspects of the District's operations until my retirement in May of 1987.

8. In addition to the foregoing, throughout my career, I have served as a consultant to a variety of public and private parties on water resource matters in Southern California. I have been involved in numerous water quality organizations and committees. I was appointed to the Los Angeles Regional Water Quality Control Board ("Regional Board"), where I served as a board member for many years, and as the chair for several years. My service on the Regional Board provided me with extensive experience in the many water quality issues facing the Los Angeles Region, including: the enforcement of water quality laws, regulations, and waste discharge requirements; the implementation and enforcement of local storm water control efforts; the regulation of contaminated or potentially contaminated sites;

coordination with other public agencies concerning water quality; and developing educational programs to inform and involve the public on water quality issues.

9. This declaration is based upon the personal knowledge I acquired as a result of working as a Registered Civil Engineer within the Los Angeles area for over 40 years, and if called to testify as a witness, I could and would competently testify thereto. Because of my many years of service for the Los Angeles County Flood Control District and the Los Angeles Regional Water Quality Control Board, I have extensive personal knowledge of water management and water pollution control issues involving the Upper Los Angeles River Area ("ULARA"). I personally investigated water quality, water conservation, and water treatment and other water protection matters within ULARA.

10. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as a Registered Civil Engineer within the Los Angeles area for many years; my experience on the Regional Board; my experience as a consultant in the areas of water management and water pollution control; and my review of numerous scientific reports and other technical documents reasonably relied upon by environmental and hydrologic experts regarding the ULARA. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. CHROMIUM 6 TASK FORCE.

11. During my tenure at Flood Control, I supervised on behalf of Flood Control, activities under an Agreement (the "Task Force") between several agencies – namely Flood Control, the Los Angeles Department of Water and Power ("LADWP"), and the Los Angeles Bureau of Sanitation ("Sanitation"). These three agencies formed the Task Force for the purpose of sampling a variety of chemical constituents, including chromium 6, in order to determine which chemicals were present in the Los Angeles River. I supervised Flood Control employees as they worked with other participating agencies in the Task Force. As part of the Task Force, the agencies allocated testing responsibilities among themselves and sampled at different points of the River from beginning to end.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on Jan 8, 2003, at Lake Forest, California.

Arthur Bruington

APPENDIX D
DECLARATION OF WILBERT CHUNG

DECLARATION OF WILBERT T. CHUNG

I, Wilbert T. Chung, declare:

I. BACKGROUND.

1. In 1951, I graduated from the University of Southern California with a Bachelor's degree in Civil Engineering, and I obtained a Registered Civil Engineering License in the State of California, License No. 9829.

2. I have extensive experience as a Civil Engineer in the areas of hydrogeology, water rights and water quality. From 1951 to 1952, I worked as a Civil Engineer for the State of California, Division of Highways. From 1952 to 1955, I worked as a Civil Engineer for Los Angeles County, where I designed sanitary sewers. From 1955 to 1958, I worked as a Civil Engineer, Job Captain, with Quinton Engineers. My responsibilities in this position included the design and preparation of plans for sanitary sewers, sewage treatment plants, pumping stations for water sewage, water storage tanks, storm drains, utilities, grading and roads for shopping centers, industrial facilities and residential subdivisions. In addition, I prepared master plan reports on sewage and water distribution systems for industrial parks and residential communities, and I served as a liaison between owner and contractor, public utilities, governmental agencies and other engineers.

3. From 1958 to 1979, I worked as a Civil Engineer for the State Water Rights Board of California ("State Board"), which is now known as the California State Water Resources Control Board.

4. During my tenure at the State Board, I served as referee for the Superior Court in the case of City of Los Angeles v. City of San Fernando et al., Los Angeles Superior Court, Case Number 650079 (the "San Fernando Case"), which involved a comprehensive determination of water rights within the Upper Los Angeles River Area ("ULARA"). The ULARA covers a vast area, encompassing 329,100 acres, including the San Fernando Valley and its 1.4 million residents. As referee, I supervised and directed the investigation of the physical facts for the Report of Referee, a detailed report that involved a complete hydrologic and geologic investigation of the ULARA, including a safe yield determination.

5. Among other things, my work as referee involved directing and supervising my staff as they personally interviewed well owners throughout ULARA. I relied on these interviews in preparing pumping, recharge and other hydrogeologic information in the Report of Referee. Interviews with well owners provided me with vast knowledge of the wells within ULARA, including well location, production rate, type of motors, purpose, volume of water production, use of return wells, and discharge practices.

6. I prepared the following appendices for the Report of Referee, Volume II, completed in 1962:

- Appendix E: Precipitation
- Appendix G: Import to ULARA by City of Los Angeles
- Appendix J: Delivered Water
- Appendix K: Land Development and Use
- Appendix L: Consumptive Use and Deep Percolation
- Appendix M: Transfers of Imported Water and Ground Water
- Appendix N: Sewage Export, Cesspool Recharge and Waste Discharge
- Appendix O: Separation of Surface Flow
- Appendix R: Ground Water Recharge and Safe Yield.

7. When the San Fernando Case was remanded, I prepared the supplemental data in connection with the remand – Supplements 1 and 2 of the Report of Referee. Supplement 1 contained corrections in connection with the remand, and Supplement 2 contained analyses, including safe yield, for each of the subareas within ULARA, namely the San Fernando, Sylmar, Verdugo, and Eagle Rock Basins.

8. My work as referee for the San Fernando Case involved a complete and comprehensive analysis of the ULARA, providing me with extensive personal knowledge of all aspects of the hydrogeology of the ULARA.

9. After completing my work on the Report of Referee, I served as the Engineer-in-Charge of the Los Angeles Office of the Division of Water Rights, State of California. My duties included supervising, compiling and managing data for the Ground Water

Extraction Recordation Act; supervising the inspection of permitted water rights for licensing water projects; representing the State Board at meetings with water companies, irrigation districts, municipalities and the general public regarding water resource allocations; negotiations between parties in water rights disputes and water rights consultation; directing and preparing investigations and reports in connection with alleged illegal diversions and water rights complaints; and serving as an expert witness in court and State Board proceedings in the field of water resources and surface and ground water hydrology.

10. From 1979 to 1984, while still employed by the State Board, I was on loan to the Los Angeles District, Corps of Engineers Construction Branch, as Program Manager, to monitor EPA grant projects for the construction of sewage treatment plants and interceptor sewers. The value of these construction contracts were in excess of $650 million. From 1984 until my retirement in 1986, I worked as a Grant Engineer for the Los Angeles District, Corps of Engineers, Construction Branch, where I was responsible for the establishment and approval of proper quality control and construction management for the construction of sewage treatment plants and sewers grant projects.

11. This declaration is based upon the personal knowledge I acquired as a result of working as a Civil Engineer within ULARA for many years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of all aspects of the hydrogeology of the ULARA. I personally investigated water rights, water quality, geology and hydrology within ULARA, and I prepared numerous documents relating to hydrogeology and water management within ULARA.

12. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as a Civil Engineer within ULARA for many years; my 35 years of experience as a Registered Civil Engineer in the area of hydrogeology, water rights, and water quality; and my preparation and review of numerous scientific reports and other technical documents reasonably relied upon by environmental and hydrologic experts regarding the ULARA. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. REPORT OF REFEREE.

A. Field Interviews.

13. I supervised four engineers in connection with the aforementioned hydrogeologic studies I prepared for the Report of Referee. For purposes of gathering data to be incorporated into tables and appendices for the Report of Referee, my staff personally interviewed well owners within ULARA.

14. Before conducting these interviews, my staff gathered DWR and State Board well data forms. These forms contained a variety of information to be requested from well owners, including: name of well owner, name of well user, location of well, well number, prior owners, type of pump, quantities extracted, water level measurements, chemical analyses, year of well drilling, depth of well, depths of perforation of casings, drilling log of wells, and other available records (Refs. 25, 31, 46).

15. After gathering the appropriate forms and data to be collected, my staff interviewed the parties, investigating the issues identified in the forms. Extraction and diversion data were major issues of inquiry. My staff determined extraction and diversion data from a combination of sources including interviews with well owners, meter records, and pump tests; and by investigating the duty of water, pump rates, hours of operation, power consumption and plant efficiency.

16. While conducting interviews and field work, my staff took handwritten notes to document the information acquired. After completing interviews and field work, my staff returned to the office where they extensively analyzed their notes and other data collected. The results of this data collection and analytical process were transcribed onto the well data forms attached hereto (Refs. 31, 46).

17. Senior engineers and supervisors reviewed the data transcribed onto the forms. If the results were approved, I would then compile the data collected for incorporation into the Report of Referee.

B. Preparation of Tables and Observations.

18. I relied on the data collected in my staff's field interviews in preparing the Report of Referee. For example, I prepared Table 12 for the Report of Referee, which is a part of Volume I, Chapter 5 (Water Utilization and Disposal). This Table, which sets forth the quantity of groundwater and surface water extractions and diversions within ULARA by parties and their predecessors, incorporates my work as supervisor of well data field work; it further explains waste disposal practices utilized within ULARA by the parties to the Judgment.

19. Of particular relevance, is Table 12's description of waste disposal practices. Extraction and disposal data for Lockheed Martin ("Lockheed"), Andrew Jergens Company ("Jergens"), Knickerbocker Plastic Company, Inc. ("Knickerbocker"), and Sears, Roebuck and Company ("Sears") are set forth in Footnote P of Table 12. This footnote expressly states that extractions by Lockheed, Jergens, Knickerbocker and Sears are "returned directly to groundwater without loss." (Ref.50 emphasis added). This is of particular importance, because as will be explained in more detail in section III below, these companies used chromium 6 in their cooling towers to control corrosion (Refs. 54-57). By directly returning groundwater used in their cooling towers without loss, each of these companies directly injected chromium 6 into the groundwaters of the ULARA (Refs. 31, 46, 50, 54-57).

20. I also worked on Appendix O (Separation of Surface Flow), which included an analysis of the quantities of waste discharged from industrial entities. I personally gathered and collected data concerning industrial waste discharges, and I supervised my staff's interviews and field work in this regard. As a result, I have personal knowledge that significant amounts of waste water were discharged into the River by industrial parties to the Judgment, particularly in the Burbank Western Wash, and as further set forth in Appendix O, Report of Referee, Volume II. My work in preparing Appendix O further revealed significant increasing industrial waste discharges into the River during and after "WWII with the expansion of industrial development in the San Fernando Valley." (Ref. 59).

III. AUTHENTICATION/DOCUMENT ANALYSIS.

21. Because of my work in supervising and investigating the use of wells within ULARA, including determining the quantity of groundwater and surface water extracted

and diverted, I recognize numerous documents as true and genuine records which were provided to me in the regular course of my employment with the State Board in my capacity as referee for the San Fernando Case.

22. I recognize and am familiar with the well logs both in Tab 54 (Defendants) to the Report of Referee, and the attached DWR well logs, which describe Lockheed's well use within ULARA, including Lockheed's extraction data and use of return wells. These well logs are true and genuine documents, provided to me in the regular course of my employment at the State Board while preparing the Report of Referee.

23. I also recognize and am familiar with the handwritten notes attached hereto concerning Lockheed's well use within ULARA (Refs. 31, 54). These notes are true and genuine documents that were provided to me in the regular course of my employment at the State Board while preparing the Report of Referee. These notes were prepared by my staff as part of their investigation of well owners and the quantity of extractions and diversions of water within ULARA. These notes indicate that Lockheed discharged water from cooling towers to return wells.

24. For example, with respect to Lockheed well number three, located at 1705 Victory Place, Burbank, California, the attached well log data states that this well was a "Return well for waters used for air. cond. of wind tunnel" (Ref. 46). Similarly, with respect to Lockheed well number four, also located at 1705 Victory Place, Burbank, California, the attached well log data states:

> "Well #4 – Pump 40hr/week 52 week/yr since well was first operated. All water from this well is returned down well # 3. Water is pumped from well through air. cond. system and returned to well # 3 100' away."
> (Ref. 46).

25. I also recognize and am familiar with Chapter 5 (Water Utilization and Disposal), Volume 1, Table 12, footnote P, described above. This Table is a true and genuine document that was prepared as part of my work on the Report of Referee. Consistent with the

notes concerning Lockheed Well Numbers 3 and 4 described above, this Table specifically provides that Lockheed's "extractions are returned directly to groundwater without loss" (Ref. 50). This Table further provides that extractions by Jergens, Knickerbocker, and Sears "are returned directly to groundwater without loss."

26. I recognize and am familiar with Appendix I, Volume II, which contains notes on each individual defendant. This is a true and genuine document prepared as part of my work on the Report of Referee. With respect to Lockheed, this section states that:

> "Since 1940, the defendant has operated four wells. Two of the defendant's wells are located on property owned by the Federal Government. The water from two wells was used in a closed air cooling system and the waste water discharged into return wells. Recently only one well used for air cooling was active. The remaining two wells were used as a standby water supply for fire protection. These wells are presently abandoned" (Ref. 56).

27. With respect to Jergens, Appendix I, Volume II, states:

> "The defendant drilled two wells in 1943 to obtain water for cooling purposes. Water was extracted from one well and the other well was used for the injection of waste water into the ground water basin" (Ref 54).

28. With respect to Knickerbocker, Appendix I, Volume II, states:

> "The well owned by the defendant has been in use since 1953. The water is used for cooling machinery in a manufacturing plant. Los Angeles city water is also used in a closed air conditioning system. Waters from both sources are injected into two return wells" (Ref. 55).

29. With respect to Sears, Appendix I, Volume II, states:

> "Well water is used in a closed cooling system at the Sears, Roebuck and Company store in Glendale. Used water is discharged into return wells" (Ref. 57).

30. Thus, as a result of my preparation of the Report of Referee – which included the gathering, collecting and preparation of numerous documents, as well as the supervision of well owner interviews within ULARA – I have knowledge that many companies at the time used chromium 6 to control corrosion in air cooling systems. Significantly, however, Lockheed, Jergens, Knickerbocker and Sears injected the chromium 6 contaminated water used in their cooling systems directly into the groundwaters of the ULARA through return wells.

IV. HYDROLOGY.

31. Because of my work in preparing the Report of Referee, I have extensive knowledge of the hydrogeology of the San Fernando Basin, including soil characteristics, groundwater direction and flow, and the opportunity for the infiltration of chemical constituents into the aquifer. The eastern portion of the Basin is an unconfined aquifer composed of alluvial deposits of sand and gravel (Ref. 49). The deposits have been eroded from the granitic rocks of the San Gabriel Mountains and transmit water at a relatively rapid rate (Ref. 49). This eroded debris is generally very coarse, and there is no significant barrier to the movement of chemical constituents in groundwater in the eastern portion of the Basin (Refs. 4, 5, 13-18, 30,49, 53, 62).

32. The general direction of groundwater flow in the Basin is from the recharge areas on the alluvial fans and along the edges of the valley fill, toward the Basin discharge area located in the Los Angeles River Narrows (Ref. 62). Well tests and observations revealed that flow velocities in the eastern portion of the Basin have been estimated to be between 300 to 500 feet per year. (Ref. 62).

33. Based upon my preparation of the Report of Referee and my extensive familiarity with the hydrogeology of the ULARA, it is my professional opinion that local

hydrogeologic conditions of the eastern portion of the Basin demonstrate that once chromium 6 contaminated water is injected into the aquifer by way of return wells or otherwise, this contaminated water commingles with other water in the Basin, rapidly migrating downstream in the general direction of groundwater flow, threatening wells utilized by the Cities of Glendale, Burbank and Los Angeles Refs. 4,5,13-18, 30, 53, 62).

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on Jan 7, 2003, at Los Angeles, California.

Wilbert Chung

Wilbert T. Chung

APPENDIX E
DECLARATION OF WILLIAM GARBER

DECLARATION OF WILLIAM F. GARBER

I, William F. Garber, declare:

I. BACKGROUND.

1. In 1941, I obtained a Bachelor of Arts Degree in Chemistry at the University of California at Berkeley. In addition, I have completed more than 65 units in additional graduate work in general engineering, sanitary engineering, sanitary chemistry, statistics, oceanography, biology, and public administration. I was officially licensed as a Registered Civil Engineer in the State of California in 1964.

2. I have over 40 years of experience in the field of environmental engineering, water management and water pollution control. From 1945 – 1947, I worked as a Sanitary Engineering Chemist with the firm of Montgomery and Pomeroy, Consulting Engineers and Chemists.

3. In 1947, I began work with the Los Angeles Bureau of Sanitation ("the Bureau"), where I worked as a chemist and engineer for over 38 years. From 1947 – 1951, I worked as the Chief Chemist for the Bureau, where I was involved in a variety of the Bureau's testing and laboratory activities. From 1951 – 1964, I worked as the Laboratory Director for the Bureau. In this position, I was in charge of research and process control laboratories as well as certain process units such as the anaerobic digestion and the activated sludge aerobic plant treatment systems. I was also involved in cooperative research work with other organizations including the City of Los Angeles Department of Public Works, Department of Water and Power and the Los Angeles County Flood Control District, covering such concerns as water conservation, industrial waste control, odor and corrosion control, sewer maintenance, and epidemiology.

4. In 1964, I was promoted to Assistant Chief Engineer for the Bureau's Wastewater Treatment Division, and I was later promoted to Chief Engineer. In this capacity, I had supervisory control over the Division's 220 employees and four large wastewater treatment plants and their processes. I was in charge of all operation and maintenance activities, as well as laboratory operations and research.

5. From 1977 to 1985, I served as the Assistant Director for the Bureau. My responsibilities in this position included supervision of all Bureau research, planning, and technical activities, including: wastewater collection; treatment and disposal; the storm drainage system; industrial waste control; sewer maintenance activities; refuse collection and disposal. I was also responsible for budget preparation and personnel management.

6. Since 1985, I have utilized my knowledge and experience in the field of environmental and sanitary engineering by providing consulting services for numerous clients, including the Orange County, California Sanitation Districts; Goleta, California Sanitation District; North American Aviation (Los Angeles, California); City of San Diego, California; ETOME, Ltd. Athens, Greece; Rio de Janeiro, Sao Paulo and Brasilia, Brasil; Southeast Asia Development Bank; and Southern California Edison.

7. I have extensive teaching experience in the field of engineering, water management and water pollution control. I served as an Adjunct Professor at Loyola Marymount University in Los Angeles, California, teaching Solid Waste Engineering and Toxic Waste Engineering. Among other things, in this capacity, I planned, organized and carried out an International Association of Water Pollution Research and Control (IAWPRC) Workshop-Conference on Wastewater Sludge Management in 1990. In 1993, I planned and organized an IAWPRC Workshop-Conference on Epidemiology, Risks and Risk Analysis in the Evaluation of Environmental Contaminants.

8. I taught qualitative-quantitative chemistry (Chemistry 1A) at the University of California at Los Angeles ("UCLA") for a number of semesters. I have been a regular lecturer and leader of seminars at UCLA. In addition, I taught sanitary chemistry for engineers at the University of Southern California ("USC"), and I have regularly presented seminars at USC in the fields of sanitary chemistry and engineering.

9. I have planned and taught in a number of Operator's Short Schools for the California Water Pollution Control Association, and I am a continuing member of the Engineering Curriculum Committee at Loyola Marymount University, in Los Angeles, California.

10. I am the author of over 80 publications in the areas of water quality, water management, wastewater disposal, wastewater treatment, environmental risk assessment, and the epidemiological risks of environmental contaminants.

11. I have been involved in numerous professional organizations in the field of water management and engineering, including the Water Pollution Control Federation, the American Society of Civil Engineers, the International Association on Water Quality and the American Academy of Environmental Engineers. I have prepared or been involved in the preparation and presentation of a number of special reports or position papers for these national organizations.

12. From 1971 to 1976, I served as a member of the Board of Governors of the California Water Pollution Control Association, a member of the Federal Water Pollution Control Federation ("WEF"). I served on numerous technical committees for the WEF, including Sludge Digestion, Land Disposal, Operator Relations, Coastal Waters, and Sewer Service Charge Recommendations. I prepared manuals of practice on sludge digestion and sewer service charges.

13. I served as the Secretary and Editor of the Newsletter-Journal for the International Association on Water Pollution Research and Control, and I am a Life Member of the American Society of Civil Engineers, the Water Environment Federation, the American Chemical Society and the American Water Works Association.

14. I received numerous honors for my work in the areas of water management, water pollution control and environmental engineering. I received the Rudolph Hering Medal from the American Society of Civil Engineers in 1953; the George Bradley Gascoigne Medal from the Water Pollution Control Federation in 1959; the Arthur Sidney Bedell Award from the Water Pollution Control Federation in 1966; the Rudolph Hering Medal from the American Society of Civil Engineers in 1977; and I have been designated a Diplomate, for the American Academy of Environmental Engineers.

15. This declaration is based upon the personal knowledge I acquired as a result of working as a Chemist and Civil Engineer within the Los Angeles area for over 40

years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of the hydrogeology of the Upper Los Angeles River Area ("ULARA"). I personally tested storm drains within ULARA, investigated water quality, water treatment, disposal and environmental risk assessment within ULARA; and I prepared numerous articles relating to water quality, water management, and environmental risk assessment within the Los Angeles area, including the ULARA.

16. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as a Chemist and Civil Engineer within the Los Angeles area for many years; my experience as a teacher, author, and consultant in the areas of water quality, water management, wastewater disposal, wastewater treatment, and environmental risk assessment; and my preparation and review of numerous scientific reports and other technical documents reasonably relied upon by environmental and hydrologic experts regarding the ULARA. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. DISCHARGES TO STORM DRAINS.

17. As a result of my work as a chemist and engineer with the Bureau, which included responsibility for testing storm drains, I acquired knowledge of State regulations promulgated in approximately 1955 which prohibited discharges to sanitary sewers. These regulations were promulgated primarily because constituents such as heavy metals, including chromium 6 and arsenic, were considered harmful to fish. Regulatory agencies therefore prohibited discharges of these constituents to sanitary sewers, due to concern that such contaminants would ultimately reach the ocean, adversely impacting aquatic life.

18. These regulations, however, had an unintended effect. During my tenure at the Bureau, I regularly visited and interviewed numerous industrial corporations and organizations for the purpose of assessing the impact of contaminants discharged to storm drains, and researching methods in which such discharges could be minimized.

19. During these interviews, I observed that, because waste discharges to sanitary sewers were prohibited, many companies instead discharged wastes to storm drains.

20. During these interviews, I further observed that discharges to storm drains and spills to the street were common because of pressures for production during WWII. Manufacturing companies were under significant pressure to timely produce products at rapid speed for use in the war This production pressure resulted in constant spills of chemical constituents, such as chromium 6 and the wash water containing chromium 6, to the ground and storm drains within ULARA. Testing I performed confirmed the presence of chromium 6 in storm drains within ULARA (Refs. 34, 35).

21. Because the Bureau had responsibility for testing and supervision of storm drains, I am familiar with the manner in which the River is impacted by discharges to storm drains, or spills to the street, which flow into storm drains. For example, in the eastern portion of the San Fernando Basin, including such areas as the Cities of Burbank and Glendale, where many industrial corporations were located, the storm drains discharge to the River (Refs. 13-18, 34-35, 63). This enables chemicals entering the storm drains to penetrate the groundwaters of the ULARA by infiltration through the River's unlined portions (Refs. 4, 5, 13-18, 30, 52).

22. Because of my work as a chemist and engineer within ULARA, I am also familiar with the manner in which chemicals spilled onto soils within ULARA may adversely impact the River. The eastern portion of the San Fernando Basin is generally considered an "unconfined aquifer," meaning that the sand and gravel that comprise the aquifer do not have extensive clay and silt layers, or aquitards, that separate it into confined layers (Ref. 49). In such a system, chemicals such as chromium 6 which are spilled or otherwise applied to the surface or shallow subsurface are likely to migrate through the porous sediments and into the underlying groundwater, causing detections of chromium 6 in the groundwaters of the ULARA utilized for domestic water supplies (Refs. 4, 5, 13-18, 30, 49).

III. <u>WORK WITH INDUSTRY GROUPS.</u>

A. <u>Preventing Spills and Leaks.</u>

23. I worked with a variety of industries to limit spills, leaks and discharges to storm drains, including: aircraft; metal pickling and plating operations; the leather industry;

those who used cooling towers or anodized aluminum; and manufacturers of paints, dyes, and explosives.

24. I personally visited companies in these industries for the purpose of showing them how to build and use drip pans to minimize spills and leaks. This was a cooperative effort, not designed to enforce regulations or to fine companies. Testing I performed confirmed the presence of chromium 6 in storm drains within ULARA (Refs. 34-35). The goal of these visits was to help limit the pollution that occurred by convincing industry groups to utilize mechanisms such as drip trays to minimize spills, leaks, and other releases of chemicals such as chromium 6 to the environment.

B. Cooling Towers.

25. I worked with a large number of companies to minimize spills, leaks and other discharges of chromium 6 related to the use of cooling towers. I personally visited companies within ULARA and interviewed them concerning their use of cooling towers. My interviews revealed that cooling towers were in all major buildings in Los Angeles and the San Fernando Valley. Chromium 6 was used for many years in these areas as a corrosion inhibitor in cooling systems.

26. My personal involvement in working with companies to eradicate discharges from cooling towers to storm drains provided me with personal knowledge that virtually every major company used chromium 6 in cooling towers, and that chromium 6 discharges from cooling towers entered the storm drains.

C. Industrial Use of Chromium 6.

27. I also worked with the plating industry and aircraft companies for the purpose of minimizing their discharges of chromium 6 into the environment. I visited plating and aerospace companies within ULARA and interviewed them concerning their use of chromium 6.

28. During this interview process, I observed that there were many plating shops throughout ULARA. These plating shops used a process that produced a bath filled with a number of constituents, including chromium 6. The plating bath and associated wash

water regularly spilled to the ground. This enabled chromium 6 to enter storm drains or percolate through the soil, in the manner described above.

29. After multiple visits and discussions with a variety of plating shops within ULARA, I convinced a number of plating companies to utilize drip trays to prevent spills of chromium 6 to the ground and storm drains.

30. During my tenure at the Bureau, I also observed that aircraft companies used chromium 6 in the manufacture of aircraft. There were several aircraft companies within ULARA. Lockheed-Martin ("Lockheed") was the largest. I personally visited Lockheed and Menasco Aerosystems Division/Coltec Industries ("Menasco"). Both companies were located in Burbank, California. I worked at North American Air Aviation ("North American Air"), which was also located within ULARA, from 1938 - 1939.

31. During my visits to Lockheed and Menasco, and during my employment at North American Air, I observed that all of these companies used chromium 6 within ULARA for anodizing aluminum. This process created a chromic acid bath that would be washed out. The wash water regularly spilled onto the ground, enabling chromium 6 to enter storm drains or percolate into the soil, in the manner described above.

32. I cooperatively worked with each of these aircraft companies to utilize drip trays to prevent such spills and leaks

IV. <u>IMPACT ON WATER PRODUCTION WELLS/COLORING IN THE RIVER.</u>

33. During my employment at the Bureau, I personally performed testing in storm drains within ULARA. This testing confirmed that chromium was present in significant amounts in storm drains throughout ULARA (Refs. 34-35).

34. I personally observed bright green/yellow coloring in the River near the Burbank Western Wash (the "Wash"). The colors I observed are typically associated with chromium 6, and it is generally recognized that if chromium 6 can be seen in water, the chromium 6 concentrations must be 1.5 mg/l (1,500 ppb) or higher (Ref. 45). Similarly, the

chromium taste threshold for the most sensitive person is approximately 1.5 mg/l (1,500 ppb) (Ref. 45).

35. I observed the bright green/yellow coloring in the Wash from approximately 1950 – 1955. The coloring made it clear that chromium 6 had been discharged to the Wash, and I believed the most likely suspect to be Lockheed because of its close proximity upstream to the Wash.

36. Testing in the Wash confirmed the presence of high concentrations of chromium 6. Testing in May 1955 at the Burbank Western Wash revealed chromium 6 concentrations of 70,000 ppb (Ref. 11). On March 23, 1955, workers tested for chromium 6 in the Burbank Western Wash every 15 minutes for two hours (Ref. 11). The recorded levels ranged from 5,000 ppb to 17,500 ppb (Ref. 11).

37. As a chemist, I was also concerned about chromium 6 because of the solubility and mobility of chromium 6 in groundwater. As stated in the Article. "Tracking Hexavalent Chromium in Groundwater," David Blowes, March 2002, Department of Earth Sciences, University of Waterloo:

> "The oxidized, hexavalent state of Cr, Cr(VI), forms chromate or bichromate. Chromate-containing minerals are very soluble and, because the chromate ion has a negative charge, chromate adsorption on aquifer minerals is limited. As a result, chromate may be present at concentrations well above water quality guidelines and may move with the flowing groundwater in aquifers. In contrast, the reduced state, Cr(III), forms insoluble precipitates under slightly acidic and neutral conditions, limiting Cr(III), to very low concentrations in most aquifers" (Ref. 2).

38. Because chromium 6, unlike trivalent chromium, is soluble and may move with flowing groundwater in aquifers, once chromium 6 reaches groundwater within ULARA, it poses a threat to groundwater production wells in the area because of its significant migratory capacity.

V. RUNOFF/SURFACE STREET CONTAMINATION.

39. During my tenure at the Bureau, I observed that rains within ULARA created a significant problem. A major rain event would cause flooding on the streets, increasing the amount of water and chemical constituents entering the storm drains. After significant rain events, I regularly sampled wastewater in manholes throughout ULARA. I, together with my staff, determined which solvents were present, traced the flow and direction of the chemical constituents, and ultimately determined the sources of the contamination. This process would often take up to a year.

40. I, together with my staff, met with organizations we deemed responsible on a cooperative basis for the purpose of educating them on how to minimize their waste discharges to the environment.

41. During my field work at the Bureau, on several occasions, I found large abandoned drums on the street filled with chromium 6 and other chemicals. I interviewed and visited industrial companies in the surrounding areas. This investigation revealed that many companies implemented such improper waste discharge practices because appropriate discharge procedures were expensive and time-consuming. My investigation further revealed that certain small companies, such as small plating operations, simply flushed the waste products from their industrial operations down the toilet.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on January 7, 2003, at Los Angeles, California.

William F. Garber

William F. Garber, P.E., D.E.E.

APPENDIX F

DECLARATION OF RODNEY KURIMOTO

DECLARATION OF RODNEY K. KURIMOTO

I, Rodney K. Kurimoto, declare:

I. BACKGROUND.

1. In 1968, I obtained a Bachelor of Science Degree in Chemistry from the University of California, Los Angeles. In 1970, I obtained a Master of Science degree in Analytical Chemistry from Purdue University. In 1977, I obtained a Master of Science Degree in Civil Engineering from Loyola Marymount University.

2. I have obtained numerous professional certificates and registrations:

- American Water Works Association Water Quality Laboratory Analyst Grade IV, Certificate 10124;
- State of California Water Distribution Operator Grade III, Certificate 17505;
- State of California Registered Environmental Assessor #REA-06961;
- Hazardous Materials Industry Technician Certificate #OR113781; and
- State of California Engineer-in-Training Certificate #36105.

3. I have substantial experience in the fields of water quality, sanitary engineering, and laboratory analysis. I have over 30 years of experience as a chemist and sanitary engineering associate with the Los Angeles Department of Water and Power ("LADWP"). I began work at LADWP in 1972, where I worked for the laboratory of the Sanitary Engineering Division/Water Quality Division. I began as a Laboratory Assistant, and I was promoted through various positions to Laboratory Supervisor. Among other things, my responsibilities included:

- Supervision of laboratory staff;
- Methods development and data validation;
- Preparation and presentation of written and oral reports; and
- Compilation and maintenance of laboratory records.

4. My duties also included maintaining written records of laboratory analyses, including chromium. From time to time, I also collected water samples from field locations within the Upper Los Angeles River Area ("ULARA"). I personally transcribed the LADWP

hexavalent chromium laboratory summaries from April 1973 to December 1974, and from May 1982 to March 1988. A true and correct copy of these summaries attached hereto and filed concurrently herewith (Ref. 11).

5. In 2000, I began work as a Sanitary Engineering Associate for LADWP's Water Quality and Operations Business Unit, Property Management Office. I am currently a Sanitary Engineering Associate III. Among other things, my responsibilities in this position include:

- Inspection/audit of hazardous materials facilities to develop and maintain compliance with state and federal risk management standards;
- Preparation of emergency response plans; and
- Development and management of worksite safety plans.

6. I have been involved in numerous professional organizations in the field of water quality, including the American Water Works Association and the American Chemical Society.

7. My professional experience in the field of water quality and sanitary engineering also includes prior service in the following positions:

- Community spokesman for LADWP Speakers Bureau;
- LADWP liaison with Certified Unified Program Agency (CUPA); and
- Member of LADWP HazMat team: first-responder, search and rescue, site remediation.

8. This declaration is based upon the personal knowledge I acquired as a result of working as a Chemist and Sanitary Engineering Associate within the Los Angeles area for over 30 years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of the water quality within ULARA, and laboratory analyses conducted within ULARA. I personally maintained written records of laboratory analyses, including hexavalent chromium, within ULARA. I collected water samples from field locations within ULARA, and I personally transcribed the attached LADWP hexavalent chromium laboratory summaries completed in 1977 (Ref. 11).

9. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as a Chemist and Sanitary Engineering Associate within the Los Angeles area for many years; my experience as a certified Water Quality Analyst, Water Distribution Operator, Hazardous Materials Technician, and a Registered Environmental Assessor; and my review of numerous scientific reports and other technical documents reasonably relied upon by chemical, environmental and hydrologic experts regarding the ULARA. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. AUTHENTICATION.

10. Because of my fieldwork and lab work since 1972, I am familiar the attached chromium 6 test results collected and maintained by LADWP (the "Cr6+ Summaries"). I personally transcribed the Cr6+ Summaries from April 1973 to December 1974, and from May 1982 to March 1988.

11. Having worked with LADWP for over 30 years and having personally transcribed LADWP test results for approximately 7 years, I am intimately familiar with LADWP's procedures for testing and posting laboratory results onto the attached Cr6+ Summaries. The attached Cr6+ Summaries constitute true and genuine LADWP records, regularly collected and maintained by LADWP. The Cr6+ Summaries are the final, official record of results obtained from LADWP's laboratory testing program. The Cr6+ Summaries are considered the permanent, complete record from the LADWP laboratory.

12. Until the late 1980s, recording test results onto the attached Cr6+ Summaries was the manner in which LADWP maintained its sampling results. In approximately 1988, this procedure was converted to a computerized process called "LIMS," an acronym for Laboratory Information Management System.

III. PROCEDURES FOR RECORDING CR6+ SUMMARIES.

13. Because I personally recorded LADWP test results for approximately 7 years, I am thoroughly familiar with the standard procedures utilized by LADWP for recording the attached Cr6+ Summaries.

14. Before entering the field, the chemist, biologist, engineer or lab technician ("Collector") performing the sampling had a checklist indicating the various samples that should be taken. The determination of what samples should be taken was generally left to the discretion of the individuals collecting the sample, provided they were of high enough seniority or rank. Otherwise, these individuals had orders specifying the sampling that should take place. The Collector would take handwritten notes indicating relevant and appropriate information such as the sample site, sample date and time, sampling conditions, and any special remarks concerning the sample.

15. After the sample was collected, it was logged and given an identification number. The lab maintained a permanent lab book from which the identification number was assigned. The number assigned would be the next available number from the permanent lab book.

16. Once a number was assigned to the sample, the Collector would write the identification number on a label (or labels) and affix the label(s) onto each sample bottle that was collected. The Collector would also write the identification number onto the handwritten notes and transcribe his or her handwritten notes onto pre-printed forms available in the LADWP lab.

17. The Collector would place the bottle(s) in a designated location in the laboratory according to established protocols. Laboratory staff was trained to check that location regularly for arrival of new samples. On occasions when samples needed immediate attention or when the Collector wished to provide special instructions, the Collector would speak directly to the laboratory supervisor or to the individual analysts about special needs.

18. This procedure for chain-of-custody of the sample bottles was employed to ensure timely processing of samples in an efficient manner. Under normal conditions, no special protocols were used to provide security of samples or to guard against tampering by unauthorized parties. However, the laboratory did have available a more rigorous procedure involving signatures when transferring custody and storage of sample bottles in locked areas. Such enhanced security was used on rare occasions when handling sensitive samples such as

evidence from police or fire investigations. Chromium 6 samples were not considered to need such special handling.

19. The pre-printed forms were then placed onto a clipboard. The lab analysts responsible for each particular chemical that had been requested (i.e., chromium 6) would read the forms on the clipboard to determine what tests were required, perform the assigned chemical tests and post the results onto the forms. Laboratory supervisors and engineers would review the clipboard data for purposes of ensuring the findings were reasonable. The supervisors and engineers would indicate their approval of the data by affixing their name to the form with a rubber stamp. Recent data recorded in the LIMS system cited above were reviewed for reasonableness and approved by supervisors in a similar manner, but all procedures were conducted electronically and the results and approvals were stored in a computer.

20. The test results were subjected to a review for reasonableness, based primarily on consistency with historical data. For example, if the test result indicated a concentration inconsistent with the historic average range for a particular chemical in a certain area, the result would be scrutinized and the test would be repeated, unless there was an adequate explanation for the variance, i.e., a new well had been drilled, there were recent treatments containing copper in the area, etc. The review for reasonableness also involved an internal check, involving anions and cations. If the negative and positive charges did not balance, additional testing would similarly be required. Other internal checks could be developed on a case-by-case basis, depending on specific needs and special test criteria.

21. After the test results were routed through management, and if the test results were deemed satisfactory, the results were recorded onto the Cr6+ Summaries attached hereto (Ref. 11). If the results were inconclusive or unsatisfactory, the sample was sent back and additional testing was required.

22. After the results were recorded onto the Cr6+ Summaries, the Cr6+ Summaries were used as official data in a variety of contexts. For example, the Cr6+ Summaries were submitted to regulatory agencies such as the Department of Health Services;

utilized by LADWP in the preparation of its annual report; utilized by individual divisions of LADWP for a variety of reports; utilized by the ULARA Watermaster in the performance of its court-mandated reporting responsibilities; and utilized by a variety of agencies and individuals for water management decisions, identifying chemical constituents, characterizing a particular area, and determining the impact of the results on the region's water supply.

IV. METHODS.

23. In compiling the attached Cr6+ Summaries, LADWP's laboratories utilized the highest standards. LADWP employees were extensively trained in accordance with the "Standard Methods for the Examination of Water and Wastewater," ("Standard Methods"), which are universally used by testing laboratories in the U.S.A. All tests, including tests for chromium 6, were performed in accordance with the Standard Methods. The Standard Methods have been published regularly since 1905 by the American Water Works Association, the Water Environment Federation, and the American Public Health Association. LADWP followed the Standard Methods as updated from time to time. A 3-Ring Binder was maintained in the LADWP laboratory that contained written procedures for all laboratory tests that varied from the Standard Methods.

24. In general, the Standard Methods set forth two methods for chromium testing – the Colorimetric Procedure and Atomic Absorption. The Colorimetric Procedure is utilized by many laboratories where finances do not allow the purchase of an Atomic Absorption instrument. The Colorimetric Procedure is a popular testing method because the procedure is fairly simple and does not require expensive equipment. In this method a sample is treated with appropriate reagents, then combined with a chemical to create a specific color that is unique to chromium 6. The intensity of the color indicates the concentration of chromium 6 in the sample. Chromium 6 is yellow or yellowish-green in neutral or basic solution. The Colorimetric Procedure has been utilized for many decades and is known and recognized for producing high quality accurate results. The Atomic Absorption method was not widely used prior to the 1960's.

25. Because of my many years of work, study and training as a lab analyst, I am familiar with the error factors for Colorimetric and Atomic Absorption testing. Both procedures are generally regarded as being very good in terms of having a low error factor. The Colorimetric error factor is between approximately 2 – 4%. The Atomic Absorption error factor is between approximately 2 – 3%.

V. SAMPLING EVERY 15 MINUTES.

26. The Cr6+ Summaries indicate regular testing for Cr6+ and a number of other heavy metals. In several instances, composite samples – a series of tests – were performed quite frequently. For example, on March 23, 1955, chromium 6 was tested in the Burbank Western Wash every 15 minutes for two hours (Ref. 11). The recorded levels ranged from 5,000 ppb to 17,500 ppb (Ref 11).

27. Frequent composite sampling occurs for a variety of reasons. Generally, such frequent testing indicates an intention to determine whether the chemical constituent is showing a trend, an average, or a time where the chemical peaks by hitting a high or low detection.

28. Based on the large quantity of historical data, trends in chromium 6 concentrations during normal conditions can be seen. On some occasions, unusually high concentrations were found; LADWP's rigorous internal accuracy verification processes confirmed these high concentrations. These unusually high concentrations indicate periods in which contamination was present from some external source.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on 06 JANUARY, 2003, at LOS ANGELES, California.

Rodney K Kurimoto
Rodney K. Kurimoto

APPENDIX G
DECLARATION OF WILLIAM REE

DECLARATION OF WILLIAM R. REE

I, William R. Ree, declare:

I. BACKGROUND.

1. In 1947, I obtained a Bachelor of Science degree in Chemical Engineering from the University of Southern California. I have been a Licensed Water Treatment Operator, Grade V (#00065) since 1956, and a Registered Civil Engineer (#17943) since 1968.

2. In February 1947, I joined the Los Angeles Department of Water and Power ("LADWP") as a Sanitary Engineering Assistant. In this position, I personally tested and supervised the sampling for water quality throughout the Upper Los Angeles River Area ("ULARA"). I supervised three employees engaged in collecting water samples from the distribution system to assure LADWP's supply complied with the requirements of the United States Public Health Service ("USPHS") and the California Department of Health Services ("DHS"). I collected samples of water from the Los Angeles Aqueduct and each individual well on a semi-annual basis for chemical analysis. In addition, I supervised three persons engaged in answering and investigating consumer inquiries or complaints regarding the municipal water supply. I investigated, answered and responded to consumer inquiries of a technical nature regarding the Department's water supply; and I developed and implemented monitoring schedules.

3. In May 1954, I was promoted to Sanitary Engineering Associate. In this position, I performed multiple tests on a variety of water treatment equipment. I supervised and operated an experimental diatomaceous earth filter to determine operating parameters and possible use for future needs of the LADWP system. In addition, I assisted in the development, design and installation of chlorine leak detectors at LADWP chlorination stations.

4. From August 1962 to June 1968, I served as a Sanitary Engineering Associate in LADWP's Water Quality Section. In this capacity, I supervised and assisted employees engaged in the treatment of reservoirs as needed to control growth and turbidity using chlorine, copper sulfate, or aluminum; and I performed field tests and collected water samples for laboratory analysis. In addition, I supervised LADWP's radiological monitoring

program, and I served as LADWP's representative to the State of California's radiological program and Civil Defense program.

5. From June 1968 to March 1977, I served as a Sanitary Engineer in LADWP's Sanitary Engineering Division. In this position, I supervised Water Treatment Section employees engaged in the operation of LADWP's chlorination stations. I supervised three employees engaged in the operation of experimental treatment processes for treating domestic supplies, and I supervised the experimental operation of an activated carbon process for water reclamation.

6. In March 1977, I was promoted to Senior Sanitary Engineer; and in 1978, I was named Division Head of LADWP's Water Quality Division, where I served until my retirement in 1980. As LADWP's Water Quality Division Head, I directed and supervised the operation of five sections: Laboratory; Water Quality; Cross-connection and Watershed Protection; Water Treatment; and Clerical – which involved the supervision of approximately 95 persons. I prepared the Annual Report of Water Quality Division, and I was in charge of supervising all water quality activities to assure compliance with state and federal drinking water standards.

7. This declaration is based upon the personal knowledge I acquired as a result of working as a water treatment and sanitary engineer within the Los Angeles area for over 33 years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of the water quality within ULARA, historic state and federal drinking water standards, and laboratory analyses conducted within ULARA. I personally monitored, tested and collected water samples from field locations within ULARA. My field work included testing for hexavalent chromium. I was also personally involved in the development and operation of facilities utilized for treating domestic water supplies.

8. To the extent opinions are expressed herein, the opinions are based upon my educational background; my work as a Civil, Sanitary and Water Treatment Engineer within the Los Angeles area for many years; my testing, monitoring and analysis of water quality and treatment within ULARA; and my review of numerous scientific reports and other technical

documents reasonably relied upon by chemical, water quality and environmental experts regarding the ULARA. If called to testify as an expert witness, I could and would competently testify to the professional opinions set forth below.

II. <u>GREEN/YELLOW COLORING IN THE RIVER.</u>

9. As part of the field work I performed as a LADWP employee, I personally observed green/yellow coloring in the Burbank Western Wash (the "Wash") from approximately 1950-1955. This field work was part of an ongoing monitoring program to determine which chemical constituents were present in the River. This field work was conducted for reporting purposes only; it was not mandated by any regulatory body, statute or court order. To the contrary, it was conducted because everyone was doing their job, being pro-active, and thought they should be aware of the chemical constituents present in the waters of the ULARA.

10. The green/yellow coloring I observed in the Wash was quite visible and could be clearly observed by anyone looking at the River. The green/yellow coloring I observed is commonly associated with chromium 6 (Refs. 43, 44).

11. Generally, chromium 6 is not visually discernible in water unless it exceeds 1.5 mg/l (1500 ppb) (Ref. 45). Testing in the lab confirmed chromium 6 was present in high concentrations in the Wash (Ref 11). For example, testing in May 1955 at the Wash revealed chromium 6 concentrations of 70,000 ppb (Ref 11). In one instance, on March 23, 1955, workers tested for chromium 6 in the Wash every 15 minutes for two hours (Ref 11). The recorded levels ranged from 5,000 ppb to 17,500 ppb (Ref. 11).

12. Extensive literature documents the use of chromium 6 by various industries, including: aircraft; metal pickling and plating operations; in anodizing aluminum; in the leather industry as a tanning agent; in cooling systems as a corrosion inhibitor; in the manufacture of paints, dyes, explosives, ceramics, paper, and many other substances (Ref. 45).

13. Because of the high concentrations of chromium 6 in the Wash, I suspected that the Wash was being utilized by industrial organizations as an open source for

the dumping of chemical constituents. Accordingly, I, together with my staff, closely watched and inspected the Wash.

14. As part of this inspection, I visually investigated the Wash and its surrounding areas. As I conducted this investigation, I personally observed that the waste stream flowing from Lockheed Martin's ("Lockheed") facilities contained the same green/yellow coloring I observed in the Wash. Indeed, I observed that the green/yellow coloring in the waste stream flowing from Lockheed's facilities flowed directly into the Wash.

III. AUTHENTICATION.

15. Based on my fieldwork and lab work since 1947, I recognize and am familiar with the summaries of chromium 6 test results attached hereto ("Cr6+ Summaries" also, "Chromium 6 Test Results – Ref 11). The Cr6+ Summaries constitute true and genuine LADWP records, which were provided to me in the regular course of my employment at LADWP.

16. I am aware of LADWP's chemical testing procedures, as well as LADWP's procedures for recording the results of chemical sampling. The Cr6+ Summaries were regularly collected and maintained by LADWP, and they were the standard sheets for recording results from the LADWP testing program at the time. The Cr6+ Summaries constitute the permanent, complete, record sheets from the LADWP laboratory.

IV. TEST METHODS.

17. LADWP followed the "Standard Methods for the Examination of Water and Wastewater," ("Standard Methods") published regularly since 1905 by the American Water Works Association, the Water Environment Federation, and the American Public Health Association.

18. LADWP sampled in accordance with the highest industry standards of the time. LADWP laboratories consistently possessed among the lowest error factors in the country for the time. LADWP generally utilized colorimetric testing for chromium 6. After approximately the early 1960s, atomic absorption was commonly utilized for total chromium testing.

19. It was common for LADWP to test for chemical constituents, including chromium, approximately once per month, as indicated by the testing frequency recorded in the attached Cr6+ Summaries.

V. <u>CHROMIUM 6 SUMMARIES.</u>

20. As part of the continuing program to monitor the River's flow from beginning to end, there was regular Department sampling at the locations indicated in the attached Cr6+ Summaries. This sampling was often conducted on a cooperative basis between several agencies, including LADWP, the Los Angeles County Flood Control District ("Flood Control"), and the Los Angeles Bureau of Sanitation ("Sanitation").

21. LADWP, Flood Control and Sanitation were all involved in monitoring and investigating contaminants in the River, and I was personally involved in this monitoring effort on behalf of LADWP. Each of the agencies was interested in a variety of chemicals for taste, odor, aesthetics, risk assessment, and compliance with state and federal standards. Heavy metals, including chromium 6, were a part of this investigative effort.

22. Flood Control initiated joint efforts to monitor constituents in the River because the River channel was within Flood Control's jurisdiction. John Mitchell, an engineer employed by Flood Control, had a major concern with the green/yellow coloring in the Wash. John Mitchell expressed a concern that the coloring would create not only a current, but also a future, water quality issue.

23. Accordingly, John Mitchell initiated and coordinated sampling for chromium 6 and allocated sampling points among the various agencies. Art Bruington, whose declaration is filed concurrently herewith, supervised John Mitchell's efforts at Flood Control. Dr. William Straub – a chemist for Flood Control at the time whose declaration is also filed concurrently herewith – performed the laboratory work for Flood Control under the supervision of John Mitchell. The cooperative testing between LADWP, Flood Control, and Sanitation confirmed that the green/yellow coloring in the River was caused by high concentrations of chromium 6 in the River.

VI. <u>TREASURY STANDARDS.</u>

24. Because my responsibilities in LADWP's water quality division included compliance with state and federal standards, I have personal knowledge of historic water quality standards promulgated by the Department of Treasury ("Treasury") and the USPHS.

25. The 1914 Treasury standards were used before the USPHS standards were promulgated in 1946 and 1962. The 1914 Treasury standards did not have chromium because there was not an awareness of chromium at that time. The 1914 standards were primarily concerned with testing for bacteria.

26. In 1946, the USPHS established a standard of .05 mg/l (50 ppb) specifically for chromium 6. This standard was promulgated due to concern of water quality in trains used for interstate commerce.

VII. CHROMIUM 6 USES.

27. Because of my degree in Chemical Engineering, as well as my work for many years in LADWP's water quality division – which included field work and personal visits and interviews with multiple industrial organizations, I have personal knowledge that chromium 6 was used by aerospace companies to anodize aluminum, and that chromium 6 was also used extensively in the plating industry. The wash water used by these industries created a chromic acid bath, which frequently spilled onto the ground, soil, and into storm drains.

28. Chromium 6 was also utilized by every building with a cooling tower. Chromium 6 was used in cooling towers to control corrosion.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on Jan. 13, 2003, at Ventura, California.

William R Ree

William R. Ree

APPENDIX G
DECLARATION OF WILLIAM STRAUB

DECLARATION OF WILLIAM O. STRAUB

I, William O. Straub, declare:

I. BACKGROUND.

1. In 1971, I obtained a Bachelor of Science degree in Chemistry from the California State University at Long Beach. In 1974, I obtained a Master of Science degree in Civil Engineering from the University of Southern California. In 1990, I obtained a Master of Science degree in Physics from the California State University at Los Angeles. In 2000, I obtained a Ph.D. in Environmental Engineering from the University of Southern California.

2. I have been a Registered Civil Engineer, License No. C-26641, since March 1976.

3. In 1972, I joined the Los Angeles County Flood Control District ("Flood Control"), where I worked as a Chemist in the water quality lab. Flood Control is now known as the Los Angeles County Department of Public Works. At Flood Control, I performed wet-chemical and instrumental analyses of water, wastewater and groundwater samples for local agencies. I tested for both organic and inorganic constituents, including chromium 6. I was also involved in Flood Control's storm water program. As part of this program, after significant rains, I personally collected samples at numerous locations along the Los Angeles River ("River").

4. In 1974, I joined the Los Angeles Department of Water and Power ("LADWP") as a Civil Engineering Associate. In this capacity, I performed sampling for conductivity, pH, carbon dioxide, and other substances. In 1980, I was promoted to Sanitary Engineering Associate. I wrote computer programs (FORTRAN, BASIC and PL1) for numeric modeling of water distribution networks; and I oversaw planning, analysis and design of new expanded water distribution networks and pump-tank facilities.

5. I prepared approximately 100 pages for the 208 Area-Wide Groundwater Quality Management Plan for the San Fernando Valley Basin ("208 Report"). The 208 Report was prepared by the Southern California Association of Governments ("SCAG"), together with LADWP, pursuant to the provisions of Section 208 of the Federal Water Pollution Control Act

of 1972, as amended (commonly referred to as the "Clean Water Act"). Among other things, the 208 Report contained a comprehensive analysis of the quality of drinking water sources within the Upper Los Angeles River Area ("ULARA"); the 208 Report further issued findings, recommendations, and implementation actions designed to carry out the goals of the Clean Water Act.

6. In 1984, I worked with Richard Bell, a former LADWP Engineer, working for SCAG at the time. With the advent of Superfund, federal grants became available to assist local agencies in the development and implementation of groundwater clean-up activities. I worked with Richard Bell in successfully securing from EPA a grant of approximately $5.6 million for groundwater remediation purposes.

7. I performed multiple tasks in connection with Superfund groundwater cleanup activities, including: developing the work plan utilized by EPA for the San Fernando Valley Superfund groundwater clean-up project; preparing the Remedial Investigation/Feasibility Study ("RI/FS") for the North Hollywood Superfund Site; conducting related contract negotiations with project consultants; and leading bi-weekly public presentations to citizens' groups in conjunction with EPA's Public Outreach program.

8. During my tenure at LADWP, I also worked with William Ree, whose declaration is filed concurrently herewith. William Ree worked as a Sanitary Engineer at LADWP for a number of years, and also headed LADWP's Water Quality Division.

9. In 1988, I began work as a Civil Engineer with the Los Angeles Bureau of Sanitation (the "Bureau"), where I worked with the Clean Water Program. In this position, I prepared concept reports, feasibility studies and cost estimates for proposed conventional and advanced water/wastewater treatment facilities in conjunction with a $3 billion capital improvement program. In addition, I supervised consultant personnel performing hydraulic analyses of proposed reclaimed water distribution systems; and I extensively participated n public outreach programs.

10. In 1992, I became the Assistant Division Manager/Senior Engineer, in the Wastewater Engineering Services Division, of the Los Angeles Department of Public Works

("Public Works"). In this position, I supervised staff responsible for water treatment plant effluent compliance, water and wastewater treatment research, regulatory negotiations, and revenue projections.

11. At Public Works, I oversaw and/or performed: (1) regulatory compliance investigations and field studies (process modifications, air emission, nitrification/denitrification); (2) negotiations with regulatory agencies (primarily Region IX EPA, Los Angeles Regional Water Quality Control Board and South Coast Air Quality Management District); (3) statistical analyses and projections of technical data and population, water use and treatment costs for development of annual multi-year revenue/O&M program; and (4) consultant contract management.

12. Since September 2002, I have served as the Assistant Executive Officer/Staff Engineer for the Main San Gabriel Basin Watermaster ("San Gabriel Watermaster"). The San Gabriel Watermaster is the court-appointed entity charged with administering adjudicated water rights and managing groundwater resources within the Main San Gabriel Groundwater Basin – which covers an area of approximately 200 square miles, and is the source of 80 – 85 percent of the water supply to over a million people.

13. At the San Gabriel Watermaster, I oversee coordination of replacement water purchases and delivery of engineering consultant services. In addition, I supervise a staff of engineering and administrative personnel concerning water supply and water quality matters relating to the Basin.

14. This declaration is based upon the personal knowledge I acquired as a result of working as a Chemist and Civil Engineer within the Los Angeles and surrounding areas for approximately 30 years, and if called to testify as a witness, I could and would competently testify thereto. I have extensive personal knowledge of the water quality within ULARA and surrounding communities; laboratory analyses conducted within ULARA; and groundwater remediation activities conducted within ULARA. I personally monitored, tested and collected water samples from field locations within ULARA. My field work included sampling for hexavalent chromium. I was also personally involved in the development and

24. In particular, because certain portions of the River were unlined, the Regional Board expressed concerns as to the ability of chlorides to percolate through these unlined reaches and adversely impact the beneficial use of groundwater wells utilized for domestic purposes by the Cities of Los Angeles, Glendale and Burbank.

25. The Bureau and the Regional Board engaged in debate over the factors contributing to the increase in chlorides, remediation options, and the infiltration characteristics in the area. After significant debate, the parties were unable to reach consensus.

26. Accordingly, the Bureau contracted with Brown and Caldwell Consultants to prepare the Report. I supervised the Report on behalf of the Bureau. I, together with Brown and Caldwell, worked with the ULARA Watermaster, Melvin Blevins, for purposes of gathering data and analyzing the hydrology and infiltration characteristics of the area.

27. The Report provides an extensive discussion of the hydrogeology of the ULARA, and the factors influencing the potential infiltration of chemical constituents within the 7-mile unlined stretch of the River. This stretch was left unlined primarily because rising groundwater conditions in the area could potentially compromise the structural integrity of the concrete lining had the entire River channel been lined.

28. The Report notes the varying levels of infiltration that may occur in the unlined reaches, depending on a number of factors, including without limitation:

(1) Groundwater levels in the area, i.e., whether conditions at the time are such that potential recharge is returned to the River channel as rejected recharge due to high groundwater conditions, allowing a portion of the recharge that could occur to eventually flow out of the Basin as rising groundwater outflow;

(2) Dilution of chemical constituents in groundwater, such as dilution which may occur as a result of flowing water released from Tillman and LA-Glendale;

(3) The amount of groundwater being pumped. That is, whether there is a condition of non-pumping, allowing higher water levels and therefore less recharge opportunity; or whether there is a draw down in the aquifer attributable to the heavy pumping of wells, such as in the Pollock, Crystal Springs, or Glendale Grandview well fields (which were

off line at the time of the Report). Heavy pumping of these wells could lower groundwater levels allowing greater recharge opportunities;

(4) Seasonal fluctuations, such as the increased volume of runoff that may provide additional dilution of chemical constituents in the surface water; and

(5) Other factors, such as the distribution of hydraulic pressure gradient; surface and groundwater interface; bedrock permeability; and the level of chemical constituents released from the Plants.

29. Notably, Figure 2-4 of the Report (Ref. 8) provides an historical analysis of the variation in recharge opportunity that may occur depending on the interplay of the aforementioned factors at different time periods. The Report notes that application of the identified factors may result in varying infiltration opportunities. During significant recharge periods, the Report notes that groundwater recharge in certain unlined portions of the River may exceed 10,000 acre-feet per year (Ref. 5).

30. As I worked on the Report, I communicated with representatives from the City of Burbank ("Burbank"). Because of these communications, I am informed that Burbank engaged in similar discussions with the Regional Board and, as a result, Burbank prepared a separate report concerning the levels of chlorides in effluent from its water reclamation facilities. I reviewed and analyzed Burbank's report. I am therefore aware that the conclusions reached by Burbank were substantially similar to those set forth in the attached Report of the Bureau, prepared by Brown and Caldwell consultants, in cooperation with the ULARA Watermaster.

IV. <u>MIGRATION AND SOLUBILITY OF CHROMIUM 6.</u>

31. Because of my degree in Chemistry, my work as a Chemist in the water quality lab at Flood Control, my water quality work at LADWP, and my involvement in the collection and analysis of chromium 6 samples, I am aware of the chemical characteristics of chromium 6.

32. Chromium 6 is generally well recognized for its solubility. In alluvial aquifers, chromium 6 is mobile, capable of flowing with moving groundwater in aquifers. As

stated in the Article. "Tracking Hexavalent Chromium in Groundwater," David Blowes, March 2002, Department of Earth Sciences, University of Waterloo:

> "The oxidized, hexavalent state of Cr, Cr(VI), forms chromate or bichromate. Chromate-containing minerals are very soluble and, because the chromate ion has a negative charge, chromate adsorption on aquifer minerals is limited. As a result, chromate may be present at concentrations well above water quality guidelines and may move with the flowing groundwater in aquifers" (Ref. 2).

33. Thus, the detection of chromium 6 in groundwater, above state and federal standards, poses a threat to the environment due to the ability of chromium 6 to migrate and threaten the beneficial use of surrounding groundwater wells utilized for domestic use.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Executed on JANUARY 9, 2003, at AZUSA, California.

[signature]

William O. Straub

IX. RESOLUTION FOR PRESERVATION OF TESTIMONY

UPPER LOS ANGELES RIVER AREA (ULARA) ADMINISTRATIVE COMMITTEE

MEETING MINUTES

June 24, 2002

The special telephone conference meeting was called to order by Mr. Fred Lantz, President of the Administrative Committee (AC) regarding the preservation of testimony at 10:00AM. The attendees identified themselves by roll call: Tom Erb – Los Angeles, Don Froelich- Glendale, Mike Sovich – Crescenta Valley Water District, and Fred Lantz - Burbank. Mike Drake – San Fernando was absent.

Mel Blevins introduced the resolution (Attachment A) that had been e-mailed to all the participants. He added that Ms. Julie Conboy, Los Angeles City Attorney who had previously reviewed and approved the resolution, asked that Mr. Ed Schlotman, Los Angeles City Attorney, be notified of the time for the conference call should he wish to be involved.

Mr. Blevins described the three changes that had been made at 9:30AM, June 24, 2002, and he stated that no further changes were made:

1. The number "2002-1" was added to the title and the word "Proposed" was deleted.
2. The Judgment was described, "San Fernando Judgment signed January 26, 1979, Case No. 650079."
3. A signature page was attached.

Mr. Fred Lantz asked if there were any further comments. Hearing none he made the following motion: I move that Resolution 2002-1 of the ULARA Administrative Committee regarding the preservation of testimony related to hexavalent contamination in the San Fernando Basin be approved.

Mr. Mike Sovich seconded the motion. The motion was unanimously passed by a roll call of all the participants: Tom Erb, Don Froelich, Mike Sovich, and Fred Lantz.

All Administrative Committee members will sign the resolution document. The ULARA Watermaster Mel Blevins will provide the resolution for all to sign on June 25, 2002. Tom Erb will sign when he returns from his vacation.

There being no further business the meeting was adjourned until the next regular meeting scheduled for September 25, 2002.

UPPER LOS ANGELES RIVER AREA WATERMASTER

CITY OF LOS ANGELES VS. CITY OF SAN FERNANDO, ET AL
CASE NO. 650079 – COUNTY OF LOS ANGELES

MELVIN L. BLEVINS – WATERMASTER

OFFICE LOCATION:
111 North Hope Street, Room 1472
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TELEPHONE: (213) 367-1020
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MAILING ADDRESS:
ULARA WATERMASTER
P.O. Box 51111, Room 1472
Los Angeles, CA 90051-0100

July 8, 2002

Administrative Committee
Upper Los Angeles River Area (ULARA)
Mr. Fred Lantz, President
City of Burbank
Mr. Michael Sovich
Crescenta Valley Water District
Mr. Michael Drake
City of San Fernando
Mr. Donald Froelich
City of Glendale
Mr. Thomas Erb
City of Los Angeles

Gentlemen:

Approved 2002-1 Resolution for Preservation of Testimony by ULARA Administrative Committee

This transmits the signed 2002-1 resolution for preserving testimony on hexavalent chromium contamination in the San Fernando Basin approved by conference call on June 24, 2002. All the Administrative Committee members have now signed this resolution.

If you have any further questions, please call me at (213) 367-1020.

Sincerely,

M L Blevins

MELVIN L. BLEVINS
ULARA Watermaster

Enclosure

PTK:bw

c: Judge Susan Bryant-Deason
Watermaster Staff
Mr. Melvin L. Blevins, Watermaster
Mr. Frederic Fudacz, Special Counsel
Mr. Mark G. Mackowski, Assistant ULARA Watermaster
Ms. Patricia T. Kiechler, Administrator

Ms. Julie A. Conboy, Los Angeles City Attorney

ULARA Watermaster File
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2002-1 Resolution for Upper Los Angeles River Area (ULARA) Administrative Committee

1. WHEREAS San Fernando Judgment signed January 26, 1979, Case No. 650079 (Judgment) - Section 8.2.1 of the Judgment provides that the Watermaster shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction; and

2. WHEREAS Section 8.3.3 of the Judgment provides that the Administrative Committee shall be consulted by Watermaster and shall request or approve all discretionary Watermaster determinations; and

3. WHEREAS, the Cities of Burbank and Glendale as members of the Administrative Committee have requested the Watermaster preserve testimony related to hexavalent chromium contamination in the San Fernando Basin (Basin) dating back to the 1940s; and

4. WHEREAS Section 8.3.2 of the Judgment requires that actions of the Administrative Committee be by unanimous vote of its members, or of the members affected in the case of an action which affects one or more basins, but less than all of ULARA; and

5. WHEREAS the Administrative Committee has requested the Watermaster prepare a report preserving testimony regarding the presence of hexavalent chromium in the Basin; and

6. WHEREAS hexavalent chromium is a metal used in a variety of industrial activities which has been detected in water wells in the Basin from which the Cities of Los Angeles, Glendale and Burbank draw water for municipal use; and

7. WHEREAS the staff of the Los Angeles Regional Water Quality Control Board for Los Angeles has stated its support for the Watermaster gathering information relevant to the hexavalent chromium in the Basin and the effect on water quality; and

8. WHEREAS in his capacities first as an engineer for the Los Angeles Department of Water and Power and subsequently as ULARA Watermaster, Mr. Melvin Blevins has witnessed activities related to hexavalent chromium contamination of the Basin, has prepared numerous reports on municipal wells in the area, and has become acquainted with individuals who possess knowledge regarding hexavalent chromium contamination in the Basin.

9. WHEREAS the Watermaster and his attorneys have heretofore conducted preliminary interviews with individuals who possess knowledge with respect to a

number of critical issues regarding hexavalent chromium contamination in the Basin dating back to the 1940s.

NOW THEREFORE the Administrative Committee hereby approves the Watermaster's preparation of a report, memorializing information gathered, which may include declarations of experts and percipient witnesses, related to the history and occurrence of hexavalent chromium contamination in the Basin (hereinafter "the Report") upon the following requirements:

1. After the effective date of this Authorization, the Watermaster shall record and itemize time spent on all activities by the Watermaster legal counsel or consultants which are associated with the preparation of the Report including but not limited to: meeting with witnesses, follow-up calls and meetings, data review, drafting, editing and finalizing declarations, legal research, preparation of memoranda, and providing counsel for declarants, should the declarations be used in future administrative or legal proceedings.

2. The City of Los Angeles has paid $65,377 as of April 30, 2002 and is responsible for all such additional costs incurred by the Watermaster's legal counsel prior to the effective date of this Authorization for preparation of the Report memorializing information regarding hexavalent chromium in the Basin. Upon payment of all such costs incurred prior to the effective date of this Authorization, the City of Los Angeles shall be deemed to have satisfied its obligations to contribute to the cost of the Report and shall bear no further responsibility to pay any additional costs in this matter.

3. Notwithstanding the provisions in the Agreement between the City of Los Angeles and Watermaster regarding Watermaster expenses, the Cities of Glendale and Burbank will between them pay the entire cost of all activities by Watermaster legal counsel and consultants as listed in Item 1 above, which are associated with the preparation of the Report incurred after the date this Authorization is approved by the Administrative Committee.

4. A draft of the Report shall be prepared and furnished to the Administrative Committee. The Administrative Committee must unanimously approve the draft Report before the Report, in its final form, is filed with the Court or released to any individual or entity. No party shall have the right to alter the declarations of the witnesses; however, any city currently employing a declarant shall have the right to inspect the declaration for information obtained in the course and scope of employment that may be subject to legal privilege.

5. Nothing in the Authorization to prepare the Report by the Administrative Committee shall be considered an endorsement of the views expressed by the declarants by the individual cities. All opinions and recollections memorialized in the report shall be considered personal to the declarants.

6. Nothing in this motion shall be interpreted to alter the function and powers of the Watermaster and the Administrative Committee as set forth in Section 8 of the Judgment.

The 2002-1 Resolution for Upper Los Angeles River Area (ULARA) Administrative Committee setting forth the Preservation of Testimony guidelines was approved by unanimous vote in a conference call.

DATED: June 24, 2002.

APPROVED

Fred Lantz, Assistant General Manager
City of Burbank

Donald R. Froelich, Water Services Administrator
City of Glendale

Michael Drake, Director of Public Works
City of San Fernando

Michael G. Sovich, General Manager
Crescenta Valley Water District

Thomas Erb, Director of Water Resources
City of Los Angeles

X. TABLES AND FIGURES

BROWN AND CALDWELL
CITY OF LOS ANGELES BUREAU OF SANITATION
REPORT OF THE POTENTIAL INFILTRATION OF CHLORIDES FROM THE
LOS ANGELES RIVER NARROWS INTO THE
GROUNDWATER AQUIFER, JANUARY 1993
FIGURE 2-1
(Reference 7)

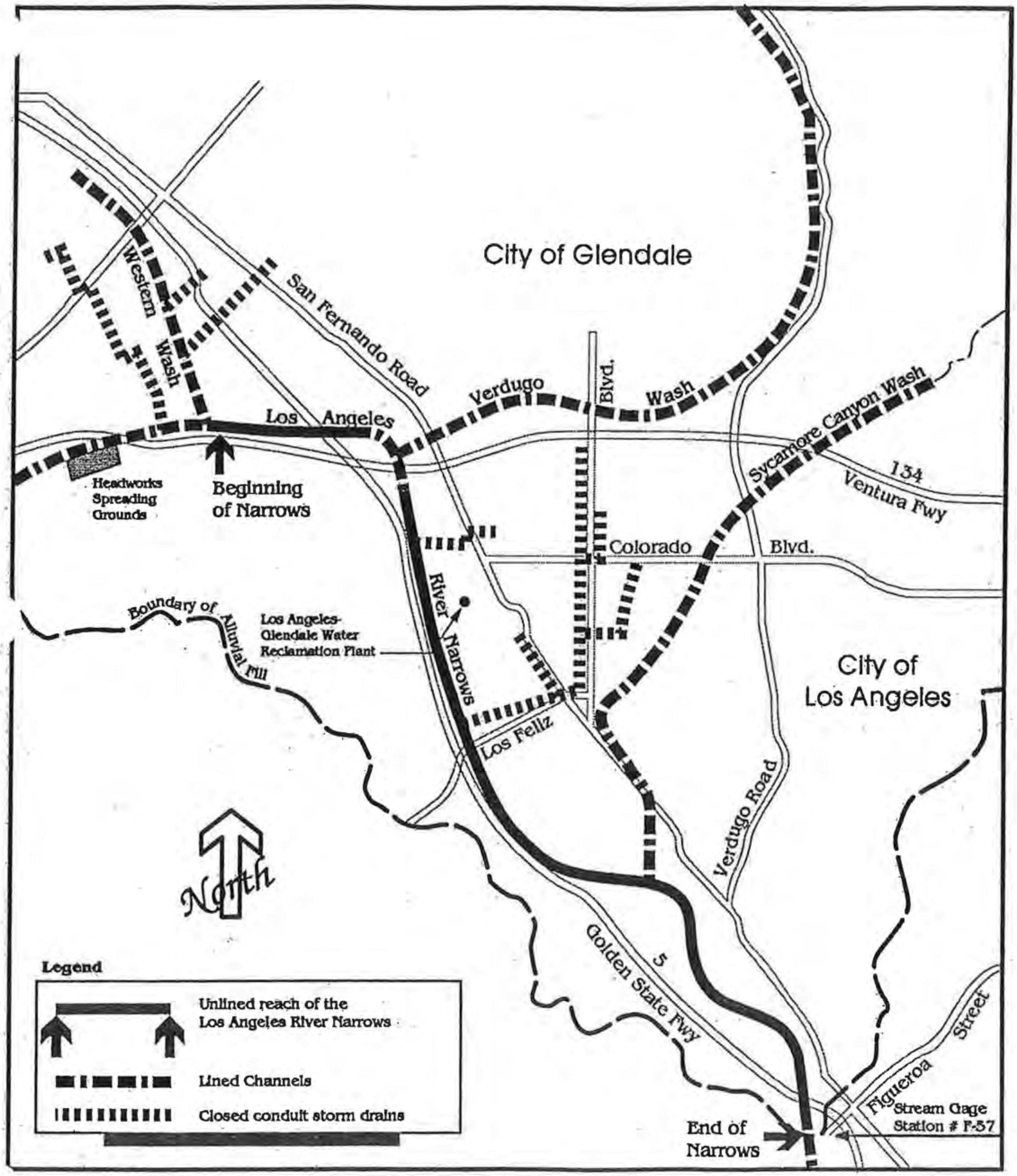

Figure 2-1. The Los Angeles Narrows Three Tributaries and Relevant Storm Drains

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
CHROMIUM 6 TEST RESULTS, 1945-1988
(Reference 11)

FORM 236

Cr^{+6} survey SANITARY ENGINEERING DIVISION

YEAR

LOCATION BURBANK WEST'N WASH CHEMICAL ANALYSES (P.P.M.)

DATE	LAB #	Cr^{+6}		DATE	LAB #	Cr^{+6}	DATE	LAB NO.	Cr^{+6}
11/4/75	R498	<.003		5/17/78	R1131	<.003	9/14/81	R167	.003
11/26/75	R560	<.003		6/21/78	R59	<.003	10/21/81	R227	<.003
12/30/75	R648	<.003		7/19/78	R169	.007	11-17-81	R280	<.003
1/26/76	R732	<.003		8/17/78	R261	<.003	2-17-82	R443	<.003
3/25/76	R954	<.003		9/22/78	R333	<.003	3-22-82	R484	<.003
4/27/76	R1033	<.003		11/15/78	R457	<.003			
5/26/76	R1146	<.003		1/24/79	R620	<.003			
6/22/76	R56	<.003		2/16/79	R682	<.003			
8/24/76	R231	<.003		3/21/79	R762	.040			
9/29/76	R363	<.003		4/26/79	R833	<.007			
10/28/76	R447	<.003		5/22/79	R890	<.003			
11/23/76	R501	<.003		6/22/79	R46	.007			
12/21/76	R577	<.003		7/19/79	R133	.003			
1/25/77	R687	<.003		8/16/79	R183	.007			
2/23/77	R757	<.003	Total Cr .015	9/19/79	R247	.007			
3/23/77	R819	<.003		11/29/79	R423	<.003			
6/15/77	R72	<.003		2-7-80	R552	<.003			
7/27/77	R203	<.003		4-11-80	R713	.020			
8/25/77	R304	<.003		5-28-80	R819	.003			
10/21/77	R498	<.003		6-24-80	R48	<.003			
11/16/77	R597	<.003		7-17-80	R126	<.003			
12/21/77	R684	<.003		7-16-80	272	<.003			
1/18/78	R762	<.003		8-25-80	222	<.003			
2/15/78	R846	<.003		5-15-81	R965	0.015			
3/16/78	R961	<.003		7/20/81	R80	<0.003			
4/19/78	R1055	<.003		8/17/81	R142	<0.003			

FORM 236 – 6/... – 1M

SANITARY ENG[illegible]ING DIVISION

Cr^{+6} SURVEY

YEAR 1962

LOCATION BURBANK WEST'N WASH

CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. No.	Cr^{+6}	Sp Cond	Lead Spectro Chemical	Phenol	Cr^{+6}	DATE	LAB NO.	Cr^{+6}	DATE	LAB NO.	Cr^{+6}	DATE	LAB No.	Cr^{+6}	DATE	LAB No	Cr^{+6}		Date	Lab #	Cr^{+6}
-28-62	R 180	1.50					9/23/64	R 369	0.22	1/27/67	R 595	0.10	5/27/69	R 727	0.007	6/18/71	R 43	< .003		10/25/73	R287	.007
-25-62	R 183	0.55					10/26/64	R 459	0.40	2/24/67	R 669	0.70	6/25/69	R 68	0.020	7/23/71	R 110	< .003		8/29/73	R157	.007
-24-62	R 318	1.60					11/24/64	R 599	0.60	3/24/67	R 734	0.40	7/23/69	R 123	< 0.003	8/13/71	R 166	0.007		11/21/73	R326 ~~R246~~	<.003
-25-62	R 434	0.90					12/28/64	R 690	0.07	4/24/67	R 798	0.07	8/26/69	R 207	0.007	9/24/71	R 248	0.070		12/19/73	R2396	<.003
0-26-62	R 546	0.34					1/25/65	R 752	0.40	5/25/67	R 881	0.10	9/25/69	R 261	0.030	10/20/71	R 300	.007		1/23/74	R444	0.003
1-26-62	R 640	0.14					2/24/65	R 854	0.12	6/28/67	R68	.020	10/24/69	R 337	< 0.003	11/18/71	R 386	.007		3/27/74	R578	<.003
1-25-63	R 828	0.34					3/24/65	R 958	0.14	7/21	R122	0.04	11/25/69	R 390	0.02	12/17/71	R 453	.055		4/23/74	R635	<.003
2-25-63	R 901	0.35					4/26/65	R 1049	0.20	8/25	R186	0.10	12/23/69	R 439	< 0.003	1/17/72	R 504	.01		2/26/74	R810	0.003
3-28-63	R1021	0.28					5/25/65	R 49	See* Sheet	9/25	R266	< .003	1/23/70	R 489	0.20	2/18/72	R 558	< .003		5/20/74	R695	<.003
5-24-63	R1226	0.14					7/20/65	R 133	0.14	10/25	R327	0.20	2/27/70	R 538	0.007	5/23/72	R 779	< .003		6/26/74	R75	0.010
6-26-63	R 89	0.40					8/27/65	R241	0.30	11/29	R409	0.02	3/20/70	R 592	0.08	3/24/72	R 630	< .003		7/24/74	R111	0.003
7-26-63	R 184	0.30					9/27/65	R315	0.40	12/27	R466	< .003	4/2/70	R 611	0.070	4/25/72	R 702	< .003		8/21/74	R166	0.003
8-29-63	R 276	.030					10/25	R394	0.50	1/25/68	R520	< 0.003	4/24/70	R 657	< 0.003	6/27/72	R54	0.01	*	*7/25/74	R201	<.003
9-25-63	R 372	0.20					12/17	R503	0.20	2/26/68	R582	< 0.003	5/22/70	R 739	< 0.003	7/25/72	R108	0.02		9/24/74	R269	<.003
10-23-63	R 461	0.14					1/24/66	R577	0.70	3/22/68	R638	< 0.003	6/26/70	R 68	0.04	8/31/72	R178	< .003		10/22 74	R308	<.003
11-29-63	R 576	0.080					2/25	R647	0.30	4/26/68	R715	0.010	7/28/70	R 145	< 0.003	9/28/72	R265	< .003		11/27 74	R430	<.003
12-27-63	R 643	0.20					3/25	R721	0.30	5/24/68	R795	0.015	8/27/70	R 216	< 0.003	10/27/72	R349	0.02		12/19 74	R472	<.003
1-24-64	R 749	0.30					4/25	R789	0.40	6/24/68	R63	0.02	9/25/70	R 288	0.007	11/30/72	R395	< .003		1/21 75	R553	<.003
2-26-64	R 835	0.20					5/23	R886	1.00	7/24/68	R 126	0.01	10/23/70	R 341	0.007	12/14/72	R440	< .003		2/28 75	R649	<.003
3/25/64	R 923	0.20					6/24	R54	0.20	8/23/68	R 226	< .003	11/20/70	R 393	0.007	1/24/73	R501	< .003		3/25 75	R711	<.003
4/24/64	R 1047		901	0.05 25.	0.5		7/25	R137	0.50	9/24/68	R 285	0.003	12/18/70	R 445	0.007	4/27 73	R551	< 0.003		4/23 75	R771	<.003
5/25/64	1144	0.45					8/29	R239	0.40	10/25/68	R 357	0.005	1/22/71	R 490	0.007	3/23 73	R602	.01		5/27 75	R856	<.003
							9/26	R300	1.00	11/26/68	R 417	< 0.003	2/19/71	R 537	<0.003	4/25 73	R697	< .003		6/25 75	R81	<.003
6/25/64	R 87	8.0					10/24	R371	0.14	12/30/69	R 475	0.04	3/19/71	R 616	<.003	5/22 73	R756	<.003		7/29 75	R181	<.003
7/24/64	R 179	0.20					11/21	R468	0.07	3/24/69	R 594	.015	4/16/71	R 677	0.02	6/27 73	R39	<.003		8/27 75	R249	<.003
[illegible]	R						12/[illegible]	[illegible]	[illegible]	[illegible]	R [illegible]	[illegible]	5/21/71	R 714	.003	7/25 73	R88	<.003		9/24 75	R330	<.003

FORM 236 — 6/02 . — 3M

SANITARY ENGINEERING DIVISION

YEAR 1945 — 62 Cr+6 SURVEY

LOCATION BURBANK WEST'N WASH CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr+6	DATE	LAB. NO.	Cr+6	DATE	LAB. NO.	Cr+6	DATE	LAB. NO.	Cr+6	DATE	LAB. NO.	Cr+6		DATE	LAB. NO.	Cr+6	DATE	LAB. NO.	Cr+6	DATE	LAB. NO.	Cr+6
2-45	SP 18	<.003	1-26-50	SP 916	.170	9-24-51	SP 243	.200	11-25-53	SP 896	.700	3-24-55	SP 1592	5:00PM 6.00		5-25-56	SP 1581	.200	6-25-58	SP 1906	.040	8-24-60	SP 720	.140
-18-45	SP 55	1.00	2-23-50	SP 1007	.150	10-22-51	SP 401	.320	12-29-53	SP 1065	.140	3-24-55	SP 1599	24 hr Comp. 2.50		6-25-56	SP 1763	.200	7-24-58	SP 172	.150	9-26-60	SP 1066	5.50
-29-45	SP 128	.700	3-22-50	SP 1153	.110	11-21-51	SP 492	.100	1-26-54	SP 1250	.400	3-25-55	SP 1608	.140		7-25-56	SP 133	.600	8-26-58	SP 339	.140	10-24-60	SP 1387	.120
1-1-45	SP 199	2.00	4-25-50	SP 1347	.300	12-26-51	SP 564	.550	2-25-54	SP 1473	7.00	4-25-55	SP 1746	.600		8-24-56	SP 299	.600	9-26-58	SP 558	.340	11-23-60	SP 1672	.140
2-4-45	SP 217	.700	5-25-50	SP 1438	.250	1-24-52	SP 815	.200	3-4-54	SP 1524	.800	5-11-55	SP 1859	70.0		9-25-56	SP 447	.300	10-24-58	SP 794	.040	12-21-60	SP 1900	.020
1-1-46	SP 309	.200	6-20-50	SP 1560	.090	2-26-52	SP 922	.240	3-25-54	SP 1615	.200	5-25-55	SP 1925	1.40		10-25-56	SP 628	.800	11-25-58	SP 991	.140	1-25-61	SP 2152	.240
3-4-46	SP 331	.800	7-24-50	SP 79	<.003	3-28-52	SP 1046	.600	4-26-54	SP 1769	.280	6-24-55	SP 2051	1.32		11-27-56	SP 726	.320	12-22-58	SP 1112	.240	2-24-61	SP 2414	.400
4-2-46	SP 350	.400	8-21-50	SP 192	.350	4-30-52	SP 1131	<.003	5-25-54	SP 1918	.760	7-25-55	SP 99	.700		12-28-56	SP 970	.800	1-26-59	SP 1296	.800	3-27-61	SP 2644	.110
5-7-46	SP 420	.700	9-25-50	SP 322	<.003	5-29-52	SP 1262	.200	6-25-54	SP 2129	.150	8-25-55	SP 238	.300		1-25-57	SP 1079	.400	2-25-59	SP 1488	4.00	4-26-61	SP 2920	3.00
6-7-46	SP 556	.200	10-26-50	SP 540	<.003	6-27-52	SP 1453	.360	7-26-54	SP 179	.060	9-26-55	SP 338	1.00		2-26-57	SP 1259	.800	3-25-59	SP 1675	.050	5-24-61	SP 3179	.200
7-5-46	SP 17	.200	11-28-50	SP 691	.550	7-29-52	SP 120	.600	8-25-54	SP 332	.060	10-25-55	SP 551	.800		3-25-57	SP 1379	.140	4-27-59	SP 1849	.400	6-26-61	SP 244	.300
8-2-46	SP 58	.400	12-26-50	SP 788	.850	8-28-52	SP 319	.280	9-24-54	SP 549	.400	11-25-55	SP 716	.500		4-25-57	SP 1498	.600	5-26-59	SP 2057	.140	7-26-61	SP 627	.060
9-6-46	SP 154	.300	1-25-51	SP 861	.400	9-25-52	SP 426	.060	10-25-54	SP 782	.080	12-27-55	SP 831	1.10		5-24-57	SP 1687	.900	6-26-59	SP 2268	1.00	8-24-61	SP 1000	.800
10-7-46	SP 291	.100	2-15-51	SP 919	7:15AM 4.80	10-27-52	SP 643	.280	11-24-54	SP 960	.560	2-4-56	SP 1033	7.00		6-25-57	SP 1864	.070	7-27-59	SP 173	.500	9-29-61	SP 1336	.500
11-6-46	SP 352	1.25	2-12-51	SP 921	8.60	11-25-52	SP 737	.200	12-27-54	SP 1129	.360	2-7-56	SP 1064	9.00		7-25-57	SP 105	.240	8-31-59	SP 426	.200	10-23-61	SP 1554	.300
12-3-46	SP 370	.400	2-19-51	SP 944	7:15AM 14.4	12-29-52	SP 842	.170	1-25-55	SP 1278	.800	2-27-56	SP 1168	.600		8-23-57	SP 252	.220	9-25-59	SP 688	.800	11-27-61	SP 1797	.280
1-10-47	SP 410	<.003	2-20-51	SP 943	.400	1-29-53	SP 982	.350	2-25-55	SP 1446	.010	3-2-56	SP 1208	8:30AM .200		9-25-57	SP 436	.040	10-30-59	SP 1003	.140	12-27-61	SP 1993	.120
2-6-47	SP 439	<.003	2-27-51	SP 973	.300	2-27-53	SP 1126	2.00	3-14-55	SP 1546	24 hr comp. .600	3-2-56	SP 1209	9:15AM .200		10-3-57	SP 476	.360	11-25-59	SP 1188	.120	1-24-62	SP 2153	.300
4-3-47	SP 494	.300	3-7-51	SP 1620	.092	3-27-53	SP 1309	.170	3-18-55	SP 1567	24 hr comp. 1.60	3-2-56	SP 1210	10:30AM .400		10-25-57	SP 597	.400	12-29-59	SP 1367	.020	2-26-62	SP 2387	.500
5-5-47	SP 513	.200	3-27-51	SP 1077	.400	4-27-53	SP 1456	9.00	3-23-55	SP 1585	12:15PM 10.0	3-2-56	SP 1224	2:30PM .800	FIELD .706	11-27-57	SP 778	.360	1-25-60	SP 1515	.170	3-23-62	R 48	2.20
6-5-47	SP 571	.100	3-30-51	SP 1696	>2.0	5-29-53	SP 1589	.080	3-23-55	SP 1586	12:30PM 6.00	3-2-56	SP 1225	2:45PM .500	FIELD .500	12-26-57	SP 886	1.40	2-24-60	SP 1688	.170	3-26-62	R 55	.030
8-7-47	SP 50	.100	5-7-51	SP 1219	.150	6-25-53	SP 1749	.280	3-23-55	SP 1587	12:45PM 5.00	3-2-56	SP 1226	3:00PM .300	FIELD .200	1-24-58	SP 997	.110	3-28-60	SP 1926	9.00	3-30-62	R 70	4.00
7-10-47	SP 12	.050	5-29-51	SP 1334	.200	7-27-53	SP 135	5.50	3-23-55	SP 1588	1:00PM 7.00	3-2-56	SP 1227	3:15PM .200	FIELD .100	2-25-58	SP 1130	.060	4-25-60	SP 2110	.280	4-13-62	R 101	2.00
2-18-48	SP 594	.200	6-26-51	SP 1476	.270	8-25-53	SP 288	.700	3-23-55	SP 1589	1:15PM 17.5	3-2-56	SP 1228	3:30PM .200	FIELD .100	3-25-58	SP 1265	.360	5-27-60	SP 2337	.060	4-25-62	R 133	.300
7-11-49	SP 39	.030	7-24-51	SP 68	.160	9-25-53	SP 475	.550	3-23-55	SP 1590	1:30PM 17.5	3-26-56	SP 1310	.960		4-24-58	SP 1475	.120	6-24-60	SP 169	.050	5-24-62	R 241	.500
[illegible]	SP	[illegible]	[illegible]-51	SP	[illegible]	[illegible]	SP	[illegible]	3-23-55	SP [illegible]	1:45PM [illegible]	4-25-56	SP 1440	2.00		5-23-58	SP 1630	.200	7-22-60	SP 342	.030	6-27-62	R 95	5.50

FC 36 — 1M

Cr^{+6} SANITARY ENGINEERING DIVISION

YEAR 1972

LOCATION General Motors Drain CHEMICAL ANALYSES (P.P.M.)

Date	Lab No.	+6 Cr		Date	Lab #	Cr^{6+}		DATE	LAB #	Cr^{+6}		DATE	LAB #	Cr^{+6}
/25/72	R700	<.003		8/21/74	R164	<.003		11/23/76	R499	<.003		6/22/79	R44	.007
/27/72	R52	<.003	*	9/25/74	R202	0.02		12/21/76	R575	<.003		7/19/79	R121	<.003
/25/72	R106	<.003		9/24/74	R267	<.003		1/25/77	R685	<.003		8/16/79	R181	* .04
/21/72	R176	0.010		10/22/74	R306	<.003		2/23/77	R755	<.003		9/19/79	R245	.010
/25/72	R263	<.003		11/27/74	R428	<.003		3/23/77	R817	.02		11/29/79	R421	<.003
/27/72	R347	0.007		12/19/74	R470	<.003		6/15/77	R70	<.003		2/7/80	R550	.07
/20/72	R393	<.003		1/21/75	R551	<.003		7/27/77	R201	<.003		4/11/80	R711	.010
/14/72	R438	0.007		2/28/75	R645	<.003		8/25/77	R392	<.003		5/28/80	R817	<.003
/24/73	R499	<.003		3/25/75	R709	.070		10/21/77	R496	<.003		6-24-80	R416	<.003
2/27/73	R549	<.003		4/23/75	R774	<.003		11/14/77	R595	<.003		7-17-80	R124	.01
3/23/73	R600	<.003		5/27/75	R854	<.003		12/21/77	R682	<.003		9-16-80	270	<.003
4/25/73	R645	<.003		6/25/75	R79	<.003		1/18/78	R760	<.003		8-25-80	220	<.003
5/22/73	R752	<.003		7/29/75	R179	<.003		2/15/78	R844	.007	(3)	5-15-81	R963	<.003
6/27/73	R37	<.003		8/27/75	R267	<.003		3/16/78	R960	.007		7/20/81	R78	<.003
7/25/73	R86	<.003		9/24/75	R328	<.003		4/19/78	R1053	<.003		8/17/81	R137	<.003
10/25/73	R285	<.003		11/4/75	R496	<.003		5/17/78	R1129	<.003		9/16/81	R165	.003
8/29/73	R153	<.003		12/26/75	R558	<.003		6/21/78	R57	<.003		10/21/81	R225	<.003
11/21/73	R324	<.003		12/30/75	R647	<.003		7/19/78	R167	<.003		11-17-81	R278	<.003
12/19/73	R394	0.007		1/26/76	R780	<.003		8/17/78	R259	<.003		2-17-82	R441	<.003
1/22/74	R442	0.007		3/25/76	R952	<.003		9/22/78	R331	<.003		3-22-82	R482	<.003
3/27/74	2576	<.003		4/27/76	R1031	<.003		11/15/78	R455	<.003				
4/23/74	R626	<.003		5/26/76	R1144	<.003		1/24/79	R618	.100				
2/26/74	R508	0.003		6/22/76	R54	<.003		2/16/79	R680	.100				
5/23/74	R693	<.003		8/24/76	R229	<.003		3/21/79	R760	<.003				
6/26/74	273	<.003		9/29/76	R361	<.003		4/26/79	R831	<.003				
[illegible]	[illegible]	<.003		10/28/76	R445	<.003		5/22/79	R888	<.003				

(3) Samples held beyond storage time

FORM 236 — 1M

SANITARY ENGIN ING DIVISION

YEAR 1950 –

Cr^{+6} SURVEY

LOCATION GENERAL MOTORS DRAIN CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}
-1-50	SP 1360	<.003	3-25-57	SP 1378	<.003	5-26-59	SP 2055	.020	8-24-61	SP 998	.900
24-54	SP 555	10.0	4-25-57	SP 1496	.040	6-26-59	SP 2266	.010	9-29-61	SP 1335	1.60
-6-54	SP 661	4.0	5-24-57	SP 1685	.090	7-27-59	SP 171	.050	10-23-61	SP 1553	1.80
1-17-54	SP 1080	0.5	6-25-57	SP 1862	.007	8-31-59	SP 424	<.003	11-27-61	SP 1795	.340
1-13-55	SP 1210	4.0	7-25-57	SP 103	.020	9-25-59	SP 686	.180	12-27-61	SP 1991	1.20
3-10-55	SP 1522	.030	8-23-57	SP 250	.010	10-30-59	SP 1001	1.40	12-28-61	SP 2010	.600
7-13-55	SP 48	.600	9-25-57	SP 435	<.003	11-5-59	SP 1062	.060	1-24-62	SP 2156	.007
8-24-55	SP 219	1.70	10- -57	SP 596	.007	11- -59	SP 1187	<.003	2-26-62	SP 2385	<.003
8-26-55	SP 245	4.50	11-27-57	SP 776	.010	12-29-59	SP 1365	.010	3-23-62	R 46	.015
10-27-55	SP 564	.700	12-26-57	SP 884	.010	1-25-60	SP 1514	<.003	4-25-62	R 131	<.003
11-30-55	SP 737	1.50	1-24-58	SP 996	.010	2-24-60	SP 1686	.170	5-24-62	R 239	.010
12-29-55	SP 845	1.60	2-25-58	SP 1128	.007	3-28-60	SP 1924	.200	6-27-62	R 93	.003
1-30-56	SP 1006	.400	3-25-58	SP 1263	.007	4-25-60	SP 2108	.100	7-25-62	R 181	9.0
3-21-56	SP 1312	1.90	4-24-58	SP 1473	.040	5-27-60	SP 2335	<.003	7-30-62	R 204	1.20
5-3-56	SP 1465	.160	5-23-58	SP 1628	<.003	6-24-60	SP 166	.003	8-24-62	R 316	.010
5-25-56	SP 1583	.160	6-25-58	SP 1904	<.003	7-22-60	SP 390	.100	9-25-62	R 432	.300
6-25-56	SP 1766	.040	7-24-58	SP 170	.020	11-23-60	SP 1670	1.50	10-26-62	R 544	.010
7-25-56	SP 135	.040	8-26-58	SP 337	.007	11-28-60	SP 1684	1.40	11-26-62	R 638	.020
8-24-56	SP 301	.140	9-26-58	SP 556	.020	12-21-60	SP 1899	3.00	1-25-63	R 826	.040
9- -56	SP 462	.013	10-24-58	SP 792	<.003	1-25-61	SP 2150	.040	2-25-63	R 899	.010
10-25-56	SP 626	.080	11-25-58	SP 990	.015	2-24-61	SP 2412	1.60	3-28-63	R 1019	.007
11-27-56	SP 724	.280	12-23-58	SP 1111	.140	3-24-61	SP 2642	.360	4-26-63	R 1119	<.003
12-28-56	SP 968	.080	1-26-59	SP 1294	.200	4-26-61	SP 2918	.080	5-24-63	R 1324	<.007
1-25-57	SP 1077	.110	2-25-59	SP 1484	.055	5-24-61	SP 3177	1.20	6-26-63	R 87	0.020
2-26-57	SP 1258	9.00	3-25-59	SP 1674	.020	6-26-61	SP 242	1.10	7-26-63	R 182	0.007
	SP		-59	SP		-61	SP		8-21-	R [illegible]	[illegible]

Date	Lab. No.	Cr^{+6}	Date	Lab No	Cr^{+6}	Date	Lab No	Cr^{+6}	Date	Lab No	Cr^{+6}
9-25-63	R 370	0.007	12/17	R501	0.04	2/26/68	R580	0.200	4/2/70	R610	0.070
10-23-63	R 459	0.007	1/24/66	R 575	0.01	3/22/68	R636	0.07	4/24/70	R657	<0.003
11-29-63	R 574	0.010	2-25-66	R 645	0.20	3/25/68	R644	0.02	5/22/70	R737	<0.003
1-27-64	R 641	0.02	3/25	R719	0.20	4/26/68	R713	0.010	6/26/70	R66	<0.003
1/24/64	R 747	0.015	4/25	R787	0.01	5/24/68	R793	0.04	7/25/70	R143	0.04
2/26/64	833	0.02	5/23	R884	0.02	6/28/68	R61	0.04	8/27/70	R215	<0.003
3/25/64	921	0.10	6/24	R52	.007	7/26/68	R 138	0.02	9/25/70	R296	<0.003
4/24/64	R 1045	0.01	7/25	R135	<.003	8/23/68	R 234	0.007	10/23/70	R339	<0.003
5/25/64	R 1142	.04	8/29	R237	0.01	9/24/68	R 293	0.04	11/20/70	R391	<0.003
			9/26	R298	.015	10/25/68	R 355	0.005	12/18/70	R442	<0.003
8/25/64	R 85	.020	10/24	R369	0.01	11/22/68	R 415	<0.003	1/22/71	R 488	<0.005
9/24/64	R 177	<0.003	11/21	R466	0.14	12/30/68	R 473	<0.003	2/19/71	R 535	<0.003
10/23/64	R 280	0.01	12/29	R535	0.02	1/24/69	R 592	0.07	3/19/71	R 608	0.02
11/23/64	R 367	0.08	1/27/67	R593	0.01	4/24/69	R 643	0.01	4/16/71	R 675	0.02
12/16/64	R 487	<.003	2/24	R667	0.007	5/27/69	R 725	<0.003	5/21/71	R 762	.010
1/21/65	R 597	0.02	3/24	R732	0.015	6/25/69	R 66	<0.003	6/18/71	R 41	0.01
2/26/65	R 688	<.003	4/24	R796	<.003	7/23/69	R 181	<0.003	7/23/71	R 108	<.003
3/26/65	R 750	0.01	5/25	R879	0.01	8/26/69	R 205	0.40	8/13/71	R 164	0.003
4/24/65	R 852	0.02	6/28	R66	.020	9/25/69	R 259	0.560	9/24/71	R 246	0.140
5/24/65	R 956	0.02	7/24	R120	<.003	10/24/69	R 335	0.40	10/20/71	R 293	.007
4/26	R 1046	0.02	8/25	R184	<.003	10/23/69	R 346	0.30	11/19/71	R 384	0.01
5/25	R 47	0.020	9/25	R264	.007	11/25/69	R 387	<0.003	12/17/71	R 451	<.003
7/22	R 131	0.007	10/25	R325	0.14	12/23/69	R 437	<0.003	1/17/72	R 502	<.003
8/27	R239	0.02	11/29	R407	0.02	1/26/70	R 487	0.007	2/18/72	R 556	<.003
9/27	R313	<0.003	12/27	R464	.03	2/27/70	R 536	0.007	3/23/72	R 777	<.003
10/	[illegible]	[illegible]	1/--	R510	[illegible]	3/25/70	R 590	0.10	3/24/72	R 688	0.02

CRM 236 – 6/62 – 1M

Cr^{+6} SANITARY ENGIN— ING DIVISION

YEAR 1971

LOCATION N. Hollywood ~~[illegible]~~ Sump

CHEMICAL ANALYSES (P.P.M.)

Date	Lab No.	Cr^{+6}	Date	Lab #	Cr^{6+}	DATE	LAB #	Cr^{+6}	DATE	LAB #	Cr^{+6}
1/25/72	R701	<.003	8/21/74	R165	<.003	11/23/76	R500	<.003	6/22/79	R45	<.003
-7/72	R53	<.003	9/25/74	R203	<.003	12/21/76	R576	<.003	7/19/79	R122	.003
-5/72	R107	<.003	9/24/74	R268	<.003	1/25/77	R686	<.003	8/16/79	R182	.003
/21/72	R177	<.003	10/22/74	R307	<.003	2/23/77	R756	<.003	9/19/79	R246	<.003
/25/72	R264	<.003	11/27/74	R429	<.003	3/23/77	R818	<.003	11/29/79	R422	<.003
/27/72	R348	<.003	12/19/74	R471	<.003	6/15/77	R71	<.003	2-7-80	R551	<.003
/20/72	R394	<.003	1/21/75	R552	<.003	7/27/77	R202	<.003	4-11-80	R712	<.003
/19/72	R439	<.003	2/28/75	R646	<.003	8/25/77	R353	<.003	5-28-80	R818	<.003
/24/73	R500	<.003	3/25/75	R710	<.003	10/21/77	R497	<.003	6/24/80	R47	<.003
2/27/73	R550	<.003	4/23/75	R775	<.003	11/16/77	R596	<.003	7-14-80	R125	<.003
3/23/73	R601	<.003	5/27/75	R855	<.003	12/21/77	R683	<.003	9-16-80	271	<.003
4/25/73	R696	<.003	6/25/75	R80	<.003	1/18/78	R761	<.003	8-25-80	221	<.003
5/22/73	R755	<.003	7/29/75	R180	<.003	2/15/78	R845	<.003	* ~~5-18-81~~	~~R964~~	~~<.003~~
6/22/73	R38	<.003	8/27/75	R268	<.003	3/16/78	R959	<.003	7/20/81	R79	<.003
7/25/73	R287	<.003	9/24/75	R329	<.003	4/19/78	R1054	<.003	8-17-81	R140	<.003
10/25/73	R286	<.003	11/4/75	R497	<.003	5/17/78	R1130	<.003	9-16-81	R166	<.003
8/22/73	R153	<.003	11/26/75	R559	<.003	6/21/78	R58	<.003	10/21/81	R226	<.003
11/21/73	R325	<.003	12/30/75	R648	<.003	7/19/78	R168	<.003	11-17-81	R279	<.003
12/19/73	R395	<.003	1/26/76	R731	<.003	8/17/78	R260	<.003	2-17-82	R442	<.003
1/23/74	R442	<.003	3/25/76	R953	<.003	9/22/78	R332	<.003	3-22-82	R483	<.003
3/27/74	R577	<.003	4/27/76	R1032	<.003	11/15/78	R456	<.003			
4/23/74	R627	<.003	5/26/76	R1145	<.003	1/24/79	R619	<.003			
2/26/74	R509	<.003	6/22/76	R55	<.003	2/16/79	R681	<.003			
5/23/74	R692	<.003	8/24/76	R230	<.003	3/21/79	R761	<.003			
6/26/74	R72	<.003	9/29/76	R363	<.003	4/24/79	R832	<.003			
			10/[illegible]			5/22		<			

FORM 257 – 6/62

SANITARY ENGIN RING DIVISION

YEAR 1970

LOCATION N. Hollywood Sump. CHEMICAL ANALYSES (P.P.M.)

Date	Lab. No.	Sp. Cond.	Ca	Mg	Total Hardness	Na	K	Field ALK. $CaCO_3$ LAB.	SO_4	Cl	NO_3	SiO_2	Fe	B	F	Field pH Lab.	Field Temp. Lab.	NH_3	Tot. KJEL. N	NO_2	Diss. PO_4	Field D.O. Lab.	BOD	Cr^{+6}	Color	Turb	Odor	Phen.	As	SYNDETS	OIL
3/25/70	R591																						← ~~0.003~~	< 0.003							
1/24/70	R658																							< 0.003							
/22/70	R738																							< 0.003							
6/26/70	R67																							< 0.003							
7/28/70	R144																							< 0.003							
8/27/70	R216																							< 0.003							
9/25/70	R287																							< 0.003							
10/23/70	R340																							< 0.003							
11/20/70	R392																							< 0.003							
12/18/70	R443																							< 0.003							
1/22/71	R 489																							< 0.003							
2/19/71	R 536																							< 0.003							
3/19/71	R 609																							< 0.003							
4/16/71	R 676																							< 0.003							
5/21/71	R 763																							< 0.003							
6/18/71	R 42																							< 0.003							
7/23/71	R 109																							< 0.003							
8/13/71	R 165																							< .003							
9/24/71	R 247																							< 0.003							
10/20/71	R 299																							< .003							
11/19/71	R 385																							< .003							
12/17/71	R 452																							< .003							
1/17/72	R 503																							< .003							
2/18/72	R 557																							< .003							
5/23/72	R 778																							< .003							
	R																							< .003							

FORM 236 – 6/62 – 1M

SANITARY ENGINEERING DIVISION

YEAR 1949 – Cr^{+6} SURVEY

LOCATION N. HOLLYWOOD SUMP CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}
11-49	Sp 40	<.003	6-27-54	Sp 1454	<.003	4-25-55	Sp 1745	<.003	11-27-57	Sp 777	<.003
23-50	Sp 1008	.009	7-28-54	Sp 121	<.003	5-25-55	Sp 1926	<.003	12-26-57	Sp 885	<.003
22-50	Sp 1154	<.003	8-28-54	Sp 320	<.003	6-24-55	Sp 2050	<.003	2-25-58	Sp 1129	<.003
25-50	Sp 1349	<.003	9-25-53	Sp 427	<.003	7-25-55	Sp 100	<.003	3-25-58	Sp 1264	<.003
-25-50	Sp 1439	<.003	2-27-53	Sp 1127	<.003	8-25-55	Sp 239	<.003	4-24-58	Sp 1474	<.003
-20-50	Sp 1559	<.003	3-27-53	Sp 1310	<.003	9-26-55	Sp 339	<.003	5-23-58	Sp 1629	<.003
-24-50	Sp 78	<.003	4-27-53	Sp 1457	<.003	11-25-55	Sp 717	<.003	6-25-58	Sp 1905	.004
-21-50	Sp 191	<.003	5-29-53	Sp 1590	<.003	12-27-55	Sp 832	<.003	7-24-58	Sp 171	.007
1-25-50	Sp 324	<.003	6-25-53	Sp 1750	<.003	2-27-56	Sp 1166	<.003	8-26-58	Sp 338	<.003
10-26-50	Sp 542	<.003	7-27-53	Sp 137	<.003	3-26-56	Sp 1311	.003	9-26-58	Sp 557	<.003
1-28-50	Sp 690	<.003	8-25-53	Sp 289	<.003	4-25-56	Sp 1442	<.003	10-24-58	Sp 793	<.003
12-26-50	Sp 787	<.003	9-25-53	Sp 476	<.003	5-25-56	Sp 1582	<.003	1-26-59	Sp 1295	<.003
1-25-51	Sp 860	<.003	10-26-53	Sp 740	<.003	6-25-56	Sp 1765	<.003	5-26-59	Sp 2056	<.003
2-19-51	Sp 972	<.003	12-29-53	Sp 1066	<.003	7-25-56	Sp 134	.005	6-26-59	Sp 2267	<.003
3- -51	Sp 1076	<.003	1-26-54	Sp 1770	<.003	8-24-56	Sp 300	<.003	7-27-59	Sp 172	.004
5-7-51	Sp 1218	<.003	5-25-54	Sp 1917	<.003	9-25-56	Sp 448	.003	8-31-59	Sp 425	<.003
5-29-51	Sp 1333	<.003	6-25-54	Sp 2130	<.003	10-25-56	Sp 627	<.003	9-25-59	Sp 687	<.003
6-26-51	Sp 1475	<.003	7-26-54	Sp 180	<.003	11-27-56	Sp 725	<.003	10-30-59	Sp 1002	<.003
7-24-51	Sp 67	<.003	8-25-54	Sp 333	<.003	12-28-56	Sp 969	<.003	12-29-59	Sp 1366	<.003
8-21-51	Sp 167	<.003	9-24-54	Sp 548	<.003	1-25-57	Sp 1078	<.003	2-24-60	Sp 1687	<.003
9-24-51	Sp 244	<.003	10-25-54	Sp 783	<.003	4-25-57	Sp 1497	<.003	3-28-60	Sp 1925	<.003
10-22-51	Sp 402	<.003	11-24-54	Sp 961	<.003	5-24-57	Sp 1686	<.003	4-25-60	Sp 2109	<.003
11-21-51	Sp 493	<.003	12-27-54	Sp 1131	<.003	6-25-57	Sp 1863	<.003	5-27-60	Sp 2336	<.003
1-24-52	Sp 816	<.003	1-25-55	Sp 1279	<.003	7-25-57	Sp 104	<.003	6-24-60	Sp 167	<.003
2-26-52	Sp 923	<.003	2-25-55	Sp 1448	<.003	8-23-57	Sp 251	<.003	7-22-60	Sp 391	<.003
[illegible]	Sp [illegible]	[illegible]	-55	Sp [illegible]	[illegible]	57	Sp [illegible]	<.003	8-24-60	Sp 714	<.003

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}
9-26-60	Sp 1065	<.003	3-28-63	1020	.003	1/25/65	R 48	< .003	10/25	R326	< .003
10-24-60	Sp 1386	<.003	4-26-63	1120	<.003	2/22	R 132	<0.003	11/29	R408	< .003
11-23-60	Sp 1671	<.003	5-24-63	R1225	.003	8/27	R240	<.003	12/27	R465	< .003
1-25-61	Sp 2151	<.003	6-26-63	R88	<0.003	9/27	R314	<.003	1/25/68	R519	< 0.003
2-24-61	Sp 2413	.005	7-26-63	R 183	.004	10/25	R393	<.003	2/26/68	R581	< 0.003
3-27-61	Sp 2643	<.003	8-24-63	R 275	.003	12/17	R502	<.003	3/22/68	R637	0.003
4-26-61	Sp 2919	<.003	9-25-63	R 371	<0.003	1/24/66	R 576	0.007	4/26/68	R714	< 0.003
5-24-61	Sp 3178	<.003	10-23-63	R 460	<0.003	2-25-66	R 646	<.003	5/24/68	R794	< 0.003
6-26-61	Sp 243	<.003	12-27-63	R 642	<0.003	3/25	R720	<.003	6/24/68	R62	0.003
7-26-61	Sp 626	<.003	1/24/64	R 748	<0.003	4/25	R788	<.003	7/26/68	R 139	< 0.003
8-24-61	Sp 999	<.003	2/26/64	R 834	<.003	5/23	R885	<.003	8/23/68	R 235	< 0.003
11-27-61	Sp 1796	<.003	3/25/64	922	<0.003	6/24	R53	<.003	9/24/68	R 294	< 0.003
12-27-61	Sp 1992	<.003	4/24/64	R 1046	0.003	7/25	R136	< .003	10/25/68	R 336	< 0.003
1-24-62	Sp 2157	<.003	5/25/64	1143	<.003	8/29	R228	< .003	11/26/68	R 416	< 0.003
2-26-62	Sp 2386	<.003				9/26	R299	< .003	3/28/69	R 593	< 0.003
3-23-62	R 47	<.003	6/25/64	R 86	<.003	10/24	R370	< .003	4/24/69	R 644	< 0.003
4-25-62	R 132	<.003	7/24/64	R 178	<0.003	11/21	R467	< 0.003	5/27/69	R 726	< 0.003
5-24-62	R 240	<.003	8/28/64	R 281	< .003	12/29	R536	< 0.003	6/25/69	R 67	< 0.003
6-27-62	R 94	<.003	9/23/64	R 368	< .003	1/27	R594	< 0.003	7/23/69	R 122	< 0.003
7-25-62	R 182	<.003	10/26/64	R 488	< .003	2/24/67	R668	< 0.003	8/26/69	R 206	0.003
8-24-62	R 317	<.003	11/24/64	R 598	< .003	3/24	R733	< 0.003	9/25/69	R 260	< 0.003
9-25-62	R 433	<.003	12/28/64	R 689	<.003	4/24	R797	< .003	10/24/69	R 336	0.003
10-26-62	R 545	<.003	1/25/65	R 761	<.003	6/28	R67	< .003	11/25/69	R 389	< 0.003
11-26-62	R 639	<.003	2/24/65	R 853	<.003	7/24	R121	< .003	12/23/69	R 438	< 0.003
1-25-63	R 827	<.003	3/24/65	R 957	<.003	8/25	R185	< .003	1/23/70	R 488	< 0.003
2-25-63	R 900	<.003	4/26/65	R 1047	< .003	9/25	R265	< .003	2/27/70	R 537	<0.003

FORM 236 – 6/6? – 1M

SANITARY ENGIN ING DIVISION

YEAR 1945 Cr^{+6} SURVEY

LOCATION GRIFFITH PARK WELL #1 CHEMICAL ANALYSES (P.P.M.)

DATE	LAB NO.	Cr^{+6}	DATE	LAB NO.	Cr^{+6}	DATE	LAB NO	Cr^{+6}	DATE	LAB NO	Cr^{+6}	DATE	LAB NO	Cr^{+6}	DATE	LAB NO	Cr^{+6}	DATE	LAB NO	Cr^{+6}	DATE	LAB NO	Cr^{+6}
-10-45	Sp. 33	.160	6-20-50	Sp 1562	.010	10-27-52	Sp 644	<.003	4-25-56	Sp 1437	<.003	6-25-58	Sp 1908	<.003	2/24/65	R 555	<.003						
-29-45	Sp 124	.280	7-24-50	Sp 81	.015	11-25-52	Sp 738	<.003	5-25-56	Sp 1577	.004	7-24-58	Sp 174	<.003	~~1/27/~~	~~R 546~~							
-1-45	Sp 189	.050	8-21-50	Sp 194	.012	12-29-52	Sp 843	<.003	6-25-56	Sp 1760	.003	8-21-58	Sp 341	<.003	[illegible]								
-2-46	Sp 262	.060	9-25-50	Sp 327	<.003	5-29-53	Sp 1591	<.003	7-25-56	Sp 129	<.003	9-26-58	Sp 560	<.003	8/17 81	R 139	<.003						
-1-46	Sp 306	.200	10-26-50	Sp 545	<.003	6-25-53	Sp 1755	.012	8-24-56	Sp 295	<.003	10-24-58	Sp 776	<.003	9/16 81	R 168	< .003						
3-4-46	Sp 325	.360	11-28-50	Sp 693	.015	7-27-53	Sp 138	.007	9-25-56	Sp 443	.003	11-25-58	Sp 993	<.003	10/21 81	R 228	< .003						
5-7-46	Sp 410	.150	12-26-50	Sp 785	.015	9-25-53	Sp 477	.010	10-25-56	Sp 630	<.003	12-22-58	Sp 1114	<.003	11-17 81	R 281	< .003						
6-7-46	Sp 554	.120	1-25-51	Sp 863	.015	10-26-53	Sp 737	.015	11-27-56	Sp 728	<.003	1-26-59	Sp 1298	<.003	2-17 82	R 444	< .003						
8-2-46	Sp 56	.120	2- -51	Sp 97	.010	11-25-53	Sp 894	.015	12-28-56	Sp 972	<.003	2-25-59	Sp 1490	<.003	3-22 82	R 486	< .003						
9-6-46	Sp 144	.080	- -51	Sp 1075	.015	12-29-53	Sp 1067	.015	1-25-57	Sp 1081	<.003	3-25-59	Sp 1677	<.003									
10-7-46	Sp 289	.040	5-29-51	Sp 1332	.015	1-26-54	Sp 1251	.020	2-26-57	Sp 1261	<.003	4-27-59	Sp 1851	<.003									
11-6-46	Sp 342	.060	6-26-51	Sp 1474	.015	2-25-54	Sp 1471	.010	3-25-57	Sp 1381	<.003	6-26-59	Sp 2269	.003									
12-3-46	Sp 368	.010	7-24-51	Sp 66	.012	6-25-54	Sp 2127	.010	4-25-57	Sp 1500	<.003	7-27-59	Sp 175	<.003									
1-10-47	Sp 400	.040	8-21-51	Sp 163	.012	8-25-54	Sp 331	.010	5-24-57	Sp 1689	<.003	9-25-59	Sp 690	<.003									
2-6-47	Sp 437	.040	9-24-51	Sp 242	.015	12-29-54	Sp 1128	.007	6-25-57	Sp 1866	<.003	10-20-59	Sp 1005	<.003									
4-3-47	Sp 484	.025	10-22-51	Sp 400	.012	1-25-55	Sp 1276	<.003	7-25-57	Sp 107	<.003	12-29-59	Sp 1369	<.003									
6-5-47	Sp 561	.055	11-21-51	Sp 491	.009	2-25-55	Sp 45	.015	8-23-57	Sp 254	<.003	2-24-60	Sp 1690	<.003									
7-10-47	Sp 9	.020	12-20-51	Sp 572	.010	3-25-55	Sp 1606	.007	9-25-57	Sp 438	<.003	8-28-63	R 1022	.003									
2-18-48	Sp 589	.020	2-26-52	Sp 924	.015	7-25-55	Sp 97	.007	10- -57	Sp 600	<.003	5-24-63	C 1227	.007									
7-11-49	Sp 37	.015	3-28-52	Sp 1048	.015	8-25-55	Sp 236	.007	11-27-57	Sp 780	<.003	11-29-63	R 527	<0.003									
12-7-49	Sp 769	<.003	4-30-52	Sp 1132	<.003	9-26-55	Sp 337	.007	12-26-57	Sp 888	<.003	[illegible]	[illegible]	[illegible]									
1-26-50	Sp 915	.003	5-29-52	Sp 1264	.015	10-25-55	Sp 550	.005	1-24-58	Sp 999	<.003	[illegible]	[illegible]	[illegible]									
2-23-50	Sp 1005	.008	6-27-52	Sp 1451	.015	11-25-55	Sp 715	.004	2-25-58	Sp 1132	<.003	4/24/64	R 1848	<0.003									
3-22-50	Sp 1151	.010	7-29-52	Sp 122	.010	12-27-55	Sp 830	<.003	3-25-58	Sp 1267	<.003	[illegible]/64	R 490	< .003									
4-25-50	Sp 1345	<.003	8-28-52	Sp 321	.015	2-27-56	Sp 1167	<.003	4-24-58	Sp 1477	.007	[illegible]/24/64	R 600	< .003									
	Sp		-52	Sp		-56	Sp		-25-58	Sp	<.003	12/28/64	R 601	<.003									

FORM 236 – 0/02 – 1M

SANITARY ENGIN[illegible] ING DIVISION

YEAR 1945 Cr^{+6} SURVEY

LOCATION GRIFFITH PARK WELL #2 CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. No.	Cr^{+6}
-2-45	SP 15	.120
-18-45	SP 48	.160
-29-45	SP 125	.240
-1-45	SP 190	.030
2-4-45	SP 214	.080
-2-46	SP 263	.100
-1-46	SP 307	.140
5-7-46	SP 411	.030
7-5-46	SP 8	.080
9-6-46	SP 145	.080
10-7-46	SP 290	.020
11-6-46	SP 343	.050
1-10-47	SP 401	.020
4-3-47	SP 485	.040
5-5-47	SP 510	.040
6-5-47	SP 562	.030
5-7-51	SP 1217	.012
2-24-61	SP 2415	<.003
10-23-61	SP 1555	<.003

FORM 236 - 0/02 . - 3M

SANITARY ENGINEERING DIVISION

Cr^{+6} SURVEY

YEAR 1945

LOCATION GRIFFITH PARK WELL #6 CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}
-18-45	Sp 49	<.003
-1-45	Sp 191	<.003
-2-46	Sp 264	<.003
-4-46	Sp 326	<.003
5-7-46	Sp 412	<.003
7-5-46	Sp 9	<.003
9-6-46	Sp 146	<.003
11-6-46	Sp 344	<.003
1-10-47	Sp 402	<.003
4-3-47	Sp 486	<.003
6-5-47	Sp 563	<.003
8-7-47	Sp 42	<.003
2-18-48	Sp 590	<.003

FORM 236

SANITARY ENGIN ING DIVISION

YEAR 1974 Cr^{6+} SURVEY

LOCATION GRIFFITH PARK #7 CHEMICAL ANALYSES (P.P.M.)

Date	Lab #	Cr^{6+}	DATE	LAB #	Cr^{6+}	DATE	LAB #	Cr^{6+}
1/23/74	R445	<.003	3/25/76	R955	<.003	9/22/78	R334	<.003
3/27/74	R579	<.003	4/27/76	R1034	<.003	11/15/78	R458	<.003
4/23/74	R629	<.003	5/26/76	R1147	<.003	1/24/79	R621	<.003
2/26/74	R511	<.003	6/22/76	R57	<.003	2/16/79	R683	<.003
5/23/74	R696	<.003	8/24/76	R232	.01	3/21/79	R763	<.003
6/26/74	R76	<.003	9/29/76	R364	<.003	4/26/79	R834	<.003
7/24/74	R112	0.007	10/28/76	R448	<.003	5/22/79	R891	<.003
8/21/74	R167	0.007	11/23/76	R502	<.003	6/22/79	R47	<.003
x 9/25/78	R205	<.003	12/21/76	R578	<.003	7/19/79	R124	.003
9/22/74	R270	<.003	1/25/77	R688	<.003	8/16/79	R184	.003
10/22/74	R309	<.003	2/23/77	R758	<.003	9/19/79	R248	<.003
11/27/74	R431	<.003	3/23/77	R820	<.003	11/29/79	R424	<.003
12/19/74	R473	<.003	6/15/77	R73	<.003	2-7-80	R553	<.003
1/21/75	R554	<.003	7/27/77	R204	<.003	4-11-80	R714	<.003
2/28/75	R648	<.003	8/25/77	R305	<.003	5-28-80	R820	.003
3/25/75	R712	<.003	10/21/77	R499	<.003	6-24-80	R49	<.003
4/23/75	R777	<.003	11/16/77	R598	<.003	7-17-80	R127	<.003
5/27/75	R857	<.003	12/21/77	R685	<.003	9-16-80	273	<.003
6/25/75	R82	<.003	1/18/78	R763	<.003	8-25-80	223	<.003
7/29/75	R182	<.003	2/15/78	R847	<.003	x ~~5/15/81~~	~~R966~~	~~<.003~~
8/27/75	R270	<.003	3/16/78	R962	<.003	9/20/81	R81	<.003
9/24/75	R331	<.003	4/19/78	R1056	<.003			
11/4/75	R499	<.003	5/17/78	R1132	<.003			
11/26/75	R561	<.003	6/21/78	R60	<.003			
12/30/75	R650	<.003	7/29/78	R170	.003			
1/26/76	R433	<.003	8/17/78	R262	<.003			

FORM 236 – 0/02 – 2M

SANITARY ENGIN ING DIVISION

YEAR 1945-

Cr^{+6} SURVEY

LOCATION GRIFFITH PARK #7 CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}
-18-45	SP 50	.005	9-25-57	SP 437	<.003	12-29-59	SP 1368	<.003	4-25-62	R 134	.005	1/25/65	R 753	<.003	5/25	R882	<.003	8/26/69	R 208	0.003	10/20/71	R301	<.003
-1-45	SP 192	<.003	10- -57	SP 598	<.003	1-25-60	SP 1516	<.003	5-24-62	R 242	.008	2/24/65	R 855	<.003	6/27	R69	<.003	9/25/69	R 262	<0.003	11/19/71	R387	<.003
-2-46	SP 265	<.003	11-27-57	SP 779	<.003	2-24-60	SP 1689	<.003	6-27-62	R 96	.007	3/24/65	R 959		7/24	R123	<.003	10/29/69	R 338	<0.003	12/17/71	R454	<.003
-4-46	SP 327	<.003	12-26-57	SP 887	<.003	3-28-60	SP 1927	<.003	7-25-62	R 184	.005	4/26/65	R 1049	0.005	8/25	R187	<.003	11/25/69	R 391	<0.003	1/17/72	R500	<.003
-7-46	SP 413	<.003	1-24-58	SP 998	<.003	4-25-60	SP 2111	<.003	8-24-62	R 319	<.003	6/25	R 50	<.003	9/25/67	R267	<.003	12/23/69	R 439	<0.003	2/18/72	R559	<.003
-5-46	SP 10	<.003	2-25-58	SP 1131	<.003	5-27-60	SP 2338	<.003	9-25-62	R 435	<.003	7/27	R 134	<.003	10/25	R328	<.003	1/23/70	R 490	<0.003	5/3/72	R780	<.003
-6-46	SP 147	<.003	3-25-58	SP 1266	<.003	6-24-60	SP 169	<.003	10-26-62	R 547	<.003	8/27	R242	<.003	11/29	R410	<.003	2/27/70	R 539	<0.003	3/31/72	R631	<.003
1-6-46	SP 345	<.003	4-24-58	SP 1476	.007	7-22-60	SP 393	<.003	11-26-62	R 641	<.003	9/27	R316	0.003	12/27	R467	<.003	3/25/70	R 593	<0.003	4/25/72	R703	<.003
1-10-47	SP 403	<.003	5-23-58	SP 1631	<.003	8-24-60	SP 721	.010	1-25-63	R 829	.007	10/25	R395	<.003	1/25/68	R521	<0.003	4/24/70	R 660	<0.003	6/27/72	R55	<.003
4-3-47	SP 487	<.003	6-25-58	SP 1907	<.003	9-26-60	SP 1067	<.003	2-25-63	R 902	<.003	12/17	R504	<.003	2/26/68	R583	<0.003	5/22/70	R 740	<0.003	7/25/72	R109	<.003
6-5-47	SP 564	<.003	7-24-58	SP 173	<.003	10-24-60	SP 1388	<.003	6-[illegible]-63	R 90	.003	1/24/66	R 578	<.003	3/22/68	R639	0.015	6/22/70	R 69	<0.003	8/21/72	R177	<.003
8-7-47	SP 43	<.003	8-26-58	SP 340	<.003	11-23-60	SP 1673	<.003	7-26-63	R 155	.003	2/25/66	R 648	<.003	3/25/68	R645	<0.003	7/27/70	R 146	<0.003	9/25/72	R266	<.003
3-26-56	SP 1309	.008	9-26-58	SP 559	.010	12-21-60	SP 1901	<.003	8-21-63	R 277	.003	3/25	R722	<.003	4/26/68	R716	<0.003	8/27/70	R 217	<0.003	10/27/72	R350	<.003
5-25-56	SP 1580	<.003	10-24-58	SP 795	<.003	1-25-61	SP 2153	<.003	9-25-63	R 373	0.007	4/25	R790	<.003	5/24/68	R796	<0.003	9/25/70	R 289	<0.003	11/20/72	R396	<.003
9-25-56	SP 444	.010	11-25-58	SP 942	<.003	3-27-61	SP 2645	<.003	10-23-63	R 462	0.003	5/23	R887	<.003	6/24/68	R64	<0.003	10/23/70	R 342	<0.003	12/14/72	R441	<.003
10-25-56	SP 629	.007	12-22-58	SP 1113	<.003	4-26-61	SP 2921	<.003	11-29-63	R 575	<0.003	6/24	R55	.003	7/26/68	R 161	<0.003	11/20/70	R 374	<0.003	1/24/73	R503	<.003
11-27-56	SP 727	.007	1-26-59	SP 1297	<.003	5-24-61	SP 3180	<.003	12-27-63	R 644	<0.003	7/27	R138	<.003	8/23/68	R 227	<0.003	12/18/70	R 444	<0.003	2/27/73	R 552	<.003
12-28-56	SP 971	.007	2-25-59	SP 1409	<.003	6-26-61	SP 245	<.003	1/24/64	R 750	<0.003	8/29	R240	<.003	9/24/68	R 296	<0.003	1/22/71	R 491	<0.003	3/23/73	R603	<.003
1-25-57	SP 1080	.004	3-25-59	SP 1676	<.003	7-26-61	SP 628	<.003	2/26/64	R 836	0.003	9/26	R301	<.003	10/25/68	R 358	<0.003	2/19/71	R 538	0.003	4/25/73	R658	<.003
2-26-57	SP 1260	<.003	4-27-59	SP 1850	<.003	8-24-61	SP 1001	<.003	3/25/64	924	0.003	10/24	R372	<.003	11/26/68	R 418	<0.003	3/19/71	R 611	<0.003	5/22/73	R737	<.003
3-25-57	SP 1380	<.003	5-26-59	SP 2058	<.003	9-29-61	SP 1337	<.003	4/24/64	1145	<.003	11/21	R469	<0.003	12/30/68	R 476	<0.003	4/16/71	R 679	<0.003	6/27/73	R40	<.003
4-25-57	SP 1499	.010	6-29-59	SP 174	<.003	11-27-61	SP 1798	<.003				12/29	R538	<0.003	3/24/69	R 595	<.003	5/3/71	R 965	<0.003	7/25/73	R59	<.003
5-24-57	SP 1688	<.003	8-31-59	SP 427	<.003	12-27-61	SP 1994	<.003	6/25/64	R 88	.008	1/27	R596	<0.003	4/24/69	R 646	<.003	6/18/71	R 44	<.003	10/25/73	R258	<.003
6-25-57	SP 1865	<.003	9-25-59	SP 689	<.003	1-24-62	SP 2159	<.003	7/24/64	R 180	0.005	2/24/67	R670	<0.003	5/27/69	R 728	<0.003	7/23/71	R 171	<.003	8/29/73	R155	<.003
7-25-57	SP 706	<.003	10-30-59	SP 1004	<.003	2-26-62	SP 2388	<.003	8/25/64	R 283	.004	3/24	R735	<0.003	6/25/69	R 69	<0.003	8/13/71	R 164	<0.003	11/21/73	R327	<.003
	SP		9	SP			R			R		4/21	R799	[illegible]	7/23/69	R 124	<0.003	1/24/71	R 950	<0.003	12/19/73	R397	<.003

FORM 236 - ... - 1M

SANITARY ENGIN[EER]ING DIVISION

YEAR 1967 Cr+6 SURVEY

LOCATION GLENDALE AIRPORT DRAIN CHEMICAL ANALYSES (P.P.M.)

DATE	LAB NO.	Cr+6	DATE	LAB NO.	Cr+6	DATE	LAB NO.	Cr+6	DATE	LAB NO.	Cr+6
1/25/67	R884	<.003	8/26/69	R 209	0.070	10/30/71	302	<.003	1/23/74	R246	<.003
5/28	R70	.003	9/25/69	R 263	0.070	11/17/71	388	<.003	3/27/74	R550	<.003
7/24	R124	0.01	10/24/69	R 339	0.003	12/17/71	455	<.003	4/23/74	R630	<.003
8/25	R188	0.05	11/25/69	R 392	0.02	1/17/72	505	<.003	3/26/74	R612	<.003
9/25	R268	<.003	12/23/69	R 448	~~0.003~~ 0.04	2/18/72	560	<.003	5/23/74	R697	<.003
10/25	R329	.007	1/23/70	R 491	0.04	5/23/72	781	<.003	6/26/74	R72	<.003
11/29/67	R411	0.01	2/27/70	R 540	<0.003	3/24/72	632	<.003	7/22/74	R113	<.003
12/27	R468	<.003	3/25/70	R 594	0.04	4/25/72	704	<.003	8/21/74	R168	<.003
1/25/68	R522	<0.003	4/24/70	R 661	0.40	6/27/72	R56	<.003	× 9/25/73	R206	<.003
2/26/68	R584	0.200	5/22/70	R 741	0.070	7/25/72	R110	<.003	9/24/74	R271	<.003
3/22/68	R640	0.200	6/26/70	R 70	<0.003	8/21/72	R180	<.003	10/22/74	R310	<.003
3/25/68	R646	0.28	7/25/70	R 147	0.20	9/25/72	R267	<.003	11/27/74	R432	<.003
4/26/68	R717	0.040	8/27/70	R 219	0.04	10/27/72	R351	<.003	12/19/74	R474	<.003
5/24/68	R792	0.02	9/25/70	R 290	0.05	11/30/72	R397	<.003	1/21/75	R555	<.003
6/24/68	R65	0.014	10/23/70	R 343	0.140	12/19/72	R449	<.003	2/28/75	R649	<.003
7/26/68	R 142	0.01	11/20/70	R 395	0.140	1/24/73	R503	<.003	3/25/75	R713	<.003
8/23/68	R 228	0.003	12/18/70	R 446	* <0.003	2/27/73	R 553	<.003	4/23/75	R778	<.003
9/24/68	R 297	0.015	1/22/71	R 498	<0.003	3/23/73	R604	<.003	5/27/75	R858	<.003
10/25/68	R 359	0.003	2/19/71	R 539	<0.003	4/25/73	R694	<.003	6/25/75	R83	<.003
11/26/68	R 419	<0.003	3/19/71	R 612	0.010	5/22/73	R758	<.003	7/29/75	R183	<.003
12/30/68	R 477	~~0.003~~ 0.04	4/16/71	R 679	<0.003	6/27/73	R41	0.07	8/27/75	R271	<.003
3/24/69	R 596	.040	5/21/71	R 766	<0.003	7/25/73	R90	<.003	9/24/75	R332	<.003
4/24/69	R 647	.100	6/18/71	R 45	<0.003	10/25/73	R289	<.003	11/4/75	R500	<.003
5/27/69	R 728	0.020	7/23/71	R 112	<0.003	8/29/73	R156	<.003	12/24/75	R562	<.003
6/25/69	R 70	0.040	8/13/71	R 168	0.003	11/21/73	R328	<.003	12/26/75	R651	<.003
	R	[illegible]	[illegible]	R	[illegible]	12/19			1/26	[illegible]	<

DATE	LAB NO.	Cr+6	DATE	LAB NO.	Cr+6	DATE	LAB NO.	Cr+6	DATE	LAB NO.	Cr+6
3/25/76	R956	<.003	9/22/78	R335	0.20						
4/27/76	R1035	0.100	11/15/78	R459	<.003						
5/26/76	R1148	<.003	1/24/79	R622	<.003						
6/22/76	R58	<.003	2/16/79	R684	<.003						
8/24/76	R233	<.003	3/21/79	R764	<.003						
9/29/76	R365	<.003	R764	oil & grease	37.0						
10/28/76	R449	<.003	4/24/79	R835	<.003						
11/23/76	R502	<.003	5/22/79	R892	<.003						
12/21/76	R579	<.003	6/22/79	R48	.007						
1/25/77	R687	<.003	7/19/79	R125	<.003						
2/23/77	R759	<.003	8/16/79	R185	<.003						
3/23/77	R821	<.003	9/19/79	R247	<.003						
6/15/77	R74	<.003	11/29/79	R425	<.003						
7/27/77	R205	<.003	2/7/80	R554	<.003						
8/25/77	R306	<.003	4-11 80	R 415	.020						
10/21/77	R500	<.003	5-28 80	R 821	<.003						
11/16/77	R599	<.003	6-24 80	R 50	<.003						
12/21/77	R686	<.003	7-17 80	R 128	<.003						
1/18/78	R764	<.003	9-16 80	274	<.003						
2/15/78	R848	<.003	8-25 80	224	<.003						
3/16/78	R963	<.003	* 5/15/81	R 967	<0.003						
4/19/78	R1057	<.003	7/20/81	R 82	<0.003						
5/17/78	R1133	<.003	8/17/81	R 141	<.003						
6/21/78	R61	<.003	11/17/81	R 282	<.003						
7/19/78	R171	<.003	2-7 82	R 447	<.003						
8/17	[illegible]	<	3-22	R [illegible]	<						

Form 236 - ... - 2M

SANITARY ENGINEERING DIVISION

Cr^{+6} SURVEY, COMPOSITE

YEAR 1953 -

LOCATION: GLENDALE AIRPORT WELL CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}
-25-53	Sp 286	0.02	7-25-56	Sp 130	.008	10-24-58	Sp 797	<.003	1-25-61	Sp 2154	<.003	5-24-63	1228	<.003	6/25/65	R 51	< .003						
-25-53	Sp 473	.015	8-24-56	Sp 296	.010	11-25-58	Sp 994	.007	2-24-61	Sp 2416	<.003	6-26-63	R 91	.003	7/27/65	R 135	< .003						
-26-53	Sp 736	.015	9-25-56	Sp 445	.010	12-22-58	Sp 1115	.007	3-27-61	Sp 2646	<.003	7-26-63	R 190	.003	8/27/65	R243	<.003						
-25-53	Sp 892	.010	10-25-56	Sp 632	.010	1-26-59	Sp 1299	.003	4-26-61	Sp 2922	<.003	8-28-63	R 278	.003	9/27	R317	<.003						
2-29-53	Sp 1069	.015	11-27-56	Sp 729	.010	2-25-59	Sp 1491	<.003	5-24-61	Sp 3181	<.003	9-25-63	R 374	<0.003	10/25	R396	<.003						
1-26-54	Sp 1253	.010	12-28-56	Sp 973	.010	3-25-59	Sp 1678	.007	6-26-61	Sp 246	<.003	10-23-63	R 463	<0.003	2/25	R649	<.003						
2-25-54	Sp 1470	.010	1-25-57	Sp 1082	.007	4-27-59	Sp 1852	.007	7-26-61	Sp 629	.005	11-29-63	R 578	<0.003	6/24/66	R56	<.003						
3-25-54	Sp 1617	.007	3-25-57	Sp 1382	.015	5-26-59	Sp 2059	.007	8-24-61	Sp 1002	<.003	12-27-63	R 645	<0.003	11/21	R470	<.003						
4-26-54	Sp 1767	.010	4-25-57	Sp 1501	.015	6-26-59	Sp 2270	.003	9-29-61	Sp 1338	.008	1/24/64	R 751	<0.003	12/29	~~R540~~ 539	<.003						
5-25-54	Sp 1920	.005	5-24-57	Sp 1690	.007	7-27-59	Sp 176	.005	10-23-61	Sp 1556	.007	2/24/64	R 837	0.003	1/27	R 397	<.003						
6-25-54	Sp 2126	.010	6-25-57	Sp 1867	.007	8-31-59	Sp 428	<.003	11-27-61	Sp 1799	.007	3/25/64	925	<0.003	3/24/67	R671	<.003						
7-26-54	Sp 177	.010	7-25-57	Sp 108	.007	9-25-59	Sp 691	.005	12-27-61	Sp 1995	.010	4/24/64	R 1049	<0.003	3/24	R736	<.003						
8-25-54	Sp 329	.010	8-23-57	Sp 255	.007	10-30-59	Sp 1006	.007	1-24-62	Sp 2160	.007	5/22/64	1146	<.003	4/24	R800	<.003						
10-25-54	Sp 780	<.003	9-25-57	Sp 439	.008	11- -59	Sp 1190	<.003	2-26-62	Sp 2389	.007				5/25	R883	<.003						
12-27-54	Sp 1127	<.003	10- -57	Sp 601	<.003	12-29-59	Sp 1370	.010	3-23-62	R 50	.007	6/25	R 89	<.003	~~[illegible]~~	~~R[illegible]~~	~~.005~~						
1-25-55	Sp 1275	<.003	11-27-57	Sp 781	<.003	1-25-60	Sp 1517	<.003	4-25-62	R 135	.005	7/24	R 182	<0.003	~~[illegible]~~	~~R65~~	~~0.014~~						
2-25-55	Sp 1447	<.003	12-26-57	Sp 889	<.003	2-24-60	Sp 1691	<.003	5-24-62	R 243	.007	8/28/64	R 285	.01	~~4/25/61~~	~~R 70~~	~~0.040~~						
4-25-55	Sp 1748	<.003	1-24-58	Sp 1000	.006	3-28-60	Sp 1928	.007	6-27-62	R 97	.007	9/23/64	R 372	< .003	~~7/25/61~~	~~R 125~~	~~0.040~~						
5-25-55	Sp 1923	.010	2-25-58	Sp 1133	.008	4-25-60	Sp 2112	.010	7-25-62	R 185	.005	10/26/64	R 492	< .003	4/16/61 R.	R 678	< .003						
6-24-55	Sp 2053	.008	3-25-58	Sp 1268	.003	5-27-60	Sp 2339	.010	8-24-62	R 320	<.003	11/24/64	R 602	.003	See next sheet								
7-25-55	Sp 96	<.003	4-24-58	Sp 1478	.008	6-24-60	Sp 170	<.003	9-25-62	R 436	<.003	12/28/64	R 692	<.003									
8-25-55	Sp 235	<.003	5-23-58	Sp 1633	.009	7-22-60	Sp 394	<.003	10-26-62	R 548	<.003	1/25/65	R 752	<.003									
9-26-55	Sp 335	<.003	6-25-58	Sp 1909	.005	8-24-60	Sp 722	.007	11-26-62	R 642	.003	2/24/65	R 856	<.003									
4-25-56	Sp 1438	.010	7-24-58	Sp 175	.010	9-26-60	Sp 1068	.007	1-25-63	R 830	.004	3/24/65	R 961	<.003									
5-25-56	Sp 1578	.010	8-26-58	Sp 242	.007	10-24-60	Sp 1389	.007	2-25-63	R 903	.007	4/26/65	R 1051	<.003									
	Sp	[illegible]	-1-58	Sp	[illegible]	-60	Sp	[illegible]	3-22-	R [illegible]	.003	6/	R 51	< .008									

Form 236 - ... 2M

SANITARY ENGINEERING DIVISION

YEAR 1949 — Cr^{+6} SURVEY

LOCATION GLENDALE AIRPORT DRAIN — CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}
-11-49	SP 38	5.0	12-20-51	SP 571	.007	2-25-54	SP 1472	.007	6-25-56	SP 1761	.600	8-26-58	SP 343	<.003	10-24-60	SP 1390	.160	10-26-62	R 549	.070	1/25/65	R 755	<.003
1-7-49	SP 772	3.0	1-24-52	SP 812	<.003	3-25-54	SP 1616	<.003	7-25-56	SP 131	.018	9-26-58	SP 562	.010	12-21-60	SP 1902	<.003	11-26-62	R 643	.040	2/24/65	R 857	<.003
-26-50	SP 917	15.0	2-7-52	SP 871	<.003	4-26-54	SP 1768	<.003	8-24-56	SP 297	<.003	10-24-58	SP 798	<.003	1-25-61	SP 2155	.040	1-25-63	R 831	.006	3/24/65	R 80	<.003
-23-50	SP 1011	3.5	3-28-52	SP 1045	<.003	5-25-54	SP 1919	.003	9-25-56	SP 446	.003	11-25-58	SP 995	.030	2-24-61	SP 2417	<.003	2-25-63	R 904	.020	4/26/65	R 1050	<.003
-22-50	SP 1152	3.5	4-30-52	SP 1130	0.14	7-26-54	SP 176	<.003	10-25-56	SP 631	<.003	12-22-58	SP 1116	.030	3-27-61	SP 2647	.030	3-28-63	R 1024	.003	6/25	R 52	<.003
1-25-50	SP 1346	0.80	5-29-52	SP 1261	<.003	8-25-54	SP 328	<.003	11-27-56	SP 730	<.003	1-26-59	SP 1300	.160	4-26-61	SP 2923	.050	5-24-63	R 1229	.40	7/27/65	R 136	0.10
5-25-50	SP 1437	0.04	6-27-52	SP 1452	<.003	9-27-54	SP 550	<.003	12-28-56	SP 974	<.003	2-25-59	SP 1492	<.003	5-24-61	SP 3182	80.0	6-24-63	R 92	.003	8/27/65	R 249	0.02
6-20-50	SP 1561	4.0	7-29-52	SP 119	<.003	10-25-54	SP 781	<.003	1-25-57	SP 1083	<.003	3-25-59	SP 1679	.010	6-26-61	SP 247	<.003	7-26-63	R 187	.004	9/27/65	R318	0.007
7-24-50	SP 80	5.0	8-28-52	SP 318	<.003	11-24-54	SP 959	.560	2-26-57	SP 1262	<.003	4-27-59	SP 1860	.200	7-26-61	SP 630	<.003	8-24-63	R 279	.003	10/25	R397	0.003
8-21-50	SP 193	5.0	9-25-52	SP 425	<.003	12-27-54	SP 1130	<.003	3-25-57	SP 1383	<.003	5-26-59	SP 2060	.007	8-24-61	SP 1003	.015	9-25-63	R 375	0.003	12/17/65	R505	<.003
9-25-50	SP 323	3.0	10-27-52	SP 642	.005	1-25-55	SP 1277	<.003	4-25-57	SP 1502	.007	6-26-59	SP 2271	.140	9-29-61	SP 1339	.015	10-24-63	R 464	<0.003	1/24/66	R 579	<.003
10-26-50	SP 541	16.0	11-25-52	SP 736	.020	2-25-55	SP 1444	<.003	5-24-57	SP 1691	.004	7-27-59	SP 177	.240	10-23-61	SP 1557	.060	11-29-63	R 577	0.030	2/25	R 650	<.003
11-28-50	SP 192	2.0	12-29-52	SP 841	<.003	3-25-55	SP 1607	<.003	6-25-57	SP 1868	<.003	8-31-59	SP 429	.007	11-27-61	SP 1800	.020	12-27-63	R 646	0.007	3/25	R723	<.003
12-26-50	SP 789	4.5	1-29-53	SP 981	.010	4-25-55	SP 1747	<.003	7-25-57	SP 169	<.003	9-25-59	SP 692	.036	12-27-61	SP 1996	.020	1/24/64	R 752	0.02	4/25	R791	0.02
1-18-51	SP 842	7.5	2-27-53	SP 1125	<.003	5-25-55	SP 1924	<.003	8-23-57	SP 256	<.003	10-30-59	SP 1007	.040	1-24-62	SP 2028	.003	2/26/64	R 838	0.016	5/23	R888	0.003
1-25-51	SP 862	9.0	3-27-53	SP 1308	<.003	6-24-55	SP 2052	.003	9-25-57	SP 440	.040	11- -59	SP 1191	.015	1-24-62	SP 2161	.005	3/26/64	926	0.014	6/24	R57	.007
2-19-51	SP 974	.013	4-27-53	SP 1455	.020	7-25-55	SP 98	<.003	10- -57	SP 602	.030	12-29-59	SP 1371	.005	2-26-62	SP 2390	<.003	4/24/64	1150	0.10	7/25	R139	0.15
3- -51	SP 1078	2.2	5-29-53	SP 1588	<.003	8-25-55	SP 237	<.003	11-27-57	SP 782	<.003	1-25-60	SP 1518	.055	3-23-62	R51	1.20	5/25	1147	.030	8/29	R241	.003
5-7-51	SP 1220	.005	6-25-53	SP 1748	<.003	9-26-55	SP 336	<.003	12-26-57	SP 890	<.003	2-24-60	SP 1692	.025	3-26-62	R56	<.003				9/26	R302	.03
5-29-51	SP 1335	<.003	7-27-53	SP 134	<.003	10-25-55	SP 549	<.003	1-24-58	SP 1001	.003	3-28-60	SP 1929	<.003	3-30-62	R71	.010	6/25/64	R 90	.24	10/24	R373	.007
6-26-51	SP 1477	.003	8-25-53	SP 287	<.003	11-25-55	SP 714	.004	2-25-58	SP 1134	.007	4-25-60	SP 2113	.040	4-25-62	R136	.005	7/24	R 181	0.003	11/21	R471	0.003
7-24-51	SP 69	<.003	9-25-53	SP 474	.320	12-27-55	SP 829	<.003	3-25-58	SP 1269	<.003	5-27-60	SP 2340	.060	5-24-62	R 244	.050	8/27/64	R 284	<.003	12/29	R540	<0.003
8-21-51	SP 165	.005	10-26-53	SP 738	<.003	2-27-56	SP 1170	.004	4-24-58	SP 1479	<.003	6-24-60	SP 171	.005	6-27-62	R 98	.009	9/23	R 371	<.003	1/27	598	0.007
9-24-51	SP 241	<.003	11-25-53	SP 895	<.003	3-26-56	SP 1308	<.003	5-23-58	SP 1634	.009	7-22-60	SP 395	<.003	7-25-62	R 186	.005	10/24/64	R 491	<.003	2/24/67	R692	0.007
10-22-51	SP 399	.004	12-29-53	SP 1068	<.003	4-25-56	SP 1439	<.003	6-25-58	SP 1910	.050	8-24-60	SP 723	<.003	8-24-62	R 321	.010	11/24/64	R 601	<.003	3/24	R737	0.007
[illegible]	SP [illegible]	[illegible]	1-5-54	SP [illegible]	[illegible]	5-25-56	SP [illegible]	[illegible]	7-24-58	SP [illegible]	.007	9-26-60	SP 1069	.003	9-25-62	R 437	<.003	12/28/64	R 693	<.003	4/24	R801	<.003

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SANITARY ENGINEERING DIVISION

YEAR 1965

LOCATION River Conduit Cl_2 Plt. CHEMICAL ANALYSES (P.P.M.)

Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}	Date	Lab. No.	Cr^{+6}
/25/65	R 53	< .003	9/25	R269	< .003	2/27/70	R541	< 0.003	3/24/72	633	< .003	7/22/74	R114	<.003	10/28/76	R450	.003	5/23/79	R893	.003			
/27/65	R 137	0.003	10/25	R330	< .003	3/25/70	R595	< 0.003	4/25/72	705	< .003	8/26/74	R169	<.003	11/23/76	R504	< .003	6/22/79	R49	< .003			
/27/65	R245	<.003	11/29	R412	< .003	4/24/70	R663	< 0.003	6/27/72	R57	< .003	3/25/74	R207	<.003	12/21/76	R579	< .003	7/19/79	R126	.003			
/27/65	R319	0.003	12/27	R469	< .003	5/22/70	R742	<0.003	7/24/72	R111	< .003	9/22/74	R272	<.003	1/25/77	R690	< .003	8/16/79	R186	.003			
10/25/65	R398	<.003	1/22/68	R523	< 0.003	6/26/70	R71	< 0.003	8/21/72	R181	< .003	10/22/74	R311	<.003	2/23/77	R760	< .003	9/19/79	R250	< .003			
12/17/65	R506	<.003	2/26/68	R585	< 0.003	7/28/70	R148	< 0.003	9/25/72	R268	< .003	11/27/74	R433	<.003	3/23/77	R822	< .003	11-29-79	R414	< .003			
1/24/66	R 580	0.007	3/22/68	R649	< 0.003	8/27/70	R220	< 0.003	10/27/72	R359	< .003	12/19/74	R475	<.003	6/15/77	R75	< .003	2-7-80	R555	< .003			
2-25-66	R 651	<.003	4/26/68	R718	< 0.003	9/25/70	R291	< 0.003	11/24/72	R398	< .003	1/21/75	R556	<.003	7/27/77	R206	< .003	4-4-80	R 716	< .003			
3/25/66	R724	<.003	5/24/68	R779	< 0.003	10/23/70	R344	< 0.003	12/19/72	R443	< .003	2/28/75	R650	<.003	8/25/77	R307	< .003	5-28-80	R 822	< .003			
4/25/66	R792	<.003	6/24/68	R 68	< 0.003	11/20/70	R396	< 0.003	1/24/73	R504	< .003	3/25/75	R714	<.003	10/21/77	R506	< .003	6-24-80	R 51	< .003			
5/23/66	R889	0.003	7/24/68	R 143	< 0.003	12/18/70	R447	< 0.003	2/27/73	R554	<.003	4/23/75	R779	<.003	11/16/77	R600	< .003	7-17-80	R 129	< .003			
6/24	R58	<.003	8/23/68	R 229	< 0.003	1/22/71	R 493	< 0.003	3/23/73	R605	<.003	5/27/75	R859	<.003	12/21/77	R687	.003	9-16-80	275	<.003			
7/25	R140	< .003	9/24/68	R 298	< 0.003	2/19/71	R 540	< 0.003	4/25/73	R700	<.003	6/25/75	R84	<.003	1/18/78	R764	< .003	8-25-80	225	<.003			
8/29	R242	.003	10/25/68	R 360	< 0.003	3/19/71	R 613	< 0.003	5/22/73	R759	<.003	7/29/75	R184	<.003	2/15/78	R849	< .003	* ~~9 3/15~~	~~R 968~~	~~<0.003~~			
9/26	R303	< .003	11/26/68	R 420	< 0.003	4/16/71	R 680	< 0.003	6/27/73	R42	<.003	8/27/75	R272	<.003	3/16/78	R964	< .003	7-30-81	R 83	<0.003			
10/24	R374	< .003	12/30/68	R 479	< 0.003	5/21/71	R 767	< .003	7/25/73	R91	<.003	9/24/75	R333	< .003	4/19/78	R1059	< .003	8/17/81	R 138	< .001			
11/21	R472	< 0.003	4/24/69	R 648	< 0.003	6/18/71	R 46	< .003	10/25/73	R290	<.003	11/4/75	R501	< .003	5/17/78	R1134	< .003	9/16/81	R 169	.003			
12/29	R541	< 0.003	5/27/69	R 730	< 0.003	7/23/71	R 113	< .003	8/29/73	R157	<.003	11/26/75	R563	< .003	6/21/78	R62	< .003	10/21/81	R 229	< .003			
1/27	R599	< 0.003	6/25/69	R 71	< 0.003	8/13/71	R 169	< 0.003	11/21/73	R329	<.003	12/30/75	R652	< .003	7/19/78	R172	.003	11-17-81	R 283	.003			
2/24/67	R673	< 0.003	7/23/69	R 126	< 0.003	9/24/71	R 251	< 0.003	12/19/73	R399	<.003	1/26/76	R735	< .003	8/17/78	R264	< .003	2-7-82	R 445	< .003			
3/24	R738	< 0.003	8/26/69	R 210	< 0.003	10/30/71	R 303	< .003	1/23/74	R447	<.003	3/25/76	R957	< .003	9/22/78	R336	< .003	3-22-82	R 488	< .003			
4/24	R802	< 0.003	9/25/69	R 864	< 0.003	11/19/71	R 389	< .003	2/27/74	R581	<.003	4/27/76	R1036	< .003	11/15/78	R459	< .003						
5/25	R885	< 0.003	10/24/69	R 340	< 0.003	12/17/71	R 456	< .003	4/23/74	R631	<.003	5/26/76	R1149	< .003	1/24/79	R623	< .003						
6/27	R71	.003	11/25/69	R 393	< 0.003	1/14/72	R 507	< .003	2/26/74	R513	<.003	6/22/76	R59	< .003	2/16/79	R685	< .003						
7/24	R125	< .003	12/23/69	R 442	< 0.003	2/18/72	R 561	< .003	5/23/74	R698	<.003	8/24/76	R234	.007	3/21/79	R765	< .003						
8/[illegible]	R1[illegible]	< [illegible]	[illegible]	R [illegible]	< [illegible]	3/23/72	R 700	< [illegible]	6/26/74	R7[illegible]	< [illegible]	9/29/76	R316	< .003	4/26/79	R836	< .003						

SANITARY ENGIN- -RING DIVISION

YEAR 1945 — Cr^{+6} SURVEY. Comp

LOCATION RIVER CONDUIT Cl_2 PLT CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	LAB NO	Cr^{+6}
1-2-45	Sp 17	.040	3-21-49	M 160	.015	11-21-51	Sp 488	<.003	3-25-54	Sp 1618	<.003	6-25-56	Sp 1759	<.003	10-24-58	Sp 799	<.003	1-25-61	Sp 2156	<.001	5-24-63	R 1230	<0.003
7-18-45	Sp 60	.035	7-4-49		.003	12-20-51	Sp 568	.007	4-26-54	Sp 1766	<.003	7-25-56	Sp 128	<.003	11-25-58	Sp 996	<.003	2-24-61	Sp 2418	.004	6-26-63	R 93	.003
7-12-45	Sp 131	.040	7-11-49	Sp 35	.004	2-26-52	Sp 926	<.003	5-25-54	Sp 1921	.003	8-27-56	Sp 294	<.003	12-22-58	Sp 1117	<.003	3-27-61	Sp 2648	<.003	7-26-63	R 188	.003
1-24-45	Sp 138	.050	12-7-49	Sp 768	.007	3-28-52	Sp 1044	.005	6-25-54	Sp 2125	<.003	9-25-56	Sp 442	.003	1-26-59	Sp 1301	<.003	4-26-61	Sp 2924	<.003	8-24-63	R 280	.003
11-1-45	Sp 202	.050	1-26-50	Sp 914	.005	4-30-52	Sp 1129	<.003	7-26-54	Sp 178	<.003	10-25-56	Sp 633	<.003	2-25-59	Sp 1493	<.003	5-24-61	Sp 3183	<.003	9-25-63	R 376	<0.003
12-4-45	Sp 216	.050	2-23-50	Sp 1004	.007	6-27-52	Sp 1456	.005	8-25-54	Sp 330	<.003	11-27-56	Sp 731	<.003	3-25-59	Sp 1680	<.003	6-26-61	Sp 348	<.003	10-23-63	R 465	<0.003
1-2-46	Sp 272	.050	3-22-50	Sp 1149	<.003	7-29-52	Sp 118	<.003	9-24-54	Sp 552	<.003	12-28-56	Sp 975	<.003	4-27-59	Sp 1853	<.003	7-26-61	Sp 631	<.003	11-29-63	R 580	<0.003
2-1-46	Sp 308	.050	4-25-50	Sp 1343	.008	8-28-52	Sp 317	<.003	10-25-54	Sp 779	<.003	1-25-57	Sp 1084	<.003	5-26-59	Sp 2061	<.003	8-24-61	Sp 1004	<.003	[illegible]	R 647	<0.003
3-4-46	Sp 334	.040	5-25-50	Sp 1435	.003	9-25-52	Sp 424	.004	11-24-54	Sp 958	.007	3-25-57	Sp 1384	<.003	6-26-59	Sp 2272	<.003	9-29-61	Sp 1340	.007	1-24-64	R 763	<0.003
4-2-46	Sp 349	.035	6-20-50	Sp 1564	.005	10-27-52	Sp 640	<.003	12-27-54	Sp 1126	<.003	4-25-57	Sp 1503	.007	7-27-59	Sp 178	.003	10-23-61	Sp 1558	<.003	2/26/64	839	<0.003
5-7-46	Sp 417	.030	7-24-50	Sp 83	.007	11-25-52	Sp 735	<.003	1-25-55	Sp 1274	<.003	5-24-57	Sp 1692	<.003	8-31-59	Sp 430	<.003	11-27-61	Sp 1801	<.003	3/25/64	R 927	<0.003
6-7-46	Sp 555	.025	8-21-50	Sp 196	.005	12-29-52	Sp 840	<.003	2-25-55	Sp 1443	<.003	6-25-57	Sp 1869	<.003	9-25-59	Sp 693	<.003	12-27-61	Sp 1997	<.003	4/24/64	1051	<0.003
7-5-46	Sp 14	.020	9-25-50	Sp 326	.005	1-29-53	Sp 980	<.003	3-25-55	Sp 1605	<.003	7-25-57	Sp 110	.007	10-30-59	Sp 1008	<.003	1-24-62	Sp 2162	<.003	5/25/64	1148	<.003
8-2-46	Sp 57	.020	10-26-50	Sp 544	<.003	2-27-53	Sp 1124	<.003	4-25-55	Sp 1749	<.003	8-7-57	Sp 192	<.003	11- -59	Sp 1192	<.003	2-26-62	Sp 2391	.003			
9-6-46	Sp 151	.015	11-28-50	Sp 695	<.003	3-27-53	Sp 1307	<.003	5-25-55	Sp 1922	<.003	8-23-57	Sp 257	<.003	12-29-59	Sp 1372	<.003	3-23-62	R52	<.003	6/25/64	91	.003
10-7-46	Sp 293	.015	12-26-50	Sp 786	<.003	4-27-53	Sp 1454	<.003	6-24-55	Sp 2054	.003	9-25-57	Sp 441	<.003	1-25-60	Sp 1519	<.003	4-25-62	R137	<.003	7/24	R 183	<.003
11-6-46	Sp 349	.020	1-25-51	Sp 865	<.003	5-29-53	Sp 1587	.003	7-25-55	Sp 95	<.003	10-7-57	Sp 603	<.003	2-24-60	Sp 1693	<.003	5-24-62	R 245	<.003	8/28/64	R 286	<.003
12-3-46	Sp 369	.018	2-19-51	Sp 970	.006	6-25-53	Sp 1747	.003	8-25-55	Sp 234	<.003	1-24-58	Sp 1002	<.003	3-28-60	Sp 1930	<.003	6-27-62	R 99	<.003	9/23/64	R 373	<.003
1-10-47	Sp 407	.015	3- -51	Sp 1074	.003	7-27-53	Sp 133	.004	9-26-55	Sp 334	<.003	2-25-58	Sp 1135	.003	4-25-60	Sp 2114	<.003	7-25-62	R 187	<.003	10/26/64	R 493	<.003
2-6-47	Sp 438	.025	5-7-51	Sp 1216	<.003	8-25-53	Sp 285	.003	10-25-55	Sp 548	<.003	3-25-58	Sp 1272	<.003	5-16-60	Sp 2341	<.003	8-24-62	R 322	<.003	11/24/64	R 603	<.003
4-3-47	Sp 491	.010	5-29-51	Sp 1331	.007	9-25-53	Sp 472	<.003	11-25-55	Sp 713	.004	4-24-58	Sp 1480	<.003	6-24-60	Sp 172	<.003	9-25-62	R 438	<.003	12/28/64	R 744	<.003
5-5-47	Sp 512	.010	6-26-51	Sp 1473	.004	10-26-53	Sp 735	<.003	12-27-55	Sp 828	<.003	5-23-58	Sp 1635	.003	7-22-60	Sp 396	<.003	10-26-62	R 550	<.003	1/25/65	R 756	<.003
6-5-47	Sp 568	.015	7-24-51	Sp 65	.006	11-25-53	Sp 893	<.003	2-27-56	Sp 1169	<.003	6-25-58	Sp 1911	<.003	8-24-60	Sp 424	<.003	11-26-62	R 644	.003	2/24/65	R 858	<.003
8-7-47	Sp 47	.008	8-21-51	Sp 162	.004	12-29-53	Sp 1070	<.003	3-26-56	Sp 1306	<.003	7-24-58	Sp 177	<.003	9-26-60	Sp 1070	<.003	1-25-63	R 832	.003	3/24/65	R 962	<.003
7-10-47	Sp 11	.015	9-24-51	Sp 239	.005	1-26-54	Sp 1254	<.003	4-25-56	Sp 1436	<.003	8-26-58	Sp 344	<.003	10-24-60	Sp 1391	<.003	2-25-63	R 905	.010	4/26/65	R 1052	<.003
[illegible]	Sp [illegible]	[illegible]	[illegible]	Sp [illegible]	[illegible]	[illegible]-25-54	Sp [illegible]	<.003	5-25-56	Sp 1571	.004	9-26-58	Sp 56[illegible]	<.003	11-23-60	Sp 1675	<.003	3-25-63	R 1025	.003			

FORM 250 — 9/62

SANITARY ENGINEERING DIVISION

YEAR

LOCATION POLLOCK WELL COMPOSITE CHEMICAL ANALYSES (P.P.M.)

DATE	LAB NO.	Cr^{+6}
3/22/82	R 482	< .003

SANITARY ENGINEERING DIVISION

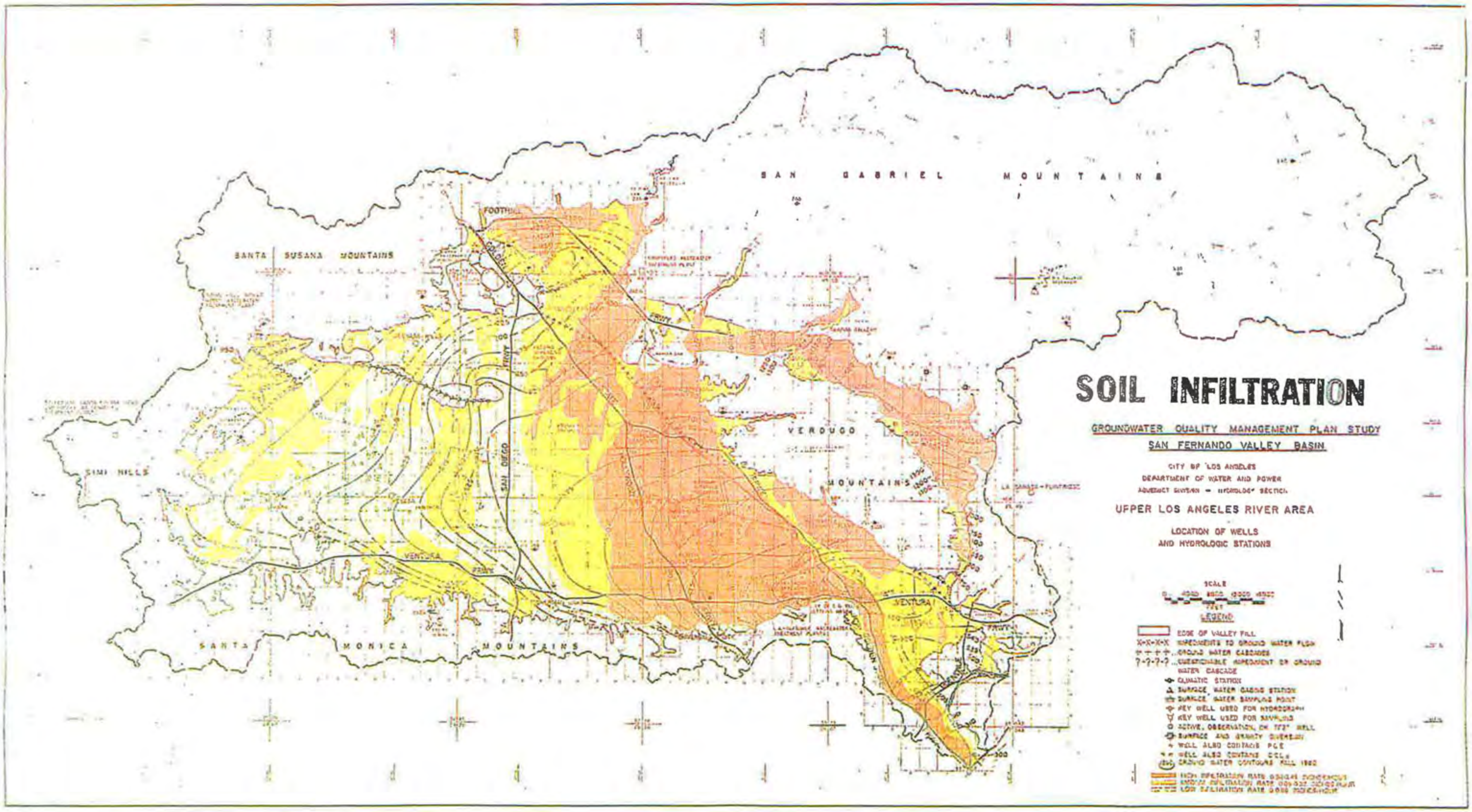
YEAR 950 — Cr^{+6} SURVEY

LOCATION POLLOCK WELLS COMPOSITE CHEMICAL ANALYSES (P.P.M.)

DATE	LAB. NO.	Cr^{+6}	DATE	LAB. NO.	Cr^{+6}	DATE	Lab. No.	Cr^{+6}	DATE	Lab. No.	Cr^{+6}	Date	Lab No.	Cr^{+6}	DATE	LAB NO.	Cr^{+6}	DATE	LAB No.	Cr^{+6}
1-26-50	SP 919	.015	6-26-61	SP 249	<.003	7/24/64	754	0.007	4/25	R793	0.01	6/24/68	R 67	< 0.003	5/27/75	R860	<.003	12/21/77	R688	< .003
-16-55	SP 224	.008	7-26-61	SP 632	<.003	9/24/64	840	0.007	5/23	R890	0.007	7/24/68	R 144	< 0.003	6/25/75	R85	.007	1/18/78	R766	< .003
-26-59	SP 2274	<.003	8-24-61	SP 1005	<.003	3/25/64	928	0.007	6/24	R59	.007	8/23/68	R 230	< 0.003	7/29/75	R185	<.003	5/11/78	R1135	< .003
-27-59	SP 180	.003	9-29-61	SP 1341	.007	4/25	1052	0.007	7/25	R141	.005	9/24/68	R 299	< 0.003	8/27/75	R273	<.003	6/21/78	R63	< .003
-31-59	SP 432	<.003	10-23-61	SP 1559	<.003	5/25/64	1149	.007	8/29	R243	.003	10/25/68	R 361	< 0.003	9/24/75	R334	< .003	7/19/78	R173	< .003
-25-59	SP 695	.003	11-27-61	SP 1802	.007				9/26	R304	< .003	11/26/68	R 421	< 0.003	11/4/75	R502	< .003	8/17/78	R245	< .003
0-30-59	SP 1009	<.003	12-27-61	SP 1998	.007	6/25/64	92	.008	10/24	R375	.003	12/30/68	R 479	< 0.003	11/26/75	R564	< .003	9/22/78	R337	< .003
1- -59	SP 1193	<.003	1-24-62	SP 2163	.005	7/24	R 184	0.013	11/21	R473	0.003	4/24/69	R 649	< 0.003	12/30/75	R653	< .003	11/15/78	R461	< .003
-29-59	SP 1373	<.003	2-26-62	SP 2392	.003	8/28/64	R 787	.007	12/29	R542	< 0.003	5/27/69	R 731	< 0.003	1/26/76	R736	< .003	1/24/79	R624	< .003
-25-60	SP 1520	<.003	3-23-62	R53	.005	9/23/64	R 374	.007	1/27	R 600	< 0.003	6/25/69	R 72	< 0.003	3/25/76	R958	< .003	2/16/79	R686	< .003
-24-60	SP 1695	.010	4-25-62	R138	.005	10/26/64	R 494	.007	3/24/67	R674	< 0.003	7/23/69	R 127	< 0.003	4/27/76	R1037	< .003	3/21/79	R766	< .003
-28-60	SP 1931	.007	5-24-62	R246	.007	11/24/64	R 604	.007	3/24	R739	< 0.003	8/26/69	R 211	< 0.003	5/26/76	R1150	< .003	4/26/79	R837	< .003
1-25-60	SP 2116	.007	6-25-62	R 439	.007	12/28/64	R 695	<.003	4/24	R803	< .003	9/25/69	R 265	< 0.003	6/22/76	R60	< .003	5/22/79	R894	.003
-27-60	SP 2343	.005	10-26-62	R 551	.007	1/25/65	R 757	0.007	5/25	R886	< .003	10/24/69	R 341	<0.003	8/24/76	R235	< .003	6/22/79	R50	.003
-24-60	SP 173	<.003	11-26-62	R 645	.010	3/24/65	R 859	0.01	6/27	R72	.007	11/25/69	R 394	<0.003	9/29/76	R367	< .003	7/19/79	R126	.003
-22-60	SP 397	<.003	1-25-63	R 833	.010	3/24/65	R 963	0.01	7/24	R126	.007	6/26/70	R 72	0.40*	10/28/76	R451	< .003	8/16/79	R187	.007
-24-60	SP 725	<.003	2-25-63	R 906	<.003	4/26/65	R 1053	0.015	8/25	R190	< .003	7/22/74	R115	<.003	11/23/76	R505	< .003	9/19/79	R251	.003
-26-60	SP 1071	<.003	3-28-63	R 1026	.01	5/25/65	R 64	0.020	9/25	R270	.005	8/21/74	R170	<.003	12/21/76	R581	< .003	11-29-79	R427	.007
0-24-60	SP 1392	<.003	5-24-63	R 1231	.005	7/27	R 138	0.01	10/25	R331	< .003	9/24/74	R273	<.003	1/25/77	R690	< .003	2-7-80	R556	< .003
-23-60	SP 1676	.007	6-26-63	R 93	.003	8/27	R246	0.015	11/29	R413	< .003	10/22/74	R312	<.003	2/23/77	R761	< .003	4-4-80	R 717	.007
-21-60	SP 1903	.007	7-26-63	R 169	.003	9/27	R319	0.02 ~~0.003~~	12/27	R470	< .003	11/27/74	R432	<.003	3/23/77	R823	< .003	* ~~5/15/81~~	~~R 909~~	~~< 0.003~~
-25-61	SP 2157	<.003	8-24-63	R 281	.003	10/25	R399	0.015	1/25/68	R524	< 0.003	12/19/74	R476	<.003	6/15/77	R76	< .003	7/20/80	R 84	
-24-61	SP 2419	.003	9-25-63	R 377	0.003	12/17	R507	0.007	2/26/68	R586	< 0.003	1/21/75	R557	<.003	7/27/77	R207	< .003	9/16/81	R 170	< .003
-27-61	SP 2649	<.003	10-23-63	R 466	0.003	1/24/66	R581	0.010	3/02/68	R642	0.003	2/28/75	R651	<.003	8/25/77	R308	< .003	10/21/81	R 230	< .003
-26-61	SP 2925	<.003	11-29-63	R 591	<0.003	2-25-66	R 652	0.010	4/26/69	R719	< 0.003	3/25/75	R715	<.003	10/21/77	R502	< .003	11-17-81	R 284	< .003
-24-61	SP 3184	<.003	12-27-63	R 648	0.003	3/25	R725	0.01	5/24/68	R799	< 0.003	4/23/75	R780	<.003	11/16/77	R601	< .003	2-7-82	R 446	< .003

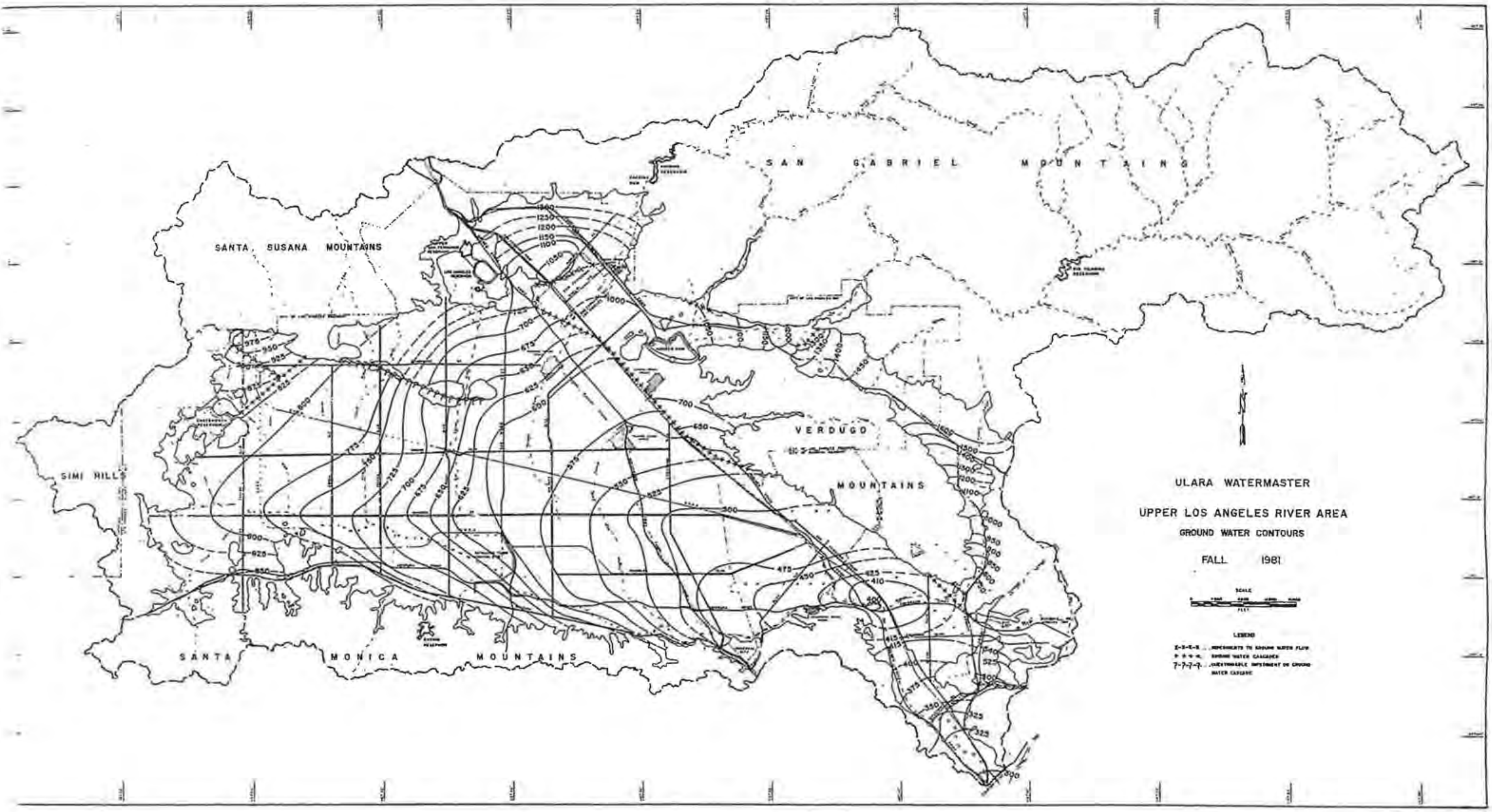
CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
GROUNDWATER QUALITY MANAGEMENT PLAN
SAN FERNANDO VALLEY BASIN, JULY 1983
SOIL INFILTRATION MAP
PLATE 1
(Reference 16)

PLATE 1


SOIL INFILTRATION
GROUNDWATER QUALITY MANAGEMENT PLAN STUDY
SAN FERNANDO VALLEY BASIN
CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
UPPER LOS ANGELES RIVER AREA
LOCATION OF WELLS
AND HYDROLOGIC STATIONS
SCALE
LEGEND
EDGE OF VALLEY FILL
CLIMATIC STATION
SAN GABRIEL MOUNTAINS
SANTA SUSANA MOUNTAINS
SIMI HILLS
SANTA MONICA MOUNTAINS
VERDUGO MOUNTAINS
VENTURA
FOOTHILL
SAN DIEGO

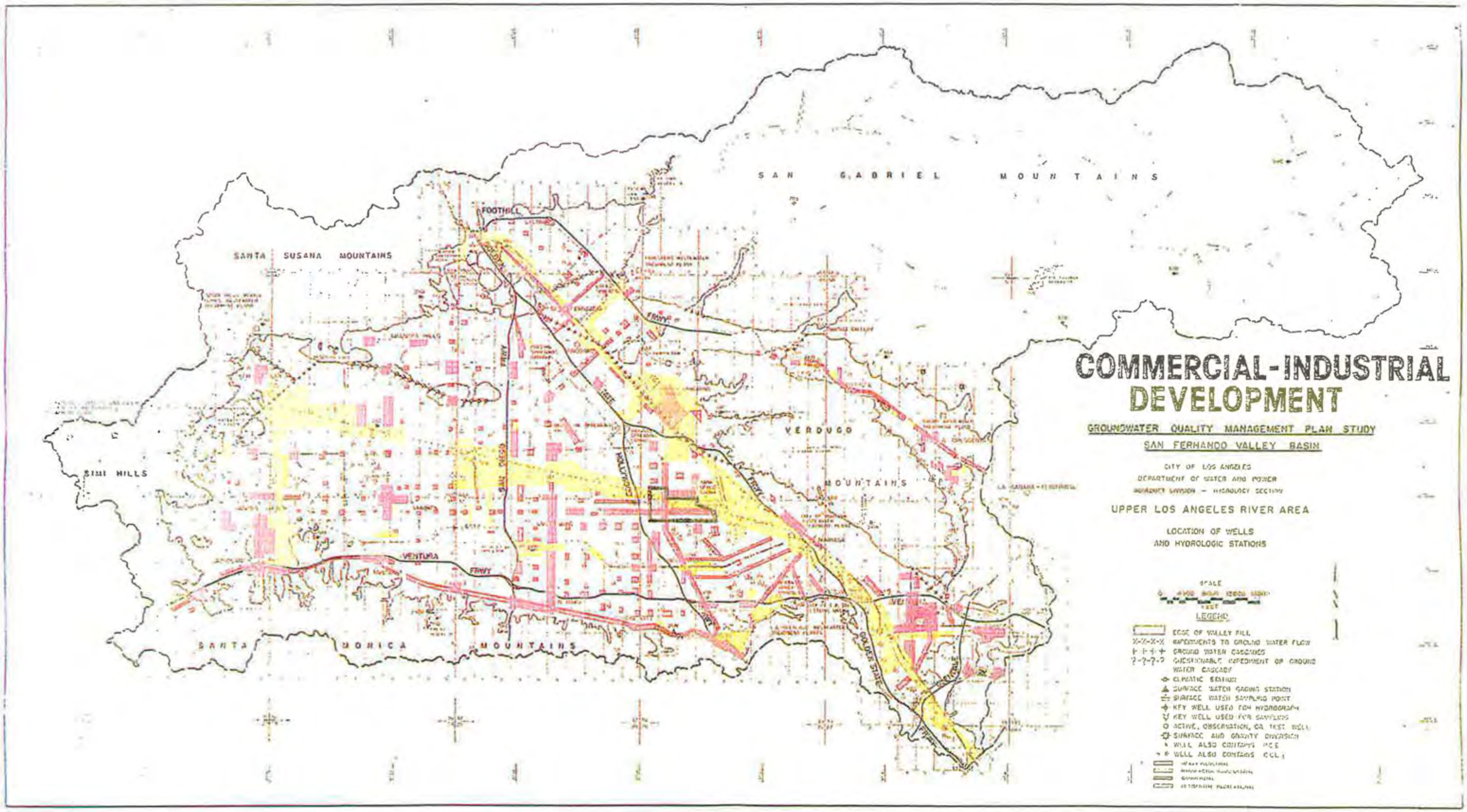
CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
GROUNDWATER QUALITY MANAGEMENT PLAN
SAN FERNANDO VALLEY BASIN, JULY 1983
GROUNDWATER CONTOURS
PLATE 2
(Reference 17)

PLATE 2


SAN GABRIEL MOUNTAINS
SANTA SUSANA MOUNTAINS
SIMI HILLS
VERDUGO MOUNTAINS
SANTA MONICA MOUNTAINS
ULARA WATERMASTER
UPPER LOS ANGELES RIVER AREA
GROUND WATER CONTOURS
FALL 1981
LEGEND

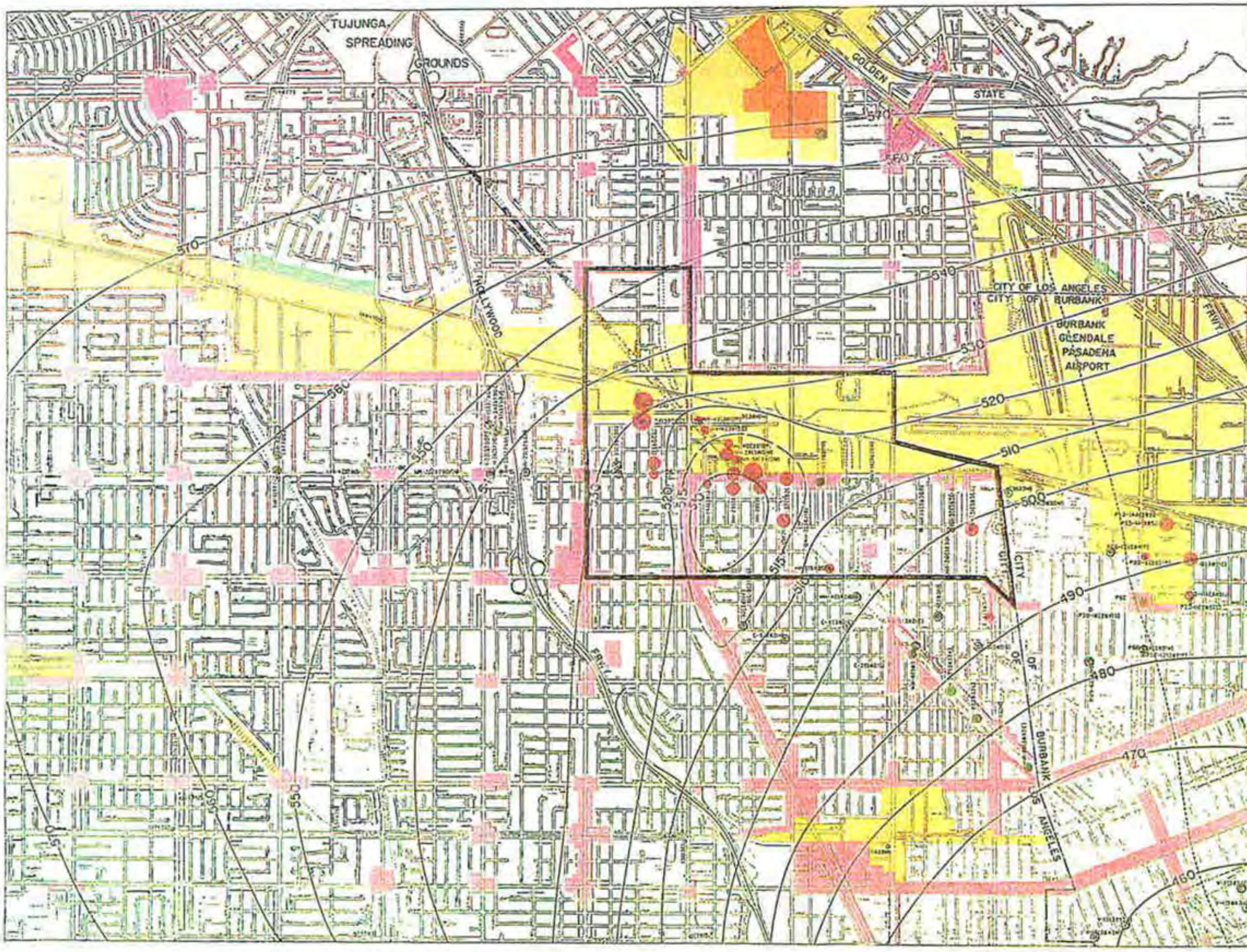
CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
GROUNDWATER QUALITY MANAGEMENT PLAN
SAN FERNANDO VALLEY BASIN, JULY 1983
COMMERCIAL-INDUSTRIAL DEVELOPMENT
PLATE 3
(Reference 18)

PLATE 3


COMMERCIAL-INDUSTRIAL DEVELOPMENT
GROUNDWATER QUALITY MANAGEMENT PLAN STUDY
SAN FERNANDO VALLEY BASIN
CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
UPPER LOS ANGELES RIVER AREA
LOCATION OF WELLS
AND HYDROLOGIC STATIONS
SCALE
LEGEND
EDGE OF VALLEY FILL
IMPEDIMENTS TO GROUND WATER FLOW
GROUND WATER CASCADES
QUESTIONABLE IMPEDIMENT OF GROUND WATER CASCADE
CLIMATIC STATION
SURFACE WATER GAGING STATION
SURFACE WATER SAMPLING POINT
KEY WELL USED FOR HYDROGRAPH
KEY WELL USED FOR SAMPLES
ACTIVE, OBSERVATION, OR TEST WELL
SURFACE AND GRAVITY DIVERSION
SAN GABRIEL MOUNTAINS
SANTA SUSANA MOUNTAINS
SIMI HILLS
SANTA MONICA MOUNTAINS
VERDUGO MOUNTAINS
FOOTHILL
VENTURA
FRWY
GOLDEN STATE
HOLLYWOOD

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
GROUNDWATER QUALITY MANAGEMENT PLAN
SAN FERNANDO VALLEY BASIN, JULY 1983
COMMERCIAL AND INDUSTRIAL DEVELOPMENT
NORTH HOLLYWOOD AND VICINITY
PLATE 5
(Reference 19)

PLATE 5



COMMERCIAL AND INDUSTRIAL DEVELOPMENT

GROUNDWATER QUALITY MANAGEMENT PLAN

SAN FERNANDO VALLEY BASIN

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
SANITARY ENGINEERING DIVISION – SOURCE WATER QUALITY SECTION

NORTH HOLLYWOOD AND VICINITY

WELL AND STREET LOCATIONS

SCALE

LEGEND:

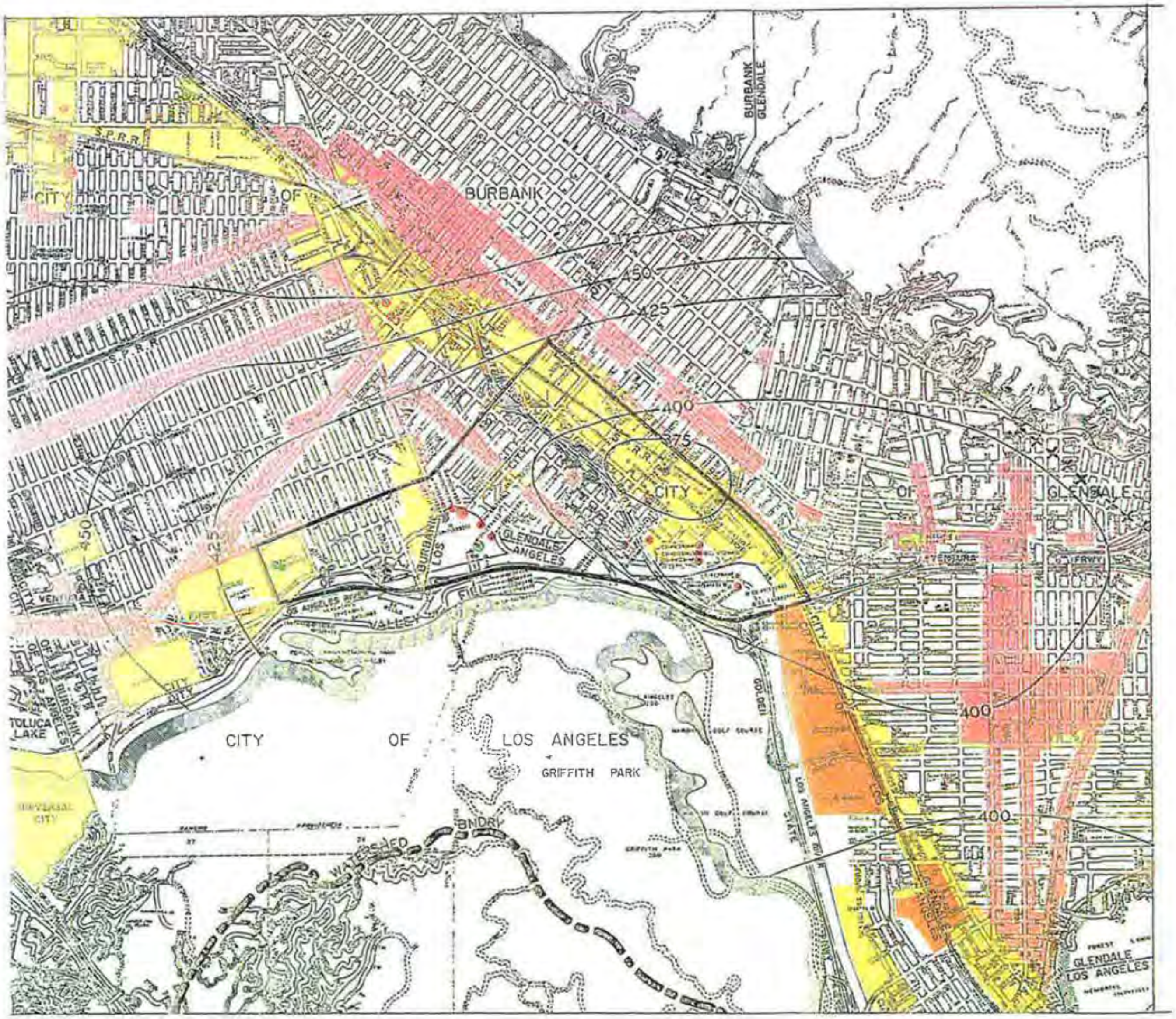
WELL LOCATION
CITY BOUNDARY
PRIVATE STREET
FUTURE STREET
RAILROAD
PARK AND RECREATION CENTER
HEAVY INDUSTRIAL
MANUFACTURING
COMMERCIAL
COMMERCIAL MANUFACTURING
GROUNDWATER CONTOURS FALL 1980

DATE

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
GROUNDWATER QUALITY MANAGEMENT PLAN
SAN FERNANDO VALLEY BASIN, JULY 1983
COMMERCIAL AND INDUSTRIAL DEVELOPMENT
CRYSTAL SPRINGS AND VICINITY
PLATE 6
(Reference 20)

PLATE 6

COMMERCIAL AND INDUSTRIAL DEVELOPMENT



GROUNDWATER QUALITY MANAGEMENT PLAN

SAN FERNANDO VALLEY BASIN

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
SANITARY ENGINEERING DIVISION – SOURCE WATER QUALITY SECTION

CRYSTAL SPRINGS AND VICINITY

WELL AND STREET LOCATIONS

SCALE

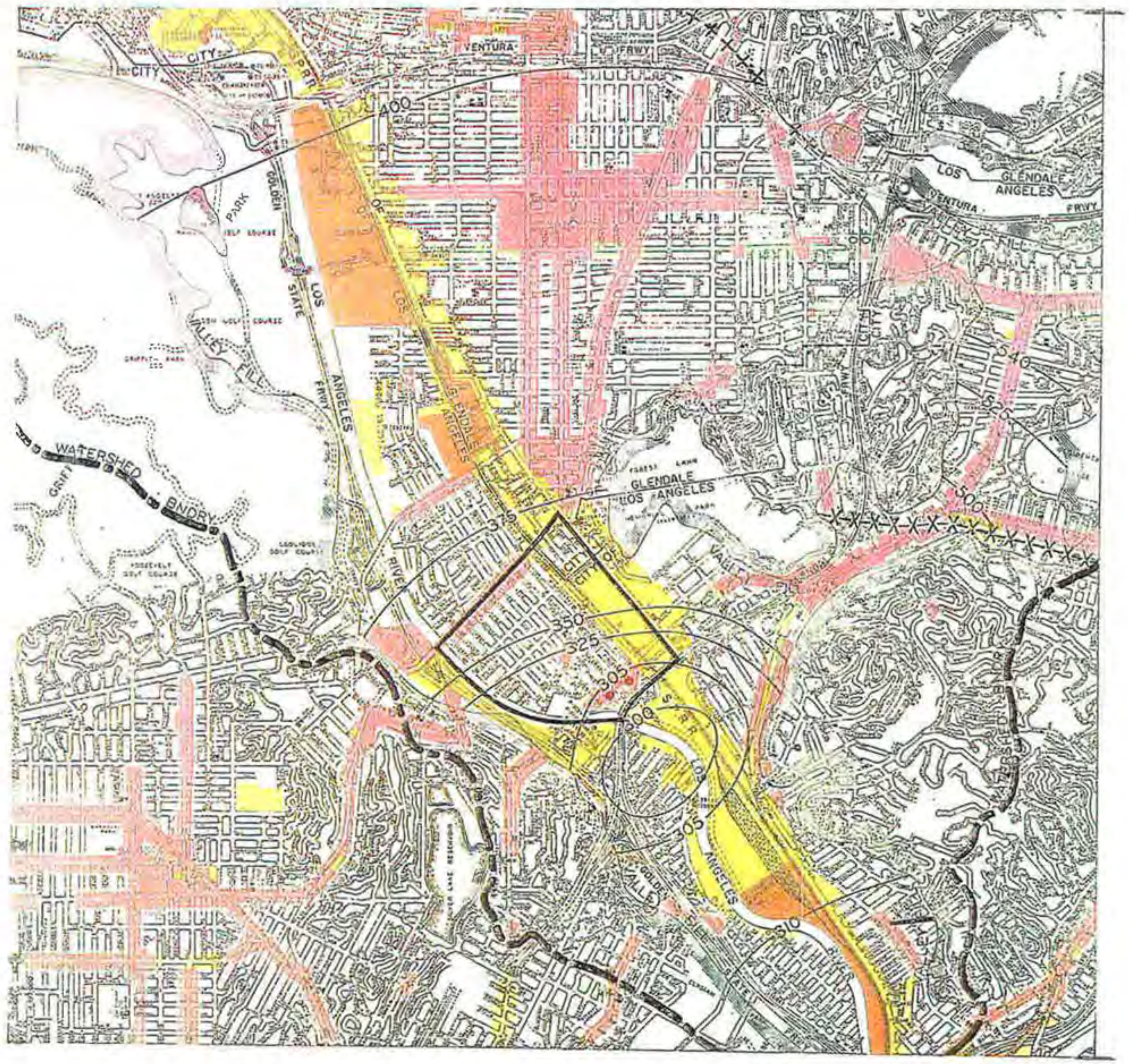
LEGEND:

- WELL LOCATION
- CITY BOUNDARY
- PRIVATE STREET
- RIVERDAD
- GROUNDWATER CONTOURS FALL 1980
- VALLEY FILL BOUNDARY
- WATERSHED BOUNDARY
- GROUNDWATER CASCADE
- HEAVY INDUSTRIAL
- MANUFACTURING
- COMMERCIAL
- COMMERCIAL MANUFACTURING

DATE ________

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
GROUNDWATER QUALITY MANAGEMENT PLAN
SAN FERNANDO VALLEY BASIN, JULY 1983
COMMERICAL AND INDUSTRIAL DEVELOPMENT
POLLOCK WELLS AND VICINITY
PLATE 7
(Reference 21)

PLATE 7



COMMERCIAL AND INDUSTRIAL DEVELOPMENT

GROUNDWATER QUALITY MANAGEMENT PLAN

SAN FERNANDO VALLEY BASIN

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
SANITARY ENGINEERING DIVISION SOURCE WATER QUALITY SECTION

POLLOCK WELLS AND VICINITY

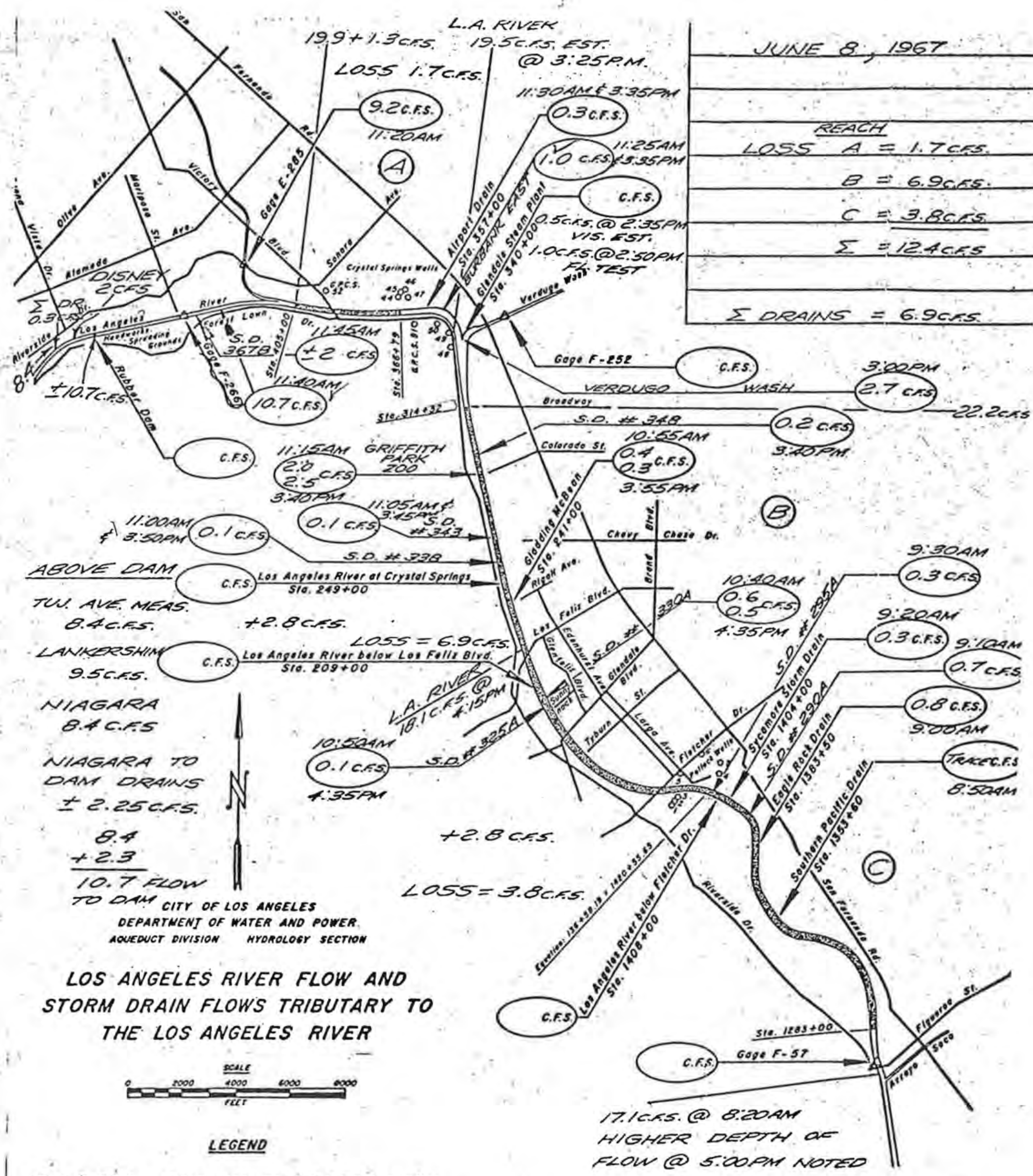
WELL AND STREET LOCATIONS

SCALE

LEGEND:

- WELL LOCATION
- CITY BOUNDARY
- PRIVATE STREET
- RAILROAD
- GROUNDWATER CONTOURS FALL 1968
- VALLEY FILL BOUNDARY
- WATERSHED BOUNDARY
- GROUNDWATER CASCADE
- IMPEDIMENT TO GROUNDWATER FLOW
- HEAVY INDUSTRIAL
- MANUFACTURING
- COMMERCIAL
- COMMERCIAL MANUFACTURING

CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER
PRELIMINARY REPORT ON PERCOLATION TEST
IN THE LOS ANGELES RIVER, GAGE F-266 TO F-57, JUNE 1967
LOS ANGELES RIVER FLOW AND STORM DRAIN FLOWS
TRIBUTARY TO THE LOS ANGELES RIVER
MAP JUNE 8, 1967
(Reference 27)



CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
AQUEDUCT DIVISION HYDROLOGY SECTION

LOS ANGELES RIVER FLOW AND STORM DRAIN FLOWS TRIBUTARY TO THE LOS ANGELES RIVER

SCALE 0 2000 4000 6000 8000 FEET

LEGEND

Gage F-57 Δ – Stream gage and L.A.C.F.C.D. number

46 O – Well, L.A.D.W.P. designation

▭ – Lined channel

CITY OF LOS ANGELES
REMEDIAL INVESTIGATION REPORT, VOL. I,
DECEMBER 1992
FIGURE 5-5
(Reference No. 30)

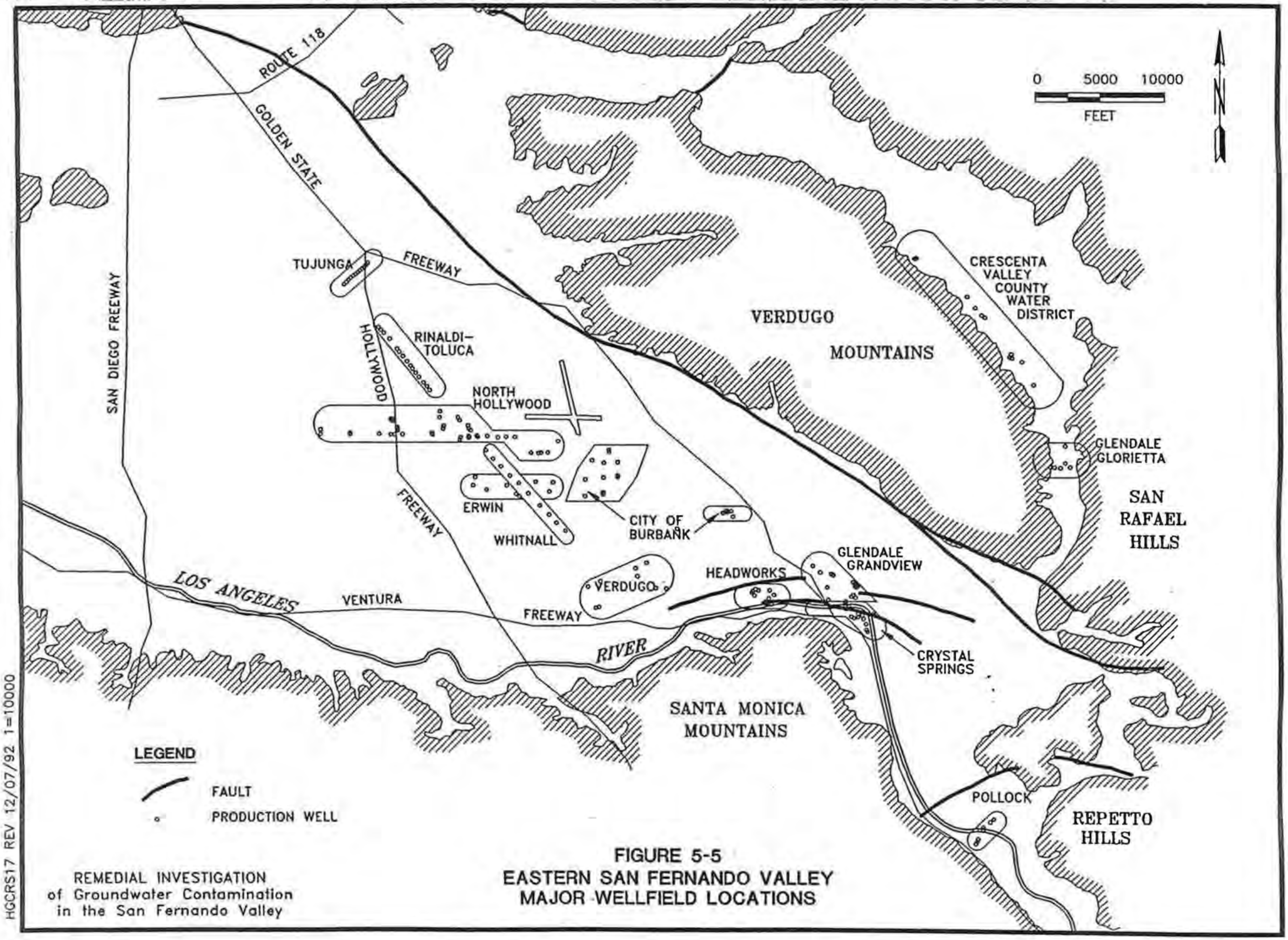


FIGURE 5-5
EASTERN SAN FERNANDO VALLEY
MAJOR WELLFIELD LOCATIONS

HGCRS17 REV 12/07/92 1=10000

DEPARTMENT OF WATER RESOURCES
THE CITY OF LOS ANGELES vs THE CITY OF SAN FERNANDO
NO. 650079
ULARA WELLS LOGS G-L ACTIVE PARTIES – 2
(Reference 31)

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner LOCKHEED Aircraft Corp. State No. 1N/14W-4Q3

Address Burbank, Calif. 91503 Other No. 3840 H

Tenant ______ Owner No. ______

Address ______

Location: County 70-Los Angeles Area ______

Region 4 Basin ULARA U-05.B1

USGS Quad Burbank Quad. No. 63-50

T 1N R 14W Sec. 4 Lot Q, 3 ~~MD~~ SB B&M ~~H~~

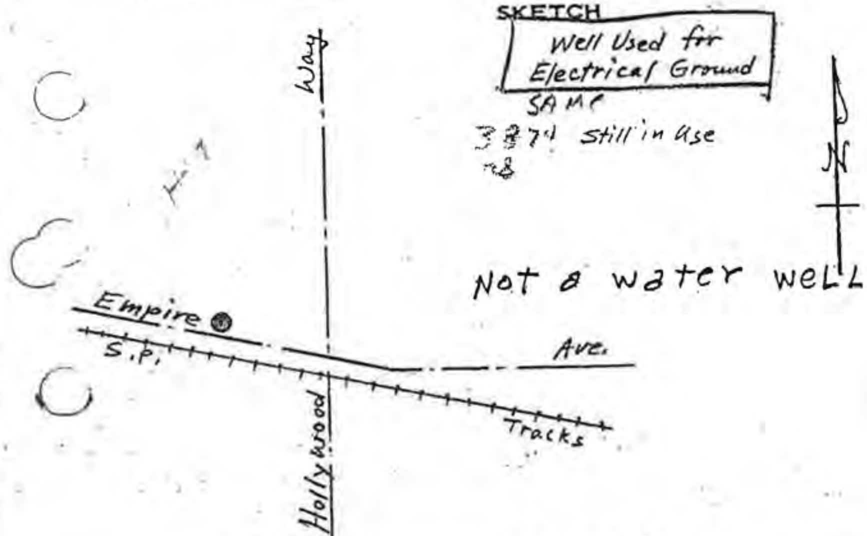
Description

Well at 3950 Empire Ave.

80' No. of ℄ Empire Ave.

550' W. of ℄ Hollywood Way

SKETCH



______ feet North and ______ feet West of SE Sec. Cor.

274 (REV. 12-64)

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a) ______

______, ______ ft. above/below land surface, Date ______

(b) ______

______, ______ ft. above/below land surface, Date ______

(c) ______

______, ______ ft. above/below land surface, Date ______

Ref. Pt. Elev.: (a) ______ ft.; (b) ______ ft.; (c) ______ ft.

Ground Elev.: (a) ______ ft.; (b) ______ ft.; (c) ______ ft.

Determined from: (a) ______; (b) ______; (c) ______

DESCRIPTION OF WELL

Use Industrial (Electrical Ground) Depth 125 ft.

Casing: size 10 in., perforations Not Perforated

Aquifer(s) ______

Driller Barber-Bridge Drilling Co.

Date drilled Nov. 26, 1940 Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type ______, Make ______

Serial No. ______, Size of discharge pipe ______ in.

Motor kind ______, Make ______

Horsepower ______, Serial No. ______

Elec. Meter No. ______, Transformer No. ______

TEST DATA

Agency ______

Date of Test ______ 19____, Capacity of well ______ G.P.M.

Static Water Level ______ ft., Drawdown ______ ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

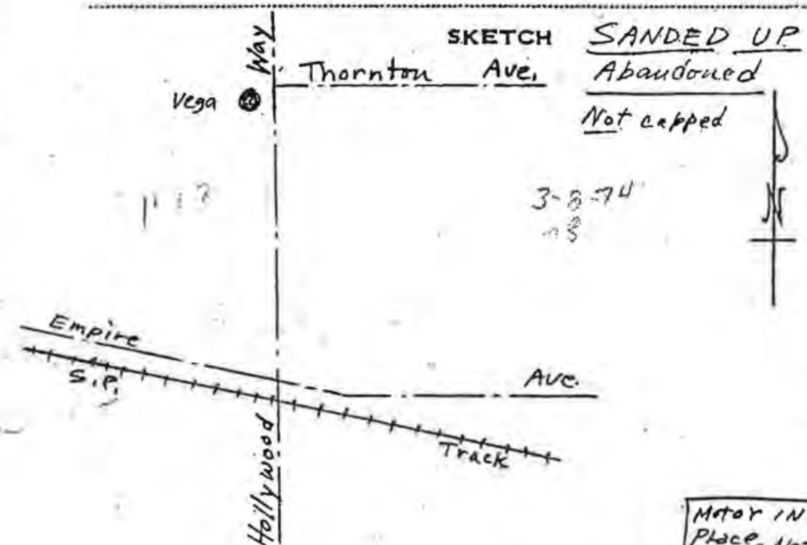
Owner LOCKHEED Aircraft Corp. | State No. 1N/14W-4Q2
Address Burbank, Calif. 91503 | Other No. 3850 F
Tenant | Owner No. VEGA
Address

Location: County 70-Los Angeles Area
Region 4 Basin ULARA U-05.B1
USGS Quad. Burbank Quad. No. 63-50
T. 1N R. 14W Sec. 4 Lot Q, 2 ~~MD~~ SB B&M

Description
1201.5' N. of ℄ Empire Ave.
70.5' W. of ℄ Hollywood Way

SKETCH

SANDED UP
Abandoned
Not capped



.......feet North and.......feet West of SE Sec. Cor

Motor IN Place. Not Used. Per W. Rasmussen JAS 3-8-74

7-274 (REV. 12-64)

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a) Top of Casing
......., ...ft. above/below land surface, Date......
(b)
......., ...ft. above/below land surface, Date......
(c)
......., ...ft. above/below land surface, Date......

Ref.Pt. Elev.: (a)......ft.; (b)......ft.; (c)......ft.
Ground Elev.: (a) 681.0 ft.; (b)......ft.; (c)......ft.
Determined from: (a)......; (b)......; (c)......

(Sanded) DESCRIPTION OF WELL

Use Industrial (Fire Protection) Depth 302 ft.
Casing: size 16 in., perforations 180-250, 270-288

Aquifer(s)
Driller Barber-Bridge
Date drilled July 15, 1941 Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type Turbine, Make Pomona
Serial No. A 1961, Size of discharge pipe......in.
Motor kind Electric, Make Pomona
Horsepower 40, Serial No. 2EM 2329 (Lockheed 32267)
Elec. Meter No. None, Transformer No.

TEST DATA

Agency
Date of Test ......19......, Capacity of well......G.P.M.
Static Water Level......ft., Drawdown......ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

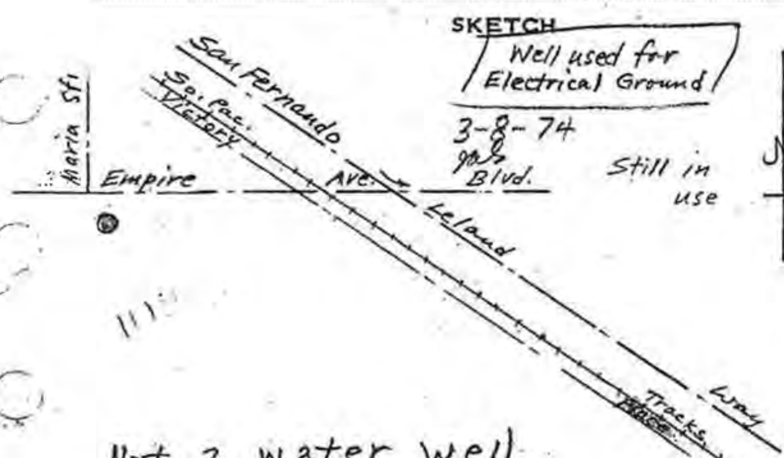
Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner LOCKHEED Aircraft Corp. State No. 1N/14W-10B2
Address Burbank, Calif. 91503 Tentative Other No. 3860-
Tenant (U.S.A.F. well) Owner No. 1A
Address

Location: County 70 - Los Angeles Area
Region 4 Basin ULARA U-05.B1
USGS Quad. Burbank Quad. No. 63-50
T. 1N R. 14W Sec. 10 Lot B, 2 ~~MD~~ SB B&M ~~H~~

Description
140' So. ℄ Empire Ave.
40' E. ℄ Maria St (Produced)

SKETCH



Not a water well.

.........feet North and.........feet West of SE Sec. Cor.

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a)
........, ... ft. above/below land surface, Date
(b)
........, ... ft. above/below land surface, Date
(c)
........, ... ft. above/below land surface, Date

Ref. Pt. Elev.: (a)........ ft.; (b)........ ft.; (c)........ ft.
Ground Elev.: (a)........ ft.; (b)........ ft.; (c)........ ft.
Determined from: (a)........; (b)........; (c)........

DESCRIPTION OF WELL

Use Industrial (Electrical Ground) Depth 125 ft.
Casing: size 10 in., perforations Not Perforated

Aquifer(s)
Driller Barber - Bridge
Date drilled Nov. 26, 1940 Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type........, Make........
Serial No........, Size of discharge pipe........ in.
Motor kind........, Make........
Horsepower........, Serial No........
Elec. Meter No........, Transformer No........

TEST DATA

Agency
Date of Test ....19........, Capacity of well........ G.P.M.
Static Water Level........ ft., Drawdown........ ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner: LOCKHEED Aircraft Corp.
State No. 1N/14W-10B1

Address: Burbank, Calif. 91503
(93A) Other No. 3860 B

Tenant: (U.S.A.F. Well)
Owner No.

Address:
Replaces 93 Destroyed (10A2)

Location: County 70- Los Angeles Area

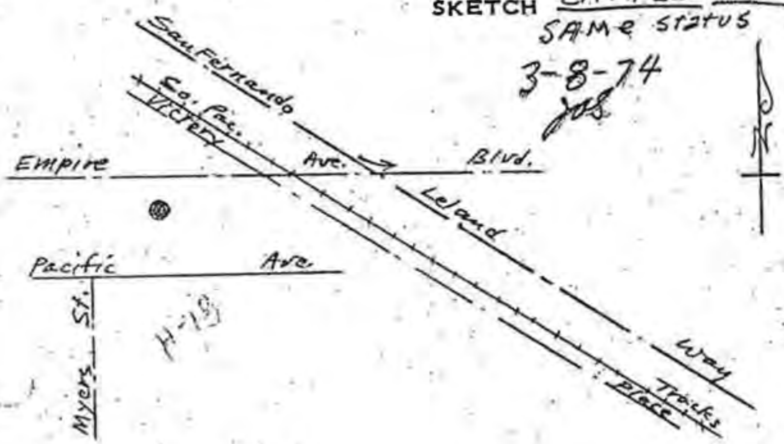
Region 4 Basin ULARA U-05.B1

USGS Quad. Burbank Quad. No. 63-50

T. 1N R. 14W Sec. 10 Lot B, 1 ~~MD~~ SB ~~H~~ B&M

Description:
482' So. of So. P/L Empire Ave.
654' E. of ℄ Myers St.

SKETCH CAPPED WELL
SAME status
3-8-74
JHS



.......feet North and.......feet West of SE Sec. Cor.

374 (REV. 12-64)

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a) ...

..., ... ft. above/below land surface, Date ...

(b) ...

..., ... ft. above/below land surface, Date ...

(c) Top of 3/4" Coupling in Concrete floor

..., ... ft. above/below land surface, Date ...

Ref.Pt. Elev.: (a) ... ft.; (b) ... ft.; (c) 621.3 ft.

Ground Elev.: (a) 625.9 ft.; (b) ... ft.; (c) ... ft.

Determined from: (a) ...; (b) ...; (c) ...

DESCRIPTION OF WELL

Use ... Depth ... ft.

Casing: size ... in., perforations ...

Aquifer(s) ...

Driller ...

Date drilled ... Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type None, Make ...

Serial No. ..., Size of discharge pipe ... in.

Motor kind None, Make ...

Horsepower ..., Serial No. ...

Elec. Meter No. None, Transformer No. ...

TEST DATA

Agency ...

Date of Test ... 19..., Capacity of well ... G.P.M.

Static Water Level ... ft., Drawdown ... ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

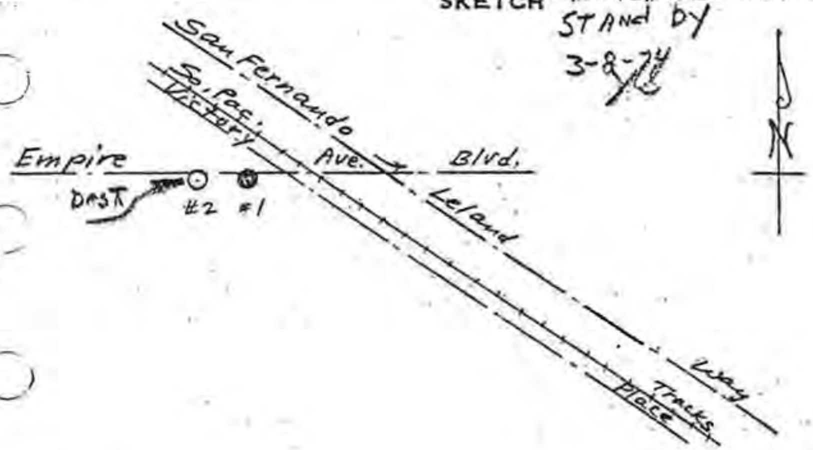
Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner: LOCKHEED Aircraft Corp. | State No. 1N/14W-10A1
Address: Burbank, Calif. 91503 | Other No. 3870 –
Tenant: (U.S.A.F. well) | Owner No. 1
Address:

Location: County 70-Los Angeles Area
Region 4 Basin ULARA U-05.B1
USGS Quad. Burbank Quad. No. 63-50
T. 1N R. 14W Sec. 10 Lot A, 1 ~~MD~~ SB B&M

Description:
50' So. of ℄ Empire Ave.
250' W. of ℄ Victory Place

SKETCH INACTIVE WELL
STAND BY
3-8-74



........feet North and........feet West of SE Sec. Cor.

274 (REV. 12-64)

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a) Meas. Pipe 0.5' Above cover, floor
........, ... ft. above/below land surface, Date........
(b) ....
........, ... ft. above/below land surface, Date........
(c) ....
........, ... ft. above/below land surface, Date........
Ref. Pt. Elev.: (a)........ ft.; (b)........ ft.; (c)........ ft.
Ground Elev.: (a) 620.0 ft.; (b)........ ft.; (c)........ ft.
Determined from: (a)........; (b)........; (c)........

DESCRIPTION OF WELL

Use Industrial (Air Conditioning) Depth 151 ft.
Casing: size 16 in., perforations 65' to 135'

Aquifer(s)........
Driller Barber-Bridge
Date drilled May 20, 1940 Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type Turbine, Make Pomona
Serial No. N 1379, Size of discharge pipe........in.
Motor kind Electric, Make U. S. Motors
Horsepower 50, Serial No. 208629
Elec. Meter No........., Transformer No........

TEST DATA

Agency........
Date of Test ....19........, Capacity of well........G.P.M.
Static Water Level........ft., Drawdown........ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner LOCKHEED Aircraft Corp.

Address Burbank, Calif. 91503

Tenant (U.S.A.F. well)

Address

State No. 1N/14W-10A4

Other No. Tentative 3870-2

Owner No. 5

Location: County 70-Los Angeles Area

Region 4 Basin ULARA U-05.B1

USGS Quad. Burbank Quad. No. 63-50

T 1N R 14W Sec. 10 Lot A, 4 ~~MD~~ SB ~~H~~ B&M

Description

Plant B-1 Bldg. 145 – IN basement

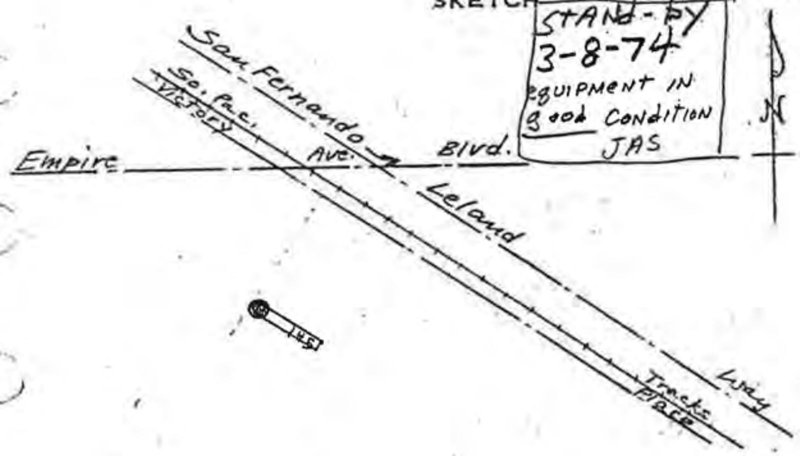
640' S.W. of ℄ Victory Blvd.

640' S. ℄ Empire Ave.

SKETCH

INACTIVE WELL

STAND-BY
3-8-74
EQUIPMENT IN
GOOD CONDITION
JAS



.......feet North and.......feet West of SE Sec. Cor.

274 (REV. 12-64)

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a) 2" Pipe – 1.0' Above basement floor

......, ...ft. above/below land surface, Date......

(b)

......, ...ft. above/below land surface, Date......

(c)

......, ...ft. above/below land surface, Date......

Ref.Pt. Elev.: (a)...... ft.; (b)......ft.; (c)......ft.

Ground Elev.: (a)...... ft.; (b)......ft.; (c)......ft.

Determined from: (a)......; (b)......; (c)......

DESCRIPTION OF WELL

Use Industrial (Fire Protection) Depth 150 ft. to 237 4-23-54

Casing: size 16 in., perforations 60'-159'

Aquifer(s)

Driller Barber-Bridge

Date drilled April 23, 1941 Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type Turbine, Make Peerless

Serial No. 6277, Size of discharge pipe 6 in.

Motor kind Electric, Make U.S. Motors

Horsepower 30, Serial No. 140611

Elec. Meter No......, Transformer No......

TEST DATA

Agency

Date of Test ......19......, Capacity of well......G.P.M.

Static Water Level......ft., Drawdown......ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner LOCKHEED Aircraft Corp. | State No. 1N/14W-11D1

Address Burbank, Calif. 91503 | Other No. 3871E

Tenant (U.S.A.F. well) | Owner No. 3

Address

Location: County 70-Los Angeles Area

Region 4 Basin ULARA U-05.B1

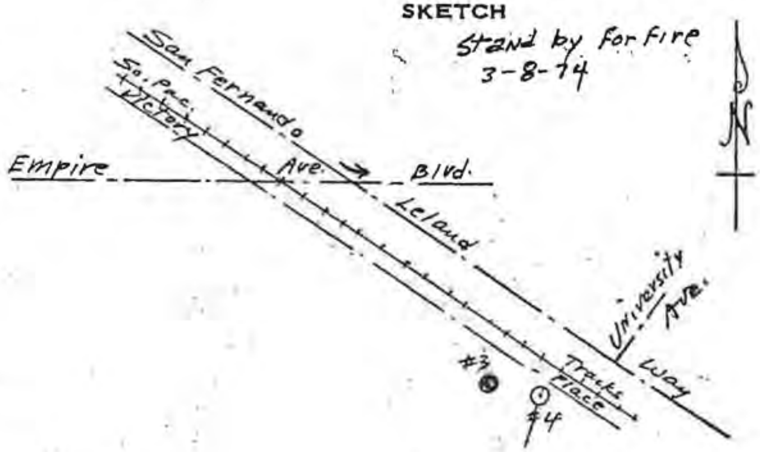
USGS Quad. Burbank Quad. No. 63-50

T. 1N R. 14W Sec. 11 Lot. D , 1 SB B&M

Description Well at 1627 Victory Place
100' S.W. of Victory Place
200' N.W. of University Ave. (Produced)

SKETCH

Stand by For Fire
3-8-74



.........feet North and.........feet West of SE Sec. Cor.

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a)

......, ... ft. above/below land surface, Date

(b)

......, ... ft. above/below land surface, Date

(c)

......, ... ft. above/below land surface, Date

Ref.Pt. Elev.: (a) 605.0 ft.; (b) ......ft.; (c) ......ft.

Ground Elev.: (a) 605.0 ft.; (b) ......ft.; (c) ......ft.

Determined from: (a) ......; (b) ......; (c) ......

DESCRIPTION OF WELL

Use Industrial (Air Conditioning) Depth 200 ft.

Casing: size 16 in., perforations 73'-178

Aquifer(s)

Driller Barber-Bridge

Date drilled Jan. 23, 1941 Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type Turbine, Make Pomona

Serial No. ......, Size of discharge pipe ......in.

Motor kind Electric, Make U.S. Motors

Horsepower 50, Serial No. 233040

Elec. Meter No. ......, Transformer No. ......

TEST DATA

Agency

Date of Test ......19......, Capacity of well ......G.P.M.

Static Water Level ......ft., Drawdown ......ft.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WELL DATA

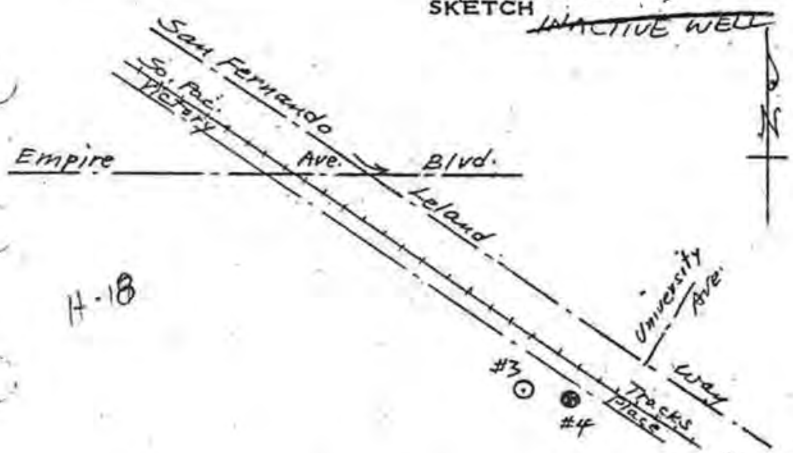
Monthly ☐ Hyd. ☐ Sampling ☐ Other ☐

Owner LOCKHEED Aircraft Corp. | State No. 1N/14W-11D2
Address Burbank, Calif. 91503 | Other No. 3871 F
Tenant (U.S.A.F. well) | Owner No. 4
Address

Location: County 70-Los Angeles Area
Region 4 Basin ULARA U-05.B1
USGS Quad. Burbank Quad. No. 63-50
T. 1N R. 14W Sec. 11 Lot D, 2 ~~MD~~ SB B&M ~~H~~

Description Well at 1627 Victory Place
160' S.W. of Victory Place
40' N.W. of University Ave., (Produced)

SKETCH (well measurable) ~~INACTIVE WELL~~



H-18

Destroyed

.... feet North and .... feet West of SE Sec. Cor.

274 (REV. 12-64)

DESCRIPTION OF SAMPLING POINT

DESCRIPTION OF REFERENCE POINT

(a) ....

........, ... ft. above/below land surface, Date ....

(b) Air Gage

........, ... ft. above/below land surface, Date ....

(c) ....

........, ... ft. above/below land surface, Date ....

Ref.Pt. Elev.: (a) .... ft.; (b) .... ft.; (c) .... ft.

Ground Elev.: (a) .... ft.; (b) .... ft.; (c) .... ft.

Determined from: (a) ....; (b) ....; (c) ....

DESCRIPTION OF WELL

Use .... Depth .... ft.

Casing: size .... in., perforations ....

Aquifer(s) ....

Driller ....

Date drilled .... Log filed: Open ☐, Confidential ☐

DESCRIPTION OF EQUIPMENT

Pump type ...., Make ....

Serial No. ...., Size of discharge pipe .... in.

Motor kind ...., Make ....

Horsepower ...., Serial No. ....

Elec. Meter No. ...., Transformer No. ....

TEST DATA

Agency ....

Date of Test .... 19........, Capacity of well .... G.P.M.

Static Water Level .... ft., Drawdown .... ft.

STATE WATER QUALITY CONTROL BOARD'S
WATER QUALITY CRITERIA, SECOND EDITION, 1963
(Reference 45)

STATE OF CALIFORNIA
EDMUND G. BROWN
Governor

WATER QUALITY CRITERIA

Second Edition

Edited by

JACK EDWARD McKEE

Professor of Environmental Health Engineering
W. M. Keck Laboratory of Environmental Health Engineering
California Institute of Technology

and

HAROLD W. WOLF

Senior Sanitary Engineer
Division of Water Supply and Pollution Control
U.S. Public Health Service

PREPARED WITH ASSISTANCE FROM
DIVISION OF WATER SUPPLY AND POLLUTION CONTROL
U.S. PUBLIC HEALTH SERVICE
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

1963

THE RESOURCES AGENCY OF CALIFORNIA
STATE WATER QUALITY CONTROL BOARD

Publication No. 3-A

ng/l of chlorine in sea water; but at 5 was a 10-15 percent reduction in photo- after two days and 50-70 percent reduction 7 days.

rsey River Board in England (2950) has pro- the free chlorine residual of wastes discharged er Alt and the River Bollin should not exceed

fish Culture. Clams and oysters will with- t exposures to free chlorine, and such treat- been used in purification of shellfish. In Massa- lams are conditioned for 24 hours in sea water a residual of 0.3 to 0.5 mg/l. In England, re exposed briefly to water containing 5.0 ee chlorine, then placed in chlorine-free water The USPHS Manual of Recommended Prac- anitary Control of the Shellfish Industry (527) hat water used to condition shellfish carry a f not less than 0.05 mg/l at all times. Experi- idence indicates that most oysters are sensi- tial chlorine concentrations varying from 0.01 /l, i.e., their pumping activity is reduced, and umping cannot be maintained at chlorine con- s over 1.0 mg/l (1104).

ing Waters. Free residual chlorine in natural uld not be considered detrimental to bathing as this bactericidal agent is used in swimming many state health departments require re- rine concentrations in such pools. Mood et al. hat a slight increase in eye irritation is easing the chlorine residual from 0.05 t within the pH range of 7.0 to 8.0, the greater effect upon eye irritation than does e residual in concentrations between 0.05 and

AURIC ACID $AuCl_3 \cdot HCl \cdot 4H_2O$

d gold trichloride, a yellowish crystalline solid ble in water, is used in photography, gold nd the manufacture of ruby glass (364). The centration of $AuCl_3 \cdot HCl$ for three mature h-water fish (*Orizias*) exposed for 24 hours ml of test solution, was reported to be about 1459). With this same substance, Jones (1460) lethal limit to be 0.4 mg/l, as gold, for stickle- average survival times at other concentrations llows: one week at 0.6 mg/l, and only 4 days l as gold.

BEN

apter IX, Chlorinated Benzenes)

FORM $CHCl_3$

dorless, volatile, but non-inflammable heavy ethereal odor and sweetish taste is used as an counterirritant, solvent, cleansing agent, and Stickleback will avoid solutions of 100 to 200 hloroform in tap water and at 500 mg/l they zed (467). At this latter concentration, the fish decreased rapidly in 10 min- d in 20 minutes. At a concentration as mg/l, fish struggled for 20 to 30 minutes then sank to the bottom. When placed in fresh water for 90 minutes, however, they revived (468).

CHLOROMETHANE

(see Methyl Chloride)

CHLOROPHENOLS

(see Chapter IX)

CHLOROPHENYL DIMETHYL UREA (CMU)

(see Chapter IX)

CHLORPLATINIC ACID $H_2PtCl_6 \cdot 6H_2O$

A brownish-yellow crystalline solid, easily soluble in water, this acid salt is used in platinum plating, photography, indelible ink, mirrors, and as a catalyzer (364). To three mature small fresh-water fish (*Orizias*), exposed for 24 hours to only 20 ml of test solution, the lethal concentration of H_2PtCl_6 was reported to be about 33 mg/l (1459).

CHLORTHION

(see Chapter IX)

CHROMATES

(see Chromium)

CHROMIC ACID

(see Chromium)

CHROMIUM

1. General. This section deals with chromium ions in their various forms, i.e. as chromous ion (Cr^{++}), as chromic ion (Cr^{+++}), as chromite ion (CrO_3^{--}) or (CrO_2^-), as chromate ion (CrO_4^{--}), and as dichromate ion ($Cr_2O_7^{--}$). In the chromic or chromite condition the chromium is trivalent, while in the chromate and dichromate form it is hexavalent. All chromous compounds tend strongly to be oxidized to the chromic condition. Hexavalent chromium can be reduced to the trivalent form by heat, by organic matter, or by reducing agents. Confusion in terminology frequently arises from the fact that chromium trioxide, a hexavalent form, is also called "chromic acid" or "chromic acid anhydride", thereby confusing it with the trivalent chromic ion. In the following abstract of literature, care has been taken to avoid this confusion of terms.

Of the trivalent chromic salts, the chloride, nitrate and sulfate are readily soluble in water, but the hydroxide and carbonate are quite insoluble. Of the hexavalent chromate salts, only sodium, potassium, and ammonium chromates are soluble. The corresponding dichromates are also quite soluble.

Hexavalent chromium salts are used extensively in metal pickling and plating operations, in anodizing aluminum, in the leather industry as a tanning agent, in the manufacture of paints, dyes, explosives, ceramics, paper, and many other substances. Trivalent chromium salts, on the other hand, are used much less extensively, being employed as mordants in textile dyeing, in the ceramic and glass industry, and in photography (364, 1106, 2121). Chromium compounds may be present in wastes from many of the foregoing industries or they may be discharged in chromium-treated cooling waters (152). Rather extensive literature is available to describe the effects of chromium as a corrosion inhibitor in cooling systems and further numerous references deal with the effect of hexavalent and trivalent chromium upon biological sewage treatment processes and sludge digestion (346), but such literature is not within the province of this survey.

2. Cross References. Chapter VIII (Radioactivity)

3. Effects Upon Beneficial Uses.

a. Domestic Water Supplies. The USPHS Drinking Water Standards of 1962, as well as those of 1946, set a mandatory limit of 0.05 mg/l for hexavalent chromium, but none for the trivalent form (2036). The WHO International (2328) and WHO European (2329) Drinking Water Standards also prescribe a limit of 0.05 mg/l for hexavalent chromium. The 1942 standards in the U.S. were even more severe in permitting no hexavalent chromium whatsoever, but this restriction was relaxed in 1946 to allow certain ground-water supplies that were slightly affected by chromates to qualify (1106). Also, at that time, a concentration of 0.05 mg/l was the lowest amount that was analytically determinable.

There is no evidence that chromium salts are essential or beneficial to human nutrition. When administered orally, chromium salts are not retained in the body but are rapidly and completely eliminated (2121). Although the salts of trivalent chromium are not considered to be physiologically harmful (997), there is evidence that large doses of chromates leads to corrosive effects in the intestinal tract and to nephritis (2129). The toxic dose for man is reported by Rothstein (2129) to be about 0.5 grams of potassium bichromate.

On the basis of physiological effects, it is difficult to understand why the USPHS and WHO have placed such a low limit on hexavalent chromium and why they made this limit mandatory. On Long Island, according to Davids, and Lieber (1106), a family used water for over three years from a well that was polluted with hexavalent-chromium wastes, with no apparent ill effects. When first discovered, hexavalent chromium was present in a concentration in 1.0 mg/l, and in May 1951 the water contained 25.0 mg/l. One physical exam of the entire family (man, wife, and two children) revealed no abnormalities and the family has refused to abandon the supply, or to submit to further examinations. The persistence of this family may eventually prove to be a valuable source of information concerning the physiological effects of hexavalent chromium in drinking water (1106).

Pomeroy (2924) used as his only fluid for drinking for 15 days water to which potassium dichromate had been added at a concentration of 10 mg/l as chromium. During that time he ingested 235 mg of chromium. Three periods of nausea were noted. The experiment was continued for two more weeks at concentrations of 2.5 to 5.0 mg/l. At a concentration of 5 mg/l, mild nausea resulted from drinking freely on an empty stomach, but under similar conditions, concentrations of 2.5 and 3.5 mg/l failed to produce any symptoms. On the basis of the animal experiments described below (under Stock and Wildlife Feeding), it would appear that man could drink water containing 5.0 mg/l of hexavalent chromium without deleterious physiological effects.

Chromium is not commonly encountered in natural foods, although traces enter cooked food from stainless steel utensils. The amount of chromium so ingested is not known to have any physiological effects.

Chromium salts impart color to water, but this effect is not discernible below about 1.5 mg/l. Similarly, the taste threshold for the most sensitive person is about 1.5 mg/l.

b. Irrigation. Chromium is present in trace amounts in soils and in plants, but there is no evidence that chromium is essential or beneficial for plant nutrition (2121). Sedova (2925) reported that concentrations of trivalent or hexavalent chromium in excess of 1.0 mg per kg of soil inhibited nitrification. On the other hand, the addition of 5 mg of chromium per kg of soil resulted in a slight increase of the nitrogen content of peas (2926). Chromium is picked up by plants from the soil, for vegetables grown on soil irrigated with wastewaters containing chromium had 3 to 10 times more chromium than those grown on similar soils devoid of chromium (2925).

According to Klintworth (1493) chromium is toxic to plants at all concentrations. In sand culture, concentrations of 3.4 to 17.3 mg/l of trivalent chromium in nutrient solutions were slightly toxic to various crops. The chromate ion was slightly more toxic than the chromic ion at equivalent concentrations (1473). Added as potassium dichromate, 5 mg/l of chromium in a nutrient solution caused slight chlorosis among oat plants, 10 mg/l caused marked chlorosis, and 15 to 50 mg/l markedly reduced the growth of the plants. A concentration of only 2 mg/l intensified the injury caused by nickel (1462).

c. Stock and Wildlife Watering. It has been reported (353) that one gram of trivalent chromium per day, as $CrPO_4$, over a period of 17 weeks did not cause illness, loss of weight, or tissue damage to cats. For hexavalent chromium salts, according to Gross and Heller (1108), the maximum non-toxic level in drinking water for white rats is 500 mg/l. Also, drinking water containing 500 mg/l of potassium chromate does not affect utilization of food by rabbits, but 10,000 mg/l of zinc chromate markedly interfered with digestion. A concentration of 5 mg/l of chromium (valence not specified) in the drinking water caused an increase in mortality among rats on a diet containing 11 mg/l of selenium (1481). As much as 100 mg/kg of chromium, fed as Na_2CrO_4, had no effect on the growth, feed conversion, or mortality of chicks (2927).

Byerrum and his colleagues (2138, 2145, 2147, 2150, 2928, 2929) conducted extensive experiments with rats and dogs to determine the long-term effects of trivalent and hexavalent chromium in drinking water. Controls received distilled water while other rats received chromium from K_2CrO_4 at dosages up to 11 mg/l of chromium for a year. Other tests were run with 25 mg/l of chromium from potassium chromate and 25 mg/l from chromic chloride. No significant differences in weight ntake, water consumption, or blood analyses were ved between the experimental groups and the controls. At chromium concentrations of 5 mg/l and lower, little chromium was found in any tissue, indicating that it was not being retained in the body. At 7.7 mg/l and higher, however, all tissues, especially the spleen showed an appreciable increase. The group receiving 25 mg/l of hexavalent chromium had an average tissue chromium content about eight times that of the group that was given trivalent chromium. Even at 25 mg/l, however, there was no significant difference in weight gain or food consumption. Over a 4-year period with dogs, no pathological changes were noted, even up to 11 mg/l of chromium.

d. Fish and Other Aquatic Life. The toxicity of chromium salts toward aquatic life varies widely with the species, temperature, pH, valence of the chromium, and synergistic or antagonistic effects, especially that of hardness. Fish are relatively tolerant of chromium salts, but lower forms of aquatic life are extremely sensitive, as the following information reveals. There appears to be no evidence to lead to a conclusion that hexavalent chromium is more toxic toward fish than the trivalent form. Toward fish, the toxicities of hexavalent chromium compounds have been reported as follows:

Concentration of Chromium mg/l	*Compound Used*	*Type of Fish*	*Remarks*	*Reference*
5	—	fish	toxic	1109
5.2	$K_2Cr_2O_7$	brown trout	toxic	346
1	$K_2Cr_2O_7$	carp	not harmed	2930
	CrO_3	fish	toxic limit	353
	$Na_2Cr_2O_7$	—	only slightly hazardous	1492
10	—	silver salmon	fresh water, toxic	2931
17.8	—	silver salmon	sea water, toxic	2931
20	$K_2Cr_2O_7$ and K_2CrO_4	rainbow trout	toxic at 18°C	617, 1110, 2190
15.2	$K_2Cr_2O_7$	goldfish	not harmed	313
45	$K_2Cr_2O_7$	bluegills	tolerated in hard water for 20 days	1459
50	$K_2Cr_2O_7$	trout	killed within 33 hrs.	1459
60	—	bluegills	toxic limit for 30-day exposure	1111
52	$K_2Cr_2O_7$	young eels	tolerated for 50 hrs.	1459
52	CrO_3	goldfish	toxic in 30 minutes	313
52	CrO_3	goldfish	survived 4 days	313
68	$K_2Cr_2O_7$	bluegills	tolerated in hard water for 5 days	1459
70	—	bluegills	toxic limit for one week's exposure	1111
75	$K_2Cr_2O_7$	bluegills	died within 4 days	1459
83	$K_2Cr_2O_7$	bluegills	tolerated for 10 days	1459
100	K_2CrO_4	trout	24-hour TL_m	2932
100	$K_2Cr_2O_7$	trout	fatal after 6 hrs.	1459
103	$K_2Cr_2O_7$	bluegills	96-hour TL_m	2933, 2934, 2935
104	CrO_3	goldfish	toxic in 6 to 84 hrs.	353, 2190
110	$K_2Cr_2O_7$	sunfish	96-hour TL_m	2937, 2938
113	$K_2Cr_2O_7$	sunfish	96-hour TL_m	2936
130	$K_2Cr_2O_7$	young eels	tolerated over 50 hours	1459
135	$K_2Cr_2O_7$	sunfish	96-hour TL_m (hard water)	2936
145	$Na_2Cr_2O_7$	bluegills	24-hour TL_m	1317
148	$Na_2Cr_2O_7$	bluegills	toxic limit	353
170	K_2CrO_4	sunfish	96-hour TL_m	2937, 2938
177	$K_2Cr_2O_7$	goldfish	toxic in 3 days	313
180–362	-	several species	toxic	1459
196	—	large-mouth bass	TL_m	2939
200	$K_2Cr_2O_7$	mummichogs	tolerated in sea wtr. for over a wk.	1459
213	$Na_2Cr_2O_7$	bluegills	48-hour TL_m	2093
300	Na_2CrO_4	bluegills	24-hour TL_m	1317
520	K_2CrO_4	young eels	killed in 5-12 hrs.	1459

highly turbid water, Wallen et al. (2940) found the r TL_m values for several chromate and dichromate compounds toward the mosquito-fish (*Gambusia affinis*) to be as follows:

Compound	*Temperature Range*	*pH Range*	*96-hour TL_m in mg/l* For Compound	*96-hour TL_m in mg/l* As Chromium
Ammonium chromate	19-23°C	7.5-7.8	240	82
Ammonium dichromate	18-20	5.7-7.4	136	56
Potassium chromate	17-21	7.6-8.1	400	104
Potassium dichromate	21-23	5.4-6.7	280	99
Sodium chromate	20-22	7.7-8.6	420	135
Sodium dichromate	24-27	6.0-7.9	264	92

For trivalent chromium, toxicities and survival times for fish have been reported as follows:

Concentration of Chromium, mg/l	*Compound Used*	*Type of Fish*	*Remarks*	*Reference*
1.2	$Cr_2(SO_4)_3$	Sticklebacks	Lethal limit	1460, 2941
1.3	$Cr_2(SO_4)_3$	Sticklebacks	Survived only 1 wk.	1460
2.0	$Cr_2(SO_4)_3$	Sticklebacks	Survived only 2 days	1460
2.4	$Cr_2(SO_4)_3$	Sticklebacks	Lethal limit	598
5.0	$Cr_2(SO_4)_3$	Sticklebacks	Survived only 1 day	1460
5.3	$KCr(SO_4)_2$	Young eels	Survived an average of 18.7 hours	1459
40	$Cr_2(SO_4)_3$	Minnows	Survived in distilled water only 6 hours	1459, 2942, 2943, 2944

From the foregoing tables, it appears that trivalent chromium might be more toxic than the hexavalent form despite apparent beliefs to the contrary. On the other side of the ledger, Olson (2945) reports that young chinook salmon were exposed for 12 weeks to either 0.2 mg/l of hexavalent or trivalent chromium. The hexavalent form showed reduced growth and increased mortality whereas the trivalent form had no observable effect.

Towards other organisms, toxicities of hexavalent chromium have been reported as follows:

Concentration of Chromium, mg/l	Compound used	Type of organism	Remarks	Reference
0.016	$Na_2Cr_2O_7$	*Daphnia magna*	toxic threshold	353
0.05	--	*Daphnia magna*	killed in 6 days	1112
<<0.10*	$Na_2Cr_2O_7$	*Daphnia magna*	toxic threshold	358
<<0.10*	Na_2CrO_4	*Daphnia magna*	toxic threshold	358
0.21	$K_2Cr_2O_7$	Protozoan (*Microregma*)	threshold effect	3343
0.21	$K_2Cr_2O_7$	Diatom (*Navicula*)	softwater TL_m, 22°C	2936
0.25	$K_2Cr_2O_7$	Diatom (*Navicula*)	hardwater TL_m, 22°C	2936
0.51	Na_2CrO_4	*Daphnia magna*	toxic threshold	2946
0.7	$K_2Cr_2O_7$	*Daphnia*	threshold effect	2158
0.7	$K_2Cr_2O_7$	*Scenedesmus*	threshold effect	2158
0.7	$K_2Cr_2O_7$	*E. coli*	threshold effect	2158
1.4	Na_2CrO_4	*Gammarus pulex*	total mortality	2947
17.3	$K_2Cr_2O_7$	Snail	softwater TL_m, 20°C	2936
25.0		Midge fly larvae	not toxic	2638
40.6	$K_2Cr_2O_7$	Snail	hardwater TL_m, 20°C	2936
148	CrO_3	*Polycelis nigra*	toxic threshold	354

*<< signifies "very much less than"

For trivalent chromium, Anderson (598) reports that the toxic threshold for *Daphnia magna* in Lake Erie water at 25°C is very much less than 1.2 mg/l (3.6 mg/l of $CrCl_3$). Bringmann and Kuhn (3343) indicate that the thresholds of toxicity occurred at 5 mg/l for *Scenedesmus*, 37 mg/l for *Microegma*, and 42 mg/l for *Daphnia*. With a flatworm, *Polycelis nigra*, Jones (608) found the toxic threshold in 48 hours of exposure to be 75 mg/l of chromium. Thus, toward *Daphnia magna*, hexavalent chromium appears to be more toxic than the trivalent form; but toward *Polycelis nigra* the opposite is true.

The toxicity of sodium chromate toward *Daphnia magna* increases as the dissolved oxygen tension of the water is lowered (2946).

Algae concentrate radioactive chromium by factors of 100 to 500 or more (2442). For further details of concentration factors, see Chapter VIII, Radioactivity.

STATE WATER RIGHTS BOARD
THE CITY OF LOS ANGELES vs THE CITY OF SAN FERNANDO
NO. 650079
SAN FERNANDO BASIC DATA DEFENDANTS NOS. 51-75, VOL. 54
(Reference 46)

Ground Water Basin #54

GROUND WATER EXTRACTION DATA

Name of owner of well(s) LOCKHEED AIRCRAFT CORP (WELLS #3, #4, #8, VEGA #1, NO #) U.S.A.F. (WELLS #1, #2, #5, #1A)

Address BOX 551 BURBANK

Name of user of well(s) LOCKHEED AIRCRAFT CORP.

Address BOX 551 BURBANK

Name of owner of property on which well(s) is located See "owner of well" above

Address

Other persons owning or claiming interest in use of water from well(s):

Name

Address

Name

Address

List additional names under general remarks

Previous owners of well(s) during past 30 years: WELLS OWNED BY USAF WERE FORMERLY OWNED BY LOCKHEED AIRCRAFT CORP.

Name

Address

Name BURBANK, CITY OF WELL # 3850E

Address

Name

Address

List additional names under general remarks

Number of well(s) operated: ONE

Location of well(s)	Well Number
347' W OF HOLLYWOOD WAY, 70' N OF ℄ EMPIRE AVE.	3850E
1627 VICTORY PLACE	TENTATIVE 3870-1
✓ ✓ ✓	TENTATIVE 3871-1
PLANT B-1 BUILDING 145 - SEE MAP OF LOCKHEED	TENTATIVE 3870-2
50' S EMPIRE AVE, 400' W SAN FERNANDO RD BURBANK	3870C
15' S EMPIRE AVE. 150' W SAN FERNANDO RD	3870
1201.5' N ℄ OF EMPIRE AVE. 70.5' W ℄ OF HOLLYWOOD WAY	3850F
1021 EMPIRE AVE. BURBANK	TENTATIVE 3860-1

Note: For information on specific wells see well data sheets attached hereto.

3950 EMPIRE AVE BURBANK	TENTATIVE 3840-1

GWE-1

Other sources of water and use:

City of Burbank & City of Los Angeles

HISTORICAL USE

Periods	Type of use*	Location 1/4 1/4 S T R	Crops served and/ or other uses	Acreage supplied
1940 – PRESENT	9	TENTATIVE 3840-1	ELECTRICAL GROUND	
✓	9	TENTATIVE 3860-1	✓	
1941 – 2-1-57	4	3850F	FIRE PROTECTION	
5/20/40 1953	4	3870	AIR CONDITIONING	
1940 1953	9	3870C	RETURN WELL FOR WATER FROM WELL #3870	
1941 9/57	4	TENTATIVE 3870-2	FIRE PROTECTION	
1-23-41 PRESENT	4	TENTATIVE ~~3870-1~~ 3871-	AIR CONDITIONING	
1-8-41 PRESENT	9	TENTATIVE 3871-1	RETURN WELL FOR WATER FROM WELL # TENTATIVE 3870-	
1-24-40	3	3850E	SEE CITY OF BURBANK RECORDS	
			NOT USED BY LOCKHEED	

*(1) irrigation; (2) domestic; (3) municipal; (4) industrial; (5) test; (6) not used; (7) destroyed, give date and reason; (8) well replaced, give date; (9) other.

GWE-2

CURRENT USE OF WATER

Attach sketch of pump facilities

Attach well data sheets for each well

Are storage facilities used? Yes ✓ No ___

Attach sketch of distribution system including:
- storage facilities - type and size
- conduits and ditches - type, size, and length
- Indicate which feature controls capacity of system
- Indicate normal flow of system

DISPOSAL OF WATER

Sewage Export	Return to G. W.	Consumed	Export Pumpage
✓	✓		

GENERAL REMARKS AND INFORMATION
(Give source of information)

HARRY PINKNEY, UTILITIES COORDINATOR, LOCKHEED AIRCRAFT CORP.

Data secured by Ron Barrett

Title Asst. Hyd. Engineer

Date 10-10-58

GWE-3

502-x

LOCKHEED AIRCRAFT CORP.

1705 Victory Place, Burbank

Information by telephone from Win. Curtis
(Lou. Barber's office)

Well #1-L.A.W.D. 501	S.W. corner of Empire and San Fernando
Well #2-L.A.W.D. 502	Near finger printing building, which is near the main gate
Well #3	About 200' inside grounds from Victory Pl., about 100' W. of Lab. Building
Well #4	About 1000' due South of #3
Well #5	N. end of Plant Engineering Bldg., about in the center of the grounds. Used for fire supply
Well #6	Near main sub station (Burbank's sub.) off Empire Ave,

----

4 wells used for air cooling
1 well Aux. fire supply
1 well was converted into ground well

Old well (may be 93-A) is now under Bldg. 126 and is completely covered--pump pulled.

Milton Anderson
Oct. 2, 1942

LOCKHEED AIRCRAFT CORPORATION

CALIFORNIA DIVISION BURBANK, CALIFORNIA

October 15, 1958

State Water Rights Board
312 West 5th St.
Los Angeles 13, California

Attention: Mr. R. H. Barrett, Junior Civil Engineer

Dear Sirs:

Attached are copies of eight well logs of cased wells on property controlled by Lockheed Aircraft Corporation. These are the wells listed on your form "Information Pertaining to Water Use and Wells in the San Fernando Valley." They are located as shown on the attached map.

Very truly yours,

LOCKHEED AIRCRAFT CORPORATION
CALIFORNIA DIVISION

H. D. Pinkney
Utilities Coordinator

HDP:ref

MR PINKNEY

LOCKHEED AIRCRAFT CORPORATION

CALIFORNIA DIVISION LOCKHEED BURBANK, CALIFORNIA

17 April 1958

R. J. SWONK
D/39-01 BLDG-72
PLANT A-1

State of California
State Water Rights Board
312 West 5th. Street
Los Angeles, 13, California

ATTENTION: Mr. L. K. Hill
Executive Officer

Gentlemen:

Enclosed is a completed form on "Information Pertaining to Water Use and Wells in the San Fernando Valley."

This form was sent us with your letter of April 7, 1958.

Very truly yours

~~LOCKHEED AIRCRAFT CORPORATION~~
CALIFORNIA DIVISION

R. J. Swonk

R. J. Swonk
Plant Engineer

INFORMATION PERTAINING TO WATER USE
AND WELLS IN SAN FERNANDO VALLEY

Pursuant to: Interim Order of Reference, March 19, 1958, Case No. 650079, Superior Court of State of California, The City of Los Angeles vs. City of San Fernando, City of Glendale, City of Burbank, et al.

Item

1. Present owner of well(s) See reverse side of form

Address

2. Name of person using water from well(s) Lockheed Aircraft Corporation

Address Box 551, Burbank, California

3. Number of wells operated 9 (See reverse side of form)

4. Street address of well location
(If more than one well use reverse side of this form)

RECORDS AND DOCUMENTS, PRESENT AND HISTORICAL, RELATING TO WELL(S) AND TO USE OF WATER

5. Circle the records or data that are available for your well(s) and check column at right indicating the period of record.

	Before 1900	1900-1950	1950-1958
(a.) Quantities extracted			Estimate
(b.) Water level measurements		X	X
c. Chemical analyses			

(d.) Year well(s) drilled

(e.) Depth of well(s)

(f.) Depths of perforation of casing(s)

(g.) Drilling log of well(s)

h. Other records available:

Precipitation, surface runoff, other geological data, (none)
please circle type of records

6. What is use of water? Irrigation, domestic, municipal, (industrial)
please circle appropriate use

7. Do you have any source(s) of water other than from the above described well(s)?
Yes x No __

If records are known to you but are in the possession of some other person or persons please write their names and addresses below.

Lockheed Aircraft Corp- Calif. Division

Signed [signature] Plant Engineer

Date April 18, 1958

Phone STanley 72711 Ext: 8-2456

Wells on U. S. Government Property, Plant #14 — Prop. leased from gov. by Lockheed. Lockheed was orig. owner of land which was sold to gov.
(None of these are in operation or can be used.)

3870 #1	1848 Empire Ave., Burbank	air cooling
3870C #2	1848 Empire Ave., Burbank	return well
3871D #5	1705 Victory Place, Burbank	fire
3860G #1A	2021 Empire Ave., Burbank	(Well for electric ground)

Wells on Lockheed Aircraft Corporation property
(Only ~~#3~~ #4 well is available for pumping).

3871E #3	1627 Victory Place, Burbank	return well
3871F #4	1627 Victory Place, Burbank	still pumping

3850F Vega #1	2625 North Hollywood Way, Burbank	sanded up
3850E #8	2555 North Hollywood Way, Burbank	— formerly owned by City of Burbank
3840G No Number	3950 Empire Ave., Burbank	(Well for electric ground)

State Well No. ____
Location No. TENTATIVE #3870-1
Owner's designation #4
Other No. Used ____

WELL DATA SHEET

WELL DATA

Drilled by BARBER - BRIDGE Date completed 1-23-41

This well replaced well no. ____ on ____ (Date)

Records available:

Log YES Where SWRB

Water analysis ____ Where ____ Period ____

Operating Static

Water Levels ____ YES Where SWRB Period JAN 1941

Pump tests YES Where SWRB Date(s) 1/22/41

Production NO Where, how measured and period of record. ____

Depth when drilled 200'

Present depth and date when changed ____

Casing: Size 16" Length 200'

Pit: Size ____ Depth ____

Perforations 73 - 178

Elev. ground surface ____

R. P. description and elev. ____

Can well be measured? Yes ✓ No ____ has air gage

Other data regarding physical changes incurred during history of well:

WD-1

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other_____

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Dates Removed	Rebuilt
US MOTOR	50	ELEC	1800	233040	DIR	UNKNOWN		

Remarks:

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs (gpm)	Rated Head	Dates Installed	Dates Removed	Rebuilt
POMONA	A-51			600				

Remarks: Probably not pumping over 400 gpm due to lower water level

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Dates Removed	Other load on meter

Remarks:

Flow Meter: NONE

Make: Description of setup

Type:

Serial No.:

WD-2

State Well No. ______
Location No. 3870
Owner's designation 1
Other No. Used ______

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE Date completed 5/20/40

This well replaced well no. ______ on ______ (Date)

Records available:

Log YES Where SWRB

Water analysis ______ Where ______ Period ______

Water Levels Operating ______ Static YES Where SWRB Period 5/40

Pump tests YES Where SWRB Date(s) 5/20/40

Production NO Where, how measured and period of record. ______

Depth when drilled 151

Present depth and date when changed ______

Casing: Size 16" Length 151

Pit: Size ______ Depth ______

Perforations 65-135

Elev. ground surface ______

R. P. description and elev. MEAS PIPE 1/2' ABV CONC FLOOR

Can well be measured? Yes ✓ No ______

Other data regarding physical changes incurred during history of well:

WD-1

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other______

Motor

anufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Removed	Rebuilt
US MOTOR	50	ELEC	1800	208629	DIR	UNKNOWN		

Remarks:

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Removed	Rebuilt
POMONA		N1379	4					

Remarks: 8" DISCHARGE PIPE

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Removed	Other load on meter

Remarks:

Flow Meter: NONE

Make: ______ Description of setup ______

Type: ______

Serial No.: ______

State Well No. ______
Location No. TENTATIVE 3840-1
Owner's designation NO NUMBER
Other No. Used ______

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE Date completed 11/26/40

This well replaced well no. ______ on ______ (Date)

Records available:

Log YES Where SWRB

Water analysis ______ Where ______ Period ______

Water Levels Operating ______ Static YES Where SWRB Period NOV. 1940

Pump tests NO Where ______ Date(s) ______

Production NONE Where, how measured and period of record. ______

Depth when drilled 125'

Present depth and date when changed ______

Casing: Size 10" Length ______

Pit: Size ______ Depth ______

Perforations NOT PERFORATED

Elev. ground surface ______

R. P. description and elev. ______

Can well be measured? Yes ____ No ____

Other data regarding physical changes incurred during history of well:

WD-1 WELL DRILLED FOR AND USED AS AN ELECTRICAL GROUND

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other______

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Removed	Rebuilt

Remarks:

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Removed	Rebuilt

Remarks:

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Removed	Other load on meter

Remarks:

Flow Meter:

Make: ______ Description of setup ______

Type: ______

Serial No.: ______

WD-2

State Well No. ______
Location No. 3850E
Owner's designation 8
Other No. Used ______

WELL DATA SHEET

WELL DATA

Drilled by BARBER - BRIDGE   Date completed 1/24/40.

This well replaced well no. ______ on ______ (Date)

Records available:

Log YES   Where SWRB

Water analysis ______ Where ______ Period ______

Water Levels   Operating ______ Static YES   Where SWRB   Period ______

Pump tests YES   Where ______ Date(s) ______

Production SEE CITY OF BURBANK RECORDS Where, how measured and period of record. ______

Depth when drilled 760

Present depth and date when changed ______

Casing: Size 20"   Length 758'

Pit: Size ______ Depth ______

Perforations 215-736

Elev. ground surface ______

R. P. description and elev. ______

Can well be measured? Yes ____ No ____

Other data regarding physical changes incurred during history of well:

WELL LOCATED UNDER LOADING DOCK

WD-1 well now capped. ~~& located~~ Water has low hardness count.

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other_____

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Removed	Rebuilt

Remarks:___

___

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Removed	Rebuilt

Remarks:___

___

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Removed	Other load on meter

Remarks:___

___

Flow Meter:

Make:___ Description of setup___

Type:___ ___

Serial No.:___ ___

WD-2

State Well No. 3850 F

Location No. ______

Owner's designation VEGA #1

Other No. Used ______

FIRE SUPPLY WELL

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE DRILLING CORP. Date completed 7-15-41

This well replaced well no. ______ on ______ (Date)

Records available:

Log YES Where SWRB

Water analysis ______ Where ______ Period ______

Operating Static

Water Levels ______ | YES Where SWRB Period JUNE, 1941

Pump tests Yes Where SWRB Date(s) 7/14/41

Production YES Where, how measured and period of record. ______

see note under pump remarks

Depth when drilled 302

Present depth and date when changed ______

Casing: Size 16" Length 302

Pit: Size ______ Depth ______

Perforations 180-250 270-288

Elev. ground surface ______

R. P. description and elev. ______

Can well be measured? Yes ______ No ✓

Other data regarding physical changes incurred during history of well:

WD-1

Well is sanded up & out of operation. Last pumped 2/1/57. Was tested once a week - Used for fire protection

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other_____

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Removed	Rebuilt
WESTINGHOUSE	40	ELEC	1470		DIR			

Remarks:

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs (gpm)	Rated Head	Dates Installed	Removed	Rebuilt
POMONA UNIDRIVE		A1961		600				

Remarks: Only use was for testing pump – run about 10 min./week Probably pumps about 400 gpm as water level lower than rated depth

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Removed	Other load on meter

Remarks:

Flow Meter: NONE

Make: Description of setup

Type:

Serial No.:

WD-2

State Well No. ______
Location No. TENTATIVE #3860-1
Owner's designation 1A
Other No. Used ______

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE Date completed 11/30/40

This well replaced well no. ______ on ______ (Date)

Records available:

Log YES Where SWRB

Water analysis ______ Where ______ Period ______

Water Levels: Operating ______ Static YES Where SWRB Period NOV. 1940

Pump tests NO Where ______ Date(s) ______

Production NONE Where, how measured and period of record. ______

Depth when drilled 100

Present depth and date when changed ______

Casing: Size 10" Length ______

Pit: Size ______ Depth ______

Perforations NOT PERFORATED

Elev. ground surface ______

R. P. description and elev. ______

Can well be measured? Yes ____ No ____

Other data regarding physical changes incurred during history of well:

WD-1 WELL WAS DRILLED FOR AND USED AS AN ELECTRICAL GROUND

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other_____

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Dates Removed	Dates Rebuilt

Remarks: ____________________

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Dates Removed	Dates Rebuilt

Remarks: ____________________

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Dates Removed	Other load on meter

Remarks: ____________________

Flow Meter:

Make: __________ Description of setup __________

Type: __________

Serial No.: __________

State Well No. ________

Location No. 3870C

Owner's designation 2

Other No. Used ________

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE Date completed 6/11/40

This well replaced well no. ________ on ________ (Date)

Records available:

Log YES Where SWRB

Water analysis ________ Where ________ Period ________

Water Levels Operating ____ Static YES Where SWRB Period MAY, 1940

Pump tests YES Where SWRB Date(s) 6/8/40

Production NO Where, how measured and period of record. ________

Depth when drilled 150

Present depth and date when changed ________

Casing: Size 16" Length 150

Pit: Size ________ Depth ________

Perforations 65-127

Elev. ground surface ________

R. P. description and elev. ________

Can well be measured? Yes ____ No ____

Other data regarding physical changes incurred during history of well:

WD-1 RETURN WELL

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other_____

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Dates Removed	Rebuilt

Remarks: ____________________

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Dates Removed	Rebuilt

Remarks: ____________________

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Dates Removed	Other load on meter

Remarks: ____________________

Flow Meter: NONE

Make: ____________ Description of setup ____________

Type: ____________

Serial No.: ____________

State Well No. ____________
Location No. TENTATIVE 3870-2
Owner's designation 5
Other No. Used ____________

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE Date completed 4/23/41

This well replaced well no. ____________ on ____________ (Date)

Records available:

Log YES Where SWRB

Water analysis ____________ Where ____________ Period ____________

Operating | Static

Water Levels ____________ | YES Where SWRB Period APRIL 1941 4/3/54

Pump tests YES Where SWRB Date(s) 4/22/41

Production NO Where, how measured and period of record. ____________

Depth when drilled 150

Present depth and date when changed 237' 4-23-54

Casing: Size 16" Length ____________

Pit: Size ____________ Depth ____________

Perforations 60-159

Elev. ground surface ____________

R. P. description and elev. 2" PIPE 1' ABV BASEMENT FLOOR (POSSIBLE PLACE FOR MEASURING) ALSO HAS AIR GAGE AIR LINE 110' IN LENGTH

Can well be measured? Yes ✓ No ____

Other data regarding physical changes incurred during history of well:

WD-1

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other_____

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Removed	Rebuilt
US MOTOR	30	ELEC	1800	140611	DIR	UNKNOWN		

Remarks:

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Removed	Rebuilt
PEERLESS		6277		800				

Remarks: 6" DISCHARGE PIPE

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Removed	Other load on meter

Remarks:

Flow Meter: NONE

Make: Description of setup

Type:

Serial No.:

WD-2

State Well No.

Location No. TENTATIVE # 3871-1

Owner's designation 3

Other No. Used

WELL DATA SHEET

WELL DATA

Drilled by BARBER-BRIDGE Date completed 1/8/41

This well replaced well no. ______ on ______ (Date)

Records available:

Log YES Where SWRB

Water analysis ______ Where ______ Period ______

Water Levels Operating ______ Static YES Where SWRB Period DEC 1940

Pump tests YES Where SWRB Date(s) 1/9/41

Production NO Where, how measured and period of record.

Depth when drilled 235

Present depth and date when changed

Casing: Size 18" Length 235'

Pit: Size ______ Depth ______

Perforations 68-228

Elev. ground surface

R. P. description and elev.

Can well be measured? Yes____ No____

Other data regarding physical changes incurred during history of well:

WD-1 RETURN WELL

PUMP AND MOTOR HISTORICAL DATA

Type of pump: Deep well turbine, horizontal centrifugal, jet, plunger, other______

Motor

Manufacturer	HP	Type Power	RPM	Serial No.	Type Drive	Dates Installed	Dates Removed	Rebuilt

Remarks: ______________________________

____

Pump

Manufacturer	Model No.	Serial No.	No. Stages	Rated cfs gpm	Rated Head	Dates Installed	Dates Removed	Rebuilt

Remarks: ______________________________

____

Power Meter

Power Co. No.	Manufacturer	Serial No.	Kh	Kts	Dates Installed	Dates Removed	Other load on meter

Remarks: ______________________________

____

Flow Meter: NONE

Make: ____________ Description of setup ____________

Type: ____________ ____________

Serial No.: ____________ ____________

WD-2

Well #1 USMOTOR 50HP SER # 208629
1800 RPM
4 bowls POMONA PUMP Ser # N1379
8" discharge pipe Has meas. pipe 1/2' abv conc floor

3879 Well #1 - Has not been used during last five years. ~~P~~ This well was used ~~as~~ for cooling (air cond.) ~~and domestic water supply~~ and water returned to ground thru well #2

Well #2 - Drilled for disposal of water for cooling. Well never had a pump installed

✓ Well #5 - Pump rated at 800 gpm. Capacity now abt 600 gpm due to greater depth. Well ~~inactive since 9/57~~ Only use for filling reservoir for fire protection. ~~Was~~ run 10 min/week for test and warmup. ~~Well now sanded up.~~ Reservoir located in basement of building #14.

disc pipe size length
size reservoir

Peerless Pump
US motor 30 H.P. 1800 RPM
Ser# 140611 6" disc pipe
Pump ser # 6277
Has 2" meas pipe 1' abv basement floor

Distances scaled from Lockheed property map

Lockheed

~~3850E~~	3.86	~~Old Burbank City well #8~~	
~~3840-1~~ 3840-1	NO #	80' N (at right angle) ℄ Empire Ave 550' W (at right angle) ℄ Hollywood Way	? ℄ See ground
3870-1	#4	160' SW ℄ Victory Place 40' NW ℄ University Ave (produced)	✓
3871-1	#3	100' SW ℄ Victory Place 200' NW ℄ University Ave (prod.)	✓
3860-1	1A	140' S ℄ Empire Ave 40' E ℄ Maria St (prod.)	elec ground ✓
3870-2	5	640' SW ℄ Victory Pl. 640' S ℄ Empire Ave	✓

Well #4 - Pomona Pump Ser# A-51

US motor 50HP 1800 RPM @60
Ser# 233040

Well #3 - Return well for water used for air cond. of wind tunnel

✓ Well #4 - Pump ~~@~~ 40 hr/week 52 week/yr. since well was

~~3870-1~~
TCN.3871
1/23/41 completed

first operated. All water from this well is returned down well #3. Water is pumped from well through ~~to~~ air cond. system and returned to well #3 100' away.

Well #8 - See City of Burbank or driller for log. Well capped and located under conc. loading dock. Well orig. tested at 3000 gpm. with water level 62' static and 100' pumping. 20" casing 760' depth. Water has low hardness count.

10-10-58

Mr. Pinkney, - Will send us copies of logs and locations of wells

Vega #1 - Well is sanded up and out of operation. Last pumped 2-1-57. Was tested once a week used for fire protection

150' of 8" discharge pipe - pumps to ~~to~~ covered reservoir approx 1/2 million gallon cap. Reservoir also fed from city of Burbank water system.

No # well - Well used as electrical ground, depth 125' owner as log depth to water 11-26-40 was 68'

Well #1A - Well used as elec. ground depth 100' depth to water on 11-30-40 was 41' - owner has log

Lockheed

Well #4
1941 — to date | 153 af/yr |

400 gpm

400 gpm × 60 × 40 × 52 = 49,920,000 gal/yr
= 153 af/yr

Well #1
1941 — 1953 | 153 af/yr |

400 gpm

1940 $\frac{7}{12} \times 153 = 89$ Drilling completed 5/20/40

LOC# 3870C

WELL LOG

BAKER-BRIDGE DRILLING CORP. Ltd.
3925 Empire Ave.
BURBANK, CALIFORNIA

Drilled for Lockheed Aircraft Corp.

Lockheed Plant, Empire Ave; Burbank, California

Well No. 2

WORK STARTED May 27, 1940 WORK COMPLETED June 11, 1940

152 ft. of 16 in. 10 ga. casing 150 left in well

Type of perforator used Mills Knife

Perforated 65 ft. to 127 ft. 8 holes per 13 in.

Size of perforations 5/8 in., length 4½ in.

Depth at which water was first found 18 ft.

Standing level before perforating 38 ft.

Standing level after perforating 38 ft.

State your observation of any change in water level while drilling
When well was about 42' water level lowered to 38 feet.

Date tested June 8, 1940.

Water level when first started test 38 ft.

Draw down from standing level 27 ft.

G. P. M. at beginning of test 600

G. P. M. at completion of test 1075

Draw down at completion of test 15 ft.

If reducing strings of casings were cut off, state how cut

Depth from surface cut ft.

Size of casing cut in.

Lap in larger casing ft.

Was adapter or cement used?

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight top to bottom, if not, what is the variation? Straight

Is there be any detrimental effect on pump, and if so, what? none

Any additional data which may be of future value: Cement plug 150 to 146

Total depth of well 150 ft.

Formation: Mention size of water gravel—

0 ft.	42 ft.	Gravel & sand
42	127	Gravel with boulders
127	150	Clay yellow, streaks sand

June 12, 1940
C. Barber
Driller

LOS ANGELES
STATE WATER RIGHTS BOARD
1328 OCT 17 AM 8: 28

LOC # 3870

Drilled for Lockheed Aircraft Corp.

Lockheed Plant, Empire Ave, Burbank, California

Well No.

May 10, 1940 — WORK COMPLETED May 20, 1940

ft of 16 in. 10 lb/ga casing 151 left in well

Kind of perforator used: Mills Knife

from 65 ft to 135 ft 8 holes per 13 in.

Size of perforations 5/8 in., length 4½ in.

Depth at which water was first found 18 ft.

Level before perforating 37 ft.

Level after perforating 37 ft.

Observation of any change in water level while drilling: Well has about 43' water level dropped to 37 feet.

Tested May 20, 1940

Water level when first started test 37 ft.

Draw down from standing level 15 ft.

G. P. M. at beginning of test 730

G. P. M. at completion of test 1400

Draw down at completion of test 19 ft.

If reducing strings of casings were cut off, state how cut

Depth from surface cut ft.

Size of casing cut in.

Lap in larger casing ft.

Was adapter or cement used?

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight top to bottom, if not, what is the variation? Straight

Will there be any detrimental effect on pump, and if so, which? none

Any additional data which may be of future value: Cement plug 151 to 147'

Total depth of well 151

Formation. Mention size of water gravel—

From	To	Formation
0	18	Top soil,
18	43	Gravel 1" Av
43	120	Gravel with
120	135	Gravel 1" Av
135	151	Clay yellow
		sand

LOS ANGELES STATE WATER RIGHTS BOARD OCT 17 1940

May 24, 1940

Clancy Surber

Driller.

Loc # 3850F

WELL LOG
BARBER-BROWN DRILLING CORP. LTD.
3026 Empire Ave
BURBANK, CALIFORNIA

Drilled for Vega Aircraft Corp. (Lockheed Plant #1)
Burbank, California
Fire Supply Well — Well No. (Vega Water
June 23, 1941 — WORK COMPLETED July 15, 1941

16 in 10 ga. casing 302 left in well	Total depth of well 302
	Formation: Mention size of water gravel—
	0 ft. to 9 ft. Sand & gravel
	9 " 134 " Sand & gravel with small boulders
B & B Hydraulic Louvre	134 " 172 " Sand & gravel
220 ft to 250 ft. 8 holes per 6 in.	172 " 179 " Boulders
270 " 288 " 8 " " 6 "	179 " 208 " Sand & gravel slightly dirty
	208 " 288 " Sand & gravel 1"
	288 " 294 " Sand & gravel 1/2" dirty
	294 " 302 " Sandy yellow clay

Size of perforations 3/8 in., length 2 in.
Depth at which water was first found 72 ft.
Standing level before perforating 74 ft.
Standing level after perforating 74 ft.
Observation of any change in water level while drilling

Date of test July 14, 1941
Depth to water when first started test 74 ft.
Draw down from standing level 22 ft.
Gallons per minute at beginning of test 550
Gallons per minute at completion of test 1120
Draw down at completion of test 10 ft.
If any portions of casings were cut off, state how cut
Depth from surface cut ft.
Size of casing cut in.
Length of casing ft.
Was any cement used?
If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight to bottom, if not, what is the variation? straight
Any detrimental effect on pump, and if so, what? none
Information which may be of future value:

STATE WATER RIGHTS BOARD LOS ANGELES 1958 OCT 17 AM 8:21

Date of Report July 15, 19
James Busby
Driller

LOCKHEED AIRCRAFT CORP.

3850 F: EXTRACTIONS

1942–1956: 52 WK × 10 MIN/WK × 400 = 208,000 GAL/YR.
= 1 AC-FT/YR

1941 24 × 10 × 400 = 96000 GAL/YR
= 0 AC-FT/YR

1957-8 4 × 10 × 400 = 16000 GAL/YR.
= 0 AC-FT/YR.

3870-2:

1941: 8/12 × 52 WK. × 10 MIN/WK × 600 = 208000 GAL
= 1 AC-FT.

1942-1956: 52 × 10 × 600 = 312000 GAL
= 1 AC-FT.

1957: 9/12 × 52 × 10 × 600 = 234,000 GAL
= 1 AC-FT

STATE WATER RIGHTS BOARD
REPORT OF REFEREE
THE CITY OF LOS ANGELES vs THE CITY OF SAN FERNANDO
NO. 650079
VOL. I AND VOL II, JULY 1962
TABLE 12, FOOTNOTE P
(Reference 50)

TABLE 12

GROUND WATER EXTRACTIONS AND SURFACE WATER DIVERSIONS BY PARTIES AND THEIR PREDECESSORS
1928-29 THROUGH 1957-58

In Acre-Feet

Party	Defendant number	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	Wells and surface diversions active, October 1, 1928 through September 30, 1958
Los Angeles, City of Department of Water and Power	Plaintiff	64,280[a]	66,390[a]	68,640[a]	42,593	39,620	62,870	51,598	58,591	53,495	48,788	47,009	48,294	51,090	44,963	55,901	59,636	74,557	81,781	87,154	82,395	81,353	86,733	78,907	75,126	95,324	93,707	87,704	92,688	98,878	89,380	See well list below.
					116	95	61	78	83	111	88	219	133	264	439	441	556	485	333	208	142	110	126	84	124	95	72	49	31	27	69	Haines and Blanchard Canyons[q].
Departments of Recreation and Parks and of Public Works[a]		1,750	1,750	2,450	2,370	2,440	2,360	2,030	2,520	2,990	3,540	4,030	3,800	3,470	3,000	3,020	2,740	2,920	4,390	2,820	1,220	3,390	3,430	3,440	2,930	2,920	2,780	2,780	2,440	2,720	2,130	See well list at end of table.
TOTAL		66,030	68,140	71,090	45,080	42,160	65,290	53,710	61,190	56,600	52,420	51,260	52,230	54,820	48,400	59,360	62,930	77,960	86,500	90,180	85,760	84,850	90,290	82,430	78,180	98,340	96,560	90,530	95,160	101,620	91,580	
San Fernando, City of	1	1,100	1,140	1,180	1,190	1,277	1,318	1,205	1,435	1,448	1,411	1,548	1,530	1,522	1,745	1,878	1,799	1,880	1,979	2,084	2,383	2,528	2,470	2,460	2,331	1,988	1,937	2,384	3,010	2,563	2,853	4850B, 4850M, 5959, 5969, 5969A, 5969B.
Glendale, City of	2	7,311	8,582	9,756	9,156	9,036	9,665	8,467	9,691	9,758	10,194	10,738	10,942	10,508	11,750	12,763	12,820	13,546	16,011	17,243	19,299	20,166	17,794	18,500	17,056	19,459	19,922	22,188	20.918	23,396	19,392	See well list at end of table.
		1,332	1,124	532	335	342	378	399	580	497	720	1,299	1,225	1,487	1,357	1,454	1,687	1,616	1,231	1,034	660	611	532	465	707	1,076	1,120	1,046	971	945	1,056	Verdugo Canyon[r].
TOTAL		8,643	9,706	10,288	9,491	9,378	10,043	8,866	10,271	10,255	10,914	12,037	12,167	11,995	13,107	14,217	14,507	15,162	17,242	18,277	19,959	20,777	18,326	18,965	17,763	20,535	21,042	23,234	21,889	24,341	20,448	
Burbank, City of	3	2,564	2,902	2,805	2,455	2,506	2,819	2,936	3,034	3,140	3,843	5,378	6,250	7,420	10,220	11,570	12,710	13,740	13,590	13,220	15,730	16,050	16,340	17,760	18,020	19,900	20,780	21,520	20,760	20,670	19,050	See well list at end of table.
Burbank City Unified School District[c]	4	10	10	10	10	10	10	10	10	10	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3872A.
La Canada Irrigation District	7	22	102	112	108	134	145	56	96	37	22	87	134	66	156	155	112	203	270	354	500	431	366	296	287	322	344	346	206	366	251	5069D, 5077A.
		140	130	110	137	112	78	142	160	283	369	350	290	410	384	464	524	364	289	300	210	230	190	170	260	290	290	103	73	69	101	Pickens and Snover Canyons[s].
TOTAL		160	230	220	245	246	223	198	256	320	391	437	424	476	540	619	636	567	559	650	710	660	560	470	550	610	630	449	279	435	352	
Crescenta Valley County Water District	8	*	*	*	714	732	893	659	653	598	648	692	700	629	789	698	805	838	1,237	1,480	2,009	1,817	1,896	1,910	2,208	2,588	2.789	2,409	2,186	2,223	2,538	See well list at end of table.
		—	—	—	0	0	0	0	22	34	39	48	83	86	89	155	211	130	72	118	185	83	104	78	99	89	67	85	81	55	89	Cooks, Dunsmore, Goss, and Pickens Canyons[t].
TOTAL					714	732	893	659	675	632	687	740	783	715	878	853	1,016	968	1,309	1,598	2,194	1,900	2,000	1,988	2,307	2,677	2,856	2,494	2,267	2,278	2,627	
The Andrew Jergens Company[c]	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20P	50P	50P	30P	20P	30P	30P	30P	30P	30P	30P	30P	30P	8P			3892K.
Beatrice Foods Company	15	—	—	—	—	—	—	—	—	—	—	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	1	1	3958F.
California Materials Company	18	—	—	—	—	—	—	—	—	—	—	—	—	80	280	300	310	300	290	330	390	380	380	360	340	370	340	240	300	350	330	4926.
Carnation Company	21	—	—	—	—	—	—	—	—	—	—	—	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3882L.
Consolidated Rock Products Company	30	220	120	130	110	0	80	170	340	350	330	300	410	540	410	340	440	440	820	700	740	560	560	640	580	970	1,250	1,000	1,390	1,340	1,113	4909A, 4909B, 4916, 4916A.
Deep Rock Artesian Water Company	34	4	4.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	3987C, 3987D.
Desco Corporation[d]	35	—	—	—	—	—	—	—	—	—	—	—	—	120	120	120	120	120	120	120	120	120	120	90	90	7	—	—	—	—	—	3883J.
Drewry Photocolor Corporation	36	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	8	11	13	17	21	24	25	27	30	30	29	21	3935.
Forest Lawn Company	39	640	790	850	840	840	760	630	770	700	790	810	790	730	710	800	720	790	880	1,050	1,070	1,180	1,150	1,060	1,080	1,000	930	880	1,010	1,270	920	3947A. 3947B. 3947C, 3947D, 3884T.
Freshpuro Water Company	41	—	*	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3987E.
Glendale Towel and Linen Supply Company	42	—	—	—	—	—	—	—	—	—	—	—	—	3	10	10	10	10	10	20	20	20	20	20	20	20	20	20	20	30	30	3936.
Glenhaven Memorial Park, Inc.	43	—	—	—	—	—	—	—	*	*	*	*	*	*	*	10	30	50	60	70	90	110	110	110	110	120	120	120	120	120	120	6028. 6028A, 6028C, 6028D, 6028E, 6029.
Hidden Hills Mutual Water Company	45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2	15	25	41	87	98	115	131	See well list at end of table.
Houston Color Film Laboratories, Inc., of California[e]	46	—	—	—	—	—	—	—	—	—	—	—	20	20	20	20	20	20	20	20	20	30	70	70	70	70	70	20	—	—	—	3882M.
Knickerbocker Plastic Company, Inc.	48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	150P	230P	230P	230P	230P	230P	3810H.
Lakeside Golf Club of Hollywood	49	330	330	330	330	330	330	330	330	330	390	390	390	390	390	390	390	390	390	390	330	320	340	180	290	280	280	280	200	130	150	3845A, 3845B, 3845D, 3855D.
Livingston Rock and Gravel Company	53	—	—	—	160	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	460	450	450	440	430	440	370	4916B, 4953C.
Lockheed Aircraft Corporation	54	—	—	—	—	—	—	—	—	—	—	—	90P	310P	310P	310P	310P	310P	310P	310P	310P	310P	310P	310P	310P	310P	160P	160P	160P	160P	150P	3850F, 3870, 3871D, 3871F.
Los Angeles Pet Cemetery	56	1	1	1	1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	3544B, 3554A.
Monteria Lake Association	61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	40	40	40	40	40	4722.
Mulholland Orchard Company	62	1,680	1,540	1,400	1,260	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	720	690	660	630	600	570	540	500	460	370	4716, 4735B, 4735C, 4736.
Oakwood Cemetery Association	64	—	—	—	—	70	70	70	70	70	70	70	70	70	70	50	50	50	50	50	50	50	50	50	50	50	50	50	50	60	70	4674, 4684B, 4684C.
Pacific Lighting and Oak Supply Company[f]	66	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	—	—	—	—	—	—	—	—	3554.
George E. Platt Company	67	240	240	240	240	240	240	240	290	270	220	230	230	140	270	190	270	680	680	680	680	680	680	680	680	680	680	1	1	1	1	See well list at end of table.
Polar Water Company	68	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3832D, 3832J.
Riverwood Ranch Mutual Water Company	70	10	10	10	10	10	0	0	0	0	0	10	20	20	20	20	20	20	20	20	20	10	10	10	9	13	13	12	12	13	14	4982.
		—	—	—	—	—	10	10	10	10	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Big Tujunga Wash[p].
Roger Jessup Farms	71	—	—	10	110	110	110	110	110	110	110	110	110	110	110	110	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3924G, 3924H.
Sears, Roebuck and Company	74	—	—	—	—	—	—	—	—	—	90P	90P	90P	100P	89P	94P	76P	104P	22P	90P	89P	109P	90P	90P	90P	90P	90P	90P	90P	110P	110P	3945.

* Diversion in existence, but production unknown. See last page of table for footno'es.

TABLE 12

GROUND WATER EXTRACTIONS AND SURFACE WATER DIVERSIONS BY PARTIES AND THEIR PREDECESSORS
1928-29 THROUGH 1957-58
(continued)

In Acre-Feet

Party	Defendant number	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	Wells and surface diversions active, October 1, 1928 through September 30, 1958
Southern California Edison Company[g]	75	—	—	—	300	300	150	150	150	0	0	120	110	110	110	110	110	110	110	30	30	30	30	30	30	—	—	—	—	—	—	4932 and 4932B.
Southern Pacific Railroad Company	76	2,335	2,335	2,140	1,570	1,680	2,150	2,340	2,170	2,180	1,870	1,750	2,010	1,890	1,600	1,890	1,940	1,910	2,320	2,274	2,284	2,281	2,281	2,259	2,261	2,256	2,256	2,237	2,233	2,225	1,949	2760A, 2760B, 2760D, 2760E, 2760F.
Southern Service Company, Ltd.	77	—	—	—	—	—	—	—	—	—	—	—	—	20	30	30	30	30	30	30	30	30	30	30	30	30	30	30	40	30	25	3934A.
Sparklett Drinking Water Corporation	78	20	20	20	20	10	20	20	20	20	20	20	20	20	20	20	30	30	30	40	40	40	40	40	100	110	110	110	120	130	140	3987A, 3987B, 3987F, 3987(1), 3987(2), 3987(3).
Spinks Realty Company	79	*	*	*	10	20	30	30	20	20	60	10	10	10	20	20	20	20	20	10	20	40	20	20	20	20	20	20	20	20	20	4694.
Sportsmen's Lodge Banquet Corporation	80	220	220	220	220	220	220	220	220	220	220	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	3785, 3785A.
Technicolor Corporation	82	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	230	380	380	380	380	380	380	360	380	380	320	300	300	3864C, 3864D, 3864G.
Toluca Lake Property Owners Association	97	—	—	5	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	*	*	*	*	0	120	110	110	100	100	3845F, 3855A.
Universal Pictures Company	99	140	140	140	140	140	140	140	140	140	150	150	150	150	150	150	150	150	150	150	150	150	150	150	174	117	227	202	173	97	14	3845C, 3845D.
Valhalla Memorial Park	101	230	230	230	230	230	230	230	230	230	240	240	240	240	240	240	240	240	240	240	240	240	240	240	250	250	250	250	250	280	280	3830F, 3830H, 3830J, 3830K, 3830L, 3830M.
Van de Kamp's Holland Dutch Bakers, Inc.	104	—	—	—	—	—	—	—	—	—	—	—	—	30	100	100	100	100	100	120	120	120	120	120	120	120	120	120	120	120	120	3958C.
Walt Disney Productions	105	—	—	—	—	—	—	—	—	—	—	290	570	520	440	600	550	680	640	690	700	840	810	910	1,240	1,520	1,850	1,950	1,770	1,480	1,860	3874E, 3874F.
Warners Brothers Pictures, Inc.	106	1	0	0	0	0	1	0	0	0	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	0	0	0	0	0	3864A, 3864B, 3865.
William O. Bartholomaus	117	*	*	*	*	*	150	90	0	0	40	70	150	160	170	150	140	60	110	40	20	0	0	20	2	3	3	0	0	0	20	4921.
Henry W. Berkemeyer	120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	2	2	2	2	2	2	2	2	1	1	1	4685.
Elfrieda M. Bishop	122	—	—	—	—	—	*	*	*	*	*	*	*	*	*	*	4	4	4	4	4	4	4	4	4	4	4	1	1	1	1	5077B.
Mark Boyar	126	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1	1	1	1	1	1	1	3541.
Stella M. Brown	127	*	*	*	*	*	*	*	*	10	10	10	10	10	10	10	10	10	10	10	10	10	10	2	2	2	2	2	2	2	2	4860C.
George A. Burns[h]	128	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	3	3	3	3	3	3	—	—	—	3624.
William M. Chace	132	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	40	30	30	20	20	20	20	20	20	6	3833.
Emma L. Clauson[i]	134	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	*	*	*	*	—	—	—	—	—	—	—	3851.
Cecil B. DeMille	138	60	60	60	60	60	60	60	60	60	70	70	70	70	70	70	70	70	70	70	70	70	70	60	60	60	60	60	40	40	40	4930A, 4931, 4931A, 4940, 4940A, 6086.
Maxine Duckworth	141	*	*	*	*	*	*	*	*	*	480	480	480	480	480	480	480	480	480	480	480	530	520	520	530	520	520	520	500	500	520	5997A, 5998, 5998A.
Richard Erratchuo[j]	143	—	—	—	—	—	—	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	—	—	—	—	—	4830A.
Howard Barton Griffith	148	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	26	26	26	26	26	4702.
Neva Bartlett	153	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1	1	1	1	1	1	4973J.
E. E. Mahannah	164	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1	1	5076.
Celeste Louise McCabe	168	—	—	—	—	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3852, 3852D.
Kisag Moordigian	173	—	—	—	—	—	30	20	10	30	40	50	50	50	50	50	50	50	50	30	30	40	40	40	40	0	0	0	40	30	0	5939.
John E. Mullin	181	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	20	20	7	10	10	10	40	40	10	5998B.
Charles Mureau	183	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3544.
Florence S. Plemmons[k]	188	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—	—	—	4973B, 4983D.
Lester Rushworth	194	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3540B, 3540C.
Lester R. Schwaiger	195	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—	—	—	5066.
Sidney Smith	198	*	*	*	*	*	*	*	*	*	*	*	*	*	*	22	23	20	19	18	17	16	14	14	15	15	15	13	10	13	11	Pickens Canyon[v].
G. Henry Stetson	200	100	100	100	100	100	100	90	110	100	130	80	70	60	90	90	90	90	90	110	110	110	110	130	130	130	130	130	130	130	130	5937, 5937A.
H. M. Warner	204	390	390	390	390	380	350	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	60	60	50	60	60	7	3600, 3601.
Elizabeth A. Wheeland	205	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4830.
Alice M. Wright	211	—	—	—	—	—	—	—	—	—	—	—	—	6	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	3937F.
Hollin Investment Corporation	Doe Corp.	540	540	540	540	630	470	460	580	530	550	520	440	380	580	560	540	460	550	550	520	570					400	400	330	330	270	5988A, 5989D, 5997.
	4	500	500	500	500	270	440	240	120	160	140	180	250	310	110	140	160	230	140	140	180	120					0	0	0	0	0	Pacoima Wash[u].
TOTAL		1,040	1,040	1,040	1,040	900	910	700	700	690	690	700	690	690	690	700	700	700	690	690	700	690	700	700	400	400	400	400	330	330	270	
Emily Louise Herrmann	Doe 1	*	*	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4850L.
Lester Townes Hope	Doe 14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1	1	1	1	1	3855E.
TOTAL		86,490	90,020	93,240	66,690	63,270	88,060	74,700	83,940	79,260	77,230	79,030	81,820	85,690	83,580	97,620	102,860	120,070	131,710	136,740	137,580	137,720	140,880	134,820	130,320	155,800	156,020	151,740	154,620	162,990	147,140	
Surface diversions		640	630	610	750	480	590	470	400	600	650	800	760	1,070	1,020	1,220	1,470	1,230	850	780	730	560	430	350	500	490	440	250	200	160	270	
Extractions returned directly to ground water		—	—	—	—	—	—	—	—	—	90	90	180	410	400	420	440	460	360	420	430	450	430	430	430	580	510	510	490	500	490	
Extractions[w]		85,850	89,390	92,630	65,940	62,790	87,470	74,230	83,540	78,660	76,490	78,140	80,880	84,210	82,160	95,980	100,950	118,380	130,500	135,540	136,420	136,710	140,020	134,040	129,390	154,730	155,070	150,980	153,930	162,330	146,380	

* Diversion in existence, but production unknown. See last page of table for footnotes.

TABLE 12

GROUND WATER EXTRACTIONS AND SURFACE WATER DIVERSIONS BY PARTIES AND THEIR PREDECESSORS
1928-29 THROUGH 1957-58
(continued)

WELL LIST

City of Los Angeles
Department of Water and Power

2771G	3800B	3821D	3842E	3884N	3884JJ	3894J	3894Z	3924B	3925S	3949	4993C
3700A	3800C	3821E	3843M	3884U	3884KK	3894K	3894AA	3924C	3925T	3949A	4993D
3770	3810	3821F	3844R	3884V	3884LL	3894L	3894BB	3924E	3925U	3949B	4994
3770A	3810A	3821G	3853F	3884W	3884MM	3894M	3914D	3924F	3926A	3959E	4994A
3770B	3810B	3821H	3853G	3884X	3884NN	3894N	3914E	3924J	3926B	4840A	4994B
3771	3810C	3830B	3854	3884Y	3884PP	3894P	3914F	3924K	3926D	4840B	4994C
3780A	3811F	3830C	3854F	3884Z	3884QQ	3894Q	3914G	3924L	3926E	4840C	4994D
3790	3811G	3830D	3863B	3884AA	3884RR	3894R	3914H	3924M	3926G	4840G	5014
3790A	3820	3831E	3863D	3884BB	3893K	3894S	3914J	3924P	3926P	4840H	
3790B	3820B	3831F	3863H	3884CC	3893L	3894T	3914K	3924Q	3926R	4983F	
3790C	3820C	3831G	3863J	3884DD	3894	3894U	3914L	3925	3926S	4983G	
3790D	3820D	3831H	3863K	3884EE	3894A	3894V	3914M	3925A	3926T	4992A	
3790F	3820E	3832K	3863L	3884FF	3894B	3894W	3914S	3925B	3926U	4992B	
3800	3821B	3832L	3874A	3884GG	3894H	3894X	3924	3925C	3926V	4993A	
3800A	3821C	3832M	3884G	3884HH	3894I	3894Y	3924A	3925D	3926W	4993B	

City of Los Angeles
Department of Recreation and Parks
and Department of Public Works

2760	3813A	3894C
3650B	3823A	3894D
3661G	3833G	3894CC
3752	3844C	3904B
3762B	3893C	3914
3764A	3893E	3915

City of Glendale

3903A	3913B	3914B	3971
3903M	3913C	3914C	3971A
3903N	3913D	3924N	3971C
3913	3913E	3961	5036
3913A	3913F	3963A	5036C
		3970	5036D

City of Burbank

3841C	3851B	3882D
3841F	3851C	3882E
3841G	3851D	3882F
3850E	3851F	3882P
	3851G	3882S

Crescenta Valley
County Water District

5036A	5058	5058E
5036B	5058A	5058F
5047	5058B	5058H
5047B	5058C	5069F
5047D	5058D	5069J

Hidden Hills
Mutual Water Company

3532	3533F	3534
3532A	3533G	3534A
3533A	3533H	3534B
3533B	3533J	3534C
3533D	3533K	3543B
		3543C

George E. Platt
Company

3540D	3570B
3561A	3570C
3561B	3571E
3561E	3571H
3561G	3571J

FOOTNOTES

a. Department of Public Works extractions made only during 1945-1946.
b. Well capped in 1938.
c. Well not used after 1955.
d. Well abandoned in 1954.
e. Well not used after 1955.
f. Well not used after 1950.
g. Well No. 4932 capped in 1945; Well No. 4932B capped in 1955.
h. Well capped in 1955.
i. Well capped in 1951.
j. Well abandoned in 1953.
k. Well No. 4973B capped in 1957; Well No. 4983 capped prior to 1955.
m. Includes gravity production.
n. Diversion located in well location grid coordinate 5997.
p. Extractions are returned directly to ground water without loss.
q. Haines Canyon diversion located in well location grid coordinate 5043. Blanchard Canyon diversion located in well location grid coordinate 5035.
r. Diversion located in well location grid coordinate 3963.
s. Pickens Canyon diversion located in well location grid coordinate 5076. Snover Canyon diversion located in well location grid coordinate 5077.
t. Cooks Canyon diversion located in well location grid coordinate 5045; Dunsmore Canyon diversion located in well location grid coordinate 5055; Goss Canyon diversion located in well location grid coordinate 5066; and Pickens Canyon diversion located in well location grid coordinate 5076.
u. Diversion located in the vicinity of well location grid coordinate 4982, exact location unknown.
v. Diversion located in well location grid coordinate 5076.
w. Does not include extractions which are returned directly to ground water without loss.

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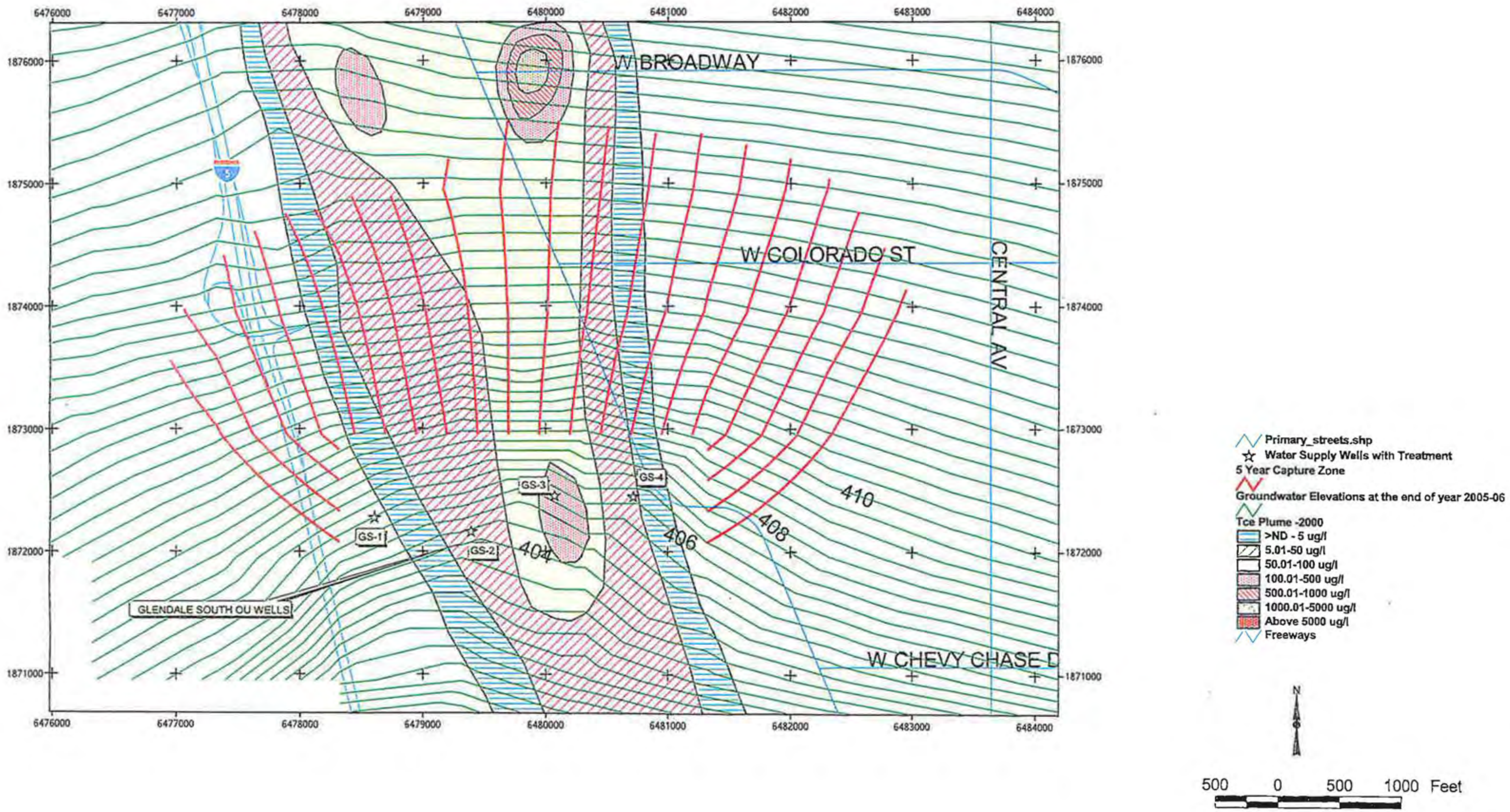
ULARA WATERMASTER
SIMULATED CAPTURE ZONE AND GROUNDWATER ELEVATIONS
AFTER 5 YEARS OF OPERATING ALL GLENDALE SOUTH OU WELLS
INCLUDING WELL GS-3
(Reference 60)

Simulated Capture Zone and Groundwater Elevations after 5 years of operating all Glendale South OU Wells including well GS-3



SCENARIO. 1
MODEL INPUT
Water Years 2001 - 2006
Assuming all Glendale South OU Wells pumping including well GS-3

	BASIN RECHARGE (AF/Y)																	
	RAINFALL (IN/Y)		PERCOLATION (A)			H&M (B)	SPREADING GROUNDS (B)							SUB-SURFACE INFLOW (B)				
WATER YEAR	VALLEY	HILL & MTN	VALLEY FILL	RETURN WATER	SUB TOTAL	HILL & MTN	BRANFORD	HANSEN	HW	LOPEZ	PACOIMA	TUJUNGA	SUB - TOTAL	PACOIMA	SYLMAR	VERDUGO	SUB - TOTAL	TOTAL RECHARGE
2001-02	5.00	7.00	3,474	64,400	**67,874**	**1,196**	338	1,242	-	-	733	101	**2,414**	350	400	70	**820**	**72,304**
2001-02	18.57	23.06	12,874	61,525	**74,399**	**3,939**	438	12,973	-	579	6,127	6,696	**26,813**	350	400	70	**820**	**105,971**
2002-03	18.57	23.06	12,874	61,525	**74,399**	**3,939**	438	12,973	-	579	6,127	6,696	**26,813**	350	400	70	**820**	**105,971**
2003-04	18.57	23.06	12,874	61,525	**74,399**	**3,939**	438	12,973	-	579	6,127	6,696	**26,813**	350	400	70	**820**	**105,971**
2004-05	18.57	23.06	12,874	61,525	**74,399**	**3,939**	438	12,973	-	579	6,127	6,696	**26,813**	350	400	70	**820**	**105,971**

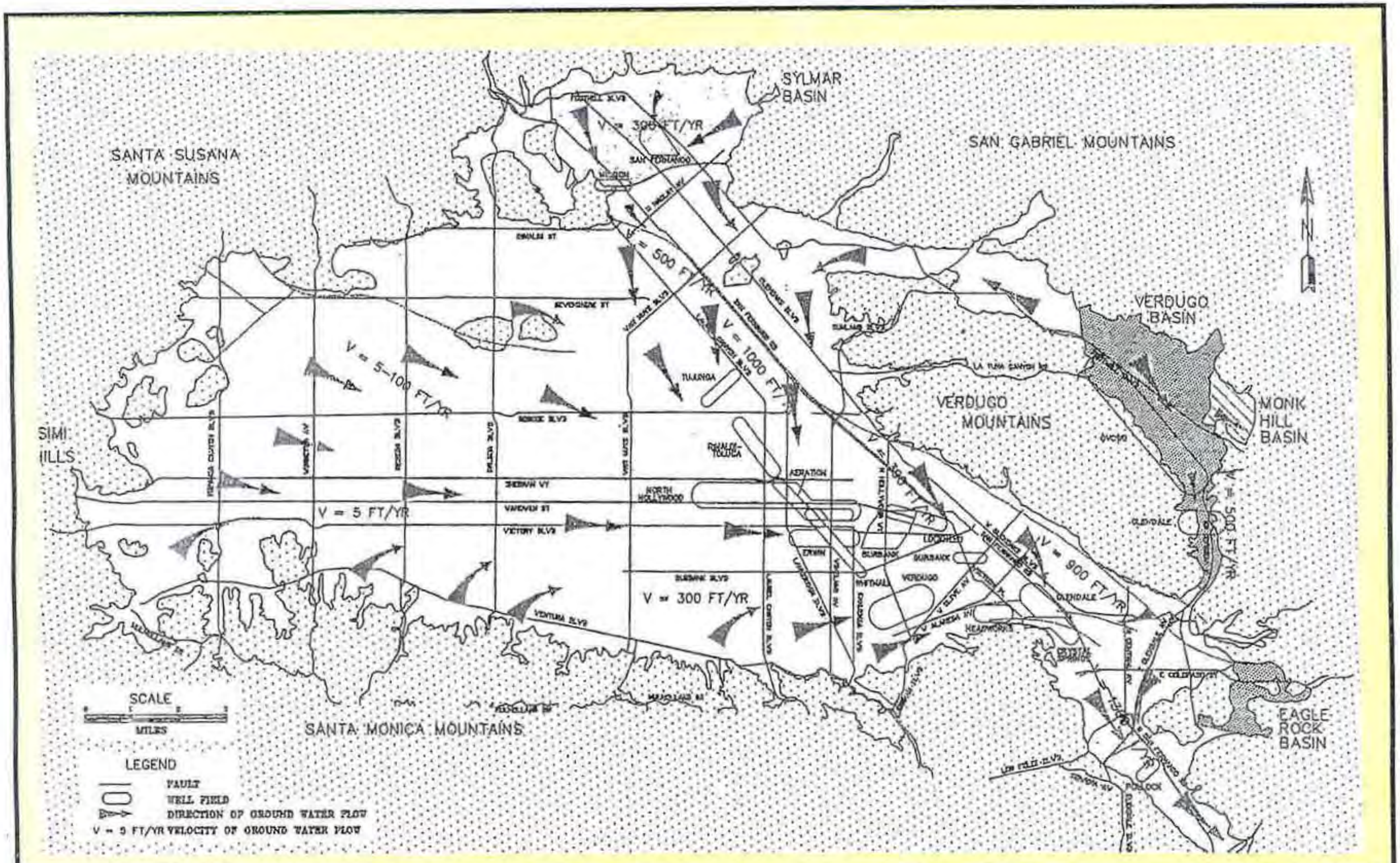
	BASIN EXTRACTION (AF/Y)																	
	LADWP (C)										BURBANK (C)			GLENDALE (C)			OTHERS (C)		
WATER YEAR	AE	EW	HW	NH	PO	RT	TJ	VD	WH	TOTAL LADWP	BURBANK PSD	LOCKHEED	NON-BURBANK (VMP)	CITY OF GLENDALE	OU-NORTH	OU-SOUTH	TOTAL NON-LADWP	TOTAL NON-GLENDALE (F. LAWN)	TOTAL EXTRACTION
2001-02	-1,773	-860	0	-21,370	-1,981	-28,422	-25,818	-4,623	-2,738	**-87,585**	0	-10,054	-300	-500	-3,969	-2,331	-2,430	-400	**-107,569**
2002-03	-2,390	-994	0	-21,647	-3,600	-25,108	-25,272	-5,261	-2,728	**-87,000**	0	-10,140	-300	-25	-4,158	-2,442	-2,430	-400	**-106,895**
2003-04	-2,390	-994	0	-25,276	-2,400	-25,900	-22,179	-5,261	-2,600	**-87,000**	0	-10,140	-300	-25	-4,158	-2,442	-2,430	-400	**-106,895**
2004-05	-2,390	-994	0	-25,276	-2,400	-25,900	-27,179	-5,261	-2,600	**-92,000**	0	-10,140	-300	-25	-4,158	-2,442	-2,430	-400	**-111,895**
2005-06	-2,390	-994	0	-25,276	-2,400	-25,900	-22,179	-5,261	-2,600	**-87,000**	0	-10,140	-300	-25	-4,158	-2,442	-2,430	-400	**-106,895**

NOTES: **(A) Model Recharge Package (Aerial)**
(B) Model Well Package (Source)
(C) Model Well Package (Sink)

PROJECT: ***WATERMASTER***

DATE: 8/19/02

ULARA WATERMASTER REPORT 2000-2001
MAY 2002
PLATE 12
(Reference 62)



2000-01 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Estimated Directions and Velocities of Groundwater	PLATE 12

XI. REFERENCES

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