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Water Projects Go Underground

*Victor E. Gleason*

I

INTRODUCTION

Because of the semi-arid characteristics of its agricultural and urban areas, California has refined common law water rights to serve the state's dominant water needs at each stage of its historical development. As the state's economic base has passed from gold mining, to ranching, to irrigated agriculture, to urbanization, California's water law has evolved to assure that the state's limited water resources would be available for the currently dominant needs. Today, public concern over energy conservation and environmental protection has led to an awareness of a critical need to utilize natural resources and existing public facilities more efficiently.

These goals are served by two recent California court decisions on water storage. In City of Los Angeles v. City of San Fernando and Niles Sand & Gravel Co. v. Alameda County Water District, California courts affirmed the public's right to store imported water in natural underground basins and to protect and recover the stored water for later use. The rulings have come at a time when water resources planning is focused more directly than ever before on the value of storing water underground to improve the efficiency of existing water works and to minimize the need for new dams.

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Over the years groundwater has provided about half of California’s water supply. Some 40 percent of the state, including most of its urban and agricultural area, overlies groundwater basins. Indeed, the state’s Department of Water Resources considers groundwater the most important single resource contributing to the present development of California. Furthermore, it has concluded that natural underground water storage capacity offers the largest potential benefit for improving water resource management.

California’s net annual water demand currently totals 31 million acre-feet (maf) and is expected to increase by at least three million acre-feet by the turn of the century. That demand is now met by a complex set of local, state and federal water developments. About 60 percent of the supply is currently derived from surface waters and 40 percent from groundwaters.

Although California’s average annual surface water supply exceeds 76.6 maf, only about 35 percent of that amount (27 maf) is available for current or future requirements. The remaining 65 percent is now reserved for protection of the Wild and Scenic Rivers System and the Sacramento-San Joaquin Delta, and for existing regulated water supplies. Furthermore, only half of the available 27 maf is developable and most of that is located far from the areas where it would be needed.

A. The Water Storage Concept

The basic method for developing a steady water supply is to store surplus water available during rainy periods for subsequent use during dry periods. Surface flows that would otherwise escape unused are saved for eventual use, thus averaging out the wide precipitation variations inherent in California’s climate. Conventionally, those flows are saved by constructing a dam that holds the surplus water in a surface reservoir. Surface storage capacity already constructed and utilized within the state totals 39 maf. But the construction of dams is expen-
sive and disruptive of natural environmental systems, and surface water storage reservoirs preempt the use of large areas of land.

Storage of surplus water in natural underground basins, on the other hand, avoids most of the expense, and nearly all of the environmental and land use dislocations of surface water storage. In addition, underground storage eliminates evaporation losses and provides natural distribution and filtration of the stored water.9

Underground water storage is generally accomplished by a process termed "artificial recharge" that involves spreading large amounts of surface water over porous surface areas.10 The water's weight and density force it to percolate through the underlying soil and into the underground basin. Groundwater is stored in minute spaces that exist around the small particles, such as sand and gravel, which constitute the subsurface structure. Vast numbers of those spaces exist within geological formations known as aquifers or underground basins—that may cover several square miles to a depth of hundreds of feet and may hold vast quantities of water. Underground basins are filled naturally from rain, floods and percolation from overlying rivers and lakes.

It is estimated that California's underground water storage capacity totals 1.3 billion acre-feet; that basins with 143 maf of storage capacity (over three times the amount of surface storage capacity already constructed) are close enough to the surface to be usable; and that 52 maf of that capacity is now empty.11 Groundwaters are primarily located in the 248 major basins throughout the state.12 Most of California's valleys overlie porous earth formations that represent natural underground water basins that are coextensive with the surface outline of the

9. See CALIFORNIA'S GROUND WATER, supra note 3, at 129 and Krieger & Banks, Ground Water Basin Management, 50 CALIF. L. REV. 56-57 (1962) [hereinafter cited as KREIGER & BANKS]. However, underground storage does involve some penalties, such as loss of energy due to the need to pump stored water out of the underground basins, and degradation of the quality of the stored water if the local groundwater is of lower quality. See CAL. DEP'T WATER RESOURCES, THE CALIFORNIA WATER PLAN 207 (Cal. State Water Resources Bull. No. 3, 1957) [hereinafter cited as CALIFORNIA WATER PLAN]. Substitution of underground basins in place of surface reservoirs requires consideration of operational factors such as groundwater percolation and transmission rates, groundwater quality, existence of water spreading and extraction facilities, electric energy supplies, and water service requirements. See D. TODD, GROUND WATER HYDROLOGY 216, 217 (1959) [hereinafter cited as TODD].

10. Artificial recharge, or water spreading, refers to the release of water into a permeable area of the ground surface, so that the water will filter into the ground and percolate into the underground basin. See CALIFORNIA WATER PLAN, supra note 9, at 207-08; TODD, supra note 9, at 252; and C. TOLMAN, GROUND WATER 173 (1937) [hereinafter cited as TOLMAN].

11. CALIFORNIA'S GROUND WATER, supra note 3, at 7, 129.

12. Id. at 2.
valley. It should be noted that the full extent of the state's groundwater reserves is still not completely known.

While many communities have relied on groundwater supplies for generations, that reliance has been limited for several reasons. The basic limitation is that only a small portion of an area's groundwater supplies are replenished naturally each year. The state's total annual average safe yield—that is, the yield from natural supplies not augmented by artificial recharge—is only about 5.2 maf.

Nevertheless, California's communities have developed groundwater basin management to the point where they have tripled the natural safe yield of the state's groundwater basins by storing native and imported flood waters in surface reservoirs for later percolation into the local underground basins. Local public agencies annually place some 7.6 maf of imported water supplies into local underground basins, so that the overlying communities can extract that additional amount of water from the ground each year. In addition, overlying communities currently extract, or overdraft, 2.2 maf of groundwater each year from underground basins, in expectation of eventually obtaining additional imported water supplies to replace that overdraft in the future.

15. "Safe yield" is the maximum quantity of water that can be extracted from a groundwater basin each year without gradually lowering groundwater levels in a manner that will eventually deplete the basin's groundwater supply. Id. at 141; and City of Los Angeles v. City of San Fernando, 14 Cal. 3d 199, 278-79, 537 P.2d 1250, 1308, 123 Cal. Rptr. 1, 59.
17. For example the Arvin-Edison Water Storage District of Kern County has developed a particularly sophisticated underground storage program using surplus surface water imported from the federal Central Valley Project that has significantly increased the overlying area's firm long-term water supply. Babcock, A Water Spreading and Well Field Water Supply System in Age of Changing Priorities for Land and Water 225 (1972). See also California Water Plan Outlook in 1974, supra note 5, at 96-97.
18. The Metropolitan Water District of Southern California and the San Gabriel Valley Municipal Water District also store portions of their respective shares of imported State Water Project deliveries in the natural groundwater basin underlying the San Gabriel Valley, pursuant to the provisions of a water rights adjudication settlement administered by the Los Angeles Superior Court in Upper San Gabriel Valley MWD v. City of Alhambra, No. 924128. The City of Los Angeles stores part of the water supplies that it imports from the Owens Valley in the groundwater basin underlying the San Fernando Valley, see text accompanying note 60 infra.
19. California Water Plan Outlook in 1974, supra note 5, at 142. The term "overdraft" refers to the annual balance between the water flowing into, and the water extracted from, an underground basin in a specific year. If more water is extracted from the basin than flows into it that year, the basin is considered in overdraft. See note 15 supra.
Both the National Water Commission\(^{19}\) and California’s Department of Water Resources\(^{20}\) have recognized the importance of storing imported water supplies underground to increase water supplies during long-term climatic cycles. A much broader utilization of California’s groundwater resources does in fact now appear feasible because of the availability of (1) imported water supplies from California’s State Water Project for semi-arid areas that overlie underground basins throughout the state,\(^{21}\) (2) more specific information regarding underground geohydrology,\(^{22}\) and (3) large capacity electronic computers that can rapidly evaluate the numerous physical parameters necessary to assure efficient groundwater management.\(^{23}\)

**B. The State Water Project**

California’s State Water Project is a multi-billion dollar system of reservoirs and conveyance works that captures runoff water in Northern California and transports it to over two dozen public agencies throughout the state. Project water is now used in Northern California, the San Francisco Bay area, the San Joaquin Valley, and Southern California. The project also provides flood control, hydroelectric power generation, water-oriented recreation, salinity control in the Sacramento-San Joaquin Delta and wildlife protection. Its major facilities, including those authorized to be built, consist of 23 dams and reservoirs, 6 hydroelectric power plants, 22 pumping plants and 685 miles of conveyance facilities.\(^{24}\)

The state has contracted to deliver Project water on a long-term basis to 31 public agencies located in 8 of the state’s 11 hydrologic areas. In return for those deliveries, the 31 public agencies have agreed to repay the cost of the Project.\(^{25}\) Under the contracts, annual water deliveries will eventually total 4.23 maf.\(^{26}\) Although these deliveries will require an annual water supply of 4.46 maf, the Project’s current

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20. See note 4 supra.
26. California Water Plan Outlook in 1974, supra note 5, at 145. The maximum contract obligation may not occur, however, until well after the turn of the century. Id. at 155.
annual water supply is less than 3.4 maf. Thus the Project must
develop over a million acre-feet of additional water supply.

Because underground storage reduces water loss due to evaporation, and because total storage capacity can be increased substantially by the use of natural underground basins, conjunctive use has the potential of making up at least some of the deficit that the State Water Project will eventually face. To the extent that increased capacity is developed from natural underground storage basins the state can avoid constructing expensive surface storage reservoirs in Northern California.

However, significant legal uncertainties over the nature of the rights involved in utilizing underground storage space has tended to frustrate the incorporation of major underground storage functions in the California State Water Project. The most important of these uncertainties concern the rights (1) to store imported water underground, (2) to protect that water while it is stored and (3) to recapture the stored water when it is needed.

In order to more fully understand the issues involved here, it is necessary first to briefly summarize some of the major elements of groundwater law.

**C. Groundwater Rights**

There are four basic types of groundwater rights: (1) overlying,

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27. *Id.* at 145, 146.

28. The term "conjunctive use" usually refers to the underground storage of surface water supplies. The term originally referred to surface impoundment of local storm runoffs and the subsequent transfer of those waters to underground storage. The term has recently been used more frequently to refer to underground storage of imported water in a manner that will increase the firm yield of the water importation project. See *California Water Plan*, *supra* note 9, at 209; *California's Ground Water*, *supra* note 3, at 121; *Todd, supra* note 9, at 214-17; *Tolman, supra* note 10, at 173-78; and *Gleason & Georgeson, Conjunctive Operation of Southern California Ground Water Basins With The State Water Project* 5-6 (Univ. of Cal. Water Resources Center Report No. 26, 1973) [hereinafter cited as *GLEASON & GEORGESON*].


31. Water rights are real property rights to use a perennial quantity of water rather than ownership rights to the corpus of specific waters. The right is an annually replenishing right to use a portion of a specific natural water supply in a reasonable and beneficial manner. Once a specific amount of water is diverted under the water right for reasonable, beneficial uses, however, ownership of that specific amount of water is
(2) appropriative, (3) prescriptive and (4) pueblo. Pueblo rights are historical rights and only two of them have been judicially perfected in California.\(^8\)

Overlying rights are the most pervasive California groundwater rights. They were carried into California law as part of the state's general incorporation of the common law.\(^3\) At common law, the only limitation on a landowner's right to extract groundwater from beneath his land was that he not be motivated solely by malice in depriving others of this water.\(^4\) At the beginning of this century, however, the California Supreme Court substantially limited overlying rights by applying the common water supply doctrine of correlative rights to the state. Under that doctrine each landowner may still extract all the groundwater he needs on his overlying land. But in times of shortage, the landowner's groundwater extractions are limited to amounts that are reasonable with respect to the water needs of the other landowners overlying the basin.\(^5\) Formerly, an overlying owner could exercise his right at any time, even after a long period of disuse, simply by extracting water from the basin and using that water on his overlying land.\(^6\) At the present time, however, it appears that unexercised overlying rights may be lost by prescription.\(^7\)


Groundwater rights are divided into two broad classifications, (1) underground stream rights and (2) percolating water rights. Hutchins, supra, at 419. As a practical matter, groundwater management involves only percolating water rights, since there is a legal presumption that groundwaters are percolating waters rather than underground streams. Id. at 421-22, 427-28; Nat'l Water Comm'n, A Summary-Digest of State Water Laws 7, 156 (1973).

The right to use an underground stream is treated as a surface water right and is thus classified as riparian or appropriative. Appropriative rights to underground streams are administered under statutory procedures established through California's Water Resources Control Board, but appropriative rights to percolating water are not. Hutchins, supra, at 419; Cal. Water Code § 1200 (West 1971).

32. The two perfected water rights belong to the cities of Los Angeles and San Diego; see 1 Rogers & Nichols, supra note 31, at 395.


35. Id. at 431-54; see also Tehachapi-Cummings Water District v. Armstrong, 49 Cal. App. 3d 992, 1001, 122 Cal. Rptr. 918, 925 (1975).


37. The California Supreme Court in Los Angeles v. San Fernando, supra note 1, indicates that public agencies can prescribe private overlying water rights to the extent that those rights are not exercised; see 14 Cal. 3d at 293, 537 P.2d 1318-19, 123 Cal. Rptr. at 69-70, especially n.101 added by the Court's July 30 modification of opinion.
an overlying right only to the extent the water is used on overlying land that the city actually owns. In order to extract groundwater and serve it as a public water supply on private lands within the city's corporate boundaries, the city must acquire some other type of groundwater right, normally an appropriative right or a prescriptive right.\footnote{38}{HUTCHINS, supra note 31, at 458-60.}

Public groundwater supplies are primarily secured by means of appropriative rights, which are acquired by simply extracting "surplus" groundwaters that overlying users do not need.\footnote{39}{Id. at 454-58.} However, the measurement of these surplus groundwaters is difficult because of the annual characteristic of the hydrologic cycle. While most of the surface water supply is generally replaced each year by precipitation, groundwater supplies are not. The amount of water in an underground basin of any significant size vastly exceeds the amount of water that naturally percolates into the basin each year. That additional quantity has accumulated over the centuries prior to the time man began extracting groundwater from the basin.\footnote{40}{A SUMMARY-DIGEST OF STATE WATER LAWS, supra note 31, at 6; CALIFORNIA'S GROUND WATER, supra note 3, at 7.}

In theory, appropriative rights should apply only to surplus annual groundwaters, not to the historic groundwater resource. When annual groundwater extractions exceed the current annual natural percolation in the underground basin, the groundwaters that accumulated historically during the pre-development period are gradually diminished, and the underground basin is considered to be in "overdraft."\footnote{41}{See notes 15 and 16 supra.} Since enough accumulated groundwater normally remains to meet the current extraction levels, no immediate shortage occurs. Nevertheless under the appropriative rights doctrine, overlying owners can sue to enjoin overdrafts, since they are injured by the eventual depletion of their groundwater supply.

Litigation protecting overlying rights from appropriative drafts has generally been too expensive to be practical because of the difficulty of distinguishing between annual and historic groundwaters and the difficulty of showing the type of adverse use that could ripen into a prescriptive right. A determination of both (1) the total amount of groundwater extracted from the basin each year and (2) the total amount of natural precipitation percolating in the ground basin each year, requires complex and expensive research, analysis, and administration. In an attempt to apportion equitably the burden of groundwater overdrafts, the California Supreme Court in 1949 converted both overlying and appropriative rights in overdrafted basins to prescriptive rights by means
of a mutual prescription concept.\textsuperscript{42}

Prescriptive rights have now superseded both overlying and appropriative rights to a large degree, at least in Southern California. Mutual prescription is a method for allocating shortages in an overdrafted groundwater basin. Under mutual prescription all groundwater extraction rights exercised during a prescriptive period of at least five continuous years are reduced to a common prescriptive rights classification. All groundwater extraction rights not exercised during the prescriptive period are lost. The remaining prescriptive rights are reduced on a pro-rata basis so that the total annual groundwater extractions equal the safe yield (\textit{i.e.}, the amount of new water percolating into the ground basin each year). The pro-rata reduction is based on the lowest annual amount of groundwater each entity extracted during the prescriptive period. Thus, all those entities extracting groundwater from the basin during the prescriptive period, whether they claim overlying or appropriative rights, are treated equally and independently of any priority dates, subject to public prescription priorities.\textsuperscript{42a}

\textbf{D. Underground Storage Rights}

In analyzing "underground storage" rights, it is important to distinguish them from the groundwater rights discussed above. One of the most important aspects of the \textit{San Fernando} and \textit{Niles} decisions is that they establish that storage rights for the public do not depend on groundwater rights. While it is tempting to assume that the right to store water in an underground basin is merely the inverse of the right to take native groundwater out of that basin, there are practical reasons why storage rights and water rights should not be considered reciprocal. The most compelling reason is that the two rights refer to significantly different physical operations.

Storage requires obtaining another water supply that would not normally percolate into the underground basin and monitoring its percolation. Although the right to store water underground implies the right to control the manner in which the water is extracted from storage, extracting stored water originally obtained from an outside source involves different types of risks and responsibilities than does the simple extraction of native waters. Finally, placing water underground for storage is much more expensive than merely extracting it.

Underground storage rights have three basic components: (1) the storage right component—the right to place imported water in an

\begin{itemize}
\item 42a. \textit{Id.; see also notes 37 supra and 77 infra.}
\end{itemize}
underground basin; (2) the protection component—the right to prevent others from taking the stored water; and (3) the recapture right component—the right to extract the stored water. These are analyzed separately in this article even though the courts have not always clearly distinguished them.\(^4\)

In the evolution of groundwater rights, the courts have given little consideration to the storage right component.\(^4\)\(^4\)\(^4\) Thus, the two recent court decisions on the use of underground basins as natural storage reservoirs represent a major development in water resource management.\(^4\)\(^5\) These decisions are particularly timely because several public agencies are now exploring the possibility of utilizing natural underground basins to optimize the public investment in the State Water Project and to reduce or eliminate the state's need to build additional dams and surface reservoirs in Northern California.\(^4\)\(^6\)

The Department of Water Resources has in fact contemplated the conjunctive use of underground basins as part of that Project for some time, but has delayed action because such use required further legal clarification.\(^4\)\(^7\) The two decisions now provide much, if not all, of that clarification, by explicitly recognizing a public right to use underground storage space. The Director of the Department of Water Resources has been quick to note that the two decisions significantly modify groundwater law and should permit more effective use of existing water resources.\(^4\)\(^8\)

The court's rulings have been made in two separate landmark cases that utilize complementary rationales. \textit{City of Los Angeles v. City of San Fernando}\(^4\)\(^9\) reaffirmed a city's exclusive right to recapture foreign water it had stored in an underground basin and, more importantly,

43. See text accompanying note 114 infra.

44. The main exception is City of Los Angeles v. City of Glendale, 23 Cal. 2d 68, 132 P.2d 574 (1943), which discusses the unused portions of natural underground reservoirs.

45. See notes 1 and 2 supra.

46. \textit{See California's Ground Water, supra} note 3, at 4; \textit{California Water Plan Outlook in 1974, supra} note 5, at 97; \textit{Gleason \& Georgeson, supra} note 28, at 5-37. Shortly after the Supreme Court rejected petitions for rehearing in \textit{Los Angeles v. San Fernando}, the Department of Water Resources began meeting with the Metropolitan Water District of Southern California and local water agencies overlying several Southern California groundwater basins, particularly the cities overlying the San Fernando Basin, to determine the practical feasibility of using those underground basins to "firm up" the State Water Project's long-term water supply. Those meetings are now attempting to formulate the specific legal, financial, and water service mechanisms that would be needed to incorporate that type of storage within the institutional framework of the State Water Project.

47. \textit{California Water Plan, supra} note 9, at 221.


extended to groundwater basins a long line of cases that authorized the use of natural streambeds to transport foreign waters.50

_Niles Sand and Gravel Co. v. Alameda County Water District_51 affirmed the right of a water district to enjoin quarry operations that interfered with the storage of water in an underground basin in the South San Francisco Bay area. It also denied inverse condemnation relief for damages caused when the stored water flooded quarry pits and impaired the quarry operations. The decision was based on the existence of a public underground water storage servitude and on police powers arising under Article XIV, Section 3 of the state constitution. Both the California and the United States Supreme Courts declined to review the decision.52

Together, _San Fernando_ and _Niles_ provide the first major judicial clarification of California groundwater law in a quarter century. Not since _Pasadena v. Alhambra_53 have the appellate courts ruled on such important groundwater management issues.

II

CITY OF LOS ANGELES V. CITY OF SAN FERNANDO

A. The Factual Setting

_San Fernando_ resolved a water rights suit filed by the City of Los Angeles in 1955. Los Angeles sought to establish its right to all the groundwaters under the San Fernando Valley and to enjoin others from extracting these waters without Los Angeles’ permission.54 Los Angeles sued all the public and private entities that had wells for extracting groundwater from the valley.55 The principal defendants were the three cities of San Fernando, Glendale, and Burbank.

The Los Angeles River originates in the San Fernando Valley, northwest of the original pueblo of Los Angeles, which was founded in 1781. That valley lies over a large natural basin that collects the rainfall from the surrounding mountains and eventually discharges it

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50. See, e.g., City of Los Angeles v. City of Glendale, 23 Cal. 2d 68, 132 P.2d 574 (1943). See text accompanying notes 82-85 infra.
53. 33 Cal. 2d 908, 207 P.2d 17 (1949).
54. 14 Cal. 3d at 207, 537 P.2d at 1258-59, 123 Cal. Rptr. at 9-10.
55. The complaint named 214 defendants and alleged that each of them had facilities for extracting groundwater from the basin; see Amended Complaint at 1-12 & Paragraph XII, City of Los Angeles v. City of San Fernando, 14 Cal. 3d 199, 537 P.2d 1250, 123 Cal. Rptr. 1 (1975).
into the Los Angeles River.\textsuperscript{56} The amount of local precipitation that percolates into the basin each year and would naturally discharge into the Los Angeles River is about 50,000 acre-feet.\textsuperscript{57}

The San Fernando Valley is now a major suburban and industrial area, with a total population of about 1.3 million people. A little over a million of those people, about 38 percent of the city's population,\textsuperscript{58} reside in the Los Angeles portion of the valley. The remainder reside in the cities of Glendale, Burbank, and San Fernando. Eighty percent of the overlying area's total annual water use of 285,000 acre-feet occurs within the portion lying in the City of Los Angeles.\textsuperscript{59} The total annual use of 250,000 acre-feet is five times the amount of the underground basin's safe annual yield. Obviously most of the water used each year in the San Fernando Valley must be imported from other areas if the basin is to avoid a major annual overdraft of its groundwater supplies.

Each of the four cities involved in San Fernando had (1) pumped water from the underground basin for several years, (2) supplemented those groundwater supplies with waters imported into the valley from outside Southern California, and (3) retailed the blended waters to areas overlying the basin through conventional municipal water systems. The cities' customers then used those waters in a manner that permitted much of it to percolate back into the underground basin. In addition, Los Angeles had consciously used the underground basin as a storage reservoir. It had placed waters that it had imported from eastern California's Owens Valley directly into the underground basins. Los Angeles had initiated the Owens Valley project in 1907, and the first imports arrived in the San Fernando Valley in 1913.\textsuperscript{60} Los Angeles had also pumped waters out of the basin and had exported them for use in areas of Los Angeles that lie outside of the San Fernando Valley.\textsuperscript{61}

\textbf{B. Early Decisions}

Los Angeles claimed two types of water rights. It claimed a "pueblo" right to all the \textit{native} ground waters—the water naturally in the basin. It also claimed the right to recapture all \textit{foreign} waters that it

\begin{itemize}
\item \textsuperscript{56} City of Los Angeles v. City of Glendale, 23 Cal. 2d at 71-72, 142 P.2d at 292.
\item \textsuperscript{57} City of Los Angeles v. City of San Fernando, 14 Cal. 3d at 256 n.47, 537 P.2d at 1291 n.47, 123 Cal. Rptr. at 42 n.47. However, annual extractions from the San Fernando Basin by all of the overlying cities have exceeded 90,000 acre-feet. \textsc{Cal. Dep't Water Resources, Watermaster Service in the Upper Los Angeles River Area 38} (Cal. State Water Resources Bull. No. 181-74, 1975) [hereinafter cited as \textsc{Watermaster Service}].
\item \textsuperscript{58} County of \textit{Los Angeles Dep't of Regional Planning Quarterly Bulletin No. 127, January 1, 1975.}
\item \textsuperscript{59} \textsc{Watermaster Service}, \textit{supra} note 57, at 48-49.
\item \textsuperscript{60} 14 Cal. 3d at 242, 537 P.2d at 1282, 123 Cal. Rptr. at 33.
\item \textsuperscript{61} \textit{Id.} at 209-10, 256, 537 P.2d at 1260, 1291-92, 123 Cal. Rptr. at 11, 42-43.
\end{itemize}
had imported into the San Fernando Valley and placed in underground storage. Although Los Angeles' pueblo right is not directly involved in the decision's underground storage rulings, those rulings do require identification of the basin's "native" water rights and thus necessitate some familiarity with the pueblo right.

A pueblo water right is the paramount right of a city, as the successor of a Spanish or Mexican pueblo, to use the water naturally occurring within the old pueblo limits for the inhabitants within the city's expanding boundaries. The California Supreme Court ruled in 1881 that the city of Los Angeles held such a right to all the waters of the Los Angeles River as of the founding of the pueblo. That water right was carried into California law when the United States annexed California under the provisions of the Treaty of Guadalupe Hidalgo. The California and United States Supreme Courts continued to recognize Los Angeles' pueblo right in a series of decisions, the most recent of which, before San Fernando, was Los Angeles v. Glendale in 1943.

In that decision, the court also recognized both Los Angeles' right to use the San Fernando Valley underground basin as a natural reservoir for the imported water supply and its right to recapture those waters. Finally, the decision recognized Los Angeles' right to recapture imported water that its customers had allowed to percolate into the ground as return flow from agricultural uses.

Until 1975, Glendale was the only significant legal authority for (1) utilizing underground basins as storage reservoirs for water importation projects, (2) protecting the stored water from others, and (3) recapturing the stored water.

C. The Trial Judgment

When Los Angeles invoked the Glendale decision and sought to enforce both its pueblo and recapture rights, the trial court rejected the
pueblo right and severely limited the recapture right. The court held that neither Spanish nor Mexican law had established a Los Angeles pueblo water right, that the previous supreme court decisions were based on erroneous translations, and that it was not bound to honor those decisions under the doctrines of *res judicata* or *stare decisis* for several reasons, including subsequent changes in circumstances and great public interest. In addition, the trial court imposed a permanent injunction on Los Angeles that in effect required prior court approval of all groundwater recharge operations and that appointed the Department of Water Resources as watermaster to administer the judgment subject to the court's continuing jurisdiction.

The trial court's decision rested on the conclusion that all of the San Fernando Valley ground waters, including the water imported by Los Angeles, were a native water supply subject to the overlying and appropriative rights of the defendants. It found that the parties had overdrafted the basin for fourteen years prior to the time Los Angeles filed its 1955 complaint and apportioned the basin's water rights on the basis of mutual prescription. Thus, the trial court awarded prescriptive rights to the defendants as well as to Los Angeles on the basis of the amounts of water each had extracted during the overdraft period.

The trial court's 1968 judgment cast a major cloud over the use of underground basins as natural storage reservoirs for imported water supplies, seriously undermining the only significant judicial recognition of underground storage recapture rights. No public agency could responsibly consider risking the major public expenditure necessary for projects involving the underground storage of imported water if that water would be subject to recapture by others on the theory of mutual prescription.

70. 14 Cal. 3d at 217-19, 537 P.2d at 1255-56, 123 Cal. Rptr. at 18-20.
71. *Id.* at 221-24, 537 P.2d at 1267-69, 123 Cal. Rptr. at 18-20. A watermaster is normally a group of individuals or a public agency charged with administering the allocation of waters in an independent manner. Most current watermasters implement a judgment under judicial appointment and supervision. The Water Code also authorizes water rights holders to designate a watermaster to administer water diversions that do not fall within a court's continuing jurisdiction. CAL. WATER CODE §§ 4000-4400 et seq. (West, 1971).
72. See text accompanying notes 42 and 42a supra.
73. 14 Cal. 3d at 220-22, 537 P.2d at 1267-68, 123 Cal. Rptr. at 18-19.
74. For example, the average equivalent unit charge for State Water Project imports in 1975 was $75 per acre-foot. Storage of 100,000 acre-feet of water at that rate would represent a 7.5 million dollar investment independently of the costs of storing and recapturing the water. See CAL. DEP'T WATER RESOURCES, THE CALIFORNIA STATE WATER PROJECT IN 1975, Table B-21 (Cal. State Water Resources Bull. No. 132-75, 1975).
D. The Supreme Court Reversal

In 1975 the California Supreme Court unanimously reversed the trial court's decision in San Fernando. In a one hundred page opinion the court awarded Los Angeles both an exclusive pueblo right to the San Fernando Basin's native groundwater and an exclusive recapture right to those foreign waters that Los Angeles or its customers add to the underground basin. It also held that the three defendant cities that overlie the basin have similar recapture rights to the net amount of water that they import and store. In addition the decision included significant rulings on public prescription and groundwater overdraft determinations. However, since the latter two rulings pertain to the establishment of prescriptive groundwater rights rather than underground storage rights, they will not be discussed here.

1. The Storage Right Component

The most important ruling in San Fernando is probably the reaffirmation that natural underground basins should be used as storage reservoirs in place of artificial surface storage facilities whenever practicable. Although Glendale had originally recognized that approach to water storage in 1943, the trial court's judgment had, as we have seen, seriously limited and undermined it.

San Fernando based the right to use underground basins as natural reservoirs on the same rationale used in Glendale, which had extended

75. San Fernando limited Los Angeles' pueblo right to the San Fernando Basin, the largest of the four basins underlying the San Fernando Valley. The other three basins are designated Sylmar, Verdugo and Eagle Rock, respectively. The decision's underground storage rulings apply, however, to all of the basins. Los Angeles v. San Fernando, 14 Cal. 3d at 208-209, 537 P.2d at 1259, 1287-88, 1296-97, 1320, 123 Cal. Rptr. at 10, 38-39, 48, 71.

76. Id. at 262, 537 P.2d at 1296, 123 Cal. Rptr. at 47.

77. Id. at 270-77, 537 P.2d at 1301-07, 123 Cal. Rptr. at 52-58. The decision significantly limited the mutual prescription doctrine of Pasadena v. Alhambra, 33 Cal. 2d 908, 207 P.2d 17, by construing CAL. CIVIL CODE § 1007 (West 1954) as barring prescription of public water rights. The relevant portion of that section provides that:

- no possession by any person . . . no matter how long continued of any . . . water right . . . dedicated to or owned by any county, city and county, city, irrigation district, public or municipal corporation or any department or agency thereof, shall ever ripen into any title, interest or right against such [entity].

78. Id. at 264-86, 537 P.2d at 1297-1313, 123 Cal. Rptr. at 48-64.

79. Id. at 277-85, 537 P.2d at 1307-12, 123 Cal. Rptr. at 58-63. The aspect of the overdraft rulings most relevant to groundwater storage is the recognition of "temporary surplus", discussed at text accompanying notes 102-06 infra. The other aspects of those rulings relate primarily to the water rights portion of the decision.

80. See note 9 supra and accompanying text.

81. See text accompanying note 74 supra.
Water Code section 7075 to groundwater.\(^8^2\) That section codifies a rule over a century old, developed during mining days, that any person may transport imported water in a natural stream bed, if that use would not impair the exercise of local water rights. The section was originally enacted in 1872 as Civil Code section 1413 and still provides that:

Water which has been appropriated may be turned into the channel of another stream, mingled with its water, and then reclaimed; but in reclaiming it the water already appropriated by another shall not be diminished.\(^8^3\)

*Glendale* explained that the purpose of that rule was to avoid the construction of artificial waterworks when natural water facilities would accomplish the same purpose, and applied the logic of that rule to underground storage facilities, stating:

Plaintiff had a prior right to the use of the water brought to the San Fernando Valley. It did not abandon that right when it spread the water for the purpose of economical transportation and storage . . .

It would be as harsh to compel plaintiff to build reservoirs when natural ones were available as to compel the construction of an artificial ditch beside a stream bed.\(^8^4\)

The *San Fernando* decision reaffirmed both the original legislative purpose and its extension in *Glendale* to underground basins.\(^8^5\) That reaffirmation manifests a clear judicial recognition of the right to store imported waters underground so long as that storage does not impair native groundwater rights.

### a. Direct storage

In *San Fernando* the supreme court reaffirmed the holding in *Glendale* that gave Los Angeles the right to carry on both direct and indirect storage operations.\(^8^6\) In direct storage, Los Angeles placed imported Owens Valley water directly into the underground basin.\(^8^7\)

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\(^8^2\) 14 Cal. 3d at 260, 537 P.2d at 1295, 123 Cal. Rptr. at 46. The supreme court had first articulated the authority to transport imported waters in natural stream beds in 1857 in *Hoffman v. Stone*. 7 Cal. 46, 49 (1857). The court reaffirmed that decision the following year in *Butte Canal and Ditch Co. v. Vaughn*, 11 Cal. 143, 151 (1858), stating:

"[T]he prior right to the use of the natural water of a stream does not entitle the owner of such a right to the exclusive use of the channel. So long as his right is not interfered with, there is no reason why the bed of the stream may not be used by others as a channel for conducting water. If the plaintiffs in the present case receive their full supply, as previous to the introduction of water by the defendants, they have no cause of complaint."

\(^8^3\) *Cal. Water Code* § 7075 (West 1971).

\(^8^4\) 23 Cal. 2d at 76-77, 142 P.2d at 294.

\(^8^5\) 14 Cal. 3d at 264, 537 P.2d at 1297, 123 Cal. Rptr. at 48.

\(^8^6\) See text accompanying notes 68-69 *supra*.

\(^8^7\) 14 Cal. 3d at 211, 212, 537 P.2d at 1261, 1262, 123 Cal. Rptr. at 12.
The trial court had enjoined that type of storage operation except where Los Angeles received prior approval from the court under its reservation of jurisdiction. 88

The supreme court summarily rejected this broad restriction on the direct storage right, 89 indicating that Los Angeles' direct storage operations might be limited only in order to provide adequate underground storage capacity for the importing operations of Glendale, Burbank, and San Fernando. 90

b. Indirect storage

Indirect storage occurs when water users dispose of the residue, or create a return flow, of purchased imported surface waters, in a manner that permits the residue to percolate into the underground basin. Los Angeles, Glendale, and Burbank have each utilized that type of storage operation through their respective customers. 91

The trial court refused to grant a right for indirect storage. It reasoned that sale of the imported water to the cities' customers precluded proper storage intent and that it was impossible to identify the amount of the customers' water that actually percolated underground or to trace those waters after they did percolate underground. 92

The trial court's ruling conflicted with Glendale, which had granted Los Angeles indirect storage rights for imported waters that percolated underground after they had been used by Los Angeles' agricultural customers. The trial court distinguished that decision because the San Fernando Valley had changed, in the intervening years, from a rural and agricultural area to a highly developed urban one. It then ruled that the Valley's development had introduced too much complexity to permit administration of indirect storage. 93

The trial court's refusal to credit the cities for these indirect groundwater augmentations substantially distorted the groundwater accounting. In fact, indirect storage percolation has in recent years provided more than forty percent of the basin's annual groundwater yield, much more than has been provided by direct storage. 94

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88. The trial court had found that the addition of imported water in the underground basin affects groundwater storage capacity, groundwater in storage, groundwater movement, and groundwater levels. Id. at 223, 224, 264, 537 P.2d at 1268, 1269, 1297, 123 Cal. Rptr. at 19, 20, 48.
89. Id. at 264, 537 P.2d at 1297, 123 Cal. Rptr. at 48.
90. Id. at 290, 537 P.2d at 1315-16, 123 Cal. Rptr. at 67. See text accompanying notes 102-06 infra.
91. Id. at 211, 256-62, 537 P.2d at 1261, 1291-96, 123 Cal. Rptr. at 12, 42-47.
92. Id. at 220, 260, 537 P.2d at 1267, 1294, 123 Cal. Rptr. at 18, 45.
93. Id. at 258, 260, 537 P.2d at 1293, 1295, 123 Cal. Rptr. at 44, 46.
94. Id. at 255-56, 537 P.2d at 1291, 123 Cal. Rptr. at 42.
In reversing the trial court, the San Fernando court held that indirect storage includes any artificial augmentation of the native groundwater supply,\(^9\) and that no prior storage intent was necessary. It also held that the amount of unused water percolating underground was sufficiently predictable, and that the recapture right does not relate to a specific, indentifiable corpus of water, but is rather a right in a commingled supply.\(^9\) Indeed, San Fernando awarded indirect storage rights to the cities of Glendale and Burbank even though those cities had denied that those rights existed.\(^9\)

The San Fernando court also ruled that the change in customer uses of the imported waters, from agricultural use to urban use, did not affect the importer's right to the return flow, explicitly extending that right to all types of water uses.\(^9\) This ruling was based on City of San Bernardino v. City of Riverside,\(^9\) which held that a change in the place or character of use of a water right does not affect that right.

Finally, the decision reaffirmed Glendale's recognition that the use of imported water by another party does not impair the importer's rights to the return flows from that water:

The fact that the water drawn from a tap into a portable receptacle becomes the customer's disposable personal property [citation] does not impair [Los Angeles'] right to recapture the return flow which is in fact produced by deliveries of its imported water.\(^10\)

c. Priority

Although San Fernando granted underground storage rights in the San Fernando Valley Basin to at least three separate cities, it did not expressly allocate storage priorities, since there was then no shortage of underground storage space:

No necessity is shown for interfering with this right to use the basin for storage, for there does not appear to be any shortage of underground storage space in relation to the demand therefor.\(^10\)

Since the court retained jurisdiction over the question of underground storage recapture rights, the court can develop storage priority

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96. \textit{Id.} at 260, 537 P.2d at 1295, 123 Cal. Rptr. at 46.
97. \textit{Id.} at 257, 262, 537 P.2d at 1292, 1296, 123 Cal. Rptr. at 43, 47.
99. 186 Cal. 7, 198 P. 784 (1921).
100. 14 Cal. 3d at 260, 537 P.2d at 1294, 123 Cal. Rptr. at 45.
101. \textit{Id.} at 264, 537 P.2d at 1297, 123 Cal. Rptr. at 48. The total usable water storage capacity of the San Fernando Basin has been estimated at 3.2 million acre feet, with about half a million acre feet of that capacity presently empty. \textit{Southern California Water Conference Ad Hoc Groundwater Storage Committee Rep.}, June 27, 1974; \textit{California's Ground Water, supra} note 3, at 50.
rules for the basin if a shortage in underground storage space does occur in the future.

One aspect of the decision's overdraft rulings, however, already seems to provide Los Angeles a degree of storage priority as part of that city's pueblo water right. The court approved the "temporary surplus" concept, a theory that implements the safe yield concept\textsuperscript{102} on a year to year basis by recognizing the wide fluctuations inherent in Southern California's annual rainfall. Theoretically, overdraft of the safe yield supply occurs in any year in which groundwater extractions exceed the basin's safe yield. On the other hand, when groundwater extractions in any year are less than the basin's safe yield, the basin theoretically contains surplus water.\textsuperscript{103}

However, a basin's safe yield is expressed as a single average value computed on the basis of a hydrologic cycle lasting many years and thus a wide range of values. Since a 29 year cycle is used in the San Fernando basin,\textsuperscript{104} the actual amount of local precipitation recharging the groundwater basin in most years will be greater or less than the theoretical average safe yield. Surplus years are of particular concern in the San Fernando Valley Basin because the physical characteristics of that basin are such that unused surplus water tends to flow out the lower end of the basin into a concrete lined channel to the ocean.\textsuperscript{105}

Consequently, more water can be extracted from the basin during wet years without damaging the basin's water supply or causing an overdraft. The excess over annual safe yield in a particular year is called a temporary surplus. The concept of temporary surplus recognizes that a certain amount of excess underground storage space is required to regulate supply, given the wide variations in precipitation between wet and dry years. The court held that users could extract the temporary surplus with impunity:

We agree with plaintiff that if a groundwater basin's lack of storage space will cause a limitation of extractions to safe yield to result in a probable waste of water, the amount of water which if withdrawn would create the storage space necessary to avoid the waste and not adversely affect the basin's safe yield is a temporary surplus available for appropriation to beneficial use. Accordingly, overdraft occurs only if extractions from the basin exceed its safe yield plus any such temporary surplus.\textsuperscript{106}

\textsuperscript{102} See note 15 supra.
\textsuperscript{103} 14 Cal. 3d at 277-78, 537 P.2d at 1307-08, 123 Cal. Rptr. at 58-59.
\textsuperscript{104} \textit{id. at} 279, 537 P.2d at 1308, 123 Cal. Rptr. at 59.
\textsuperscript{105} \textit{id. at} 279-80, 304 nn.80-84, 537 P.2d at 1308-09, 1327-28 nn.80-84, 123 Cal. Rptr. at 59-60, 78-79 nn.80-84.
\textsuperscript{106} \textit{id. at} 280, 537 P.2d at 1309, 123 Cal. Rptr. at 60.
2. Protection Right Component

The basic protection for stored water is judicial recognition of an exclusive recapture right that would prevent third parties from taking the stored water. *San Fernando* implemented that protection by invoking the principle of continuing administration of competing rights to ground basin water and by appointing a watermaster and retaining jurisdiction.\(^{107}\)

While the supreme court found that there was no need to enjoin the exercise of the storage right, it did find that the exercise of the recapture right required continuing judicial administration.\(^{108}\) Indeed, it indicated that the existence of the storage operation, *per se*, justified judicial administration to protect the recapture right from unreasonable overdrafts of the native water supply.\(^{109}\)

*San Fernando* extends the Water Code section 7075 concept\(^{110}\) by investing public recapture rights with the same "first" priority held by Los Angeles' pueblo water right. Since the recapture right to stored imported water and the pueblo right to native water attach to separate water supplies, a dual priority appears at first glance to be compatible. On closer examination, however, it becomes apparent that a potential incompatibility exists.

That incompatibility arises because the native water supply includes an historically accumulated water supply in addition to the annual supply from local precipitation. In a period of water shortage, Los Angeles would presumably employ its pueblo water right to overdraft substantially the underground water supply. That overdraft would lower ground water levels so that deeper wells and additional amounts of electrical energy would be needed to recapture stored water.

Anticipating this problem, the court therefore limited the overdraft portion of Los Angeles' pueblo water right where the exercise of that right would unreasonably impair the ability of other parties to recapture imported water stored in the underground basin.\(^{111}\) This limitation apparently stems from the reasonable water use provisions found in Article XIV, Section 3 of the California Constitution.\(^{112}\) Although *San Fernando* does not explicitly base the recapture right priority on those provisions, it does use language reflecting those provisions when it states that the court has a constitutional duty to protect the underground water supply, native and imported, in a manner that will minimize waste and

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108. *Id.* at 264, 290, 537 P.2d at 1297, 1316, 123 Cal. Rptr. at 48-49, 67.
110. See text accompanying notes 82-85 *supra*.
111. 14 Cal. 3d at 288, 537 P.2d at 1314-15, 123 Cal. Rptr. at 65-66.
112. See text accompanying notes 193-204 *infra*. 
maximize the beneficial use of that supply, without unreasonably affecting the rights of the parties.\footnote{113}

3. Recapture Right Component

\textit{San Fernando} does not distinguish clearly between the storage and recapture components of the underground storage right. In fact, much of the decision's underground storage rulings are phrased in terms of recapture since the latter is the most obvious manifestation of the basic storage right. For example, it summarizes the basic underground storage right as:

\begin{quote}
    a right to all San Fernando basin ground water derived from water imported by [each city] from outside the [overlying area] and either spread or delivered within [that area].\footnote{114}
\end{quote}

a. Nature of the right

The court defines the nature of the recapture right as:

\begin{quote}
    an undivided right to a quantity of water in the ground reservoir equal to the net amount by which the reservoir is augmented by [imported water].\footnote{115}
\end{quote}

The measure of the recapture right is thus the net amount of additional groundwater attributed to the imported supply, so that the storer bears the risk of loss. Indeed the decision expressly recognizes that "losses from evaporation or otherwise" involved in a direct storage operation will be deducted from recapture credits. The indirect storage credit includes similar deductions since the measure of that credit is the amount of increase in the underground water supply caused by return flows of imported water, rather than the gross amount of the returns.\footnote{116}

More importantly, the decision gives the recapture right important protection by placing it on an equal priority with Los Angeles' pueblo right to all native waters. The court stated that a public recapture right attaches to imported groundwater that is coequal to all public rights to native groundwater, and perhaps more important, is superior to all private rights to native water:

\begin{quote}
    Plaintiff's pueblo right and the respective imported water rights of plaintiff and each defendant city are mutually exclusive and of equal priority. All such rights are prior to rights dependent on ownership of overlying land or based solely upon appropriation of ground water from the basin. Therefore, all the rights of the private de-
\end{quote}

\footnote{113. 14 Cal. 3d at 287, 290-91, 537 P.2d at 1314, 1316-17, 123 Cal. Rptr. at 65, 67-68.}
\footnote{114. \textit{id.} at 286, 537 P.2d at 1313, 123 Cal. Rptr. at 64.}
\footnote{115. \textit{id.} at 262, 537 P.2d at 1296, 123 Cal. Rptr. at 47.}
\footnote{116. \textit{id.} at 290, 537 P.2d at 1316, 123 Cal. Rptr. at 67.}
fendants are subordinate to the foregoing rights of the . . . cities and all rights of the defendant cities other than their imported water rights are subordinate to the foregoing rights of plaintiff.\textsuperscript{117}

Thus, \textit{San Fernando}'s recapture right extends farther than \textit{Glen-dale}'s recapture right based on Water Code section 7075. That section expressly limits the use of natural facilities for imported water supplies so that native water rights would not be "diminished" when the imported water is recaptured. \textit{San Fernando}, however, appears to permit some impairment of native water rights—of both private individuals and public agencies—when stored imported waters are recaptured from the underground. For example, if the importing water agency claims appropriative or prescriptive rights to the native supply, those rights may conceivably now be reduced by the amount of imported water placed in the underground basin indirectly the year before by the agency's customers. That result would occur if an importing water agency is now presumed to have recaptured each year water it stored indirectly the previous year, absent any clear manifestation to the contrary.\textsuperscript{118}

\textbf{b. Creation of the recapture right}

Under \textit{San Fernando}, there are three elements necessary to establish the right of recapture: (1) the underground storage of imported water (2) by a public agency (3) with access to the underground basin. On the other hand, \textit{San Fernando} eliminates the requirements of prior recapture intent and physical tracing that the trial court had imposed.\textsuperscript{119}

Each of these elements is discussed below.

\textbf{(1) Imported water requirement}

The court found that the recapture right is based, at least partially, on the public policy of protecting the importer's investment by assuring that he receives proper credit for augmenting local water supplies. It expressly rejected the contention that the recapture right should also apply to native water:

The purpose of giving the right to recapture returns from delivered imported water priority over overlying rights and rights based on appropriations of the native ground supply is to credit the importer with the fruits of his expenditures and endeavors in bringing into the basin water that would not otherwise be there. Returns from deliveries of extracted native water do not add to the ground supply but only lessen the diminution occasioned by the extractions.\textsuperscript{120}

\begin{flushleft}
\textsuperscript{117} \textit{Id.} at 287, 537 P.2d at 1314, 123 Cal. Rptr. at 65.
\textsuperscript{118} See text accompanying notes 39-42a \textit{supra}.
\textsuperscript{119} 14 Cal. 3d at 259-61, 537 P.2d at 1294, 123 Cal. Rptr. at 45.
\textsuperscript{120} \textit{Id.} at 261, 537 P.2d at 1295, 123 Cal. Rptr. at 46 (footnote omitted).
\end{flushleft}
Since the decision bases this requirement on augmentation of the water supply, it is the author's view that the recapture right should also attach to local waters that would not normally percolate into the ground but for the action of local water conservation or waste water reclamation projects. Water agencies should receive recapture benefits for augmenting the groundwater supply through extraordinary investments and programs, whether the augmentation consists of imported or reclaimed local water. There is some indication in *San Fernando* that the court is in accord with this view. The decision recognizes that the Los Angeles County Flood Control District did augment the underground supply with native waters that would presumably not otherwise have reached the underground supply. Apparently, the supreme court did not apply the recapture right to that augmented supply solely because the District, which operates only as a spreading agency, did not seek that right.121

(2) Public Agency Requirement

*San Fernando* implies that at least some aspects of the recapture right are limited to public agencies. In essence, the decision recognizes the importance to the entire community of public water importation projects, and protects the equities that attach to those projects.

In particular, the priority aspect of the recapture right appears limited to public agencies, since the court subordinates private water rights to it.122 Furthermore, the ruling that the indirect recapture right remains in the importing city even after the city sells its imported water to its customers, implies a limitation of the recapture right to agencies that provide a public water service, rather than to private entities.123

(3) Access Requirement

*San Fernando* also suggests that the storage and recapture rights require access to the underground basin. However, it appears to require only physical access, rather than an overlying water service jurisdiction. Indeed, the underlying concept of the Water Code section 7075 right is the use of natural facilities that lie outside the users' jurisdiction.124 Furthermore, the decision does not indicate any disapproval of *Glendale's* recognition that Los Angeles uses underground storage in the Owens Valley to regulate the Los Angeles water supply.125

In establishing the indirect storage right, however, the decision does rely on the fact that the imported surface supplies are delivered to

121. Id. at 264 n.60, 537 P.2d at 1297 n.60, 123 Cal. Rptr. at 48 n.60.
122. Id. at 287, 537 P.2d at 1314, 123 Cal. Rptr. at 65.
123. See text accompanying notes 91-100 supra.
124. See text accompanying notes 80-85 supra.
125. 23 Cal. 2d at 76, 142 P.2d at 294.
areas overlying the underground basin. Only in that context does the decision require that the underground basin be within storing agency’s corporate boundaries. 126

(4) Elimination of Intent Requirement

San Fernando rejects the trial court’s requirement that an importer manifest a specific intent to recapture when the water is originally imported. 127 The supreme court relies on Stevens v. Oakdale Irrigation District, 128 which provides particularly strong authority for a presumed intent to recapture imported water.

In Stevens, the Oakdale Irrigation District had for thirty-two years allowed a portion of its imported water to escape into a natural channel as seepage, waste and spill. During that period, a downstream riparian had used the uncaptured portion of Oakdale’s imported water and had constructed expensive works to divert and distribute it. When Oakdale finally began to recapture that water by terminating its discharge into the stream channel, the downstream user’s crops failed for three successive years. The trial court ordered Oakdale to pay damages to the downstream user for interfering with his water supply. 129

In reversing the trial judgment, Stevens emphasized that the importing district had expended vast sums developing and obtaining its imported water supply 130 and that major water development projects required a long formative period before full utilization. 131 The court distinguished the right to recapture an imported water supply from the right to capture the corpus of specific imported waters. The abandonment of specific quantities of imported water was held not to constitute abandonment of the underlying right to recapture and use all of the water imported in some future year. The release of imported waters to the downstream user for thirty-two years did not impair Oakdale’s basic right to recapture its imported waters, even though the downstream user’s supply was cut off. 132 Stevens found that the public commitment inherent in constructing and operating works to import foreign water includes an adequate intent eventually to recapture all of the imported water supply. Although Stevens involved only the recapture of import-

126. 14 Cal. 3d at 259-60, 537 P.2d at 1294, 123 Cal. Rptr. at 45.
127. Id. at 259-61, 537 P.2d at 1294-95, 123 Cal. Rptr. at 45-46.
128. 13 Cal. 2d 343, 90 P.2d 58 (1939).
129. Id. at 345-47, 90 P.2d at 59-60.
130. Oakdale Irrigation District had imported water from the Stanislaus River for over 20 years. Six years prior to the lawsuit Oakdale expanded its Stanislaus diversion capability by constructing Melones Reservoir at a cost of over a million dollars. Id. at 345-46, 90 P.2d at 59-60.
131. Id. at 351, 90 P.2d at 62.
132. Id. at 350-51, 90 P.2d at 61-62.
ed waters from a surface creek bed rather than from an underground basin, Glendale extended that concept to groundwater basins, specifically to Los Angeles' storage of imported Owens Valley water in the San Fernando underground basins. San Fernando has now reaffirmed the extension.\textsuperscript{133}

(5) \textit{Elimination of Tracing Requirement}

San Fernando also rejects the trial court's requirement that the corpus of the stored water must be physically traced to the recaptured water. Instead, it applies a fungible goods commingling concept.\textsuperscript{134} The supreme court had adopted the commingling concept for imported waters transported in natural streambeds as far back as 1858 in \textit{Butte Canal v. Vaughn}:

The rights of the parties, after such mingling, are not unlike the rights of the owners of goods of equal value after their mixture—both are entitled to take their given quantity.\textsuperscript{135}

The San Fernando decision expressly extends the rule to underground basins and succinctly summarizes its application:

The recapture right, however, does not necessarily attach to the corpus of water physically traceable to particular deliveries but is a right to take from the comingled supply an amount equivalent to the augmentation contributed by the return flow from those deliveries.\textsuperscript{136}

III

\textbf{NILES SAND AND GRAVEL CO., INC. V. ALAMEDA COUNTY WATER DISTRICT}

The California supreme court's decision in \textit{Los Angeles v. San Fernando}, has attracted much more attention than the Court of Appeals' decision in \textit{Niles v. Alameda Water District}.\textsuperscript{137} San Fernando has a much broader impact on groundwater rights generally, and a more substantial and colorful history. Niles, however, appears to be the more significant decision in terms of basic underground storage rights because it deals directly with fundamental subsurface property rights. Whereas San Fernando established underground storage rights as an extension of the public right to transport imported water in natural water courses and deals essentially only with competing \textit{public} agencies, Niles establishes underground storage rights as a limitation on overlying \textit{private} property

\textsuperscript{133} 14 Cal. 3d at 257-60, 537 P.2d at 1292-94, 123 Cal. Rptr. at 43-45,
\textsuperscript{134} \textit{id.} at 220, 260, 537 P.2d at 1267, 123 Cal. Rptr. at 18.
\textsuperscript{135} 11 Cal. at 151.
\textsuperscript{136} 14 Cal. 3d at 260, 537 P.2d at 1295, 123 Cal. Rptr. at 46.
rights. The basic theory of *Niles* is that protection of a public ground-water supply requires protection of the underground storage space as well as of the stored groundwater itself.  

The storage aspect of groundwater management involves a stronger community interest than does the extraction aspect because it requires a broader public investment and coordination. The replacement of groundwater in an overdrafted basin is much more difficult and expensive than is the control or coordination of groundwater extraction. It requires the construction of additional local surface reservoirs or, more likely, importation of additional water supplies. Either of these solutions requires major capital investments which in turn require a broadly based community financing program. *Niles* recognizes that the realistic protection of underground storage capacity, as well as the basin's water supply, may require that the activities of overlying owners be regulated.

**A. The Factual Setting**

In *Niles* a private company had dug a large quarry pit in an underground basin known as the “Niles Cone” basin on the east side of San Francisco Bay. The company, which leased the land on which it was digging, extracted sand and gravel from the pit. The quarry operation began in 1952 at a location where the underground basin was forty feet below the surface of the ground.

The Alameda County Water District had been formed nearly forty years earlier, to protect the Niles Cone basin, and had been placing local surface waters in the underground basin since 1935. Although groundwater rights in the basin had not been adjudicated, the Alameda District acted as a *de facto* watermaster. It placed water in the underground basin so that the District’s residents could then extract it for their own uses. The District regulated those extractions to some degree, and

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138. Id. at 930, 112 Cal. Rptr. at 850.
139. Todd, *supra* note 9, at 304.
140. The Niles Cone Ground Water Basin lies under southwestern Alameda County, generally within the 96 square mile boundary of the Alameda County Water District. The basin was geologically formed over thousands of years by the deposit of sand, gravel and clay materials from the flow of Alameda Creek. Id. at 928; see also CAL. DEPT WATER RESOURCES, *EVALUATION OF GROUND WATER RESOURCES—SOUTH BAY*, Vol. I, at 3-7, 10-14 (Cal. State Water Resources Bul. No. 118-1, 1968) and *EVALUATION OF GROUND WATER RESOURCES—SOUTH BAY, APPENDIX A*, at 58-85 (Cal. State Water Resources Bul. No. 118-1, 1967). The annual safe yield of the basin’s native water is about 25,000 acre feet, while Alameda County Water District’s annual water service demand is about 40,000 acre feet. Address by Stanley Saylor, Chief Engineer, to the Southern California Water Conference, March 17, 1975.
141. 37 Cal. App. 3d at 927, 929, 112 Cal. Rptr. at 848, 849.
142. Id. at 928, 112 Cal. Rptr. at 849.
assessed the area overlying the basin for the costs of replenishing the underground water supply.\textsuperscript{143}

The quarry operations began at a time when the basin was not full, predating by ten years enactment of an expanded District groundwater management authority\textsuperscript{144} and the District’s execution of a State Water Project supply contract.\textsuperscript{145} The quarry operators expected to encounter groundwater in their excavation and installed special facilities to pump water from their excavations. By 1969, seven years after the District had begun placing imported State Project water in the underground basin, the quarry operator’s pit had encroached some 80 feet into the basin. At that point the flow of groundwater into the pit was great enough to seriously impair the quarry operation.\textsuperscript{146}

The quarry operator pumped large quantities of this seepage water out of the pit into a flood control channel where most of it flowed unused into San Francisco Bay. The amount of groundwater pumped out of the pit was substantial enough to impair the Alameda District’s groundwater replenishment program. The extracted water totaled several billion gallons over a two-year period and reached a daily rate of five million gallons, large enough to supply a city with a population of 30,000 people.\textsuperscript{147}

In addition to depleting the groundwater supply, the quarry operator’s extraction of sand and gravel from the pit removed the porous material that held the groundwater, thus reducing the basin’s storage capacity.\textsuperscript{148} The extraction of sand and gravel also impaired the basin’s capability to store water under the hydrostatic pressure needed to pre-

\textsuperscript{143} Id. at 928, 112 Cal. Rptr. at 849.

\textsuperscript{144} Ch. 1942 [1961] Cal. Stat. 4092. Section 4(b) of the Act authorizes Alameda County Water District “to store water in underground water basins”; and Sections 4(f) and 11 authorize the levy of annual replenishment assessments on the production of groundwater, commonly referred to as a pump tax. \textit{Niles} expressly recognized the validity of the District’s groundwater management program, and the District’s ownership of the ground water as trustee for the overlying surface owners. 37 Cal. App. 3d at 928-29 n.5, 112 Cal. Rptr. at 849 n.5.

\textsuperscript{145} Alameda County Water District executed a contract with the State, dated November 29, 1961, for the delivery of a permanent supply of water from the State Water Project, with a maximum annual delivery of 42,000 acre-feet. \textit{Brief for State of California as Amicus Curiae} at 7-8, Alameda County Water District v. Jamieson, Civil No. 400155 (Alameda Superior Court, Filed Apr. 7, 1971).

\textsuperscript{146} 37 Cal. App. 3d at 926, 112 Cal. Rptr. at 847. \textit{Brief for State of California as Amicus Curiae} at 3.

\textsuperscript{147} The two quarry operators originally involved in the litigation pumped some 23,000 acre feet (7.5 billion gallons) of ground water out of the excavations and over half of that water, some 13,000 acre feet (4.2 billion gallons) flowed unused to the Bay. Alameda County Water District v. Jamieson, Civil No. 400155, Memorandum Decision (Alameda Superior Court, Oct. 15, 1971) at 6 and \textit{Niles} v. Alameda, 37 Cal. App. 3d at 929, 112 Cal. Rptr. at 849.

\textsuperscript{148} Record in Alameda v. Jamieson, Civil No. 400155, at 317, 360.
vent the pollution of the groundwater by the intrusion of saline waters from the Bay.\textsuperscript{149}

The overlying owner sued the Alameda District for over a million dollars in damages that he claimed were caused by groundwater seepage into the quarry pit.\textsuperscript{150} Alameda, in turn, sued the quarry operator to enjoin it from pumping the groundwater out and to recover damages for the groundwater previously pumped from the pit.\textsuperscript{151}

\section*{B. The Trial Judgment}

The trial court granted a permanent injunction to the Alameda County Water District and dismissed the inverse condemnation claims which were raised against it.\textsuperscript{152} It held that the quarry operator had failed to establish the existence of a basic property right to the maintenance of a dry subsurface within the underground basin area. However, the judgment specifically limited the operation of the injunction against pumping water from the basin to depths below historical groundwater levels.\textsuperscript{153}

The basis of the trial court decision was that Alameda held an "acknowledged public servitude" to raise underground water levels to their historical maximum. The court concluded, therefore, that the overlying owner had failed to establish the existence of a property interest affected by Alameda's storage of water under his land. The Memorandum Decision went on to caution that if the overlying owner had established a property interest in the underground basin, neither the police power justification for the storage operation nor the community's need for water would exempt Alameda from compensating the quarry operator for flooding damages.\textsuperscript{154}

\begin{footnotesize}
\textsuperscript{149} Id. at 317, 359-60, 366-67. See also 37 Cal. App. 3d at 931 n.8, 112 Cal. Rptr. at 851 n.8.
\textsuperscript{151} 37 Cal. App. 3d at 926, 112 Cal. Rptr. at 847-48.
\textsuperscript{152} The trial court bifurcated the trial between issues of liability and damages. Niles v. Alameda, 37 Cal. App. 3d at 926, 112 Cal. Rptr. at 848. In the liability phase, the court found that Niles had caused 7,700 acre-feet of Alameda District's stored groundwater to flow unused into the San Francisco Bay. Alameda v. Jamieson, Memorandum Decision (Oct. 15, 1971) at 6. After the damages trial, the court set Alameda's damages at $273,000. Alameda County Water District v. Niles, Civil No. 403003 (Alameda Superior Court, Apr. 4, 1975). Niles is currently appealing the award.
\textsuperscript{153} The trial court found that under natural conditions the average groundwater elevation was forty feet below the earth's surface, and accordingly limited its injunction to water located below that level. Alameda v. Jamieson, Memorandum Decision (Oct. 15, 1971) at 5-7.
\textsuperscript{154} Id. at 3, 5.
\end{footnotesize}
C. Relevance to State-Wide Management

The court was aware that its decision would affect groundwater management throughout California. A former Director\textsuperscript{155} of the state's Department of Water Resources testified at the trial on the extent of groundwater storage operations:

Replenishment programs of this nature through artificial recharge of the local run-off and water from nontributary sources is a type of program which is very widely practiced in the State of California and in many parts of the United States, as well as other parts of the world.\textsuperscript{156}

He also emphasized the importance of storing water underground because California's surface storage capacity is nearly exhausted and because underground storage is necessary to regulate State Water Project and Federal Central Valley Project water supplies.\textsuperscript{157}

At trial, the court was specifically advised of the wide ramifications its decision would have on the underground storage of water that the State Water Project delivers to various portions of the state. The Department of Water Resources filed an amicus brief noting that part of the water Alameda was storing underground was imported from the State Water Project. It described Alameda's groundwater storage program as vital for implementing the state's public policy of utilizing its water resources as efficiently as possible, stating:

The issues to be decided in this case will affect all future replenishment programs carried on by local districts throughout the State, and, in turn, will affect the Department's plans to deliver water to local districts that are presently buying or planning in the future to buy water from the State Water Project.\textsuperscript{158}

D. Correlative Rights

At the time of its decision, the appellate court in \textit{Niles} was in effect faced with a case of first impression. The one prior underground storage decision, \textit{Glendale}, had become doubtful authority since it had been restrictively interpreted by the \textit{San Fernando} trial court and the supreme

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{155} Harvey O. Banks, a well known consulting civil engineer, active in water resources management generally, in groundwater management specifically, and coauthor of \textit{KRIEGER & BANKS, supra} note 9. The appellate court stated that Mr. Banks' qualifications as an expert "were, and are, unchallenged" and quoted excerpts from his trial testimony. \textit{Niles v. Alameda}, 37 Cal. App. 3d at 930, 112 Cal. Rptr. at 850.
\item \textsuperscript{156} Record in \textit{Alameda v. Jamieson}, Civil No. 400155 (Alameda Superior Court, Oct. 15, 1971) at 319 (emphasis added). This testimony is also reproduced in Brief for Respondent at 6-7, \textit{Niles v. Alameda}. Mr. Banks also testified that as of 1954, 86 groundwater recharge programs were operational within the State, and that groundwater recharge programs had become much more widespread since then. \textit{Id.} at 321-22.
\item \textsuperscript{157} \textit{Id.} at 321.
\item \textsuperscript{158} Brief for State of California as Amicus Curiae at 10, \textit{Alameda v. Jamieson}.
\end{itemize}
\end{footnotesize}
court had not yet indicated whether it would uphold or reject that lower court interpretation.

The Niles court avoided the problems posed by the trial court’s decision in San Fernando by basing its decision primarily on a new application of the old correlative water rights doctrine.\(^{159}\) The doctrine arose at the beginning of the century when the California Supreme Court set aside the common law rule of absolute ownership and use in an extremely important case in the development of California’s groundwater law, *Katz v. Walkinshaw*.\(^{160}\)

*Katz* expressly excluded groundwaters from the common law’s *cujus est solum ejus est usque ad inferos* absolute ownership rule, which provided that the owner of the surface of land also owned everything beneath the surface. It thus imparted to the owner of land an absolute right to control and use everything under that land. The leading groundwater authority prior to *Katz* was the 1843 English Chancery decision in *Acton v. Blundell*.\(^{161}\) That decision had invoked the absolute ownership rule in refusing relief to a landowner when an adjoining coal mining operation dried up the landowner’s springs.

In two decisions by two successive justices,\(^{162}\) *Katz* refused to apply

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159. In applying the correlative rights doctrine, *Niles* chose a broad base for its decision, although a narrower one was arguably available in the form of a conditional use permit issued by the City of Fremont that required the quarry operator to cooperate with the Alameda County Water District to the end that water pumped in connection with [its] . . . operations shall not be wasted to San Francisco Bay nor shall groundwater percolation capacity be diminished in quality or quantity. (37 Cal. App. 3d at 927 n.3, 112 Cal. Rptr. at 848 n.3).

The *Niles* court found that the permit conditions alone were sufficient ground to reject the landowner’s claim against the Alameda District, stating that the portion of the judgment enjoining the quarry operator from pumping the extraction pits without Alameda’s consent amounted to no more than a judicial imposition of the restraint which was already imposed upon appellants as an explicit condition of the revocable use permit which controlled their land . . . . As they have lost no rights which they had, in fact, there has been no actual ‘taking’ or ‘damaging’ of their property which is compensable under Article I, section 14 [of the California Constitution]. (Id. at 935, 112 Cal. Rptr. at 854).

However, had the court ruled solely on the basis of the conditional use permit, it would not have resolved the basic issue of whether an overlying owner’s real property interest must give way to public use of the water storage spaces below his land. By choosing to invoke the correlative rights doctrine, *Niles* met that basic issue head-on and probably avoided subsequent litigation challenging the conditional use permit itself.

160. 141 Cal. 116, 74 P. 766 (1903).


162. Justice Temple wrote the original opinion in 1902; *Katz v. Walkinshaw*, 141 Cal. 138, 70 P. 663 (1902). Because the issues were so important to the state’s water suppliers, the court reheard the appeal, with counsel for ten additional water suppliers from throughout the State appearing as *Amici Curiae*. Justice Temple died during the rehearing period, and the new justice, Lucien Shaw, wrote the second opinion in 1903, affirming Justice Temple’s original opinion. *Katz v. Walkinshaw*, 141 Cal. at 120, 137, 74 P. at 766, 773.
the absolute ownership rule in California, and permitted a landowner to
enjoin a neighbor's export of groundwater, so long as those groundwa-
ters were needed on land overlying the underground basin. \textit{Katz}
described at length California's indigenous water shortage conditions,
compared them with the humid English conditions under which \textit{Acton}
was decided, and invoked Civil Code section 3510, which states:
"When the reason of a rule ceases, so should the rule itself."\textsuperscript{163}

In the first \textit{Katz} opinion, Justice Temple captured the essence of
the holding when he stated:

In short, the members of the community, in the case supposed, have
a common interest in the water. It is necessary for all, and it is
an anomaly in the law if one person can for his individual profit
destroy the community and render the neighborhood uninhabitable.\textsuperscript{164}

In order to protect the community interest in the water supply, the
\textit{Katz} court applied the correlative rights doctrine. That doctrine pro-
vides that each owner of land that lies over an underground basin has a
right to use a reasonable amount—an amount necessary for reasonable
use on his overlying parcel—of the groundwater in the basin. Thus, all
the landowners overlying the basin have similar, or correlative, rights to
use the common supply on their respective parcels of overlying land.\textsuperscript{165}

\textit{Niles} summarizes the correlative rights doctrine as follows:

\textit{[A]}s between the owners of land overlying strata of percolating waters,
the rights of each to the water are limited, in correlation with those
of others, to his 'reasonable use' thereof when the water is insuffi-
cient to meet the needs of all.\textsuperscript{166}

\textbf{E. The Storage Right}

\textit{Niles} extended \textit{Katz} by establishing an underground storage right
based on the existence of a public servitude for groundwater and
groundwater conservation purposes. A property owner's right to use
the ground beneath his land does not now include, and apparently has
not included for the past seventy years, the right to use the underground
in a manner that would impair a public groundwater storage program.
In declaring the servitude, \textit{Niles} followed \textit{Katz} in rejecting a strict
interpretation of California's statutory incorporation of real property
ownership rights. Although the \textit{Niles} court did not deal very specifical-
ly with these statutes, it is clear that the decision severely limits their
scope. These statutes are discussed in the section below.

\textsuperscript{163} 141 Cal. at 123, 74 P. at 767.
\textsuperscript{164} 141 Cal. 138, 140, 70 P. 663, 665 (1902).
\textsuperscript{165} 141 Cal. 116, 74 P. 766 (1903).
\textsuperscript{166} Niles v. Alameda, 37 Cal. App. 3d 924, 934, 112 Cal. Rptr. 846, 853.
I. Civil Code Section 829

Section 829 codifies the common law rule that landowners have vested rights to everything permanently situated beneath the land's surface. It states that: "The owner of land in fee has the right to the surface and to everything permanently situated beneath or above it." In *Niles*, the overlying owner argued that he had the absolute right to use the land "to unlimited depths below its surface," pursuant to section 829, and that the flooding of his quarry pits interfered with his subterranean rights in his land. He went on to charge that the declaration of a public storage servitude would create a new property interest merely to circumvent Alameda's eminent domain responsibility under the State Constitution.

The appellate court rejected these arguments by distinguishing between subsurface water and subsurface land and finding that the correlative rights doctrine pertains to the use of subsurface water rather than subsurface land:

Read together, the [trial court's] conclusions unmistakably express the court's application of the so-called 'correlative rights doctrine' which pertains, not to surface owners' use of their lands within an underground water basin, but to their use and disposition of water percolating in it.

The court approved the designation of Alameda District's underground storage right as a servitude created by the correlative rights doctrine:

The trial court was also correct in using the word 'servitude' to connote the obligation imposed by the [correlative rights] doctrine upon appellants, as landowners in the basin, to refrain from discharging more than their reasonable share of the underground water therein; the term ('servitude') is commonly used with reference to such obligations when imposed by law, and limiting the use of lands lying in a particular geographical area, where an overriding public interest requires it.

Thus, the decision applies the servitude as a burden on the property owner's subsurface land, even though the subject matter of the servitude is the right to use the percolating groundwater rather than the right to use the subsurface land itself. This apparent inconsistency reflects only the close physical interrelationship between subsurface land

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168. 37 Cal. App. 3d at 932-33, 112 Cal. Rptr. at 852; art. I, § 14 of the California Constitution provides that:
   Private property shall not be taken or damaged for public use without just compensation having been made to . . . the owner . . .
169. Id. at 933, 112 Cal. Rptr. 852 (footnote omitted).
170. Id. at 934, 112 Cal. Rptr. at 853.
and water, as well as the distinction between the correlative water right and the subsurface water within the property.

*Niles* found that the subsurface water supply could not be protected without burdening the overlying land, and based the subsurface servitude on the protection established for community groundwater supplies in the 1903 *Katz* decision:

the court merely declared the existence of the 'public servitude' in the Niles Basin and fixed its level. The 'servitude' having been declared by application of the correlative rights doctrine, which originated in 1903 (*Katz v. Walkinshaw*, supra, 141 Cal. 116), it has applied to surface owners in the basin (as throughout California) ever since, and has accompanied any devolution of title by which appellants hold the property in question.

Although California law defines the term "servitude" negatively, as the burden on land caused by an easement, Civil Code section 801 recognizes both flooding and water flow servitudes as positive rights:

The following land burdens, or servitudes upon land, may be attached to other land as incidents or appurtenances, and are then called easements:

10. The right of flooding land;
11. The right of having water flow without diminution or disturbance of any kind;

The application of the "servitude" concept in *Niles*, where both flooding and water flow burdens were at issue, seems entirely appropriate. *Niles* makes it clear that a servitude can extend to underground as well as surface flooding and water flow.

It is very important to note, however, that *Niles* limited the underground storage servitude to operations that provide a public water supply service:

The court also properly denominated the 'servitude' as 'public,' because the right to enforce it is held by a public agency (respondent

171. Id.
172. Id. at 935, 112 Cal. Rptr. at 853.
173. The conventional definition of a servitude is:
A charge or burden resting upon one estate for the benefit or advantage of another . . . . When the freedom of ownership in land is fettered or restricted, by reason of some person, other than the owner thereof, having some right therein, the land is said to "serve" such person. The restricted condition of the ownership or the right which forms the subject-matter of the restriction is termed a "servitude". . . . BLACK'S LAW DICTIONARY (4th ed. 1968) at 1535.
district) as trustee for all surface owners and suppliers of water (i.e., the 'public') in the Niles Basin.\textsuperscript{175}

The resulting description of the servitude as "public" represents a somewhat novel type of servitude classification since the benefits from servitudes are generally considered to obtain to specific tracts of land. One notable exception is the judicial development of equitable servitudes to assure the orderly development of new subdivision communities.\textsuperscript{176} Actually, there does not appear to be any inherent incompatibility in applying the benefit of a servitude to an entire community rather than to particular individuals.

2. \textit{Civil Code Section 659}

Civil Code section 659 poses a more difficult problem than does section 829. Section 659 complements section 829 by defining land as the "material of the earth, whatever may be the ingredients of which it is composed, whether soil, rock or other substance. . . ."\textsuperscript{177} A 1963 amendment added, \textit{inter alia}, to that definition, "free or occupied space for an indefinite distance upwards as well as downwards," and deleted the adjective "solid" as a limitation on the phrase "material of the earth."\textsuperscript{178}

The amendment subjected the "upwards" part of the definition "to limitations upon the use of airspace imposed, and rights in the use of airspace granted by law," without any similar limitation on the "downwards" portion of the definition. As amended, therefore, the section arguably reflects a legislative recognition that a landowner owns the subsurface spaces contained within his land.

However, the 1963 amendment reflected concerns over contemporary airspace problems, without any apparent legislative consideration of groundwater resources. Airspace problems had been quite controversial. In fact, the legislature had previously attempted to deal with the ownership of airspace rights in Public Utilities Code section 21402, which provides:

\textsuperscript{175} 37 Cal. App. 3d at 934, 112 Cal. Rptr. at 853.
\textsuperscript{176} 3 \textsc{Miller} & \textsc{Starr}, \textit{supra} note 31, at 328.
\textsuperscript{177} \textsc{Cal. Civil Code} § 659 (West Supp. 1976) provides in full:

\begin{quote}
Land is the \textit{solid} material of the earth, whatever may be the ingredients of which it is composed, whether soil, rock, or other substance, \textit{and includes free or occupied space for an indefinite distance upwards as well as downwards, subject to limitations upon the use of airspace imposed, and rights in the use of airspace granted, by law.} (See note 178 regarding strike out and emphasis.)
\end{quote}

\textsuperscript{178} The 1963 amendment to § 659 added all the text after the word "substance", and deleted the adjective "solid" immediately prior to the word "material", as indicated by the strike out and emphasis in note 177.
The ownership of the space above the land and waters of this State is vested in the several owners of the subsurface beneath, subject to the right of flight described in Section 21403. No use shall be made of such airspace which would interfere with such right of flight; provided, that any use of property in conformity with an original zone of approach of an airport shall not be rendered unlawful by reason of a change in such zone of approach.\textsuperscript{179}

But the legislature has also recognized similar public interests in underground water basins:

It is hereby declared that the people of the State have a primary interest in the correction and prevention of irreparable damage to, or impaired use of, the groundwater basins of this State caused by critical conditions of overdraft, depletion, sea water intrusion or degraded water quality.\textsuperscript{180}

The storing of water underground . . . constitutes a beneficial use of water if the water so stored is thereafter applied to the beneficial purposes for which the appropriation for storage was made.\textsuperscript{181}

Furthermore, the legislature has explicitly authorized several local water agencies throughout the state to store water underground.\textsuperscript{182} In particular, the legislature had authorized the Alameda District to store water in, and to recapture stored water from, the Niles Basin.\textsuperscript{183} These
statutory recognitions of the use of airspace under land to store water provide a striking parallel to the statutory recognition of public aviation use of airspace above land.\textsuperscript{184}

Finally, the correlative water rights doctrine in \textit{Katz} manifested a clear governmental recognition of the public interest in community use of underground water supplies. Indeed, \textit{Katz} modified three generations ago the common law concept of absolute ownership implicit in section 659. Thus, although \textit{Niles} does not refer to section 659, that provision arguably offered little support to the landowner's condemnation claim.

3. Storage Limitation

While recognizing the public's underground storage right, \textit{Niles} limited the amount of underground storage space subject to the storage servitude: the storer cannot raise underground water levels higher than they have been historically. The court termed this a "state of nature" limit and defined it as "that condition which would have existed without diversion from the watershed and/or extractions from the basin."\textsuperscript{185}

Consequently, \textit{Niles} recognized that overlying property owners have compensable rights for seepage damage to surface and near surface lands and structures which are caused by raising groundwater levels above "natural" elevations: such use of the basin is unreasonable in terms of the correlative rights doctrine. Specific identification of that limit apparently requires reconstruction of the groundwater conditions that existed prior to settlement by the overlying community. Indeed, that reconstruction relates back prior to the 1903 creation of the servitude.

Since the state of nature pre-dates artificial watershed diversions as well as groundwater extractions, it relates back to the first diversion of surface waters. Thus, a public agency may generally fill an underground basin well above current water levels, because water diversions and extractions will probably have reduced the basin's groundwater supply substantially below its original historical level. Consequently, the state of nature limitation preserves most, if not all, of the state's underground storage capacity.\textsuperscript{186}

The state of nature limit, however, may require additional clarification for swamp lands that have been drained and have thus become useable as a result of accumulated groundwater overdrafts. Subsequent

\textsuperscript{184} See CAL. CIV. PRO. §§ 1239.2, 1239.3 and 1239.4 (West 1972).
\textsuperscript{185} 37 Cal. App. 3d at 929, 112 Cal. Rptr. at 849.
\textsuperscript{186} Because of the semi-arid climate of California's urban and agricultural areas, local water development has been an integral part of any community settlement. \textit{See} CALIFORNIA WATER PLAN, supra note 9, at 11, 23-24.
surface and near surface development on those lands appears to merit protection against seepage damage that would now occur if the underground basin were filled to maximum historical levels. Since the underground storage servitude implements a public policy established to protect the overlying community, it should include reasonable protection against that type of damage.

F. Protection of the Right: Police Power

_Niles_ protected the Alameda District's underground storage right by enjoining groundwater extractions from the quarry pit and by denying any inverse condemnation relief. The denial of inverse condemnation relief for flooding the quarry operations was particularly significant because it imbued the underground storage right with police power status.

In declaring the police power protection, the _Niles_ court went substantially beyond the trial judgment by holding that the Alameda District's underground storage operations represented a non-compensable police power regulation under Article XIV, Section 3 of the California Constitution. Thus, it concluded, even if overlying owners have a property interest in the underground basin, subsurface flooding damage caused by the storage operation is "not constitutionally compensable because it is the result of the district's exercise of its police powers."

The overlying owners argued that federal law, as well as California law, required compensation for damages that result from artificially causing water to flow over the surface of another's land and that this protection also applied to subsurface flooding. They recognized that the Alameda District's underground water storage with its resulting injury to the quarry operations represented a necessary public purpose, but insisted that it was an eminent domain taking rather than a police power regulation. They also noted that the decision would set a significant precedent for the storage of imported water from the State Water Project in underground basins throughout the state.

The _Niles_ court denied the landowners' taking claim by invoking Article XIV, Section 3 of the California Constitution. Article XIV,
Section 3 is a self-executing provision that (1) requires that California's water resources be put to optimum use and (2) enjoins waste or unreasonable use of water. What is reasonable is a question of fact to be determined on a case-by-case basis. The section was enacted in 1928 after extensive statewide debate and provides:

It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or water course in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water. Riparian rights in a stream or water course attach to, but to no more than so much of the flow thereof as may be required or used consistently with this section, for the purposes for which such lands are, or may be made adaptable, in view of such reasonable and beneficial uses; provided, however, that nothing herein contained shall be construed as depriving any riparian owner of the reasonable use of water of the stream to which the owner's land is riparian under reasonable methods of diversion and use, or of depriving any appropriator of water to which the appropriator is lawfully entitled. This section shall be self-executing, and the Legislature may also enact laws in the furtherance of the policy in this section contained.

In applying this constitutional provision to the underground storage of water, Niles relied on two cases that had applied the provision to the diversion of surface waters, Gin S. Chow v. City of Santa Barbara and Joslin v. Marin Municipal Water District. Gin S. Chow limited riparian rights that had previously been declared vested by an unbroken line of cases extending back to 1886.
Specifically, it eliminated the absolute priority to flood-waters that had been considered part of a riparian’s entitlement to the full flow of a stream, basing that limitation on the then recently enacted Article XIV, Section 3, of the California Constitution.

In emphatic terms *Gin S. Chow* held that this section represented a legitimate exercise of the state’s police power:

> That the constitutional amendment now under consideration is a legitimate exercise of the police power of the state cannot be questioned. It is the highest and most solemn expression of the people of the state in behalf of the general welfare. The present and future well-being and prosperity of the state depend upon the conservation of its life-giving waters.¹⁹⁸

*Gin S. Chow* ruled that Article XIV, Section 3 only regulated the exercise of water rights for the public benefit and was therefore not a taking of those rights.¹⁹⁹ *Niles* has similarly limited the property right claimed by an overlying land owner to full use of the ground beneath his property. It has subordinated that right in order to permit a public agency to store imported water underground, free of rent or subsurface flooding damage liability, to the extent groundwaters occurred there historically.

In extending the reasoning of *Gin S. Chow* to subsurface waters, *Niles* relied on *Joslin v. Marin Municipal Water District*, which had more recently stated that Article XIV, Section 3 applies to all natural waters in the state:

> The police power thus endorsed by the Constitution applies to all water rights enjoyed or asserted in this state, whether the same be grounded on the riparian right or the right analogous to the riparian right, of the overlying land owner, or the percolating water right, or the appropriative right.²⁰⁰

*Niles* presents an interesting analogy to *Joslin*, since both cases involved inverse condemnation claims by private rock and gravel quarry operators against public agencies. In *Joslin*, the quarry operator sued because a water district had constructed a dam that had cut off the surface stream flows that previously carried sand and gravel down to the quarry site. The supreme court held that as a matter of law the use of stream flows to transport rock and gravel was unreasonable under the Constitutional limitations of Article XIV, Section 3.²⁰¹

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¹⁹⁸ 217 Cal. at 701, 22 P.2d at 16.
¹⁹⁹  Id. at 701, 22 P.2d at 16; see also SWRCB v. Forni, 54 Cal. App. 3d at 753.
²⁰⁰ 37 Cal. App. 3d at 936-37, 112 Cal. Rptr. at 855, quoting Joslin v. Marin Water Dist., 67 Cal. 2d at 138, 429 P.2d at 893, 60 Cal. Rptr. at 381 (emphasis added by *Niles* court).
²⁰¹  67 Cal. 2d at 141, 60 Cal. Rptr. at 383.
In *Niles*, on the other hand, the rock and gravel operator sued because a public agency was flooding its quarry, and the court held that the flooding was privileged under the same constitutional section. *Niles* thus extended Article XIV, Section 3 to groundwater storage rights.

The two cases are obviously distinguishable in that one sought the release of water flows while the other sought protection from water flows. However, each case demonstrates the importance which the courts attach to the constitutional directive that California's water resources be used beneficially "to the fullest extent of which they are capable."

By pumping more of the District's stored water from the underground basin than he needed for reasonable beneficial uses on his overlying land, the landowner exceeded his share of the water supply, thus exceeding his correlative overlying water right. Rather than utilizing that excess water for reasonable beneficial uses elsewhere, however, the landowner discharged it into the San Francisco Bay, thus wasting it within the conventional context of Article XIV. In addition, the quarry operation physically interfered with the District's underground storage operation.

In refusing inverse condemnation damages for the quarry flooding caused by the underground water storage, *Niles* found that the quarry operation was an unreasonable use of the underground storage space. Although *Niles* did not expressly distinguish between "all water rights" and underground water storage rights, it clearly applied Article XIV, Section 3 to the Alameda District's underground storage operations when it concluded that the District's activities were carried on in the exercise of its police powers.

**IV**

**EXCHANGE STORAGE**

Neither *Niles* nor *San Fernando* discussed one area of the protection component that does require clarification. That area is "exchange" storage, the underground storage that results when a groundwater right owner forgoes the extraction of a certain amount of groundwater by substituting imported surface water supplies. The Legislature has encouraged that type of substitution in order to reduce groundwater overdrafts in Southern California. The implementing provisions of the Water Code merely protect the underlying groundwater right from impairment due to prescription or non-use.

202. See text accompanying note 165 supra.
203. See text accompanying notes 147-49 supra.
204. 37 Cal. App. 3d at 937, 112 Cal. Rptr. at 855.
Water Code sections 1005.1 and 1005.2 do not refer to the ownership of the specific amount of groundwater left in the ground each year as a result of the substituted use of imported surplus waters. They refer instead only to the ownership of the underlying right to perennial groundwater. The entity bearing the cost of substituted surface water supply should logically have a claim to the resulting groundwater augmentation, and should be permitted to preserve, lease or sell its rights to these “exchange” waters.

Clarification of the ownership of that augmented water is important since in many instances that type of exchange storage represents the most efficient, and sometimes the only, means of storing water underground. However, since neither San Fernando nor Niles involved claims for in-lieu storage, additional judicial, legislative or contractual authority will apparently be necessary to provide the protection necessary for storing water underground by surface water exchange provisions.

V

PUBLIC PRIORITIES

The priority of an underground storage right refers to the manner in which underground storage space will be apportioned among competing storers when there is a shortage in storage space. Actually, the priority rules concern the storage, protection, and recapture components. When more water is stored underground than the ground basin can contain, some of that water will either cause surface seepage damage, or will “spill” to downstream areas subject to other groundwater management jurisdictions.

Although neither Niles nor San Fernando deal directly with underground storage priorities, each seems to imply that overlying water agencies have a prior right to store enough water underground to assure an adequate annual water supply for the overlying community. The correlative rights concept of Niles is premised on protecting the overlying community’s water supply. Similarly, the “natural reservoir” concept of San Fernando incorporates the “excess capacity” limitation of Water Code section 7075, which in turn recognizes that underground storage must not interfere with the local groundwater supply.

As noted above, the Alameda District acted as a de facto watermaster.206 It stored local and imported water underground so that anyone overlying the basin could extract the stored water. The District’s residents in turn reimbursed the District for the costs incurred in

206. See text accompanying note 143 supra.
obtaining and storing the extracted water.\textsuperscript{207} The correlative rights concept of \textit{Niles} is premised on protecting the overlying community's water supply,\textsuperscript{208} and thus the District apparently had first priority to all the underground space up to the basin's natural safe yield.

\textit{San Fernando}, on the other hand, imposed certain underground storage limits on Los Angeles, the one city that owned all the native groundwater rights. It in effect required Los Angeles to exercise those rights so that overlying cities, with no native groundwater rights, could store imported water underground. However, \textit{San Fernando} expressly avoided ruling on how storage priorities would be apportioned should underground storage space shortages eventually arise.\textsuperscript{209} The court did retain jurisdiction over the parties in a manner that would facilitate establishing storage priorities should shortages occur. The \textit{San Fernando} court also indicated that groundwater rights include a priority to use a certain amount of underground storage space to regulate fluctuations in the local precipitation recharging the basin.\textsuperscript{210}

However, many underground basins contain more storage capacity than the overlying community requires. Indeed, part of Los Angeles' underground storage right in the San Fernando Basin is used to supply areas that lie outside the San Fernando Valley.\textsuperscript{211} This is the type of underground storage that the state contemplates using conjunctively with the State Water Project, that was described to the \textit{Niles} court,\textsuperscript{212} and that the \textit{San Fernando} decision anticipated.

The cost of fully utilizing a basin's underground storage capacity may in fact exceed the reasonable financing capability of overlying local agencies. Those agencies may well prefer that regional water agencies use a basin's excess storage capacity to store water supplied and financed by regional or state agencies.

For example, the overlying communities might thereby participate in State Water Project benefits to a larger extent than they do as conventional customers of State Project water, by reducing the Project's need to build more expensive surface reservoirs. Since the Project's water users must eventually repay those costs, any reduction in Project construction costs would lower water prices from what they otherwise would have been. In addition, the overlying communities would realize incidental storage benefits such as reduced groundwater pumping lifts, reduction of water treatment costs, reduced groundwater salinity, and

\begin{itemize}
\item \textsuperscript{207} See 37 Cal. App. 3d at 929 n.5, 112 Cal. Rptr. at 849 n.5.
\item \textsuperscript{208} See text accompanying notes 165-66 supra.
\item \textsuperscript{209} See text accompanying note 101 supra.
\item \textsuperscript{210} See text accompanying notes 102-106 supra.
\item \textsuperscript{211} 14 Cal. 3d at 209-10, 537 P.2d at 1260, 123 Cal. Rptr. at 11.
\item \textsuperscript{212} See text accompanying note 157 supra.
\end{itemize}
perhaps state financial participation in the costs of storage, extraction, and distribution works.\textsuperscript{213}

VI

CONCLUSION

The expansion of California's communities and their increase in population have led to increased demands on, and overdrafts of, groundwater supplies.\textsuperscript{214} The state's basic water management problem is still the same as it was at the turn of the century—protection of a limited water supply. Today, however, a wider range of solutions is available to water agencies to protect water supplies.

The groundwater storage rules established in \textit{Niles} and \textit{San Fernando} reflect current public concern that the state's existing resources, both natural and man-made, be used to their fullest extent. In the tradition of the common law, these decisions extend yesterday's rules to meet today's problems.

The chief significance of \textit{Niles} lies in its recognition of a prior public right to use the underground to store imported water supplies. A public agency can now place large quantities of water into natural underground basins without liability to overlying property owners, so long as the resulting groundwater elevations remain lower than the maximum historical groundwater levels.

\textit{San Fernando} leaves no doubt that unused underground storage capacity throughout the state may be used to store imported water, and that the importer has an exclusive right to recapture that water as long as local water rights are adequately protected.

Although \textit{Niles} and \textit{San Fernando} deal with different aspects of underground storage and utilize separate lines of legal authority, each complements the other by extending well-established water law concepts to groundwater storage. \textit{Niles} upholds underground storage rights against an overlying property owner's claim of subsurface interference, while \textit{San Fernando} upholds underground storage rights against rights to extract native groundwater from the basin.

Between them, the two decisions have judicially established four public rights that, taken together, represent the general underground

\begin{footnotes}
\footnote{213. \textsc{Gleason }\& \textsc{Georgeson, supra} note 28, at 33-34.}
\footnote{214. See note 5 \textit{supra}, text accompanying note 18 \textit{supra}, and \textsc{California Water Plan, supra} note 9, at 13. The Legislature has declared that the State's underground water supplies are: subject to critical conditions of overdraft, depletion, sea water intrusion and degraded water quality causing great detriment to peace, health, safety and welfare of the people of the State. \textsc{Cal. Water Code} § 12922.1 (West 1971).}
\end{footnotes}
storage right and that are of critical importance if California is to realize the full potential of its groundwater basins:

1. The right to store water in a natural underground basin without compensating overlying landowners;
2. The right to protect the stored water from expropriation by others and from inequitable operational burdens;
3. The right to recapture the stored water when it is needed; and
4. The public's priority to store water underground when there is a shortage of underground storage space.