

STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petition of )  
AEROJET GENERAL CORPORATION and )  
CORDOVA CHEMICAL COMPANY for Review )  
of Orders Nos. 79-196, 79-197, 79-198, )  
79-200, 79-201 and 79-202 of the )  
California Regional Water Quality )  
Control Board, Central Valley Region. )  
Our File No. A-252. )

Order No. WQ 80-4

BY THE BOARD:

On September 21, 1979, a petition was filed on behalf of the Aerojet General Corporation (Aerojet) and the Cordova Chemical Company (Cordova) for review of several orders adopted by the California Regional Water Quality Control Board, Central Valley Region, (Regional Board) after public hearings in June and August 1979. These orders pertain to waste discharges of Aerojet and Cordova from manufacturing facilities located in eastern Sacramento County. Orders Nos. 79-196, 79-197, 79-201 and 79-202 refer violations of Water Code Section 13350 to the Attorney General for enforcement. Orders Nos. 79-198 and 79-200 are cleanup and abatement orders issued under Water Code Section 13304.

The Regional Board submitted a response to the petition. Our review is based upon the Regional Board record.<sup>1/</sup>

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<sup>1/</sup> Neither petitioners nor the Regional Board have requested a hearing to present new evidence, nor have they requested us to review additional evidence. An opportunity to present oral argument was requested. The State Board's workshop session provides such an opportunity.

## I. BACKGROUND

A. The Petitioners. Aerojet is an Ohio corporation which manufactures rocket engines and propellants and uses or produces a variety of complex chemicals. (Reporter's Transcript (R.T.), August 24, 1979, Page 13; Petition Page 2.) Since the 1950's it has owned or leased approximately 10,000 acres in eastern Sacramento County. This land is located south of the American River between Highway 50 and New White Rock Road.<sup>2/</sup> On a portion of this property, Cordova, a subsidiary of Aerojet and a California corporation since 1977, manufactures various chemical products. The production facilities at the Sacramento site consist of 800 or more buildings, test sites, and disposal areas. (R.T., August, 3.)

The Aerojet-General Corporation is a subsidiary of the General Tire and Rubber Company. The divisions, production companies, and other subsidiaries in the corporate structure have changed from time to time during operations in Sacramento County. Among those which have used the Sacramento site are Aerojet Solid Propulsion Company and Aerojet Liquid Propulsion Company. Cordova was described as a division of Aerojet until its incorporation in 1977.

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<sup>2/</sup> Attached hereto as Appendix A is a map prepared by the Regional Board staff to illustrate the general location and configuration of the Aerojet and Cordova facilities which are the subject of this order.

Waste discharges from three specific processes, and general waste disposal practices at unspecified areas within Aerojet's Sacramento site are the subject of the orders which this Board has been requested to review. The areas of specific concern to the Regional Board were Plants 1 and 2, which are now apparently operated by Cordova, and the "hog-out" process.

Plant 1 produces various organic chemicals and discharged approximately 20,000 gallons per day of process wastewater to five unlined ponds, which were constructed at various times from 1962 to 1976.<sup>3/</sup> (R.T., August, 13, 14.)

Plant 1 wastewater typically contained dissolved salts, organic chemicals, phenols, arsenic, other heavy metals and inorganic constituents. Boiler blowdown and cooling waters are discharged to a separate area known as the "swamp". (R.T., August, 14.)

Plant 2, which also produces chemical products, discharges wastes containing complex chemical compounds. The Regional Board permits the disposal of these wastes by injection into two deep wells on the Aerojet property. There is a concrete holding pond for storing wastes prior to disposal in the wells. (R.T., June, 3, 23, 25.)

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<sup>3/</sup> Ponds 1 and 2 were constructed in 1962; Pond 3, in 1972; and Ponds 4 and 5, in 1976. The ponds are located adjacent to the Plant 1 buildings.

The third discharge area was at the Aerojet "hog-out" operation. In the "hog-out" process, Aerojet cleans rocket motors with water under high pressure. Disposal works for this process consist of lined ponds for fuel residue and wastewater which is recycled. The washwater often contains perchlorate, a soluble compound found in solid rocket fuel. (R.T., August, 5, 2, 65.)

B. The Area. Soils in this area consist largely of sedimentary rocks, permeable gravel, sand, silts, and dredger tailings left from past mining operations. These soils are considered pervious and rapid infiltration may occur in old stream bed locations on the property. (R.T., August, 3, 143.) Petitioners stated that the area is underlain by shallow alluvial aquifers. (R.T., August 130.) Clay formations have created some perched groundwater zones of undefined size under the Aerojet site<sup>4/</sup> at a depth of about 20 feet. (R.T., August, 3, 7; R.T., June, 5-6, 12.) According to Bulletin No. 133 of the Department of Water Resources (March, 1964) groundwater in the area was historically of excellent chemical and organic quality. High quality groundwater occurs to about 490 feet and is a domestic water supply source. Between 490 feet and the brackish waters found below 900 feet is a thick layer of silts and silty sands.

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<sup>4/</sup>By "Aerojet site or property" we mean that area owned or controlled by Aerojet.

The groundwater underlying the Aerojet property is part of a larger groundwater body. The general gradient of this major groundwater body is westerly and southwesterly. (R.T., August, 61, 79, 130; R.T., June 12-13, 81.) This groundwater body is in hydraulic continuity with the American River. The Regional Board did receive evidence of some groundwater movement in northerly and northwesterly directions. (R.T., August, 101-102, 143-145, 149, 152.) Perched groundwaters may move in a pattern distinct from the main groundwater body. The direction and rate of groundwater movement may be affected by the lack of uniform geology in the area, the pumping of wells, waste disposal practices, and other factors, all of which make it difficult to predict with certainty the exact movement of pollutants contained in groundwaters at this time.

Pursuant to Water Code Section 13241, the Regional Board has adopted a Water Quality Control Plan (Basin Plan) for the Central Valley, Sacramento River Basin. The Basin Plan identifies the beneficial uses of groundwaters in the area to include municipal and domestic supply, irrigation and industrial supply. These groundwaters are a domestic supply source for the community of Rancho Cordova and for local businesses.

The beneficial uses of the American River to which these groundwaters are tributary include domestic supply for the Sacramento area, irrigation supply, fishing, water contact recreation, preservation and maintenance of fish and wildlife. (Basin Plan, Page I-2-3.) The Basin Plan requires that

surface waters and groundwaters which are identified as domestic water supply sources be maintained free of pollutants in concentrations in excess of drinking water standards.<sup>5/</sup>

C. Waste Discharge Requirements. Since the 1950's, Aerojet's waste disposal activities have been governed by various requirements issued by the Regional Board. These requirements have generally prohibited discharges of chemical wastes which may cause pollution of usable groundwaters. For example, Resolution No. 127, adopted on May 15, 1952, prohibited the discharge of process wastes containing potassium perchlorate, ammonium perchlorate, xylene, trichloroethylene, perchloroethylene, and other compounds "in a manner which will permit their entry into either the groundwater or the waters of the American River".

In 1962 in response to an Aerojet request to consolidate its requirements, the Regional Board rescinded its orders except for No. 61-115<sup>6/</sup> and issued Order No. 62-21. This order affirmed that groundwaters in the area must be protected. Order No. 62-21 prescribed general requirements for industrial waste

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<sup>5/</sup> Basin Plan, Pages I-4-6 and I-4-18. Standards for domestic water supplies were set by the U. S. Public Health Service in the past. They are now established by the U. S. Environmental Protection Agency under the Safe Drinking Water Act (42 U.S.C. Section 300, et seq.) and the California Department of Health Services as set forth in the California Administrative Code, Title 22. Drinking water standards currently set the following limits for constituents which are at issue in this appeal: arsenic .05 mg/l, phenol .001 mg/l, selenium .01 mg/l, and sulfate 250 mg/l.

<sup>6/</sup> Order No. 61-115 provided for the deep injection disposal of wastes from the rocket propellant agent (nitroplasticizer) production facilities which became known as Aerojet Solid Propulsion Company, Cordova Chemical Division, Plant No. 2.

disposal on the property owned or controlled by Aerojet in Sacramento County. The provisions of Order No. 62-21 include the following:

"1. Waste discharges shall not cause concentrations of materials in usable groundwaters which are deleterious to human, animal, plant or aquatic life."

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"5. The waste discharges shall not cause the quality of usable ground or surface waters to fall below those standards generally accepted for a Class 1 irrigation water, nor shall the quality of these waters fall outside the limits set in the U. S. Public Health Standards for domestic water supply."

Order No. 62-21 contains as a finding this recital:

"Aerojet General Corporation has accepted the responsibility for control of all waste discharges originating on Aerojet owned or leased properties, or originating from Aerojet operations on other properties in the Nimbus area."

Order No. 62-21 requires any new discharges and any material change in the waste disposal to be reported to the Regional Board.<sup>7/</sup>

In addition to the general requirements contained in Order No. 62-21, two orders were issued to govern specific waste discharges from Plant 2. Order No. 74-251 was issued to Aerojet for the reactivation<sup>8/</sup> of a deep disposal well which had been used from 1962 to 1968. It requires waste disposal to brackish

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<sup>7/</sup>There is no evidence in the record showing that Order No. 62-21 was adopted in response to changes regarding the discharge or disposal facilities. A 1961 report listing the processes, wastes, and disposal facilities for the Aerojet operations states generally that chemical wastes were treated or contained or removed without describing the disposal processes in detail. (R.T., August, 63, Aerojet 1961 Waste Control Report, L.R.P. 216)

<sup>8/</sup>Order No. 61-115 governed the previous operations of the injec-

waters at a depth at least 900 feet below ground surface, that the well be sealed to prevent migration of wastes to fresh groundwaters or to the surface, and that wastewaters be stored in impermeable holding ponds prior to discharge. In essence, these requirements prohibit discharges of chemical wastes to usable groundwaters and to surface waters. A second deep disposal well was constructed in 1976 to receive up to 12 million gallons per year of neutralized acid wastes from Plant 2. It is governed by Regional Board Order No. 76-12, which was issued to Cordova Chemical Company. This order requires the disposal of wastes at a depth at least 1,000 feet below the ground surface and contains other terms to protect usable groundwaters similar to Order No. 74-251, including:

"Surface wastewater holding facilities shall prevent the percolation or infiltration of wastewater to the underlying sedimentary section."

Orders Nos. 74-251 and 76-12 explicitly require that changes in the volume or type of wastes discharged, disposal facilities, and site control or ownership be reported to the Regional Board.<sup>9/</sup>

Aerojet also operates facilities for the treatment and disposal of domestic wastes from its operations pursuant to Order No. 79-39, an NPDES permit for surface discharges which are not at issue in this proceeding. Waste discharges expressly permitted by Order No. 79-39 were not affected by the subject orders of August, 1979.

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<sup>9/</sup> These orders each contain the following language: "The discharger shall report promptly to the Board any material change or proposed change in the character, location or volume of the discharge."



D. Regional Board Hearings. On June 22, 1979, the Regional Board conducted a public hearing relating to discharges on the Aerojet property and adopted a cease and desist order pursuant to Water Code Section 13301. The Regional Board found that at a various times from June 1976 to June 1978 an unknown quantity of chemical wastes from Plant 2 had been discharged through a 3,500 foot pipeline to an unlined dredger pit in hydraulic continuity with usable groundwaters, instead of to deep injection wells as required by Orders Nos. 74-251 and 76-12. The Regional Board staff presented evidence of high levels of sulfate and chemical oxygen demand (COD) in soils in the pit and in nearby groundwaters, including sulfates in at least two wells near the dredger pit in excess of the drinking water standard of 250 mg/l. (R.T., June 22, 1979, 5-6, 43.)

Consultants for petitioners admitted that groundwater from test wells near the dredger pit showed the influence of chemical waste discharges, but asserted that degradation was limited to a small area of the perched groundwaters. (R.T., June 22, 1979, 86, 89, 98-99, 104.) Petitioners apparently believed such a discharge to be appropriate due to the changed location of certain manufacturing processes.<sup>10/</sup> However, no report of the

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<sup>10/</sup>Mr. Swanson, Vice President of Operations, testified that the process for manufacturing the herbicide PROWL had been moved from Plant 1 to Plant 2. Before the move, wastes from the process had been discharged to the unlined ponds at Plant 1. Due to problems with the deep injection disposal wells, the 3,500 foot pipeline was constructed to discharge wastes from Plant 2. Mr. Swanson testified that discharge to the ground was assumed to be appropriate based upon the prior discharge practices at Plant 1, although the Regional Board was not notified of the change. (R.T., June, 110-113.)

changes in the processes, the new discharge location, or the construction of the pipeline was received by the Regional Board. (R.T., June, 114, 119-120.) The pipeline was in use about three months after the waste discharge requirements for the second deep disposal well were issued.

The exact extent and degree of degradation of the groundwater by waste discharges from Plant 2 was not established at the June, 1979, hearing. However, there was no objection raised to the Regional Board staff's analyses of groundwater from the test wells near the dredger pit. Neither was it disputed that substances discharged to the ground had reached groundwater and would move toward domestic water supplies unless removed, even though the rate of movement and the volume of pollutants underground had not been determined. (R.T., June, 55-56, 82-89, 90, 93, 98-101.)

After further investigation of the groundwater near the Aerojet and Cordova discharges and after a review of monitoring data submitted by Aerojet, the Regional Board conducted a public hearing on August 24, 1979. Evidence was received concerning alleged violations of waste discharge requirements by Aerojet and Cordova at Plant 1 and the hog-out site, along with new data on discharges from Plant 2.

A synopsis of wastewater analyses from 1972 to 1978 from the unlined ponds at Plant 1 showed the wastewaters therein to contain substantial amounts of arsenic, phenol, COD, ether solubles, sulfate, total dissolved solids (TDS) and volatile dissolved solids. (See Table 2, A4, Regional Board Staff Report,

R.T., August 24, 1979, attached hereto as Appendix B.) Analyses of samples from several monitoring wells drilled near the Plant 1 disposal ponds showed the presence at levels well over background for the area of several of the same pollutants as were found in the ponded wastewaters. In some of these test wells, sulfate, phenols, and arsenic had reached levels of 2,170 mg/l, .03 mg/l, and .36 mg/l. Each of these levels is well in excess of drinking water standards for those constituents. (See Table 1, A3, Staff Report, R.T., August 24, 1979, attached hereto as Appendix C.)

A review of required well monitoring performed by Aerojet indicated the presence in groundwater of significant amounts of perchlorate, a rocket fuel component. After tests in the vicinity of the hog-out area showed high levels of perchlorate, Aerojet removed to lined ponds about 120 cubic yards of the soil near the hog-out area.<sup>11/</sup>

The review of Aerojet's monitoring data having caused concern to the Regional Board staff, a number of wells on and around the Aerojet property were tested for organic materials on August 2, 1979. The samples showed the presence of organic compounds, including trichloroethylene (TCE), dichloroethylene and chloroform. These materials are generally considered toxic substances by state and federal agencies. (R.T., August 16, 22, 24, 31-33. See Exhibit 3, attached hereto as Appendix D.) None of these are known to occur naturally in the area as groundwater constituents.

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<sup>11/</sup> Aerojet reported that overflows of perchlorate had occurred in 1978 from the hog-out operation to a nearby surface depression.

Regional Board sampling generally showed the highest concentrations of pollutants to occur in groundwater toward the center of the Aerojet site, and lower concentrations of the same pollutants at the edges of the site and in wells on adjacent property. TCE was shown in concentrations up to 2,300 and 3,400 ppb on the site, the levels found in Wells Nos. 15 and 17, and as high as 340 ppb off-site in the well which serves Rudy's Hiway, a bar and restaurant near the northern edge of the site.

No safe daily intake level or drinking water standard has been set for TCE under the Safe Drinking Water Act although industrial use has been regulated for worker safety.<sup>12/</sup> However, in recent years a number of industrial chemicals have been suspected to contain carcinogens. The Regional Board found that the presence of TCE and other chemicals in waters designated for drinking water supplies even at the low levels shown in the instant case should be considered a public health hazard.

(R.T., August, 24.) Sacramento County Health officials concurred.

At the August hearing, the Regional Board received additional evidence concerning the Plant 2 waste discharges which were the subject of the June 1979 hearing, the record

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<sup>12/</sup> Recently the U.S. Environmental Protection Agency proposed a maximum concentration limit of 100 ppb for total trihalo-methanes in drinking water, which would include chloroform. Chloroform has been found at up to 100,000 ppb in wells in the Aerojet area. (44 Federal Register 68624 et seq., November 29, 1979.) EPA has also recently recommended a limit on TCE of 5 ppb for public health protection. This order uses the terms parts per million (ppm) or parts per billion (ppb) rather than the technically correct terminology of milligrams per liter (mg/l) and micrograms per liter (ug/l). The two types of terminology are equivalent as long as the mass of a liter of water is close to one kilogram as is the case here.

of which was incorporated in these proceedings. The Regional Board rescinded Cease and Desist Order No. 79-151 and directed the immediate cleanup of the site.

At the conclusion of its August hearing, the Regional Board adopted the orders which are the subject of this review. Order No. 79-196 refers Aerojet and Cordova to the Attorney General for violations of waste discharge requirements and Water Code Section 13350 by waste discharges from Plant 1. Order No. 79-197 refers Aerojet to the Attorney General for violations of discharge requirements and Section 13350 and pollution of groundwater due to discharges at the hog-out site and at other locations on the Aerojet site. Order No. 79-198 finds that toxic and hazardous waste discharges have polluted groundwater in violation of waste discharge requirements in Order No. 62-21, and directs Aerojet to:

"1. Abate forthwith the discharge of wastes to usable groundwater and to ponds, surface waters, surface water drainage courses, or to soil and sediment in hydraulic continuity with usable groundwater.

"2. Cleanup forthwith polluted groundwater and toxic or hazardous earth."

Order No. 79-200 finds that groundwater pollution has occurred due to discharge from Plant 2 in violation of Orders Nos. 74-251 and 76-12 and directs Cordova and Aerojet to cleanup and abate such discharges. Order No. 79-201 refers Cordova and Aerojet to the Attorney General for discharges from Plant 2 in violation of waste discharge requirements Orders Nos. 74-251 and 76-12 and Section 13350. Order No. 79-202 refers Aerojet and Cordova

to the Attorney General for willful or negligent discharges in violation of Section 13350, pursuant to a plan or design or gross mismanagement and in reckless disregard of public health, safety, and resources.

## II. CONTENTIONS AND FINDINGS

The contentions set forth in the petition are raised by both Aerojet and Cordova. Petitioners generally assert that the evidence received by the Regional Board was not adequate to support the issuance of any of the orders reviewed herein and that such orders are improper without a showing of actual harm to the beneficial uses of affected receiving waters, especially waters not on or underlying the Aerojet site. It is further asserted generally that there is no evidence that the chemicals found in "off-site" groundwater originated from petitioners' property. 12a/

1. Contention: Petitioners contend that no evidence was presented of pollution, nuisance, or contamination within the meaning of the Porter-Cologne Act or of public health hazard either on or off the Aerojet site in order to support the findings contained in Cleanup and Abatement Orders No. 79-198 and 79-200. Petitioners argue that because waters under the Aerojet site are not used for domestic purposes or other beneficial uses, no harm or pollution can be shown. It is also submitted that the cleanup and abatement orders are improper unless clearly demonstrated off-site pollution is due to actions of petitioners.

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12a/ At the March 6, 1980 workshop and by letter dated March 11, 1980, petitioners allege that they did not receive sufficient notice of Regional Board staff reports considered at the August 24, 1979 Regional Board hearing. This contention was not raised in the petition. Neither does the record indicate that petitioners objected to Regional Board about the adequacy of notice. We find nothing in the record to support this belated allegation.

Finding: After our review of the record herein, we find that the Regional Board received evidence sufficient to support the findings of pollution in Orders Nos. 79-198 and 79-200 and to satisfy the requirements of Water Code Section 13304(a).<sup>13/</sup> The degradation of the area's groundwater by chemical wastes constitutes pollution. This groundwater degradation also violates applicable waste discharge requirements.

a. Pollution defined. Water Pollution is defined by Section 13050(1) as follows:

" 'Pollution' means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects: (1) such waters for beneficial uses; or (2) facilities which serve such beneficial uses. 'Pollution' may include 'contamination'."<sup>14/</sup>

Evidence of a public health hazard existing due to the disposal of waste would constitute contamination and would certainly be adequate to sustain a finding of pollution under the Porter-Cologne Act. In this regard, state and local health officials testified before the Regional Board to the existence of a public health hazard on and around the Aerojet site due to degraded groundwaters. (R.T., August, 22, 24, 34.) These officials recommended that users in the affected area obtain substitute supplies. (R.T., August, 23, 34.) It was entirely proper for the Regional Board to rely on the testimony of officials whose duty is to regulate drinking water supplies for public health protection.

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<sup>13/</sup> All section references herein are to the California Water Code unless otherwise specified.

<sup>14/</sup> Contamination is defined by Section 13050(k) as "an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease." The definition includes "any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected".

Section 13304(a) permits the issuance of a clean-up and abatement order based upon violations of waste discharge requirements without the need for proof of any pollution, nuisance or contamination. Moreover, if requirements do not govern the discharge, then Section 13304 permits the issuance of an order to one who (1) "negligently or intentionally causes or permits any waste to be . . . deposited where it is, or probably will<sup>g</sup> be, discharged into the waters of the state" and (2) "creates or threatens to create a condition of pollution or nuisance." (Section 13304)

On August 24, 1979, the Regional Board received substantial uncontested evidence that toxic and hazardous chemicals which have been used at the Aerojet site are now found in significant amounts in groundwaters under the site and that numerous of the same chemicals have also been found in nearby wells on property adjacent to the site. This evidence is reflected in summary form in the background discussion above and Appendices C through G attached hereto. There was no dispute that the presence of the chemicals in groundwater under the Aerojet site is due to the waste disposal practices of Aerojet and its subsidiaries. (R.T., August, 180, 181, 130; Petition, Page 6; Points and Authorities, Page 1.)

Waters of the state are defined by Section 13050 to include all groundwaters within or under the surface area of the state.<sup>15/</sup> There is no question that the groundwaters under the Aerojet site are waters of the state. The ownership of

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<sup>15/</sup> Section 13050(a) states " 'Waters of the state' means any water, surface or underground, including saline waters, within the boundaries of the state"



property may give rise to rights to the use of water. However, such usufructuary rights do not by any means divest the state of title to these waters. (See Water Code Sections 100, 101, and 102.)<sup>16/</sup> Since groundwaters under the Aerojet site are waters of the state, pollution or the threat of pollution of those waters alone would suffice to sustain a cleanup and abatement order under Section 13304.

Petitioners offered no evidence to refute the staff's evidence of the presence of chemical wastes in groundwaters under or near the Aerojet site. (R.T., June, Aerojet Exhibit 6; R.T., August, 58.) Evidence was not offered to show that Aerojet and Cordova disposed of chemical wastes at other locations or in a manner such that they could not reach waters of the state or that the presence of chemical wastes on and under the Aerojet site was due to other sources. Neither was any evidence produced to show that chemicals reaching the soils and groundwater under the site were contained due to the geology of the area. To the contrary, uncontradicted evidence received at both the June and August hearings indicates that soils in the area are generally permeable and that there are no barriers to groundwater movement at either shallow or deep levels.

Petitioners argue that since the groundwaters under the Aerojet site are not presently used for domestic purposes, no beneficial use has been impaired, and therefore, the Regional Board's findings of pollution cannot be sustained. This contention lacks merit. The Regional Board need not await actual

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<sup>16/</sup>We note that the "beneficial uses" of waters defined by the Porter-Cologne Act do not include the conveyance of wastes and that pursuant to Section 13263 prior waste discharges do not create any vested right to continue to discharge.

harm to beneficial uses to find pollution due to substances whose mere presence in drinking waters is considered a health hazard. Moreover, there is no requirement that the affected waters must presently be used as a direct domestic supply source in order to receive protection. As we stated in an earlier order, "the fact that there may be no immediate risk to health does not negate the finding that the discharge of waste by petitioners has in fact altered the quality of waters of the state to a degree which unreasonably affects the beneficial use of the water as a domestic supply". (State Board Order No. WQ 74-13, Page 12.)

The Regional Board has a clear duty to protect the quality of waters of the state for past, present, and future beneficial uses, (Section 13050, Section 13241), and to implement basin plans which designate beneficial uses and the quality levels to be maintained in specified waters. (Section 13263).

There is no question that unless such groundwater is contained and removed it will flow to other areas. Moreover, some of the well water adjacent to Aerojet shows signs of chemical degradation which the movement of polluted groundwater from the Aerojet site may only exacerbate. As noted above, no barriers to the movement of these groundwaters have been shown.

Testimony was received that methyl chloride, trichloroethylene (TCE), and other compounds have been used at the Aerojet site as industrial solvents. During the past five years at least 14,000 gallons of TCE have been used on site, principally at Building Number 12 located near Aerojet Well No. 17. At the August hearing, petitioners attempted to show that wastes from Building 12 could not have affected off-site wells.

However, Dr. Sharp, a hydrogeologist testifying for petitioners, admitted that based upon available groundwater contour data, chemical wastes discharged at the northeast corner of the Aerojet site could affect groundwater wells on property adjacent to the site. (R.T., August, 143-145.) Petitioners produced no evidence of a lack of such effect nor did they indicate that these substances were disposed of elsewhere.

Among those chemicals found in wells both on and off of the Aerojet site, the following are included in the Section 307, Clean Water Act,<sup>17/</sup> list of toxic substances for which water quality criteria are to be developed by the Environmental Protection Agency: arsenic, chloroform, trichloroethylene, dichloroethylene, methyl chloride, and tetrachloroethylene. Of these substances chloroform, dichloroethylene, and TCE are identified by EPA as known or suspected carcinogens.<sup>18/</sup> With the exception of tetrachloroethylene,

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<sup>17/</sup> Title 33, U.S.C. 466 et seq. (including P.L. 92-500 and P.C. 95-217).

<sup>18/</sup> Federal Register Vol. 44, No. 52, Thursday, March 15, 1979, Page 15927 et seq., containing proposed water quality criteria for the protection of aquatic life and human health with respect to 27 of the list of 65 toxic pollutants, pursuant to Sections 304(a) and 307 of the Clean Water Act.

the above-listed substances are also considered hazardous substances by the California Department of Health Services,<sup>19/</sup>

The Regional Board has not itself established water quality objectives for these constituents. However, based upon the uncontradicted evidence of the presence of substances which are known and suspected carcinogens and the testimony of state and local health officials, the Regional Board found the waters under the Aerojet site to be polluted and threatened with further pollution. They also found violations of various waste discharge requirements issued to petitioners. Citing the terms of Order No. 62-21, which are set forth above at Page 7 the Regional Board adopted the following findings in Order No. 79-198:

"2. Toxic and hazardous wastes from Aerojet-General Corporation and one or several of its wholly owned subsidiaries have been discharged to Corporation land in hydraulic continuity with usable groundwater.

3. Hydrogeologic and water quality studies show the Aerojet land surface and groundwater are in communication through permeable intervening geologic strata.

4. Studies show the underlying groundwater is polluted and is threatened with further pollution."

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<sup>19/</sup>Title 22, California Administrative Code, Section 60001, et seq. See Section 60281.

Citing the terms of Orders Nos. 74-251 and 76-12, the Regional Board made these findings with respect to waste discharges from Plant 2:

"3. Investigation by staff has revealed that between June 1976 and June 1978 industrial waste was discharged to an unlined pit northeast of Chemical Plant 2 and at other unspecified times to a ponding area north of and adjacent to Plant 2 where it was able to percolate or infiltrate to underlying sedimentary sections.

4. The underlying groundwater is polluted and is threatened with further pollution by toxic wastes."

The referral orders adopted on the same date contain a more specific description of both the discharges and the pollution.<sup>20/</sup>

Pollution is established in this case by the presence in a groundwater aquifer used for domestic purposes and other beneficial uses of suspected carcinogenic substances for which there is no known "safe" concentration level and of pollutants in excess of drinking water standards, all as a result of waste disposal activities. These substances violate the Basin Plan objectives for the protection of water for domestic use and per se present an unreasonable degradation of groundwater quality for such use.

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<sup>20/</sup>Regional Board Orders Nos. 79-196 and 79-197 contain specific findings that discharges in violation of Order No. 62-21 have occurred near Cordova Chemical Plants 1 and 2, the hog-out facility, and other areas unknown to the Regional Board, with the knowledge of Aerojet and Cordova, and have created a condition of pollution. Additional findings are also contained in Orders Nos. 79-201 and 79-202. We find it appropriate to review the findings of these orders together, since all were based upon and adopted after the same hearing. (Kephart v. Wilson (1963) 219 F.Supp. 801; affirmed 350 F2d 669, certiorari denied 86 Sup.Ct. 548.)

b. Administrative Notice. Petitioners contend that taking administrative notice of the carcinogenic nature of chemicals found in waters under and near the Aerojet site is improper to support the above findings of pollution. They cite as support a State Board regulation that no finding may be based solely on hearsay evidence not admissible in civil actions (23 Cal.Admin. Code 2059). They further asserted at the August hearing that the scientific bases of the EPA proposed criteria were inadequate and inappropriate for the purposes of the Regional Board actions, since there was no proof of the carcinogenic effect of the substances on humans and the assessments of risk or potential risk to human health were based upon extrapolations from animal toxicity studies. We disagree.

This case involves enforcement actions taken for the protection of water quality and the public health by a mechanism designed to obtain immediate correction or prevention of pollution, nuisance, and contamination occurring as a result of waste discharges. (Section 13304) It does not involve the setting of general standards for the discharge of hazardous materials for which a hearing broader in scope would be appropriate. It was appropriate and proper for the Regional Board to take notice of scientific data developed by EPA as to the hazardous, toxic, and carcinogenic nature in general of various substances found in the groundwater and in wastes discharged by Aerojet and its subsidiaries. Such notice was properly used to reach the conclusion that, due to the potential harm to human health from these substances, groundwaters had been unreasonably affected.

Administrative agencies typically are empowered to take official notice of the actions of other public agencies and of general scientific data. 2 K. Davis, Administrative Law Treatise, 15.08 (1958); United States v. Gould 536 F2d 216, 219-221. State Board regulations so provide. Section 2060 permits notice to be taken of "such facts as may be judicially noticed by the courts of this State". (23 Cal.Admin. Code 2060). Pursuant to Evidence Code Section 452 courts may take notice of regulations and legislative enactments of the federal government or any public entity in the United States, and of the official acts of departments of the United States. (Evidence Code Section 452(b), (c), (g), and (h).)

The Regional Board properly took notice of proposed water quality criteria published in the Federal Register by EPA. Even though these criteria do not have the force of regulation, they represent a recent compilation of accepted scientific data and opinion concerning the toxic substances identified under Section 307 of the Clean Water Act. Scientific writings should be freely used by administrative agencies and are generally considered "at least as reliable as the ordinary expert's testimony from the stand". Dolcin Corporation v. Federal Trade Commission (1955) (219 F2d 742, cert.den. 348 U.S. 981, citing Wigmore, Evidence, § 1690 (3d Ed. 1940)). California courts have found it appropriate to take notice of scientific endeavor and articles from reliable sources (People v. Law (1974) 40 Cal.App.3d 69); of federal regulations (Rader v. Apple Valley Building Company (1968) 261 Cal.App.2d 308); of official acts of departments of

the federal government (People v. Ouellette (1969) 271 Cal.App.2d 33); and of regulations and memoranda from the California Department of Health (People v. French (1978) 77 Cal.App.3d 511).

In addition to the EPA proposed criteria verification of the carcinogenic potential of several of the pollutants found in waters under the Aerojet site was offered by Dr. Lyman of the Department of Health Services, who cited a 1978 textbook and publications of the National Cancer Institute and the National Institute of Occupational Safety and Health. (R.T., August, 29.) Certain of the substances in issue are also identified as toxic and potentially carcinogenic in a standard chemical dictionary. (See Appendices, R.T., August, 7, 6.)

Regional Board reliance on the scientific data presented was proper given the widespread, long-time use of hazardous chemicals on the Aerojet site, the proximity of domestic water supplies, the hydraulic continuity of water under the Aerojet site with domestic water supply sources, and the lack of complete data on the penetration into groundwaters of chemical wastes from the activities of Aerojet and its subsidiaries. Prudence dictates caution in regulating known and suspected carcinogens in waters which may be used for domestic purposes. Dr. Lyman's testimony captures the gravity of the situation before the Regional Board:

"All of these chemicals have been determined to be carcinogenic to animals by the National Cancer Institute. The National Institute for Occupational Safety Health has recommended that they be handled as if they were human carcinogens. The presence of multiple carcinogens in hundreds of parts per billion is still significant. Since threshold doses for carcinogens have not been established, it is prudent to assume that any doses may induce or promote carcinogenesis." (R.T., August, 24.)



The expertise of the EPA and the use of animal test data to determine the carcinogenic potential of hazardous substances are by now well established, Environmental Defense Fund v. EPA (1976) 548 F2d 998; Environmental Defense Fund v. EPA (1975) 510 F2d 1292. <sup>21/</sup> Likewise, courts have recognized that when environmental disputes involve conflicting theories and experimental results, certain areas of uncertainty must be accepted and findings can do little more than determine the existence of potential harm to human health. That such potential harm may require the abatement of waste discharges to waters is well illustrated by Reserve Mining Company v. EPA, (1975) 514 F2d 492. The court held that the record demonstrated a potential for harm from Reserves's discharges, although conflicting scientific test results were received. The court concluded:

"These concepts of potential harm, whether they be assessed as 'probabilities and consequences' or 'risk and harm', necessarily must apply in a determination of whether any relief should be given in cases of this kind in which proof with certainty is impossible. . . .

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<sup>21/</sup>The 1975 Environmental Defense Fund case involved carcinogenic hazards associated with the pesticides aldrin and dieldrin; At Page 1298, the court states:

"Use of animal data is particularly appropriate where, as here, accurate epidemiological studies cannot be conducted because the virtually universal contamination of humans by residues of aldrin/dieldrin make it impossible to establish an uncontaminated human control group. The long latency period of carcinogens further hinders epidemiological research, and the ethical problems of conducting cancer experiments on human beings are too obvious to require discussion. Although extrapolation of data from mice to man may be quantitatively imprecise, it is sufficient to establish a 'substantial likelihood' that harm will result."

"In assessing probabilities in this case, it cannot be said that the probability of harm is more likely than not. Moreover, the level of probability does not readily convert into a prediction of consequences. On this record it cannot be forecast that the rates of cancer will increase from drinking Lake Superior water or breathing Silver Bay air. The best that can be said is that the existence of this asbestos contaminant in air and water gives rise to a reasonable medical concern for the public health. The public's exposure to asbestos fibers in air and water creates some health risk. Such a contaminant should be removed." (Emphasis added)

That the need for public health protection demands a margin of safety to protect against unknowns and caution in the regulation of carcinogenic substances cannot be overstated. "What scientists know about the causes of cancer is how limited is their knowledge. . . . If regulation were withheld until the danger was demonstrated conclusively, untold injury to public health could result." Environmental Defense Fund v. EPA (1978) 598 F2d 62, at 88, concerning polychlorinated biphenyls.<sup>22/</sup>

Based on the above factors, we find that the evidence of which the Regional Board properly took notice, coupled with testimony received at the hearing, was sufficient to support its findings with regard to pollution and violation of requirements.

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<sup>22/</sup>The need to prevent harm from carcinogenic substances was well stated in Certified Color Manufacturers' Association v. Mathews (1976) 543 F2d 298:

"Courts have traditionally recognized a special judicial interest in protecting the public health, particularly where 'the matter involved is as sensitive and frightening as cancer'. Where the harm envisaged is cancer, courts have recognized the need for action based upon lower standards of proof than otherwise applicable."

2. Contention: Petitioners contend that technical evidence offered to show that concentrations of pollutants discovered off-site were not hazardous, toxic, or otherwise injurious was improperly rejected by the Regional Board.

Finding: We can find no abuse of discretion in the Regional Board's refusal to accept petitioner's offer of proof.

Administrative agencies have discretion in determining whether to admit expert testimony. Georgia Independent Insurance Agents v. Federal Reserve System (1976) 533 F2d 224; National Airlines v. Civil Aeronautics Aviation Board (1963) 321 F2d 380. The exclusion of technical evidence may be based upon the hearing officer's determination that there has been no showing of a relationship between the testimony and the issues before the agency, and therefore, the evidence is without probative value. American Trucking Association v. Federal Communications Commission (1968) 377 F2d 121.

We note that petitioners' offer of proof addresses only the concentrations of chemical pollutants found in wells not located on the Aerojet site. No new scientific evidence or other technical evidence was offered with respect to the constituent levels found in waters under the site, which were the primary focus of the Regional Board staff's investigation, contrary to the petitioners' claim. (Petition, Page 5). In our view, based upon the entire record before it, the magnitude of the inquiry which petitioners apparently were seeking, the

time it would consume and the minimal probative value of the data sought to be introduced, we cannot conclude that the Regional Board improperly exercised its discretion by excluding the evidence.

3. Contention: Petitioners contend that without evidence that the pollutants shown in wells off the Aerojet site originated in waste discharges by Aerojet and its subsidiaries on site, the adopted orders are not proper.

Finding: Petitioners assert that no evidence was presented to establish a direct causal link between chemicals used on the Aerojet site and the presence of the same chemicals in off-site wells. Our discussion of "pollution" above, demonstrates that degradation of waters underlying the Aerojet site is sufficient to support the issuance of a cleanup order. In any case, evidence of pollutants found in off-site wells is relevant to establish the extent of groundwater degradation in the Aerojet area which could be attributable to or affected by waste disposal activities on the Aerojet site.

There is no dispute that Aerojet and its subsidiaries have operated on site using hazardous substances and complex chemicals for more than twenty years. There is no dispute that such chemicals were discharged by Aerojet to groundwaters underlying its site. There is no dispute that such groundwaters are in continuity with the general groundwater body of the area. There is no dispute that the same chemicals have been found in the general groundwater body. Petitioners had ample opportunity to present rebuttal and other evidence that its discharge activities

are not the source of off-site chemical concentrations. After the Regional Board had received evidence from the staff and others to address the question of the source of such chemicals, petitioners had a duty to present evidence in rebuttal. They did not. 22a/

4. Contention: Petitioners assert that the evidence before the Regional Board of off-site well contamination by pollutants similar to those found on the Aerojet site and of the dangerous nature of these pollutants was inadmissible hearsay inadequate to support the orders issued.

Finding: As discussed above, it was appropriate for the Regional Board to take administrative notice of the carcinogenic and hazardous nature of the chemical substances found in groundwaters under and around the Aerojet site. Regardless of hearsay nature of the groundwater test data presented, it was properly received by the Regional Board. Such evidence was also augmented by direct testimony. Based on such factors, this contention must be rejected. In any event, it should be emphasized that evidence of groundwater degradation under the site was sufficient alone to support issuance of the cleanup and abatement orders. Evidence of off-site degradation provides independent support and is also relevant to show the widespread nature of the problem.

5. Contention: Petitioners contend that Order No. 62-21 which was issued to Aerojet in 1962 is invalid and that violations thereof may not support any of the orders which are the subject of this review. Petitioners argue that Order

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22a/ By letter dated March 11, 1980, petitioners indicate that this Order places on them the burden of showing the absence of unlawful conduct. This is not the case. As our findings and conclusions clearly indicate, there is ample evidence to support the Regional Board Orders being reviewed herein.

No. 62-21 expired with the adoption of the Porter-Cologne Act revisions to the Water Code in 1970; that, in the alternative, no violations of Order No. 62-21 have been shown; and that Order No. 62-21 is unconstitutionally vague. They also argue that findings of violations of Order No. 74-251, issued to Aerojet, and No. 76-12 issued to Cordova were improper since these orders do not accurately reflect the petitioners' corporate structure.

Finding: The Regional Board's findings of pollution as a result of the waste discharge activities of Aerojet and Cordova are adequate to sustain the orders adopted by the Regional Board pursuant to Section 13304. However, insofar as violations of waste discharge requirements provide an alternative basis for the issuance of orders under Section 13304 and are necessary to the Regional Board's referral actions under Section 13350, it is appropriate for us to discuss them specifically. It is our opinion that Order No. 62-21 is presently valid and imposes on Aerojet a responsibility for wastes discharged from Aerojet processes and from Aerojet subsidiaries operating at the Aerojet site, as well as a duty to cleanup the effects of past discharges which have resulted in groundwater pollution. Further, the Regional Board findings of violation of requirements were appropriate.

a. Present validity of Order 62-21. It is a general rule of statutory construction that when the legislature adopts a new statute, amending and rescinding an existing statute but continuing in effect most of its terms, then those provisions which are unchanged but recodified continue in effect without

any break, unless the legislature provides otherwise. In Re Dapper (1969) 61 Cal.2d 184. It then follows that unless explicit statutory language provides otherwise, the orders which are adopted pursuant to a statute which is rescinded but adopted anew continue in effect. This is true for the Porter-Cologne Act and for Order No. 62-21. That this was the intended effect of the adoption of the Porter-Cologne Act in 1970 is indicated by an opinion of the Legislative Counsel, dated February 9, 1971, stating:

"We think it is clear beyond any doubt that it was not the intent of the Legislature in repealing and reenacting Division 7 of the Water Code to invalidate waste discharge requirements prescribed by California regional water quality control boards which were in effect at such time."

b. Aerojet's continuing responsibility. Petitioners maintain that Aerojet is not responsible for the waste discharge activities of Cordova or other subsidiaries. Order No. 62-21 states that Aerojet has accepted responsibility for wastes discharged on its property, as set forth on Page 7 above. Based on this order, Aerojet was considered responsible for waste discharges occurring on its property in violation of requirements contained in Orders Nos. 62-21, 74-251, and 76-12. We agree with the Regional Board's determination in this respect. Cordova is responsible for discharges under its control which also occurred in violation of waste requirements.

The close nexus between petitioners is clear. Evidence was received of Aerojet's ownership and control of the Aerojet site; of lease arrangements between Aerojet and Cordova for the

use of certain portions of the site; and of a continuing relationship between petitioners, inspite of changing details in the corporate structure. Cordova remains an Aerojet subsidiary operating on Aerojet owned or leased property. Facilities on this site are and have been used by both entities. Both entities have apparently disposed of wastes at unidentified locations on the Aerojet site. (R.T., August, 57, 63, 80, 171.)

The close relationship of the petitioners and the lack of evidence to show their activities to be truly separate, lead to the conclusion that the pollution of waters under the Aerojet site was knowingly permitted by Aerojet. In February, 1979, well after the incorporation of Cordova, T. J. Glad, the Director of Regulatory Affairs for Cordova, requested the Regional Board to change the company name on Order No. 74-251, governing the oldest deep injection disposal well. The request letter states:

"Both Well No. 1 and Well No. 2 are operated by Cordova Chemical Company, a Division of Aerojet-General Corporation. There is no change of ownership. The requested change simply reflects the current organizational structure and provides a uniform name for each of the two wells."

That the operations of Aerojet and Cordova are still closely linked is also clear from the August, 1979, testimony of Jack Heckel, Group Vice-President for Aerojet-General Corporation. (R.T., August, 154-164.) Mr. Heckel testified as follows:

". . . That (group vice-president) encompasses in addition to the Liquid Rocket Company the Aerojet Services Company and the two divisions of the Aerojet Solid Propulsion Company, the Strategic Systems Division and the Tactical Systems Division. And about a month and a half ago I was given an additional responsibility of a subsidiary company, Cordova Chemical." (At Page 154)



Mere changes in corporate organization without any apparent or reported changes in processes, procedures, or responsibilities do not relieve a discharger of the duty to control the disposal of hazardous wastes used and produced at the site by the discharger and, with his knowledge and permission, by others.

Aerojet has not disputed that it owns or controls the Aerojet site. Civil penalties for various discharges must of course be judicially determined. Nonetheless, it was appropriate and proper for the Regional Board to have included Aerojet in Cleanup Orders Nos. 79-198 and 79-200. Aerojet's ownership and control of the site dictates a continuing responsibility for the proper disposal of hazardous and toxic substances applied there.

As to Cordova's responsibilities pursuant to waste discharge requirements, petitioners admitted discharges in violation of Order No. 76-12 (R.T., June, 61, 106), but argued that somehow the 1977 change in organization from a company to a corporation removes any legal liability for violations. This contention is without merit. Waste discharge requirements translate water quality standards into personal obligations of dischargers. A change in the business structure of a discharger could indicate a change in ownership calling for the issuance of new requirements. The record before us in this case indicates, however, that the subject change in structure did not cause a change of ownership and management. Thus, the terms of Order No. 76-12 represent continuing obligations of Cordova without the need for a new order.

c. Violation of waste discharge requirements.

Our extensive discussion in this order of the evidence received by the Regional Board concerning pollutants in excess of drinking water standards and carcinogenic substances in waters under the Aerojet site, and the intentional waste discharges from Plant 2 to the dredger pit through the pipeline, is sufficient to indicate that the Regional Board had substantial evidence on which to base their findings of discharges in violation of waste discharge requirements by both petitioners.

d. Clarity of Order 62-21. Petitioners' constitutional argument must also fail. Petitioners argue that Order No. 62-21 fails to provide adequate notice as to what conduct is permitted or prohibited, as required by the due process clause. We disagree.

It is true that Order No. 62-21 does not state what specific procedures are permitted. Such specification of the manner of compliance in a waste discharge requirement is impermissible under Water Code Section 13360. While an order must be sufficiently clear to give fair notice of prohibited conduct, reasonable certainty is all that is required. Based on this standard, we cannot conclude that Order No. 62-21 is unconstitutionally vague. Moreover, it can be argued that petitioners lack standing to raise such an argument. Order No. 62-21 was adopted in 1962. Rather than resolving any possible indefiniteness in the Order, petitioners made a calculated decision to dispose of wastes without objection to Order No. 62-21.

6. Contention: Petitioners contend that Orders Nos. 79-198 and 79-200 are unconstitutionally vague, and therefore violate the requirements of due process, by directing the cleanup and abatement of unspecified water pollution "forthwith".

Finding: The adopted orders do not violate any constitutional due process requirements. Due to the hazardous nature of the materials discharged; the proximity of drinking water supplies; the size of the groundwater area potentially affected; the uncertainty as to the volumes, locations, and concentrations of pollutants present in groundwaters; the need for flexibility to address the cleanup effort; and the uncertainty as to the time needed to accomplish the cleanup, the Regional Board ordered Aerojet and Cordova to cleanup and abate the pollution at the site "forthwith".

Under these circumstances and in view of the substantial cleanup efforts of petitioners, including consultation with Regional Board staff, we decline to modify the subject orders. The recommended procedure is to specify in some detail a program to achieve the cleanup and abatement. Such a program should include a determination of the scope and extent of the problem, specific remedial measures required, and the establishment of a consultation process between the Regional Board and the dischargers. Desirable flexibility should be provided in a cleanup program. Both compliance with technical requirements and necessary adjustments to the cleanup program may be determined by the Regional Board Executive Officer upon an appropriate delegation of authority.

In this case, the cleanup details have been evolving since the adoption of the orders and a cleanup program is taking shape.<sup>23/</sup> Based on this and the other factors listed above, we conclude that the orders to cleanup and abate "forthwith" are appropriate.

The direction to proceed "forthwith" to cleanup the Aerojet site may create a question of fact as to the propriety of specific steps taken to comply with the order, if the Regional Board finds it must take further enforcement action. Since the exact time necessary to cleanup the site and to abate the effects of discharges cannot now be measured, the adoption of an order to act "forthwith", which provides a reasonable time to achieve compliance, is proper. (See Reserve Mining Company v. EPA (1975) 514 F2d 492.)

Petitioners also contend that they cannot be asked to abate discharges which have ceased. However, as was stated in Order No. WQ 74-3, cleanup and abatement orders are appropriate vehicles to abate the effects of discharges. Discharges may continue to groundwater long after discharges to unlined ponds cease. That is, once soils in the disposal areas have become polluted, there may be a continued seepage or release of pollutants into groundwater, due to such factors as rainfall, soil permeability, and the nature and characteristics of the pollutants. In view of the continuing nature of such discharges, abatement of their effects is clearly authorized.

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<sup>23/</sup>The Regional Board records submitted for our review include the transcript of December 19, 1979, public hearing. This hearing included a review of cleanup program reports submitted by petitioners to show the approach taken to comply with Orders Nos. 79-198 and 79-200.

7. Contention: Similar to the above contentions regarding Cleanup Orders Nos. 79-198 and 79-200, petitioners contend that the adoption of Orders Nos. 79-196, 79-197, 79-201, and 79-202,<sup>24/</sup> each referring matters to the Attorney General for enforcement pursuant to Water Code Section 13350, was inappropriate and not supported by the evidence before the Regional Board.

Finding: Generally we decline to review such discretionary referral orders. This policy was aptly expressed in State Board Order No. WQ 73-25 and reiterated in Order No. WQ 75-9. Order No. 73-25 states:

"...[I]n general a request by the Executive Officer of a Regional Board for the Attorney General to take 'appropriate enforcement action' in connection with violations of Board orders is an administrative action which should not be review [sic] by this Board. What constitutes 'appropriate enforcement action' should be determined by the Attorney General in consultation with the Board and its legal staff and, ultimately, by the court in those cases where court action is filed. Hereafter, petitions for review of such requests by Regional Board Executive Officers will not be accepted."

In this case, our findings regarding other issues raised by the petitioners, including the incidence of pollution in waters under the Aerojet site and violations of waste discharge requirements, tend to indicate that there was no abuse in the Regional Board's exercise of discretion to refer such

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<sup>24/</sup>We are aware that Order No. 79-202 was amended by the Regional Board on December 19, 1979, to request the Attorney General to seek injunctive relief pursuant to Water Code Section 13002. This request was made in Order No. 79-260 of the Regional Board. Water Code Section 13002 authorizes the Attorney General to enjoin any pollution or nuisance, either at the request of a regional board or upon his own motion. Aerojet and Cordova have filed a petition for review of Order No. 79-260. That petition will be addressed in another order and does not affect our treatment of the issues herein.

matters to the Attorney General. Petitioners' arguments fail to persuade us to change our policy not to disturb such discretionary referrals. Accordingly, we will not discuss petitioners' claim that civil remedies should not be sought based on corrective measures taken or because of alleged adverse publicity.

### III. CONCLUSIONS

After review of the record and for the reasons expressed in this order, we have reached the following conclusions:

1. That Aerojet and Cordova have discharged wastes so as to create a condition of pollution and a threat of further pollution in groundwaters under the Aerojet site in eastern Sacramento County;
2. That waste discharges caused or permitted by Aerojet have violated the provisions of Orders Nos. 62-21 and 74-251 of the Central Valley Regional Board;
3. That waste discharges by Cordova have violated the provisions of Order No. 76-12 of the Central Valley Regional Board;
4. That Cleanup and Abatement Orders Nos. 79-198 and 79-200 are appropriate and proper; and
5. That the Regional Board orders referring violations of waste discharge requirements and Water Code Section 13350 by Aerojet and Cordova to the Attorney General for appropriate action are proper.

IV. ORDER

IT IS HEREBY ORDERED that the Petition of Aerojet General Corporation and Cordova Chemical Corporation for review of Orders Nos. 79-196, 79-197, 79-198, 79-200, 79-201, and 79-202 of the Central Valley Regional Water Quality Control Board is denied.

Dated: MAR 20 1980

ABSENT

Carla M. Bard, Chairwoman

ABSENT

William J. Miller, Vice-Chairman

L. L. Mitchell

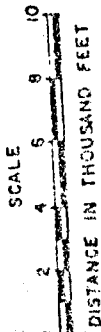
L. L. Mitchell, Member

Jill B. Dunlap

Jill B. Dunlap, Member

F. K. Aljibury

F. K. Aljibury, Member



LOCATION MAP

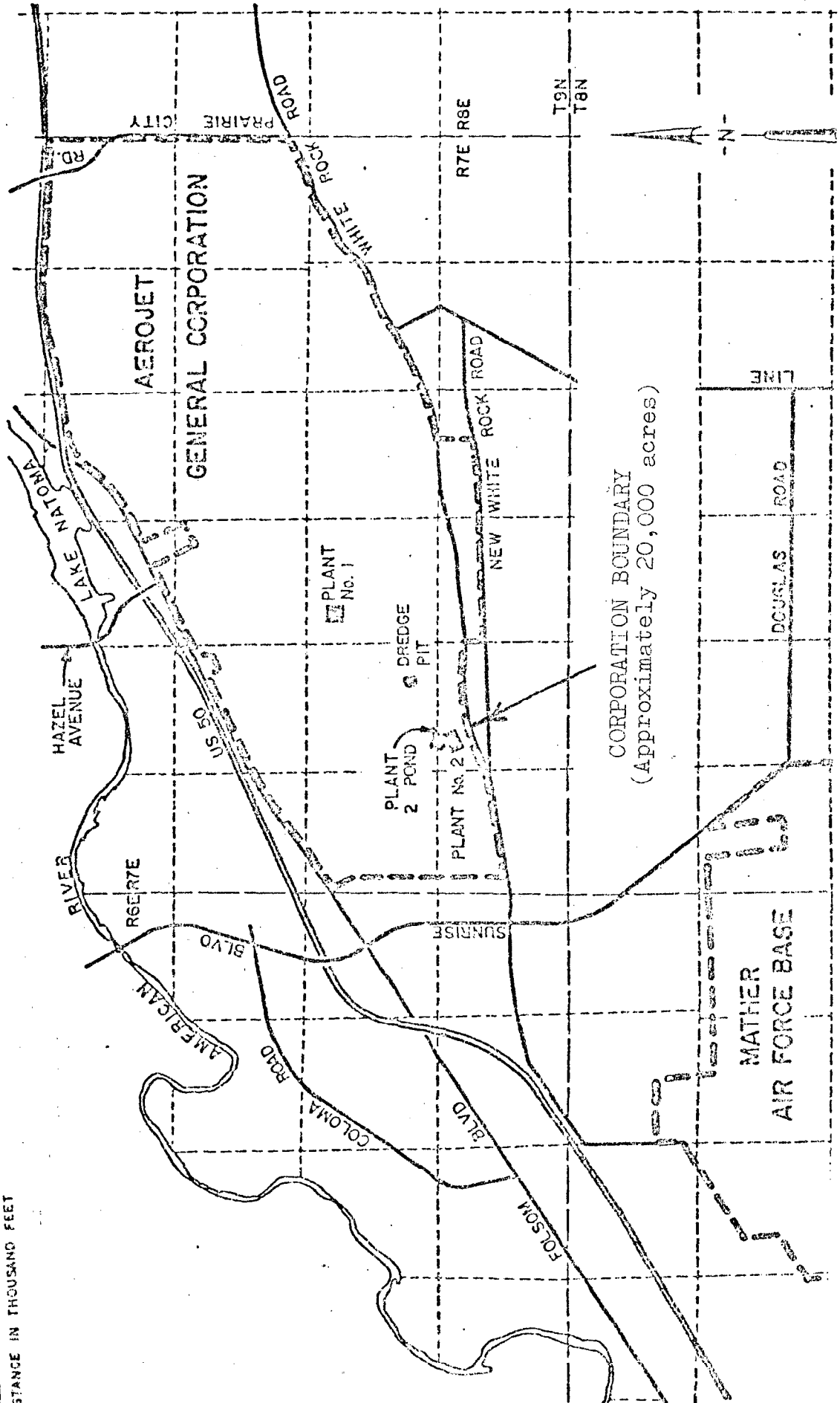




TABLE 2

CORDOVA CHEMICAL COMPANY - PLANT 1WASTE PONDS WATER QUALITY DATA  
1972-1978 SYNOPSIS

<u>Partial Constituent List</u>	<u>Maximum Levels (mg/l unless specified)</u>
Arsenic	16.1
Chloride	2320
COD	4860
Conductivity	17000 $\mu$ mhos/cm
Ether soluble	910
Hydrazine	0.22
pH	3 - 11.8 units (range)
Phenol	0.560
Sulfate	6800
TDS	16700
Volatile Dissolved Solids	2420

TABLE 1

CORDOVA CHEMICAL COMPANY - PLANT 1PRELIMINARY WATER QUALITY DATA - 30 JULY 1979

<u>Well #</u>	<u>Depth (ft)</u>	<u>SO<sub>4</sub> (mg/l)</u>	<u>Cl (mg/l)</u>	<u>Ec (µmhos/cm)</u>	<u>Inorg. Arsenic (mg/l)</u>	<u>Total Arsenic (mg/l)</u>	<u>Phenol (mg/l)</u>
11	29	1500	75	>5000	<0.02	0.29	0.03
11	35	2170	40	>5000	<0.02	0.36	0.02
12	35	1250	50	1900			
13	30	500	150	2500			
13	40	250	30	1600			
13	50	500	75	1950			
13	76	25	25	325			
14	27	500	50	1825			
14	34	150	25	1200			
14	38	250	50	2700			
Monitor Well		25	<5	200	<0.02	<0.02	0.002
Swamp		<10	<10	100	0.037	0.076	<0.002
Drinking Water Standards		250	250	900		0.05	.001

CORDOVA CHEMICAL COMPANY PLANT NO. 1

	Ec umhos/cm	SO <sub>4</sub> ppm	As ppm	Phenol ppm	1,2 Dichloro ethane ppb	Chloro form ppm	Tri Chloro ethylene ppb	Di Chloro methane ppb	Trans 1,2 Dichloro ethylene ppb	1,2 Di chloro ethylene ppb	Chloro benzene ppb
DRINKING H <sub>2</sub> O STANDARD	900	250	0.05	0.001							
WASTE PONDS 1972-1978	17000	6800	16.1	0.560							
WELL NO.											
11	>5000	2170	0.36	0.02	980	480	1100	790			
12	1500	1250			420	87					
13	2500	500			22	510					
13a					1800	290	7	44			
14	1825	500			45000	2100	120	2100			250
15					42000	100,000	2300	11000			
16					330	770	400	61	45		
17					3300	14000	140	80			
18					580	240		16	750	48	

Source: McLaren Preliminary  
Data, 30 July 1979

Source: CVRWQCB samples taken  
15 August 1979

USES AND EFFECTS OF VARIOUS CHEMICALS  
FOUND IN GROUNDWATER ON AND NEAR AEROJET

Trichloroethylene	Metal degreasing, solvent	C**T*
11,1-Trichloroethane	Solvent, aerosol propellant, metal degreasing, pesticide	T*
Trans 1,2-Dichloroethylene	Solvent, thermoplastics, medicine, perfumes	T*
Tetrachloroethylene	Solvent, heat transfer medium, propellant for aerosol, dry cleaning	C**T*
Methylenechloride	Solvent, paint remover, propellant for aerosol, plastics processing	T*
1,1,2-Trichloro- 2,2,1-Trifluoroethane	Solvent	T*
1,1-Dichloroethylene	Solvent, dye extractor, perfumes, thermoplastics	C**T*
1,1-Dichloroethane	Solvent, fumigant, medicine	T*
Phenol	Solvent, dyes, slimicide germacide	T*
Perchlorate	Medicine, electropolishing, explosives, manufacture of esters	
Arsenic	Alloying additive for metals, medicine, electronics	C**T*
Chloroform	Fluorocarbon refrigerants and propellants, solvent, dyes, drugs	C**T*
Carbon Tetrachloride	Refrigerants and propellants, metal degreasing, fumigant, production of semiconductors	C**T*
1,1-Dichloroethane	Solvent, medicine, fumigant	T*
Methylene Chloride	Paint remover, solvent, refrig- eration, plastics synthesizing, aerosol propellant	T*
Chlorobenzene	Solvent carrier for methylene diisocynate, intermediate, DDT	T*
1,2 Dichloroethane	Solvent, paint, soaps, organic synthesis	T*

\* Chemical Dictionary  
\*\* Water Quality Criteria,  
Federal Register, 15 March 1979

T = Toxic  
C = Suspected carcinogen

TABLE 4

ANALYSIS OF AEROJET WELLS - 2 AUGUST 1979

<u>Constituent</u>	<u>Petrucci Well (depth unknown)</u>	<u>Credit Union Well (T.D. 120')</u>	<u>0017 (T.D. 335')</u>	<u>00018 (T.D. 325')</u>
perchlorate, mg/l	26	15	25	91
trichloroethylene, mg/l	<0.0007	0.170 <sup>a</sup>	3.400	0.100
COD, mg/l	19.2	16.0	17.7	32.1
hydrazine, mg/l	<0.02	<0.02	<0.02	<0.02
ammonia, mg/l	<0.5	<0.5	<0.5	<0.5
nitrite, mg/l	<0.1	<0.1	<0.1	<0.1
nitrate, mgN/l	1.8	2.7	0.2	0.6
arsenic, mg/l	<0.01	<0.01	<0.01	<0.01
sulfate, mg/l	9	24	7	8
Ec, $\mu$ hos/cm	750	400	300	300

a - Also contained three additional unidentified volatile halogenated organics at 1-50  $\mu$ g/l.

Computer assisted gas-chromatography mass-spectrometry was used to scan for organic components in dichloromethane extracts of the samples. The extracts contained very few chromatographable compounds: BHT (butylated hydroxytoluene, a common preservative), diethylphthalate and a dibutylphthalate isomer (e.g. dibutyl or butyl, metholpropyl) were identified. 2,4-dicyano toluene could have appeared in the scan if present at greater than 10 ppb; none was found.

NOTE: T.D. is total depth of well

## AEROJET GENERAL CORP.

<u>Constituent</u>	<u>Wells</u>					
	<u>R.C. Fire Sta. 3 (80')</u>	<u>Credit Union (120')</u>	<u>Rudy's Hideway (66')</u>	<u>Rudy's Hideway (200')</u>	<u>AGC 17 (335')</u>	<u>AGC 18 (325')</u>
	(PPB)					
Trichloroethylene	110	170	340	130	3400	100
Trans-1-2-Dichloroethylene	12	6.6	59	21		
1-1-1-Trichloroethane	3		60			
Chloroform	≈1	≈5		≈2.7		
1-1-Dichloroethylene	3	50	10-20	12		
1-1-Dichloroethane	1.4	5	10-20	5		
1-2-Dichloroethane				5.3		
Dichloromethane	≈1	1		10-20		
Tetrachloroethylene	1.6	5.9	12	2		
Carbon Tetrachloride		1.3				
1-1-2-Trichloro- 2-2-1-Trifluoroethane	≈1	≈5	10-20	≈2.7		