ADDENDUM 1

Definitions

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Definitions

Appraisal-Related Definitions

Appraisal. (noun) The act or process of developing an opinion of value; an opinion of value. (adjective) Of or pertaining to appraising and related functions such as appraisal practice or appraisal services.[1]

Appraiser. One who is expected to perform valuation services competently and in a manner that is independent, impartial, and objective.[2]

Appraiser's Peers. Other appraisers who have expertise and competency in a similar type of assignment.[3]

Appurtenance. Something that has been added or appended to a property and has since become an inherent part of the property; usually passes with the property when title is transferred.[4]

Assumption. That which is taken to be true.[5]

Business Enterprise Value (BEV). A term applied to the concept of the value contribution of the total intangible assets of a continuing business enterprise such as marketing and management skill, an assembled work force, working capital, trade names, franchises, patents, trademarks, contracts, leases, and operating agreements. *See also* capitalized economic profit; going-concern value.[6]

Cash Equivalence. A price expressed in terms of cash, as distinguished from a price expressed totally or partly in terms of the face amounts of notes or other securities that cannot be sold at their face amounts.[7]

Extraordinary Assumption. An assumption, directly related to a specific assignment, which, if found to be false, could alter the appraiser's opinions or conclusions.[8]

Farm Budget. The plan for the financial organization and operation of a farm for a specified period of time; includes a detailed statement of anticipated gross income, expenses, and net income.[9]

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[1] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice*, 2006 ed., (Washington, DC, 2006) p. 1

[2] Ibid

[3] Ibid, p. 2

[4] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 17.

[5] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice*, 2006 ed., (Washington, DC, 2006) p. 2.

[6] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 37.

[7] Ibid, p. 43.

[8] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice*, 2006 ed., (Washington, DC, 2006) p. 3

[9] Appraisal Institute, The Dictionary of Real Estate Appraisal, 4th ed., (Chicago: Appraisal Institute, 2002), p. 109.

Fee Simple Estate. Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power, and escheat.[10]

Highest & Best Use.

> **Dictionary of Real Estate Appraisal**
>
> The reasonably probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value. The four criteria the highest and best use must meet are legal permissibility, physical possibility, financial feasibility, and maximum productivity.[11]
>
> **Uniform Appraisal Standards (2000)**
>
> Before it can be concluded that any use for the property is its highest and best use, that use must be physically possible, legally permissible, financially feasible, and must result in the highest value. Each of these four criteria must be addressed in the appraisal report.[12]
>
> The highest and most profitable use for which the property is adaptable and needed or likely to be needed in the reasonably near future. [Olson v. United States, 292 U.S. 246, 255 (1934). See also Boom Company v. Patterson, 98 U.S. 403, 408 (1878).][13]
>
> …if the property is clearly adaptable to a use other than the existing use, its marketable potential for such use should be considered to the extent that potential affects market value. [Olson v. United States, 292 U.S. 246, 255 (1934).] But, market value cannot be predicated upon potential uses that are speculative and conjectural; …[14]

Hypothetical Condition. That which is contrary to what exists but is supposed for the purpose of analysis.[15]

Improvements. Buildings or other relatively permanent structures or developments located on, or attached to, land.[16]

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[10] Ibid, p. 113.

[11] Ibid, p. 135.

[12] *Uniform Appraisal Standards for Federal Land Acquisitions,* Interagency Land Acquisition Conference, Washington, D.C. 2000, Appraisal Institute (in cooperation with the U.S. Department of Justice), Chicago, 2000, p. 17.

[13] Ibid, p. 34.

[14] Ibid

[15] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice*, 2006 ed., (Washington, DC, 2006) p. 3.

[16] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 142.

Intangible Property (Intangible Assets). Nonphysical assets including, but not limited to, franchises, trademarks, patents, copyrights, goodwill, equities, securities, and contracts, as distinguished from physical assets such as facilities and equipment.[17]

Intangible Value. A value that cannot be imputed to any part of the physical property, e.g., the excess value attributable to a favorable lease or mortgage, the value attributable to goodwill.[18]

Larger Parcel. The larger parcel, for purposes of these Standards [USFLA], is defined as that tract, or those tracts, of land which possess a unity of ownership and have the same, or an integrated, highest and best use. Elements of consideration by the appraiser in making a determination in this regard are contiguity, or proximity, as it bears on the highest and best use of the property, unity of ownership, and unity of highest and best use.[19]

Market Value. Market value is the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the appraisal, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the appraisal. [20]

Partial Interest. Divided or undivided rights in real estate that represent less than the whole.[21]

Personal Property. Identifiable tangible objects that are considered by the general public as being "personal," for example, furnishings, artwork, antiques, gems and jewelry, collectibles, machinery and equipment; all tangible property that is not classified as real estate.[22]

Personal Property. Consists of every kind of property that is not real property; movable without damage to itself or the real estate; subdivided into tangible and intangible.[23]

Real Estate. An identified parcel or tract of land, including improvements, if any.[24]

Real Property. The interests, benefits, and rights inherent in the ownership of real estate.[25]

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[17] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice*, 2006 ed., (Washington, DC, 2006) p. 3.

[18] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 148.

[19] *Uniform Appraisal Standards for Federal Land Acquisitions*, Interagency Land Acquisition Conference, Washington, D.C. 2000, Appraisal Institute (in cooperation with the U.S. Department of Justice), Chicago, 2000, p. 17, Footnote 47.

[20] Ibid, p. 30.

[21] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 209.

[22] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice,* 2006 ed., (Washington, DC, 2006) p. 4.

[23] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 212.

[24] The Appraisal Foundation, *Uniform Standards of Professional Appraisal Practice*, 2005 ed., (Washington, DC, 2005) p. 4.

[25] Ibid

Usufruct. The right to use and enjoy the fruits or profits of something belonging to another.[26]

(Note: Water rights are frequently referred to as *usufructuary* – a right to use the water, not a right to own it.)

Value in Use. The value a specific property has to a specific person or specific firm as opposed to the value to persons or the market in general. Special-purpose properties such as churches, schools, and public buildings, which are seldom bought and sold in the open market, can be valued on the basis of value in use. The value in use to a specific person may include a sentimental value component. The value in use to a specific firm may be the value of the plant as part of an integrated multiplant operation.[27]

[26] Appraisal Institute, *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002), p. 303

[27]. Ibid, p. 306.

Water Terms and Definitions

(Source: Unless otherwise noted, California State Water Resources Control Board Web Site http://www.swrcb.ca.gov/waterwords.html and California Department of Water Resource Bulletin 160-98 – California Water Plan Update)

Term	Definition
Acre Foot (af)	The amount of water required to cover an acre that is one foot deep. A family of five uses about one acre foot of water per year (325,861 gallons).
Adjudication	A determination of water rights for an entire stream or groundwater basin. Adjudication sets priorities of rights during shortages.
Aquifer	Any underground formation that stores, transmits, and yields water to wells and springs.
Applied Water Demand	The quantity of water delivered to the intake to a city water system or factory, the farm headgate, or other point of measurement, or a marsh or wetland, either directly or by incidental drainage flows. For instream use, it is the portion of the stream flow dedicated to instream use or reserved under the federal or State legislation.
Beneficial use of water	Water used for the following purposes: domestic (homes, human consumption, etc.), irrigation (crops, lawns), power (hydroelectric), municipal (water supply of a city or town), mining (hydraulicing, drilling), industrial (commerce, trade, industry), fish and wildlife preservation, aquaculture (raising fish, etc. for commercial purposes), recreational (boating, swimming), stockwatering (for commercial livestock), water quality, frost protection (misting or spraying crops to prevent frost damage), heat control (water crops to prevent heat damage), groundwater recharge, agriculture, etc.
Central Valley Project (CVP)	A system of dams, reservoirs and conveyance systems operated by the U.S. Bureau of Reclamation. Begins at Shasta Dam on the Sacramento River and ends at the Kern River near Bakersfield. Water is used for agricultural irrigation, flood control, water supply, power production, fish and wildlife, recreation, etc.
Confined aquifer	A water-bearing subsurface stratum that is bounded above and below by formations of impermeable, or relatively impermeable, soil or rock.
Conjunctive use	The operation of a groundwater basin in combination with a surface water storage and conveyance system. Water is stored in the groundwater basin for later use by intentionally recharging the basin during years of above-average water supply.
Corcoran Clay	A thick, impermeable layer of clay that lies under much of the San Joaquin Valley. This clay layer separates the groundwater basin into two distinct aquifers. One region, referred to as the “unconfined” aquifer, lies above the Corcoran Clay. The other region, referred to as the “confined” aquifer, lies entirely below the Corcoran Clay. (*Water Supply Report 1992*, Kern County Water Agency, December 1993)
Cubic feet per second (cfs)	The rate of flow passing any point equal to the volume of one cubic foot of water every second. One cfs is equal to 7.48 gallons per second; 448.8 gallons per minute; 646,317 gallons per day.
Decision 1485 operating criteria	Standards for operating the CVP and SWP under Water Right Decision 1485 for the Sacramento-San Joaquin Delta and Suisun Marsh, adopted by the State Water Resources Control Board, August 1978.
Deep percolation	Percolation of (irrigation) water through the ground and beyond the lower limit of the root zone of plants into groundwater.
Dependable supply	The annual average quantity of water that can be delivered during a drought period.

Term	Definition
Environmental Protection Agency (EPA)	Federal regulatory agency responsible for protecting environmental quality throughout the nation; acts in oversight role to state agencies that carry out federal laws.
Estuary	Water at the mouth of a stream that serves as mixing zones for fresh and ocean waters during a major portion of the year. Estuarine waters generally extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. (Basically, where a freshwater river meets the sea.)
Evapo-transpiration (ET)	The quantity of water transpired (given off), retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces.
Evapo-transpiration of applied water (ETAW)	The portion of the total evapotranspiration which is provided by irrigation and landscape watering.
Firm yield	The maximum annual supply of a water development project under drought conditions, for some specified level of demands.
Fish and Game, Department of (DF&G)	State agency responsible for protecting fish and wildlife. Programs include investigations of toxic pollution problems, enforcement of fish and game pollution control laws, and assisting State and Regional Water Boards in monitoring programs.
Groundwater	Water that occurs beneath the land surface and fills the pore spaces of the alluvium, soil, or rock formation in which it is situated.
Groundwater basin	A groundwater reservoir, defined by an overlying land surface and the underlying aquifers that contain water stored in the reservoir. In some cases, the boundaries of successively deeper aquifers may differ and make it difficult to define the limits of the basin.
Groundwater overdraft	The condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average conditions.
Groundwater recharge	The natural or intentional infiltration of surface water into the zone of saturation (that is, groundwater).
Hydrogeology	The geology of groundwater, with particular emphasis on the chemical composition and movement of the water
Instream use	Use of water within its natural watercourse as specified in an agreement, water rights permit, etc. For example, the use of water for navigation, recreation, fish and wildlife, aesthetics, and scenic enjoyment.
Irrecoverable losses	The water lost to a salt sink or water lost by evaporation or evapotranspiration from a conveyance facility or drainage canal, or in fringe areas of cultivated fields.
Land subsidence	The lowering of the natural land surface due to groundwater (or oil and gas) extraction.
License	An official document giving permission to engage in a specified activity, such as an appropriation of water.
MWD	Metropolitan Water District of Southern California.
Net water demand (net water use)	The amount of water needed in a water service area to meet all requirements. It is the sum of evapotranspiration of applied water in an area, the irrecoverable losses from the distribution system, and the outflow leaving the service area; it does not include reuse of water within a service area.
Perched groundwater	Groundwater supported by a zone of material of low permeability located above an underlying main body of groundwater.

Term	Definition
Prescriptive rights	Water use rights gained by trespass or unauthorized taking that ripen into a title —on a par with rights to land gained through adverse possession.
Pueblo rights	A water right possessed by a municipality that, as a successor of a Spanish-law pueblo, is entitled to the beneficial use of all needed, naturally occurring surface and groundwater of the original pueblo watershed.
Pump lift	The distance between the groundwater table and the overlying land surface.
Recharge basin	A surface facility constructed to infiltrate surface water into a groundwater basin.
Regional Water Quality Control Boards (RWQCB)	Nine Water Boards located throughout California that are responsible for enforcing water quality standards within their boundaries.
Riparian rights	Comes with ownership of land adjacent to a water source, groundwater rights are held by those owning land over a groundwater basin.
Safe yield	The maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect. (DWR Bulletin 118-80, *Groundwater Basins in California*)
Saturated zone	An underground zone in which all openings in and between natural geologic materials are filled with water.
Service area	The geographic area served by a water agency.
State Water Project (SWP)	A system of large dams, reservoirs, and a major aqueduct, which begins at the Oroville Dam on the Feather River and ends at Lake Perris in Southern California. Water is used for agriculture, domestic and industrial uses, flood control, hydropower and recreation. A coordinated operation agreement between the State and federal governments provides for release from the State Water Project and the Central Valley Project to maintain water quality and control salinity in the Sacramento-San Joaquin Delta.
State Water Resources Control Board (SWRCB)	The State Board responsible for protecting and preserving water quality and water rights in California.
Tailwater	Applied irrigation water that runs off the end of a field. Tailwater is not necessarily lost; it can be collected and reused on the same or adjacent fields.
Threatened Species	Under the Endangered Species Act, animal populations may be determined to be either threatened or endangered. Populations listed as threatened are less severely depleted than populations classed as endangered.
Unconfined aquifer	A groundwater bearing strata that is not constrained at its upper surface by an impervious or semi-impervious unit, such as a regional clay. (*Water Supply Report 1992*, Kern County Water Agency, December 1993)
Water Quality Control Plan	Defines beneficial water uses, establishes water quality objectives to protect those uses, identifies water quality threats, and outlines corrective measures. It is used to develop discharge limits and guide Regional Board decisions on specific cases. There is a plan for each of California's 16 major watersheds.
Water Resources, Department of (DWR)	State agency that constructs and operates the State Water Project, provides statewide water resources planning, regulates dam safety, and controls floods.
Water year	A continuous 12-month period for which hydrologic records are compiled and summarized. Different agencies may use different calendar periods for their water years. *(Note: In California, it usually begins on October 1 and ends September 30 of the following year.)*

SWP Water Definitions

Except for the definition of "surplus water," the following definitions are taken from contracts between the State of California Department of Water Resources and the State Water Contractors.

Term	Definition
Annual entitlement	The amount of project water to be made available to a contractor during the respective year, at the delivery structures provided for such contractor under the terms of its contract with the State.
Municipal use	All those uses of water common to the municipal water supply of a city, town, or other similar population group, including uses for domestic purposes; uses for the purposes of commerce, trade, or industry; and any other use incidental thereto for any beneficial purpose.
Agricultural use	Any use of water primarily in the production of plant crops or livestock for market, including any use incidental thereto for domestic or stockwatering purposes.
12 (d) water	Delivery of Water not Delivered in Accordance With Schedule If in any year the State, as a result of causes beyond its control, is unable to deliver any portion of the Agency's annual entitlement for such year under Table A of this contract as provided for in the delivery schedule established for that year, the Agency may elect to receive the amount of water which otherwise would have been delivered to it during such period at other times during the year or succeeding years, to the extent that such water is then available and such election is consistent with the State's overall delivery ability, considering the then current delivery schedules of all contractors.
Unscheduled water	Water available in the Delta as determined by the State at various times during the year when scheduled project demands are being delivered and project storage requirements for both project water deliveries and water to meet Delta water quality requirements established by the SWRCB are being met.
Surplus water	Water in excess of that required to meet all entitlement demands, reservoir storage goals, water quality requirements, and other SWP requirements (such as recreational water), which can be delivered to contractors when SWP capability is available. Surplus water may be released from storage and scheduled in advance for use by contractors. *(This definition comes from page 25 of Bulletin 132-90, State of California Department of Water Resources, September 1990)*

CVP Water Definitions

Term	Definition
Class I Water	(Friant Division Only) Firm supply of water for certain contractors who have no other surface water supply. That supply of water stored in or flowing through Millerton Lake that will be available for delivery from Millerton Lake and the F-K and Madera Canals. It is a dependable water supply during each year. [800,000 acre-feet]
Class II Water	(Friant Division Only) Undependable water. Supplied when available. That supply of water that can be made available subject to the contingencies for delivery from Millerton Lake and the F-K and Madera Canals in addition to the supply of Class I Water. Because of its uncertainty as to availability and time of occurrence, such water will be undependable characterized and will be furnished only if, as, and when it can be made available as determined by the Contracting Officer. [1,400,000 acre-feet]

Term	Definition
Section 215 Water	A supply of irrigation water made available to the Contractor pursuant to Section 215 of the Reclamation Reform Act (RRA) of October 12, 1982 (96 Stat. 1263), as amended. This supply of water is temporary, not to exceed one year, and is made possible as a result of (1) an unusually large supply not otherwise storable for project purposes or (2) infrequent and otherwise unmanaged flood flows of short duration.

Conversion Factors

The following information was taken from pages 389 and 390 of the Appraisal Institute's *The Dictionary of Real Estate Appraisal, 4th ed.*, (Chicago: Appraisal Institute, 2002).

Conversion Factors for Measurement of Irrigation Water	
1 second foot	1 cubic foot per second
	450 gallons per minute
	About 1 acre-inch per hour
1 cubic foot of water	7.48 gallons

Water Measures	
1 cubic foot	7.4805 gallons
	62.42 pounds
1 gallon	8.355 pounds
1 cubic foot per second	50 miner's inches in Idaho, Kansas, Nebraska, New Mexico, and Southern California
1 cubic foot per second	40 miner's inches in Arizona, Montana, Oregon, and Northern California

ADDENDUM 2

Bibliography

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Definitions – http://www.swrcb.ca.gov/waterwords.html

Groundwater – http://www.waterrights.ca.gov/application/forms/infobook.htm#_Toc442697730

Groundwater Substitution Transfers – How to Make Them Work in the Sacramento Valley in 2002, Water Transfers Office, California Department of Water Resources, March 2002

A Guide to Water Transfers, Division of Water Rights, State Water Resources Control Board, California Environmental Protection Agency (Draft), July 1999

Hutchins, Wells A., *Water Rights Laws in the Nineteen Western States*, Volumes I and II, U.S. Department of Agriculture, Washington, 1971 and 1974

Littleworth, Arthur L. and Eric L. Garner, *California Water*, Solano Press, Point Arena, California, 1995

Metropolitan Water District, *Sacramento Valley One-Year Transfer Options*, Sacramento, March 2003

Mooney, Donald and Marsha Burch, *Water Acquisition Handbook: A Guide to Acquiring Water for the Environment in California*, The Trust for Public Lands, San Francisco, 2003

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Water Transfer Issues in California, Final Report to the California State Water Resources Control Board by the Water Transfer Group, June 2002

Water Transfers Papers For Water Transfers In 2002 Involving The Department Of Water Resources (Draft) March 2002, Water Transfers Office, California DWR. Three papers:

- Information to Parties Interested In Making Water Available to the Environmental Water Account or the State's 2002 Dry Year Water Purchase Program
- Groundwater Substitution Transfers—How to Make Them Work in the Sacramento Valley in 2002
- Water Transfers Based on Crop Shifting and Crop Idling—How to Make Them Work in the Sacramento Valley in 2002

Water Education Foundation, *Layperson's Guide to Water Rights Law*, Sacramento, 2000 Update

Water Education Foundation, *Layperson's Guide to Water Marketing*, Sacramento, 2000 Update

Web Sites

Department of Water Resources
http://wwwdwr.water.ca.gov/

Department of Water Resources – Water Transfers
http://www.watertransfers.water.ca.gov/

The Sacramento Valley Water Management Agreement
http://www.watertransfers.water.ca.gov/docs/SactoValley.pdf

Groundwater Substitution Transfers – How to Make Them Work in the Sacramento Valley in 2002
http://www.watertransfers.water.ca.gov/docs/Groundwater_Substitution_Transfers_5_23_02.pdf

Department of Water Resources
Division of Operations and Maintenance, Operations Control Office
http://wwwoco.water.ca.gov/indexo.html

Department of Water Resources
Adjudicated groundwater basins
http://www.dpla2.water.ca.gov/publications/waterfacts/water_facts_3.pdf

California Bay-Delta Authority
Water Transfer Issues report location
http://www.calwater.ca.gov/Programs/WaterTransfers/adobe_pdf/Final_Report%20_Water_Transfer_Group.pdf

California Water Districts and Associations
http://www.lib.berkeley.edu/WRCA/district.html

Water Education Foundation
http://www.water-ed.org/

State Water Resources Control Board
http://www.swrcb.ca.gov/

Water Strategist
http://www.waterstrategist.com/

Association of California Water Agencies
http://www.acwanet.com/

California Farm Bureau Federation
http://www.cfbf.com/

California Farm Water Coalition
http://www.cfwc.com/

Department of Water Resources
Division of Flood Management
California Data Exchange Center
http://cdec.water.ca.gov/

California Bay-Delta Authority
http://calwater.ca.gov/

California Groundwater Association
http://www.groundh2o.org/

U.S. Bureau of Reclamation
http://www.usbr.gov/

California Law (water law is one of the selection options at the site)
http://www.leginfo.ca.gov/calaw.html

California Groundwater Bulletin 118
http://www.groundwater.water.ca.gov/bulletin118/index.cfm

On-Tap, California Water Market Information, Cal-Fed
http://ontap.ca.gov/

U.S. Geological Survey
http://www.usgs.gov/

U.S. Fish and Wildlife Service
http://www.fws.gov/

California Department of Fish and Game
http://www.dfg.ca.gov/

National Marine Fisheries Service
http://www.nmfs.noaa.gov/

ADDENDUM 3

State Water Resources Control Board (SWRCB) Information

ADDENDUM 3

State Water Resources Control Board (SWRCB) Information

The following information comes from the SWRCB web site referenced below.

http://www.waterrights.ca.gov/application/forms/infobook.htm#_Toc442697730

General Information Pertaining to Water Rights

The following general information pertaining to water rights is offered for the guidance and assistance of those who may be interested. While believed to be correct, the information is by no means complete. For additional information, see the California Water Code and case law.

Those to whom this general information is of particular importance or who propose to apply it to specific cases should seek the advice of an attorney or engineer, depending on the kind of information needed.

Appropriative Rights Initiated Prior to December 19, 1914

Prior to 1872, appropriative water rights could be acquired by simply taking and beneficially using water. The priority of the right was the first substantial act leading toward putting the water to beneficial use provided the appropriation was completed with reasonable diligence; otherwise, priority did not attach until beneficial use of the water commenced.

In 1872, sections 1410 through 1422 of the California Civil Code were enacted. These sections established a permissive procedure for perfecting an appropriation of water. Provisions were made for establishing a priority of right by posting a notice of appropriation at the proposed point of diversion and recording a copy of the notice with the respective County Recorder. If these procedures were not followed, the pre-1914 appropriative right did not attach until water was beneficially used.

Once acquired, an appropriative right can be maintained only by continuous beneficial use of water. Regardless of the amount claimed in the original notice of appropriation or at the time diversion and use first began, the amount which now can be rightfully claimed under an appropriative right initiated prior to December 19, 1914 therefore has, in general, become fixed by actual beneficial use as to both amount and season of diversion. The conditions under which an appropriative right may be forfeited in

whole or in part are set forth under the heading "Loss of Appropriate Rights".

Successful assertion of an appropriative right which was initiated prior to December 19, 1914, where the validity of the right is disputed, requires evidence of both the original appropriation and the subsequent maintenance of the right by continuous and diligent application of water to beneficial use (see California Water Code section 1202(b)). Frequently such evidence consists of oral testimony of persons who have actual knowledge of the relevant facts. As the years pass, such testimony, dependent upon the recollection of individuals, may become difficult or impossible to secure. At least a partial remedy for this situation may be found in the procedure for perpetuation of testimony set forth in section 2017 of the California Code of Civil Procedure.

A record of water use under "pre-1914 Appropriative Rights" should be established by filing a Statement of Water Diversion and Use with the SWRCB.

Appropriative Rights Initiated Subsequent to December 19, 1914

The two methods of appropriation existing prior to December 19, 1914, the effective date of the California Water Commission Act, no longer are available for appropriating water from surface streams, other surface bodies of water, or from subterranean streams flowing in known and definite channels. An appropriation of such water now requires compliance with the provisions of Division 2, Part 2 of the California Water Code.

The steps which now must be taken in order to initiate and acquire an appropriative water right are described under the heading "General Information Pertaining to Applications for Permits to Appropriate Unappropriated Water".

Loss of Appropriative Rights

By Abandonment—To constitute abandonment of an appropriative right, there must be concurrence of act and intent, the relinquishment of possession, and the intent not to resume it for a beneficial use, so that abandonment is always voluntary, and a question of fact (1 Wiel, 3d ed., 604, 605).

By Nonuse—Nonuse is distinguished from abandonment. Nonuse means failure to put water to beneficial use for a period of years. The courts have held that pre-1914 rights can be lost as the result of five years' nonuse (Smith v. Hawkins 42 P. 454).

California Water Code section 1241 provides for loss of appropriative rights after five years' nonuse. This section applies only to an appropriative right acquired after December 19, 1914.

Riparian Rights

No California statute defines riparian rights, but a modification of the common law doctrine of riparian rights has been established in this State by decisions of the courts and confirmed by the provisions of section 3, Article XIV of the California Constitution (see California Water Code sections 100, 101). Lands within the watershed of a natural watercourse, which are traversed thereby or border thereon, with the exceptions and limitations hereinafter, indicated, may be riparian. Each owner thereof may have a right, which is correlative with the right of each other riparian owner to share in the reasonable beneficial use of the natural flow of water, which passes his land. No permit is required for such use. The State Water Resources Control Board's (SWRCB) policy is to consider natural flow as not including return flows derived from use of groundwater, water seasonally stored and later released, or water diverted from another watershed. In administering the California Water Code, the SWRCB is governed by the following considerations relative to the doctrine of riparian rights as applied to this State:

1. The riparian right exists by reason of ownership of land abutting upon a stream or body of water and affords no basis of right to use water upon nonriparian land. (Rancho Santa Margarita v. Vail, 11 Cal. 2d 501, 81 P. 2d 533)

2. In order to divert water under claim of riparian right, the diverter must use the water on riparian land but need not own the land at the point of diversion. That is, such diverter may divert at a point upstream from his land so long as permission is granted to use that point of diversion, and intervening land owners between the point of diversion and the place of use are not adversely affected by such practices. (Turner v. James Canal Co., 155 Cal. 82, 99 P. 520 (1909))

3. A parcel of land loses its riparian right when severed from land bordering the stream by conveyance unless the right is reserved for the severed parcel. The riparian right also may be destroyed when purportedly transferred apart from the land by grant, contract, or condemnation. Once lost, it cannot be restored.

4. As between riparian owners, priority of use establishes no priority of right; i.e., one cannot claim superior right merely because water was used first. (Pabst v. Finmand, 190 Cal. 124, 211 P. 11 (1922))

5. The riparian right is neither created by use nor lost by nonuse.

6. If there is insufficient water for the reasonable beneficial requirements of all riparian owners, they must share the available supply. Apportionment is governed by various factors, including each owner's reasonable requirements and uses. In the absence of mutual agreement, recourse to judicial determination may be necessary.

7. As between riparian owners, one of them may take the whole supply if necessary for strictly domestic use; that is, for so-called "natural uses arising out of the necessities of life on the riparian land, such as household use, drinking, watering domestic animals." (1 Wiel, 3d ed., Water Rights in the Western States, page 795; Deetz v. Carter, 232 Cal. App. 2d 851; but see Prather v. Hoberg, 24 Cal. 2d 549, 150 P. 2d 405, re an equitable apportionment where the use is commercialized as for resort purposes and therefore is not strictly domestic.)

8. The riparian owner is subject to the doctrine of reasonable use, which limits all rights to the use of water to, that quantity reasonably required for beneficial use and prohibits waste or unreasonable use or unreasonable methods of use or diversion. (Sec. 3, Art. XIV, Const. of Cal.; Peabody v. City of Vallejo, 2 Cal. 2d 351, 40 Pac. 2d 486; Tulare Irr. Dist. et al v. Lindsay Strathmore Irr. Dist., 3 Cal. 2d 489, 45 Pac. 2d 972; Rancho Santa Margarita v. Vail, 11 Cal. 2d 501, 81 P. 2d 533)

9. A riparian right may be impaired or lost through prescription. Refer to the following section, "PRESCRIPTION".

10. The riparian right attaching to a particular parcel of land is subject to appropriative rights established by diversion upon vacant public domain before the first valid steps were taken to acquire said parcel of land from the United States, whether diversion was made at points upstream or downstream.

11. The riparian right cannot be transferred for use upon another parcel of land.

12. The riparian right does not apply to foreign water; i.e., water originating in a different watershed cannot be used under claim of riparian right. (E. Clemens Horst Co. v. New Blue Point Mining Co., 177 Cal. 631, 171 P. 417; Crane v. Stevinson, 5 Cal. 2d 387, 54 P. 2d 1100; Rancho Santa Margarita v. Vail, 11 Cal. 2d 501, 81 P. 2d 533)

13. Water cannot be stored and withheld for a deferred use (other than regulatory storage) under claim of riparian right. (Seneca Consol. Gold Mines Co. v. Great Western Power Co., 209 cal. 206, 287 pac. 93; Colorado Power Co. v. Pac. Gas and Electric Co., 218 cal. 559, 24 p. 2d 495; Moore v. California Oregon Power Co., 22 cal. 2d 725, 140 p. 2d 798)

14. A record of water use under riparian claim should be established by filing a Statement of Water Diversion and Use with the SWRCB.

Prescription

A right secured by appropriation does not depend upon use for any given length of time. It is complete immediately upon full beneficial use being made of water pursuant to a permit. The right, however, is subordinate and subject to all prior vested rights, whether appropriative or riparian. This limitation may be removed under certain circumstances by continuous use adverse to prior rights for five years and failure of the owners of the prior rights to file legal action to protect themselves during that time. Their cause of action then becomes barred by the statute of limitations. The right of the subsequent appropriator thereafter no longer is subject to the prior vested rights. This result is called a prescriptive right to the use of water.

In order for an appropriative or riparian claim to ripen into a prescriptive right as against the owner of a riparian or a prior appropriative right, the use must be continuous and uninterrupted for a period of five years. During all of such time, the use must be open and notorious, exclusive, under claim of right, hostile and adverse to the title of the prior owner, and an invasion of the prior owner's right. The prior right owner must have had an opportunity to prevent the adverse use by legal action, and such taxes as are assessed must be paid. Absence of any of these conditions is fatal to the acquisition of a prescriptive water right.

Water users ordinarily have no concern with the use of water by others after it has passed their land or point of diversion. The upstream users thus have no legal right to prevent downstream use. A well-established rule is that a prescriptive water right ordinarily cannot be acquired against an upstream user.

A right cannot be acquired by prescription to use a greater quantity of water than reasonably is necessary for the beneficial purpose served, regardless of the amount actually used, in accordance with the constitutional amendment of 1928 (art. XIV, sec. 3).

Since enactment of the California Water Commission Act on December 19, 1914, a right to appropriate or use water (other than as a riparian or overlying owner, or appropriator of percolating groundwater, or stockponds that comply with article 2.5, commencing with section 1226 of chapter 1 of part 2 of division 2 of the California Water Code), cannot have been secured without first obtaining a permit from the State (see California Water Code section 1225 and Crane v. Stevinson, 5 cal. 2d 387, 54 p. 2d 1100). Although one who now uses water without a permit for a sufficient period of time may, under certain circumstances foreclose objection by those who have been adversely affected, such user thereby does not acquire a right to prevent diversions by others which deplete the supply of water available. California courts have not been called upon to determine this precise question. In view of the uncertainty in this respect and because a prescriptive right can be finally determined only by a court of competent

jurisdiction, the policy of the SWRCB is to disregard a claim to water subject to the permit procedure which is based only upon use initiated subsequent to 1914 unless such use is supported by a permit.

In PecDle v. Shirokow (1980) 26 cal. 3d 301, the California Supreme Court addressed the question of whether a person who does not hold a water right permit or license may establish a prescriptive water right to divert and use water. The Court held that the water appropriation procedure established by statute constitutes the exclusive method of acquiring a right to appropriate or use water, which is subject to appropriation. Since Shirokow was using water and held no permit or license authorizing an appropriation of water, the Court concluded that such use of water was improper. In addition, the Court held that the State's governmental interest in regulating the use of public water is a public right, which cannot be lost through prescription.

Vested Appropriative and Riparian Rights Not Affected by Filing an Application

An existing valid riparian or appropriative right will be neither strengthened nor impaired by a permit to appropriate water issued to the owner of such right (see Barr v. Branstetter, 42 cal. app. 725, 184 p. 409). An application to appropriate water may be filed by such owner, however, in the following instances: (1) to initiate a right to additional unused water where water is available for further appropriation in excess of that covered by the existing right; and (2) to establish a new right to water already in use by applicant where the validity of the existing right has not been adjudicated or is in doubt. In either event, the priority of the right acquired by beneficial use under the permit will be the date of filing the application—the priority will not relate back to the time of the first use under a former claim.

The California Code of Regulations, title 23~ section 731, requires an applicant for a permit to list all claims to existing rights for the use of all or part of the water sought by the application. A permit, if issued, will limit the water to be appropriated so that existing rights, combined with the permit will not yield a right to use an unreasonable quantity of water. Subsections (c), (d), and (e) of section 731 contain penalties for anyone who transfers an existing right before, or does not claim an existing right until, a permit or license is issued. This provision is in recognition of the fact that a permit should be issued only for unappropriated water, and that water which is being used pursuant to an existing right is not unappropriated, whether the right is being exercised by the applicant or by another person.

Disputes Over the Use of Water

The right to use water is a property right and may be protected against infringement in the same manner as any other property right; i.e., by appropriate court action. *(emphasis added)* The SWRCB does not have the authority to determine the validity of vested rights other than appropriative rights initiated December 19, 1914 or later. The SWRCB, however, may assist the courts in such determination as described in the following paragraphs entitled, "Determination of Existing Rights". The SWRCB will investigate and take appropriate action on a written complaint received alleging (1) a violation of the conditions of a permit or license issued by the SWRCB, (2) waste or unreasonable use of water, (3) illegal diversion or use, or (4) unreasonable effects on public trust or public interest uses of the water. (See title 23, chapter 3, subchapter 2, articles 18 and 22 of the California Code of Regulations; California Water Code section 275 et. seq.; and California Water Code section 1050 et. seq.)

When a complaint of an illegal diversion or use is filed, the SWRCB will take action under section 1052 of the California Water Code. Subsection (a) provides that "The diversion or use of water subject to this division other than as authorized in this division is a trespass." Subsection (d) provides, in part, that "Any person or entity committing a trespass as defined in this section may be liable for a sum not to exceed five hundred dollars ($500) for each day in which the trespass occurs. The Attorney General, upon request of the SWRCB, shall petition the superior court to impose, assess, and recover any sums pursuant to this subdivision. "SWRCB policy is to initiate court action only in a clear instance of unlawful use of water. Where there is a bona fide dispute as to the facts, or where circumstances indicate adjudication is required, action by the SWRCB under section 1052 generally is not considered appropriate.

Public Trust

With its roots in Roman law, the doctrine of public trust holds that certain resources are the property of all. In its modern form, the public trust doctrine holds that a state, as sovereign, takes title to tidelands and the beds of nontidal navigable waters at the time the state is admitted to the Union. Holding these lands and the waters above them in trust, the state's duty is to exercise continued supervision over the trust for the benefit of the people. Entities acquiring rights, for example in navigable streams, lakes, marshlands and tidelands, generally hold those rights subject to the trust and can assert no vested right in a manner harmful to the public trust. In other words, rights acquired in public trust resources cannot be placed entirely beyond the direction and control of the state.

The scope of the public trust doctrine continues to evolve as popular perceptions of the values and uses of waterways change. The public trust

was traditionally defined to protect navigation, commerce, and fisheries; but recently it has been held to include the right to fish, hunt, bathe, swim, boat, recreate, navigate, and use the bottom of navigable waters for anchoring, standing, or other purposes.

In this century, the California courts have interpreted the legal term "navigable" very broadly to include recreational rafting and kayaking which can take place in very shallow water. Within the last decade, the California Supreme Court has recognized that uses of public trust resources include the preservation of the land, especially tideland, in its natural state to serve as ecological units for scientific study, as open space, and as habitat for birds and aquatic life. In administering the public trust, the courts have allowed the state to favor one use over another.

In its presently-developed form, the public trust doctrine requires the courts and the SWRCB to perform a balancing test to weigh the potential value to society against the impact on trust resources of a proposed or existing diversion. The action which will feasibly protect public trust values must be implemented.

On February 17, 1983, the California Supreme Court filed its decision in National Audubon Society v. Superior Court of Alpine County, 33 Cal. 3d 419, 189 Cal. Rptr. 346 (1983). The Court merged the public trust doctrine with the California water rights system. The Court also held that all uses of water, including public trust uses, must conform to the standard of reasonable use. The Court further held that the SWRCB has a duty to consider public trust values before it approves water right applications. Finally, the Court held that the SWRCB has a continuing duty to supervise the taking and use of appropriated water.

Determination of Existing Rights

Court Reference. When a suit is brought by private parties in any court of competent jurisdiction in this State for determination of water rights, sections 2000 and 2001 of the California Water Code provide that the case, at the discretion of the court, may be referred to the SWRCB, as referee, for investigation. All rights of whatever character may be included under this procedure.

Statutory Adjudication. Section 2525 of the California Water Code provides for the initiation of proceedings for the determination of all rights to the water of any stream, lake, or other body of water except percolating underground water. A petition signed by one or more claimants of the right to the use of water from the source involved must be filed with the SWRCB. The procedures outlined in sections 2500 through 2900 of the California Water Code must be followed.

If a determination is undertaken under either the court reference or statutory procedure, the SWRCB thoroughly investigates the stream system

and water rights involved. In general, such investigation will include measurements of the water supply and of all diversions from the stream system, a survey of all diversion systems and areas irrigated therefrom, and a determination of the duty of water for irrigation and other uses.

After due notice to all parties, the SWRCB prepares findings which are submitted to the court. The court itself hears those who may be dissatisfied with these findings and enters a decree establishing the various rights involved.

The court also sets forth the relative priority, amount, purpose of use, season of diversion, point of diversion, and place of use of each right. Appeals from such decree may be taken in the same manner and with the same effect as in other civil cases.

By virtue of the above procedures, the SWRCB may supplement with effective and expeditious methods the work of the courts in determining water rights. These procedures lead to a complete and final determination of all the water rights involved, and, should necessity arise, a watermaster may be appointed to administer the stream and insure distribution of the water as decreed.

A copy of the SWRCB's publication, "Regulations and Information Pertaining to Determination of Rights to the Use of Water in California" may be obtained on request.

Appropriation of Undergroundwater

The jurisdiction of the SWRCB to issue permits and licenses for appropriation of underground water is limited by section 1200 of the California Water Code to "subterranean streams flowing through known and definite channels".

If use of underground water on nonoverlying land is proposed and the source of the water is a subterranean stream flowing in a known and definite channel, an application pursuant to the California Water Code is required. A Statement of Water Diversion and Use should be filed for use of water from a subterranean stream on overlying land (see Statements of Water Diversion and Use section of this document).

Underground water not flowing in a subterranean stream, such as water percolating through a groundwater basin, is not subject to the SWRCB's jurisdiction. Applications to appropriate such water, regardless of use, should not be submitted. Owners of lands overlying a groundwater basin or other common source of supply have the first right to withdraw water for reasonable beneficial use on their overlying lands, and the right of each owner is equal and correlative to the right of all other owners similarly situated. In case of insufficient water to supply fully the requirements of all, the available supply must be equitably apportioned. In these respects,

overlying rights are closely similar to riparian rights pertaining to surface bodies of water.

Subject to future requirements on overlying lands, surplus water which may be withdrawn without creating an overdraft on the groundwater supply may be appropriated for use on nonoverlying lands. Such appropriation is accomplished simply by use—no permit is required. An application filed to appropriate underground water subsequently may be rejected if the water it seeks to appropriate is not flowing through a known and definite channel.

Division 2 of Part 5 of the California Water Code, commencing with section 4999, requires every person who extracts groundwater within the counties of Riverside, San Bernardino, Los Angeles, and Ventura in excess of 25 acre-feet per annum (with certain exceptions) to file a notice with the SWRCB on forms provided by the SWRCB. Copies of the SWRCB's rules, together with further information concerning this requirement, may be obtained on request.

Every person who intends to dig, bore, drill, deepen, or reperforate a water well must file a notice of intent with the California Department of Water Resources. The notice must be filed on forms furnished by the Department and must contain information required by the Department. A report of completion also must be filed with the Department on forms furnished by the Department and containing information required by it (California Water Code sections 13750, 13751). These requirements also apply to any person who converts, for use as a water well, any oil or gas well originally constructed under the jurisdiction of the California Department of Conservation pursuant to the provisions of Article 4, Chapter 1, Division 3 of the California Public Resources Code. Further information or forms may be obtained from the California Department of Water Resources, Division of Planning, Post Office Box 942836, Sacramento, CA 942360001.

Spring Water

Courts have held that water in springs and standing pools which have no natural outlet belong to the owner of the land on which these sources are located (see State v. Hansen, 189 Cal. App. 2d 604). Such water may be used without obtaining a permit.

If a spring contributes to a flowing stream, either by surface or subterranean means, the doctrine of correlative rights applies between the owner of the spring and those riparian to the stream. The right of the owner of a spring likewise is correlative with the right of those using groundwater which supplies the spring. A Statement of Water Diversion and Use should be filed for such use.

No Assistance Rendered in Securing Right of Access to Point of Diversion or Right-of-Way

The SWRCB will not assist in the matter of securing right of access to the stream or other source of supply, or in securing rights-of-way for ditches and conduit lines. In accepting an application or in issuing a permit, the SWRCB does not affirm that the applicant or permittee has right of access to the source of supply or necessary rights-of-way. The SWRCB will accept an application for filing before right of access has been secured. The SWRCB, however, may refuse to approve the application when the applicant apparently will be unable to secure right of access (see Title 23 of the California Code of Regulations, sections 775, 776, and 777).

Patents and Homesteads

All patents granted or homesteads allowed by the U. S. Bureau of Land Management shall be subject to any vested and accrued water rights as may have been recognized and acknowledged by the local customs, laws, and decisions of courts (30 USCA 278, 287).

Supervision Over Dams

Division 3 of the California Water Code, commencing with section 6000 et seq., requires that construction or enlargement of any dam over a certain height and storage capacity shall not be commenced without written approval of the plans and specifications by the California Department of Water Resources. The California Department of Water Resources ordinarily will require a statement that the SWRCB is satisfied as to the adequacy of the water right.

Dams subject to supervision are as follows:

1. Dams which are 25 feet or more in height from downstream toe to spillway level provided they store more than 15 acre-feet of water.
2. Dams which store 50 acre-feet or more of water provided they are more than 6 feet in height from downstream toe to spillway crest.

Further information concerning construction or enlargement of any dam may be obtained from the California Department of Water Resources, Division of Safety of Dams, Post Office Box 942836, Sacramento, CA 94236-0001.

Further information concerning construction or enlargement of any dam may be obtained from the California Department of Water Resources, Division of Safety of Dams, Post Office Box 942836, Sacramento, CA 94236-0001.

Provisions Of Fish and Game Code

The owner of a dam is required to allow sufficient water to pass downstream at all times in order to keep fish below in good condition (section 5937, Article 2, Chapter 3, Part 1, Division 6 of the California Fish and Game Code). For purposes of Article 2, "dam" includes all artificial obstructions. Further information relating to the requirements of the California Department of Fish and Game may be obtained from local game wardens or from the California Department of Fish and Game, 1416 Ninth Street, Sacramento, CA 95814.

Statements of Water Diversions and Use

All diverters of surface water, with certain exceptions, are required to file a Statement of Water Diversion and Use with the SWRCB (see Division 2 of Part 5.1 of the California Water Code). The requirement applies to water diverted under claim of riparian right and to appropriations initiated prior to December 19, 1914, the effective date of the California Water Commission Act. Forms may be obtained from the Division of Water Rights, Post Office Box 2000, Sacramento, CA 95812-2000. One purpose of filing Statements of Water Diversion and Use is to make a public record of all surface diversions not already on file with or known to the SWRCB. The following types of diversions are excluded from the requirement:

1. From a spring which does not flow off the property on which it is located.

2. Covered by an application, permit, or license to appropriate water on file with the SWRCB.

3. Included in a notice filed under the recordation of groundwater extractions law (Division 2 of Part 5 of the California Water Code) in the counties of Riverside, San Bernardino, Los Angeles, and Ventura.

4. Regulated by a watermaster appointed by the California Department of Water Resources.

5. Reported by the California Department of Water Resources in its hydrologic data bulletins.

6. Included in the consumptive use data for the delta lowlands published by the California Department of Water Resources in its hydrologic data bulletins.

7. Included in annual reports filed with a court or the SWRCB by a watermaster appointed by a court or pursuant to statute to administer a final judgment determining rights to water, which reports identify the persons who have diverted water and give the general place of use and the quantity of water which has been diverted from each source.

8. For use in compliance with the provisions of Article 2.5 (commencing with section 1226) of Chapter 1 of Part 2 of Division 2 of the California Water Code concerning stockponds.

A statement should be completed for diversions during a calendar year and should be filed before July 1 of the following year. Supplemental statements are required at three-year intervals thereafter.

Stockpond Rights

The stockpond program was 'sunset' by the Legislature as of December 31, 1997.

Under certain conditions, the owners of stockponds having a capacity of not more than 10 acre-feet as of January 1, 1975 which were constructed prior to 1969 have a valid water right. Prior to January 1, 1975, a right for seasonal storage of water in a reservoir of any kind could be obtained only by appropriating the water through the application-permit-license procedure, and this is still the only way to obtain a water right for stockponds constructed after January 1, 1969 or which are larger than 10 acre-feet. Claims of rights for such stockponds and applications for this certification should be filed with the SWRCB. The priority of the right will be subject to other stockpond water rights on which certificates have been issued by the SWRCB with an earlier priority, to appropriative water rights with an earlier priority, and to riparian rights. The priority of the right will be the date the claim is filed. Ponds which were the subject of water right litigation between private parties prior to January 1, 1974 are excluded.

Before a certificate of validity of the stockpond right is issued, the SWRCB will verify the location of the pond, its capacity, and that it is used primarily for stockwatering purposes. In some cases, a field investigation is necessary. The original certificate will be filed with the SWRCB and will be available for public inspection. A copy of the certificate will be mailed to the owner of the stockpond. So that the records may be reasonably current, a statement of continued existence of the pond and its use for stockwatering will be solicited from the owner as determined by the SWRCB (currently every 10 years). If the water has ceased to be used primarily for stockwatering, the SWRCB may revoke the certificate after notice and an opportunity for hearing.

A reasonably accurate estimate of the capacity of a stockpond of 10 acre-feet or less can be computed by use of the "one-third rule' as follows:

Stockpond capacity in acre-feet = 1/3 height of dam to spillway crest, in feet, multiplied by the surface area of pond when full, in acres.

General Information Pertaining to Applications for Permits to Appropriate Unappropriated Water

The following information describes the statutory procedure for acquiring appropriative water rights. It is intended as a guide for persons who propose to take water from a surface or underground source or who are uncertain as to the validity of their present taking. Those who are not already familiar with the procedure should carefully read this information.

Who Should File an Application

Since December 19, 1914, the appropriation of water in surface streams and other surface bodies of water and in subterranean streams flowing through known and definite channels has been governed by the California Water Commission Act (Statutes 1913, Chapter 586) now contained in the provisions of the California Water Code.

New legislation, effective January 1, 1989, modified the California Water Code to provide two methods of appropriating water through the California State Water Resources Control SWRCB. Provisions were added to the law for registering small domestic use appropriations, rather than applying for a water right permit under the existing process.

Small domestic use includes normal domestic use, plus incidental stockwatering of domestic animals and incidental irrigation of one-half acre or less of lawn, garden, and pasture at any single establishment, not exceeding 4,500 gallons per day by direct diversion or 10 acre-feet per annum by storage, the latter including incidental aesthetic, recreational, or fish and wildlife enhancement purposes. Refer to the SWRCB's booklet, "How to File an Application/Registration to Appropriate Water in California" for specific information on filing for a permit or for registering a small domestic use appropriation.

Anyone who intends to divert water from surface waters or subterranean streams flowing in known and definite channels, either (1) directly to use on land which is not riparian to the source, (2) to storage in a reservoir for later use on either riparian or nonriparian land, or (3) for direct use of water which would not naturally be in the source, should apply with the SWRCB for a permit or small domestic use registration as the first step toward securing an appropriative water right. Persons diverting water under riparian or pre-1914 claims of right, with certain exceptions, are required to file a Statement of Water Diversion and Use with the SWRCB.

Who Should Not File an Application

Underground water is not subject to the permit procedure unless it is the underflow of a surface stream or otherwise is flowing in a subterranean stream with a known and definite channel. One who proposes to pump groundwater (with the exceptions noted) should not file an application. Anyone who pumps groundwater in the counties of Riverside, San Bernardino, Los Angeles, and Ventura, with certain exceptions is required to file a notice with the SWRCB (see section 4999 of Division 2 of the California Water Code).

A permit is not required for the proper exercise of a riparian right. Diverters of surface water, with certain exceptions, are required to file a Statement of Water Diversion and Use with the SWRCB.

Purpose of Filing

The purpose of filing an application for a permit is to secure a right to the use of unappropriated water; i.e. water that is available and is not already in use under prior and existing rights. The purpose of filing also is to establish a record of the right sought under the application so that its status in relation to other rights may be determined more readily. One who takes and uses water without possession of a valid right or first obtaining a permit does so at their own risk and is subject to possible court action to enjoin his use.

An application should not be filed in order to adjust a dispute which has arisen over water. Permits issued by the SWRCB cannot serve to ratify or confirm existing rights claimed by the applicant.

When to File

An application should be filed well in advance of construction of diversion works. An application, however, should not be filed until a definite plan has been formulated for construction of a project for use of water within a reasonable time in the future. What is reasonable depends on the size of the project and the circumstances of each case. In every case, the applicant should be prepared to commence construction work within the time ordered by the SWRCB and thereafter to complete construction and use of water with diligence. For most privately-owned projects designed to serve the individual needs of the applicant, the SWRCB will require actual construction to commence within a few months after issuance of permit. The filing of an application cannot serve to reserve water for an indefinite future use. Requests for undue delay in final disposition of an application will be denied.

Unappropriated Water and Responsibilities of Permittees

All applications are for permits to appropriate unappropriated water, and all permits are issued subject to vested rights. In order for the SWRCB to approve an application, unappropriated water must be available to supply the applicant. Water in many streams already has been fully appropriated during the dry seasons of the year. If there is doubt whether unappropriated water is available, the SWRCB's staff should be consulted before an application is filed.

The flow of water in most streams is variable and cannot be predicted with accuracy. Approval of an application and issuance of a permit thus does not guarantee that unappropriated water will be available at all times in the full amount specified in the permit. In some cases, there may be times during the authorized diversion season when no unappropriated water will be available. The holder of a permit should be prepared to accept responsibility for diverting only to the extent and at such times as will not

Impair the prior rights of others, regardless of the amount or season named in the permit. The holder of the permit likewise must defend the right if it is attacked by others. A water right is a property right, and the owner has the same obligation to defend it against encroachment as in the case of any other kind of property.

Outline of Essential Steps

The California Water Code and the regulations adopted pursuant thereto prescribe a definite procedure for the initiation and consummation of rights to appropriate water by permit. The essential steps are as follows:

Appropriation by Permit:

1. An application is filed with SWRCB on forms provided. If the application is not complete, failure to complete it within the time allowed by the SWRCB will result in cancellation.

2. Notice of application is issued by the SWRCB and is posted or published by the applicant, depending on the size of the project.

3. If protests are received which cannot otherwise be adjusted, a hearing or an investigation under a proceeding in lieu of hearing is held. At the discretion of the SWRCB, a hearing also may be held on an unprotested application.

4. The application is reviewed and analyzed for possible environmental impacts as required by the California Environmental Quality Act of 1970.

5. If an application is approved and permit fees paid, a permit is issued. A reasonable time is allowed within which to begin construction of the diversion works, complete the construction, and make full beneficial use of the water. These times may be extended upon request if there are good reasons for doing so. Failure to comply with the time requirements or other-permit terms will be investigated by the SWRCB, and findings against the permittee may result in revocation of the permit.

   All permits are issued SUBJECT TO PRIOR RIGHTS, and the permittee is required to respect all prior rights when diverting under the permit.

6. When construction and use of water are complete to the full extent contemplated, an inspection is made for possible issuance of a license. To the extent that beneficial use of the water has been made, as to both amount and season as specified in the terms and conditions of permit, a license may be issued.

A license has no time limit and continues as long as proper use is made for the water and required reports are submitted.

Statutes provide that, under certain conditions, a license may be lost through a five-year period of nonuse.

Appropriation by Registration:

l. Forms to file for appropriation of water by registration are provided by the SWRCB.

2. The Environmental Services Supervisor for the California Department of Fish and Game region in which the diversion will be located (map, address, and telephone number are included on the form) is contacted to discuss the proposed project and to obtain answers to the questions contained on the Fish and Game Information form.

3. Registration forms are filed with both the State Water Resources Control SWRCB and the regional office of the California Department of Fish and Game.

4. If the registration is complete, fees have been paid, and written approval has been received from both the SWRCB and the California Department of Fish and Game, construction of the project may begin and diversion of water made.

5. If the forms are not complete, failure to complete them within the time allowed by the SWRCB will result in the return of all materials and fees.

Preparation of Applications

The SWRCB publishes a pamphlet entitled, "How to File an Application/Registration to Appropriate Water in Californians which will be of assistance in completing the blanks of an application form. When an application fails to comply with provisions of the California Water Code, the application will not be accepted for filing.

Changes in Ownership

The SWRCB must be able to communicate with a registrant, applicant, permittee, or licensee. Any changes in ownership or address therefore should be submitted promptly to the SWRCB.

The SWRCB will not settle contests as to ownership but will accept any ownership claim, which is asserted unless the owner of record or an asserted successor objects. In case of contest the SWRCB's record will not be changed until the matter is settled by agreement or by a court decision.

The Water Transfers quote was taken from the following SWRCB web site:

http://www.waterrights.ca.gov/html/wr_process.htm#WaterTransfers

Water Transfers

In recent years, temporary transfers of water from one water user to another have been used increasingly as a way of meeting statewide water demands, particularly in drought years. Temporary transfers of post 1914 water rights are initiated by petition to the State Board. If the Board finds the proposed transfer will not injure any other legal user of water and will not unreasonably affect fish, wildlife or other instream users, then the transfer is approved. If the Board cannot make the required findings within 60 days, a hearing is held prior to Board action on the proposed transfer. Temporary transfers are defined to be for a period of one year or less. A similar review and approval process applies to long-term transfers in excess of one year.

The California Water Code is also available on the web site:

http://www.leginfo.ca.gov/calaw.html

This web site lists 29 State codes, with Water Law being one of them. The Water Code is accessed by selecting the appropriate checkbox, and then selecting the "search" button at the bottom of the page. A table of contents appears with links to each particular section. "Division 2" begins with Section 1000 and is most relevant to the matter at hand.

The Water Code can also be accessed at the SWRCB web site:

http://www.SWRCB.ca.gov/water_laws/index.html

Click on the link "California Water Code."

Though water rights appraisers need to be familiar with the process of transferring water rights, they should not be the ones who investigate the validity of a water right or identify any unusual obstacles that might exist in a public agency's acquisition of any water right. These matters should be the domain of a water rights attorney, either on staff or retained by the agency. Water rights should also be investigated before the appraisal is ever ordered.

ADDENDUM 4

The 2005 Dry Year Option Water Purchase Program: Background and Agreement Terms

ADDENDUM 4

The 2005 Dry Year Option Water Purchase Program: Background and Agreement Terms

Background

1. The Department of Water Resources (DWR) will conduct a 2005 Dry Year Water Purchase Program, as well as their annual Environmental Water Account (EWA) Program, and serve as a clearinghouse for both buyers and sellers. The Dry Year Program will be open to all interested California water agencies. DWR recognizes the importance of local leadership in making decisions to better manage the State's water resources. Accordingly, DWR will work cooperatively with local water associations, their member agencies, and other leaders in the Sacramento Valley and other regions to assist local interests in the management of their resources in a manner that fully meets local objectives.

2. DWR will represent the interests of all parts of the State, including those areas needing additional supplies and those that can make supplies available. DWR will coordinate the activities of the Dry Year Water Purchase Program with other local, State, and federal actions to purchase water in 2005. State Water Project contractors will assist DWR in developing water purchase agreements.

3. DWR, water sellers, and water buyers will respect the right of individual local water districts to determine the best way to make water available for local, regional and statewide use. Local agencies will be responsible for complying with all applicable laws, including local ordinances, and in seeking necessary approvals from DWR, U.S. Bureau of Reclamation, State Water Resources Control Board (SWRCB), and other relevant government entities.

4. Water management strategies will comply with State Jaw and prevent injury to other legal users of water, prevent unreasonable effects to fish or wildlife, and prevent unreasonable economic impacts to the overall economy of the county from which the water is transferred. If the water is made available by crop idling, the amount of idled land must not exceed 20 percent of the cropland that would have been planted and harvested in 2005.

5. Actions to develop water supplies will undergo appropriate environmental review and should be designed to not interfere with ongoing environmental protection and restoration programs or cause significant impact to fish and wildlife.

Programmatic Terms for all Agreements

6. Buyer will pay seller a $10 per acre-foot initial option payment for each acre-foot made available, within 30 days of executing the contract.

7. Buyer will call on the transfer water no later than May 1,2005.

8. The exact location where the water will be measured for transfer to DWR will be determined on a case-by-case basis, through negotiations between the individual sellers and DWR. The buyers will incur an estimated 20 percent carriage water loss for any transfer water pumped at Banks Pumping Plant for delivery to their service area.

9. Seller agrees to make all water under the contract available to buyer if buyer calls on the transfer water. The contract shall include provisions for penalties if water under option is not made available,

10. The contract between seller and DWR may be for both the Dry Year Program and EWA program at the seller's option.

Specific Terms for Crop Idling and Crop Substitution Agreements

11. Buyer will pay seller an additional $10 per acre-foot incremental option payment on March 15, 2005, and April 15, 2005, if buyer has not yet called on the transfer water, but wants to maintain the option past these dates.

12. If buyer calls on the transfer water at the time the year is classified as Dry or a wetter year type, seller will receive a total payment of $100 per acre-foot for the transfer water. The previous option payments made under Terms 6 and 11 will be credited towards the total payment of $100 per acre-foot Year type is based on the 40-30-30 Sacramento River Index in SWRCB Decision-1641.

13. If buyer calls on the transfer water at the time the year is classified as Critically Dry, seller will receive a total payment of $125 per acre-foot for the transfer water. The previous option payments made under Terms 6 and 11 will be credited towards the total payment of $125 per acre-foot

Specific Terms for Groundwater Substitution Agreements

14. The buyer's payments will be based on the Sacramento Valley Water Management Program (shown in the table below) for whichever year type classification is in place at the time the transfer water is called. Year type is based on the 40-30-30 Sacramento River Index in SWRCB Decision-1641. The previous option payment made under Term 6 will be credited towards the total payment for the transfer water.

Year Type	Price per Acre-Foot
Wet	$25
Above Normal	$60
Below Normal	$75
Dry	$100
Critically Dry	$125

Specific Terms for Reservoir Reoperation Agreements

15. To be developed on a case-by-case basis.

ADDENDUM 5

Agreement for 2004 Services for the Environmental Water Account Under the California Bay-Delta Authority

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

AGREEMENT BETWEEN THE DEPARTMENT OF WATER RESOURCES OF THE STATE OF CALIFORNIA AND KERN COUNTY WATER AGENCY FOR 2004 SERVICES FOR THE ENVIRONMENTAL WATER ACCOUNT UNDER THE CALIFORNIA BAY-DELTA AUTHORITY

This Agreement is made as of this 8 day of June, 2004, pursuant to the provisions of the California Water Resources Development Bond Act, the Central Valley Project Act and other applicable laws of the State of California, between the Department of Water Resources of the State of California (Department), and Kern County Water Agency (Agency), each existing and acting pursuant to the laws of the State of California.

RECITALS:

A. The Department is engaged in the operation of, and is a participating agency in the Federal-State California Bay-Delta Authority's Environmental Water Account (EWA).

B. The Department operates and maintains the State Water Resources Development System, known as the State Water Project (SWP), pursuant to the laws of the State of California, involving the development and conveyance of water supplies to water supply agencies throughout the State of California, including the Agency.

C. The Agency operates and maintains a major water system serving the Kern County region of California, partly relying on water from the SWP and the Central Valley Project to provide that service.

D. The Kern Water Bank, the Pioneer Recharge and Recovery Project, the Berrenda Mesa Project and the Buena Vista Water Storage Program provide for water recharge, water extraction, and water supply for the primary benefit of certain lands and people in Kern County and Kings County. These operations have resulted in the storage of water from various sources that is proposed for sale through the Agency to the Department pursuant to this Agreement.

E. The Agency, for purposes of this Agreement, will act on behalf of various agencies which have stored or banked water in groundwater facilities in Kern County that is proposed for sale to the Department pursuant to this Agreement.

F. The CALFED Program resulted in Federal and State agreement to implement the EWA, a cooperative management program intended to provide protection to the fish of the Bay-Delta estuary through environmentally beneficial changes and increased flexibility in the operations of the SWP and CVP, at no uncompensated water cost to the Projects' water users.

G. The Department and the Agency desire to enter into this Agreement to transfer water to the EWA to assist in fishery protection and restoration/recovery needs as described in the August 28, 2000, CALFED Record of Decision and the EWA Operating Principles Agreement.

H. The Department finds that implementation of this Agreement will not materially impair the Agency's capacity to make payments to the Department as provided in its Water Supply Contract with the Department.

I. This Agreement is entered into pursuant to the provisions of the existing EWA Operating Principles Agreement.

J. The Department and the United States Bureau of Reclamation Bureau jointly prepared an Environmental Impact Statement/Environmental Impact Report, (EIS/EIR) in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). That document addresses the implementation of EWA through Stage 1 (2007). Impacts to the environment resulting from EWA-related water transactions of different types, including the one for which this Agreement has been prepared, were discussed and analyzed in that EIS/EIR. The findings of the EIS/EIR were that the project this Agreement contemplates will not significantly impact any aspect of the environment. The EIS/EIR has been certified and Findings and a Notice of Determination approved and filed with the State Clearinghouse on March 22, 2004, in accordance with CEQA procedures (State Clearinghouse Number 2001072046).

AGREEMENT

The Department and the Agency agree as follows:

1. DEFINITIONS

(a) "Agency" means the Kern County Water Agency acting on behalf of the Participants for purposes of this Agreement.

(b) "EWA" means the Environmental Water Account established by the CALFED Agencies pursuant to the August 28, 2000 CALFED Bay-Delta Program Programmatic Record of Decision, and currently operated under the California Bay-Delta Authority.

(c) "EWA Operating Principles Agreement" means the Environmental Water Account Operating Principles Agreement dated August 28, 2000, which is Attachment No. 2 to the CALFED Record of Decision.

(d) "Kern Fan Project" means the following groundwater storage and recharge facilities located in Kern County: Kern Water Bank, Pioneer Recharge and Recovery Project, Berrenda Mesa Project and Buena Vista Water Storage Program.

(e) "Participants" means those entities that have stored water in the Kern Fan Project, that have given the Agency through agreement or other legal means the authority to act on their behalf for purposes of this Agreement, and that have provided to the Department satisfactory evidence of Agency's authority to act on behalf of the Participants.

(f) "Parties" means the Department and the Agency.

(g) "Purchase Water" means water that the Participants stored within Kern Fan Project groundwater banking facilities and that remains in storage as of the effective date of this Agreement, and that will be made available to the Department on behalf of EWA by exchange of Agency's 2004 Table A Allocation or Article 21 water for groundwater pumped and used in the Agency service area, or by reclassification of previously banked water as Agency's banked 2004 Table A Allocation water pursuant to Article 11 of this Agreement. Purchase Water includes both a minimum commitment amount and an optional purchase amount.

(h) "Water Supply Contract" means the contract for a water supply between the Department and the Agency dated November 15, 1963, as amended.

(i) To the extent applicable, the definitions in the Water Supply Contract are incorporated herein.

2. TERM

This Agreement shall become effective upon execution by the Parties and shall terminate when all obligations under this Agreement have been satisfied.

3. NO IMPACT ON WATER SUPPLY CONTRACT

Except as expressly provided herein, this Agreement does not supersede the Water Supply Contract and the terms and conditions of the Water Supply Contract remain in effect and apply to this Agreement.

4. NO IMPACT ON OTHER SWP CONTRACTORS

This Agreement will not cause adverse impacts on allocation or delivery of project water (including Article 21 water), pursuant to the SWP long-term Contract, to other SWP contractors, nor to SWP operations or facilities. The Agency agrees that Agency's 2004 Table A Allocation water delivery schedule will be prepared and submitted based on conditions existing without this Agreement. The Agency agrees not to increase Agency's SWP delivery request to the Department and agrees not to sell Agency's 2004 Table A Allocation water, 2004 Turn Back Pool Water or 2004 Article 21 water to EWA, as a result of entering into this Agreement.

5. STATE FUNDING CONTINGENCY

The Department's obligations under the EWA Operating Principles Agreement and this Agreement are contingent upon appropriation or allotment of funds, other than

SWP funds, to pay for the cost of the EWA program and this Agreement. Similarly, Agency obligations under this Agreement are contingent upon the Department obtaining appropriation or allotment of funds for this purpose. By signing the Agreement, the Department declares that sufficient State funds are available for the State's share of the cost of this Agreement.

6. NON-SWP FUNDS

Costs of the EWA are to be paid by non-SWP funds. The Department will develop estimates of the cost to the SWP for operating the EWA program, including power costs, and will recover such incremental costs through funding from the California Bay-Delta Authority, or other non-SWP funds, such that the Agency and the other SWP contractors do not incur increased costs because of the EWA program.

7. DISPUTE RESOLUTION

In the event of a dispute regarding interpretation or implementation of this Agreement, or if the Parties are unable to agree upon a matter as to which their agreement is provided for hereunder, the Director of the Department of Water Resources and the General Manager of the Agency shall endeavor to resolve the dispute by meeting within 30 days after the request of a Party. Nothing in this Article 7 limits legal or equitable remedies otherwise available to the Parties.

8. ENVIRONMENTAL COMPLIANCE

The Department shall be the lead agency for purposes of compliance with the California Environmental Quality Act (CEQA).

9. OTHER APPROVALS

The Parties will cooperate in obtaining any other necessary approvals to implement this Agreement. Each Party shall bear its own costs for engineering and technical expenses, legal fees and expenses related to obtaining approval(s) for the transfer or exchange of water, pursuant to this Agreement.

10. GOVERNING LAW

This Agreement shall be interpreted in accordance with the applicable laws of the State of California.

11. 2004 PURCHASE AND DELIVERY OF WATER

(a) Based on the SWP allocation, announced following the May 1, 2004 snow survey (hereafter referred to as "May 2004 SWP Allocation"), Agency shall make Purchase Water available for delivery in accordance with this Article in the amount and at the price set forth in Exhibit A. Exhibit A lists both a minimum commitment amount and an optional purchase amount which varies, depending upon the May 2004 SWP Allocation.

(b) The Department, on behalf of the EWA, agrees to purchase the entire minimum commitment amount as listed in Exhibit A based upon the May 2004 SWP Allocation at the price listed in Exhibit A.

(c) The Department, on behalf of the EWA, agrees to pay a non-refundable option fee of forty (40) dollars per acre-foot for the entire optional purchase amount listed in Exhibit A for the May 2004 Allocation. If the Department, on behalf of the EWA, elects to exercise the option to purchase all or any part of the optional purchase water, it may do so by notifying Agency in writing, by

FAX or by email within 5 working days of the announcement of the May 2004 SWP Allocation. The price for the water the Department elects to purchase under this provision shall be the price listed in Exhibit A, less any option fee paid for that water.

(d) By April 15, 2004, the Agency shall provide to the Department the following information about the Purchase Water: 1) the name of the Participant who stored water in a groundwater bank and the name of the groundwater bank; 2) the year in which each Participant stored water and the quantity stored in each groundwater bank; 3) the type of water stored, e.g., SWP Table A Allocation, Friant-Kern Flood Water, Kern River Water Rights/Flood Water, etc.; and 4) the name of the Participant that has ownership of the stored water, if different from the Participant that originally stored the water.

(e) If the Department increases the SWP 2004 allocation after the initial May 2004 SWP Allocation is announced, or if the Department does not elect to purchase the entire optional purchase amount listed in Exhibit A within 5 days of the May 2004 Allocation, the Department may request to exercise its option to purchase the remainder or any portion of the remainder of the optional purchase amount, and/or request an increase in the amount of Purchase Water to be acquired and delivered by Agency. Agency shall approve or disapprove such request within 10 days following receipt of the request in writing.

(f) If the Department decreases the SWP 2004 allocation after the initial May 2004 Allocation is announced, the Agency or the Department, on behalf of the EWA, may request a decrease in the amount of Purchase Water, except that any Purchase Water already delivered to the Department will remain in the ownership and control of the Department as an asset of the EWA.

(g) The Agency may notify the Department in writing on the 1st of each month beginning June 1, 2004, of the availability of additional purchase Water over and above the amounts required to be made available in accordance with Exhibit A. Such notice will include the information provided in Article 11(d) of this Agreement. The Department will respond to the Agency within 30 days of receipt of the Agency's notice as to the quantity (if any) of additional Purchase Water the Department requests the Agency to deliver. The price of additional Purchase Water shall be in accordance with the price shown in Exhibit A based on the SWP Allocation at the time the Department requests the water.

(h) The Agency shall deliver Purchase Water to the Department at O'Neill Forebay, by exchange for the Agency's SWP 2004 Table A Allocation or Article 21 water that would otherwise be delivered for use within the Agency. Purchase Water will be delivered at mutually agreeable times and at rates of delivery in accordance with Article 12 of the Agency's Water Supply Contract, at which time the water shall become EWA water. The Agency will

make all reasonable efforts to deliver Purchase Water after high point in San Luis Reservoir and prior to low point in San Luis Reservoir. If EWA needs to repay the Bureau for curtailments in export pumping, and the Department files a petition with the State Water Resources Control Board to change the place of use of any Purchase Water after it is delivered to EWA for such repayment, the Agency agrees that it will not object to or protest any such petition.

(l) The Agency agrees that Purchase Water will be made available and delivered to the Department by exchange of SWP 2004 Table A Allocation or Article 21 water pursuant to this Agreement after or as such water has been replaced by (1) groundwater pumped and used in Agency service areas in lieu of scheduled SWP 2004 Table A Allocation Water or (2) by reclassification of previously banked water as banked SWP 2004 Table A Allocation or Article 21 water, if the Agency would otherwise store such 2004 SWP water in the groundwater basin. Any such reclassification of previously banked water shall be accomplished in accordance with applicable state law and water rights. Agency shall submit to the Department confirming documentation of the groundwater accounting by January 30, 2005.

12. CHARGES

For Purchase Water delivered by exchange for Agency's 2004 SWP water, the Agency shall pay to the Department the SWP charges associated with the delivery of Purchase Water from the Delta to O'Neill Forebay. Agency shall pay the Department for the variable operation, maintenance, power,

and replacement components of the Transportation Charge of the Water Supply Contract related to conveyance of 2004 SWP water to O'Neill Forebay for the year of delivery. Agency shall be obligated for all payments under its long-term Water Supply Contract with the Department, including the Off-Aqueduct Power Facilities Charges for the year of delivery. Any storage or conveyance costs or losses and any liability associated with the Purchase Water, once delivered to the Department at O'Neill Forebay, shall be the responsibility of the EWA.

(b) If necessary, portions of Purchase Water may be recovered through groundwater pumping and introduced into the California Aqueduct for delivery back in the Agency's service area in lieu of scheduled 2004 SWP Table A Allocation Water, provided that an agreement between the Department and the Agency for introduction of local water and flood water into the California aqueduct is executed beforehand and the operation is carried out in accordance with the terms and conditions laid out in that Agreement. Such an operation shall not be subject to conveyance charges for the water introduced into the Aqueduct.

13. PAYMENTS AND INVOICING

(a) Within ten working days after announcement of the May 2004 SWP Allocation, Agency shall invoice the Department for the forty (40) dollar per acre-foot option fee described in Article 11(c) above.

(b) The Department shall pay the Agency for delivery of Purchase Water pursuant to Article 11 of this Agreement at the price set forth in Exhibit A. The purchase price for optional purchase water shall be reduced by any option fees paid for that water. The Agency shall invoice the Department on a monthly basis, by the fifteenth of each month, for the quantity of Purchase Water made available during the preceding month.

(c) Two copies of each invoice bearing the Agreement Number and the Agency's Taxpayer Identification Number shall be submitted to the Department at following address:

Mr. Dan Flory, Chief
State Water Project Analysis Office
Department of Water Resources
Post Office Box 942836
Sacramento, California 94236-0001

(d) One additional copy of each invoice shall be sent simultaneously to the Department's Accounting Office at the following address:

DWR Accounting Office, Contracts Payable Unit
Post Office Box 942836
Sacramento, California 94236-0001

(e) The Department shall pay the Agency following receipt of the Agency's invoices prepared in accordance with this Article 13 within sixty (60) days of receipt of an invoice from Agency.

14. FORCE MAJEURE

Any flood, earthquake, failure of the California Aqueduct, acts of God (other than drought), court decision, or any other events beyond the reasonable control of the

Department or the Agency constitute a force majeure event and would allow suspension of performance for the duration of the force majeure event.

15. NOTICES

Any notice, demand or request made in connection with this Agreement shall be in writing and shall be deemed properly served if delivered in person or on the third day after mailing, if mailed by first class mail, postage prepaid, to the addresses specified below:

To the Department:

Mr. Dan Flory, Chief
State Water Project Analysis Office
Department of Water Resources
Post Office Box 942836
Sacramento, California 94236-0001
Fax: (916) 653-9628
E-Mail: dflory@water.ca.gov

To Agency:

Mr. Thomas N. Clark
General Manager
Kern County Water Agency
Post Office Box 58
Bakersfield, California 93302-0058
Fax: (661) 634-1438
E-Mail: tnclark@kcwa.com

16. WATER RIGHTS

No Party hereto shall assert that any activity under this Agreement shall affect the validity of any existing water rights held by any Party.

17. CONTRACT NOT A PRECEDENT

The Parties intend that the provisions of this Agreement shall not bind the Parties as to the provisions of any future agreement between them. This Agreement was developed specifically for the EWA and the specified Agreement term.

18. MODIFICATION

This Agreement may be modified only upon mutual written consent of the Parties.

19. NO THIRD-PARTY BENEFICIARIES

No third-party beneficiaries are intended or created by this Agreement.

20. ASSIGNMENT

This Agreement is not assignable either in whole or in part, except upon mutual written consent of the Parties.

21. COMPLETE CONTRACT

Other than as specified herein, no document or communications passing between the Parties to this Agreement shall be deemed as part of this Agreement. The Parties may amend this Agreement in writing.

22. WAIVER

The waiver, at any time, by either Party of its right with respect to default or other matter arising in connection with this Agreement, shall not be deemed a waiver by that Party with respect to any subsequent default or matter.

23. TIME

Time is of the essence in this Agreement.

24. LIABILITY

The Agency shall hold the Department, its officers, agents, or employees harmless and indemnify them for damages of any nature whatsoever arising out of this Agreement.

25. SIGNATURE CLAUSE

The signatories represent that they have been appropriately authorized to enter into this Agreement on behalf of the Party for which they sign.

26. RESOLUTION

The Agency must provide the Department with a copy of a resolution, order, motion, or ordinance of the local governing body which, by law, has authority to enter into this Agreement, authorizing execution of this Agreement.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the date first written above.

Approved as to legal form
and sufficiency:

Chief Counsel
Department of Water Resources

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

Director

General Counsel

KERN COUNTY WATER AGENCY

General Manager

EXHIBIT A

May 2004 SWP Allocation	Minimum Commitment	Optional Purchase	Price
(%)	(af)	(af)	($/af)
54	0	0	0
55	0	20,000	200.00
56	0	24,000	200.00
57	0	28,000	200.00
58	0	32,000	200.00
59	0	36,000	200.00
60	0	40,000	200.00
61	0	42,000	198.00
62	0	44,000	196.00
63	0	46,000	194.00
64	0	48,000	192.00
65	35,000	49,000	190.00
66	41,000	47,000	188.00
67	47,000	45,000	186.00
68	53,000	44,000	184.00
69	59,000	42,000	182.00
70	65,000	15,000	180.00
71	65,000	26,000	179.50
72	65,000	37,000	179.00
73	65,000	48,000	178.50
74	65,000	59,000	178.00
75	65,000	60,000	177.50
76	65,000	60,000	177.00
77	65,000	60,000	176.50
78	65,000	60,000	176.00
79	65,000	60,000	175.50
80	65,000	50,000	175.00
81	65,000	50,000	174.50
82	65,000	50,000	174.00
83	65,000	50,000	173.50
84	65,000	50,000	173.00
85	65,000	50,000	172.50
86	65,000	50,000	172.00
87	65,000	50,000	171.50
88	65,000	50,000	171.00
89	65,000	50,000	170.50

EXHIBIT A (CONTINUED)

2004 SWP Allocation	Minimum Commitment	Optional Purchase	Price
(%)	(af)	(af)	($/af)
90	65,000	50,000	170.00
91	65,000	50,000	169.00
92	65,000	50,000	168.00
93	65,000	50,000	167.00
94	65,000	50,000	166.00
95	65,000	50,000	165.00
96	65,000	50,000	164.00
97	65,000	50,000	163.00
98	65,000	50,000	162.00
99	65,000	50,000	161.00
100	65,000	50,000	160.00

ADDENDUM 6

Uniform Appraisal Standards for Federal Land Acquisitions (UAS) References

ADDENDUM 6

Uniform Appraisal Standards for Federal Land Acquisitions (UAS) References

The UAS was searched for references to water, water rights and irrigation. Those sections where these references occur, that are considered significant for the valuation of water rights, are quoted in full or in part. In addition, other sections of the UAS that are particularly applicable to water right valuations are commented upon and sometimes quoted. All underlines in the primary quoted text are Herzog's insertions, and strikeouts of the quoted text are also Herzog's. All direct extractions from the UAS are in quotation marks and indented.

Unless otherwise noted, wherever the term "water right(s)" appears, it should taken to mean all forms of ownership interest in water that may be separated from real estate. The primary water right that cannot be separated from real estate is riparian. Unless specific reference is made to riparian water rights, they are not the water rights being discussed.

Appropriative rights used for irrigation are considered to be appurtenant to the real estate where the water application takes place, therefore, they are a real property right. Such rights can, however, be transferred from one parcel to another. Appropriative rights that are utilized for municipal and industrial purposes result in the actual water becoming personal property when it is delivered to the customer.

Contractual entitlements are not water rights; they are intangible assets.

It is absolutely critical for the appraiser and the agency to understand and clearly define the interest being appraised at the beginning of the assignment. If the water right is appurtenant to real estate, then it is included in the *bundle of rights* associated with a particular parcel of land and a *partial acquisition* is being made (See Section B-11). If the water rights are in integral and important part of the value of the ownership, then a *before and after* approach will be required. This would be the case in appraising the water rights associated with 40 acres of irrigated land. If, on the other hand, one is appraising the water rights associated with 40 acres of irrigated land which is part of a 5,000 acre ranch with 1,000 irrigated acres, it is probable that a *takings + damages* approach would be more reasonable. The cost and effort of appraising the whole property with and without the water right would not be warranted. In this latter situation, the water right would be valued on a stand-alone basis with damages to the remainder being analyzed as well.

Any time that a *before and after* approach is taken, then the UAS can be applied without modification provided that the appraiser insures that all aspects of the water right is taken into consideration both *before* and *after*. In a *takings + damages* approach, the value of the water right on a *stand-alone* basis would be estimated with any damages to the remainder, if any, being added. Even when the water right is being valued on a *stand-alone* basis, the principles of highest and best use and "larger parcel" apply to the real estate of which the water right is a part.

Part I – Introduction

Sections A-1 through A-10 describe the presentation and contents of the Introduction section of an appraisal report. All of these apply to a water rights valuation. Special attention should be given to Section A-10, Summary of Appraisal Problems. The first reference in the UAS to water rights appears in the final paragraph of that section.

A-10. Summary of Appraisal Problems.

> "This section gives the appraiser the opportunity to acquaint the reader of the appraisal report with the specific appraisal problems, if any, which have been encountered by the appraiser and that will be discussed in detail in the body of the appraisal report. Appraisers are encouraged to take advantage of it. If the property under appraisal is a single-family residence, the whole of which is being acquired, in an area of plentiful market data, the appraiser will usually only report that no special appraisal problems were encountered. However, federal land acquisitions are seldom that simple.
>
> In considering subjects to be discussed in this section of the report, appraisers should review the subjects discussed in Section B of these Standards, which cover many of the specialized, sometimes complex, appraisal problems often encountered in preparing appraisal reports for federal ~~land~~ property acquisition purposes. The appraiser should briefly describe the principal problems presented in estimating the market value of the property under appraisal and describe the estate to be taken. In the case of a partial acquisition, the appraiser should describe the principal differences in the property between the before and after situations, including a brief description of the government's project and any changes in the highest and best use of the subject property.
>
> If the parcel under appraisal includes **water rights**, minerals, or suspected mineral values, fixture values, growing crops, or timber values, the treatment of their contributory value should be discussed, including the methodology employed to avoid the forbidden *summation* or *cumulative* appraisal.[26] If the valuation of the property required the use of any consulting reports, the appraiser should describe such reports, the method of utilization thereof, and the weight or reliance placed thereon." *(end of excerpt)*

The "forbidden *summation or cumulative* appraisal" can occur when appraising a whole property that has two or more real property components to it that could be separated from each other and individually marketed (see Section B-13). It is not wrong to develop market values for each component. It is wrong to simply add up the individual conclusions and present the sum as the market value of the whole. The value of the whole must reflect the perspective of the private buyers and sellers in the market – when buying and selling the whole. Usually, the market will not take a summation approach but will apply a discount to the sum of the pieces.

[26] See Section B-13, "The Unit Rule," in these Standards.

In the case of valuing water rights or contractual entitlements to water that have an historical use of irrigation for agricultural production, care should be exercised on a several issues. Unless there is evidence from the market of similar properties being purchased primarily for their water right, then there would be no reason to value the whole by separating its components and then combining them. The whole should be valued by directly comparing the subject to other irrigated parcels.

If the highest and best use of the land is transitioning from irrigated agriculture to urban use of the water and non-irrigated use of the land, then it is possible that the value of the water rights alone could exceed the value of the irrigated land. However, evidence should exist in the market of the transition before the appraiser is justified in concluding to a water rights value that is equal to or above the value of irrigated land. See Section B-9 regarding conjectural and speculative evidence.

Demand and supply must be considered, as well as all costs associated with obtaining a change in point of diversion and purpose of use.

Part II – Factual Data

A-11. Legal Description. In addition to the legal description of the land to which the water right is attached, it is important to identify the water right being valued and its validity. This should be done before any appraisal begins. Reaching conclusions about the validity of the water right, and its effective date of origin, is the responsibility of the agency interested in acquiring that water right. Appraisers generally do not have the expertise to perform this task with a high degree of certainty. The validity of the right being appraised will be an Extraordinary Assumption of the appraisal. Therefore, the agency should confirm the validity of the water right prior to engaging the appraiser. An alternative would be to have this research be part of the appraisal process with the appraiser engaging a sub-contracting attorney to perform this research. If this approach were taken, then the assignment should be "phased" with the water right research being Phase I and the appraisal being Phase II.

If the water right is a result of a permit issued by the State Water Resources Control Board (Board) then there will be a "License to Divert" that identifies the date of the license, amount of water that can be extracted, the point of diversion, the purpose of use and the season of use. All of these items are significant in that they help to identify the obstacles and opportunities that a buyer of that water right is faced with.

If the water right is pre-1914 appropriative, then there will not be a License to Divert since the water right pre-dates the Board. The owner should have documentation that proves the water right. It would be advisable for a water rights attorney on staff with the acquiring agency to confirm the validity of the water right. A document recorded with the county is not sufficient proof, in and of itself, of the validity of the water right. There must be evidence of the actual exercising of that right through the years.

If the water right is a riparian right, then it can not be separated from the land in California.

If it is a groundwater right, there will not be a License to Divert but there should be a use history that the property owner can provide. Groundwater rights are usually associated with overlying lands, but there can be appropriated groundwater as well. Any related groundwater management units, and associated restrictions, should be researched.

If it is a contractual entitlement to water, then the party benefiting from that entitlement is not the holder of the primary water right. Frequently, this is the situation in an irrigation district. The district may have appropriative rights with contractual agreements to deliver water, upon certain conditions, to an irrigator within the district. The irrigator may not have the right to transfer the contractual entitlement to another party without the district's permission. The district itself may obtain the water through contractual entitlements, which is the case in both the Central Valley Project and the State Water Project.

Adjudicated water rights will have a court decree reference with rights to specific amounts of water allocated among a group of water users. Point of diversion, period of use and purpose of use may also be stipulated. A copy of the decree should be obtained by the public agency and reviewed by staff attorneys prior to engaging the appraiser. The decree and the attorney's written opinion regarding the water right being appraised should be provided to the appraiser and included in the addenda of the appraisal. Both surface and groundwater rights can be adjudicated.

A-12. Area, City and Neighborhood Data.

> "This data (mostly social and economic) must be kept to an absolute minimum and should only include such information that directly affects the appraised property, together with the appraiser's conclusions as to significant trends."

When appraising water rights, it is critical that the appraiser accurately describes the market in which the right exists, as well as trends in that market. This is also an opportunity for the appraiser to convince the reader that the appraiser has a sufficient level of competency to value this type of property. The extent of the area/market described should encompass not only the subject property but also the region from which comparable sales will be utilized. The foundation for the highest and best use conclusions and future adjustments made to comparable sales is laid in this section of the report. It would be appropriate to re-label this section "Area Data and Market Trends" for water rights appraisals. Value ranges for irrigated agricultural lands should be included as well as water costs from various sources in the area of the subject.

A-13. Property Data.

A. **Site**. The current point of diversion should be described in this section.

B. **Improvements.** The UAS indicates that "irrigation systems" and "domestic and private water systems" should be described. A brief description of the existing infrastructure facilitating the application of the water at its historical location of use is appropriate. However, unless those systems are being included in the

valuation, possibly when both land and water rights are being acquired, the description should be very brief. If the water right is exercised by delivery through an off-site infrastructure to the current place of use, i.e. "upstream" from the place of use, then that infrastructure should be described in detail along with any costs associated with infrastructure use. This is especially important if any buyer of the water rights will have continuing financial responsibility for maintenance costs for this infrastructure, even if it is no longer used for delivery to the new point of diversion.

C. **Fixtures.** Not applicable.

D. **Use history.** A detailed description of the historical use of the water is important along with the source of the information presented. It should be kept in mind that a period of non-use of five years or longer can cause a loss of the water right based on California law. The "consumptive use" that has occurred historically associated with this water right, especially in recent years, must be understood. Most appraisers can only deal in general terms with this by referencing evapotranspiration of applied water by crop type from published tables. It is frequently required that either qualified agency personnel or a private consultant do sufficient analyses to reach conclusions about the consumptive use associated with the water right.

E. **Sales history.** If the water right or the land and water right combined have been sold, then this information should be presented according to UAS requirements. Market offerings made by the owner to sell the water rights, or offers made to the owner by others to buy the water rights should be reported upon.

F. **Rental History.** Water leasing does take place, and if the water right has been leased in the past, that information should be presented. Market offerings made by the owner to lease the water rights, or offers made to the owner by others to lease the water rights should be reported upon.

G. **Assessed Value and Annual Tax Load.** A water right does not have an Assessor's parcel number or any assessed value. The water right most commonly impacts the assessed value of a parcel of real estate because of value enhancement.

H. **Zoning and Other Land Use Restrictions.** A water right is not "zoned," but it can be subject to a wide range of restrictions on use. As indicated earlier, a License to Divert will detail certain restrictions. An overriding principal in all water right transfers is the "no harm" rule, i.e. no other water right holder can be damaged by a proposed water right transfer. Consequently, it is usually only the consumptive use that has historically occurred that will be available for transfer, not the "face value" of the water right.

Part III – Data Analysis and Conclusion

The UAS presents Data Analysis and Conclusions before acquisition in Part III and after acquisition in Part V. If there is a situation where *before and after* valuations are required, then the valuation methodology presented in the UAS should be adhered to while considering the unique factors of water rights appraisals addressed in these guidelines. If the water right is being valued on a stand-alone basis, then the "after" analysis would not be required. The following edits pertain to the stand-alone valuation.

> "**A-14. Analysis of Highest and Best Use.** The appraiser's determination of highest and best use is one of the most important elements of the entire appraisal process.[45] Therefore, the appraiser must apply his or her skill with great care and clearly justify the highest and best use conclusion in the appraisal report.
>
> The highest and best use of the land, as if vacant, and including the water right is first estimated. If the land is improved, the highest and best use of the property, as improved, is then estimated. In some cases, the highest and best use of property cannot be reliably estimated without extensive marketability and/or feasibility studies, which in complex cases may call for the assistance of special consultants.[46] Before it can be concluded that any use for the property is its highest and best use, that use must be physically possible, legally permissible, financially feasible, and must result in the highest value. Each of these four criteria must be addressed in the appraisal report.
>
> If the appraiser concludes a highest and best use that will require a rezoning of the property or modification in point of diversion and/or purpose of use of the water right, the probability of that rezoning or modification must be thoroughly investigated, analyzed and reported. Likewise, if the appraiser's highest and best use conclusions will require other forms of government approval, the probability of obtaining those approvals must be investigated, analyzed, and reported. The extent of the investigation and analysis required by the appraiser to meet the requirements of this standard will be found in Section D-6.
>
> Essential in the appraiser's conclusion of highest and best use is the determination of the *larger parcel*.[47] The appraiser must make a larger parcel determination in every appraisal conducted under these Standards, even in the case of a minor partial acquisition where the client agency has determined a complete before and after appraisal is not necessary. The appraiser's analysis that led to the larger parcel determination and the determination itself must both be reported.[48] Because the ultimate determination of highest and best use is the appraiser's to make, and that determination cannot be made until after considerable investigation and analysis has

45 See Section B-3.

46 See Section D-4. See also Section D-3.

47 The larger parcel, for purposes of these Standards, is defined as that tract, or those tracts, of land which possess a unity of ownership and have the same, or an integrated, highest and best use. Elements of consideration by the appraiser in making a determination in this regard are contiguity, or proximity, as it bears on the highest and best use of the property, unity of ownership, and unity of highest and best use.

48 The legal basis and reasoning for this specific Standard may be found in Section B-11.

been completed, the appraiser's conclusion as to the larger parcel is sometimes different from the specific parcel he or she was requested to appraise by the agency. In such an instance, the appraiser shall inform the agency of his or her determination of the larger parcel and the agency shall amend the appraisal assignment accordingly.

Appraisers must bear in mind that the determination of the larger parcel is required in every appraisal assignment; irrespective of whether the agency has designated an acquisition a *total acquisition* or a *partial acquisition.* This is so because, from a practical standpoint, whether an acquisition is a total or partial acquisition cannot be determined until such time as the appraiser has made a determination of the highest and best use, and the larger parcel. By applying the rules for larger parcel determination, as described in Section B-11, it is possible that two physically separate tracts may constitute a single larger parcel, or conversely, a single physical tract may constitute multiple larger parcels. This can be important not only in consideration of damages and special benefits, but also in the appraiser's selection and comparative analysis of comparable sales.[49]

In light of the discussion in Section B-11 regarding the larger parcel, it is recommended that the appraiser begin an analysis of the *unity of ownership* test with the premise that, in making their larger parcel determination, it is allowable to consider all lands that are under the beneficial control of a single individual or entity, even though title is not identical in all areas of the tract(s). If the appraiser then concludes that the larger parcel constitutes lands that are under the beneficial control of a single entity, but title is not identical, the appraiser's larger parcel determination, together with the facts upon which it is based, should be submitted to agency, or Department of Justice, legal counsel for review before the appraiser proceeds. Based on applicable case law and the facts of the case, legal counsel can then determine whether, as a matter of law, the unity of ownership test of the larger parcel is present, and provide written legal instructions to the appraiser accordingly.

Appraisers conducting appraisals for federal land exchanges, or in connection with inverse condemnation claims, should be aware that the tests applied in larger parcel determination may be different than that suggested above. For a discussion of those potential differences, appraisers should refer to Section D-7 regarding federal land exchange appraisals and to Section D-8 regarding inverse condemnation appraisals.

The use to which the government will put the property after it has been acquired is, as a general rule, an improper highest and best use.[50] It is the value of the land acquired which is to be estimated, not the value of the land to the government. If it is solely the government's need that creates a market for the land, this special need

49 For instance, if an appraiser determined that the larger parcel was a ten-acre tract out of a total ownership of 200 acres, the unit (e.g., per sq. ft.; per acre) value may well be different for the smaller tract, and the appraiser would utilize comparable sales similar in size to the 10 acre larger parcel, rather than sales similar in size to the entire 200 acre ownership.

50 See Section B-3 for the legal basis of this statement.

must be excluded from consideration by the appraiser.[51] Only on the rare occasion that a private demand for the land exists, for the same use for which it is being acquired by the government, is it proper for the appraiser to conclude that the highest and best use of the property is that use for which it is being acquired by the government.

The appraiser's estimate of highest and best use must be an *economic* use. A noneconomic highest and best use, such as *conservation, natural lands, preservation,* or any use that requires the property to be withheld from economic production in perpetuity, is not a valid use upon which to estimate market value.[52] Therefore, any appraisal based on such a non-economic highest and best use will not be approved for federal land acquisition purposes. Similarly, an appraiser's use of any definition of highest and best use that incorporates non-economic considerations (e.g., value to the public, value to the government, or community development goals) will subject the appraiser's report to disapproval for use for federal land acquisition purposes."

"A-15. Land Valuation. The appraiser shall estimate the value of the land for its highest and best use, as if vacant and available for such use. In doing so, the appraiser's opinion of value shall be supported by confirmed sales of comparable or nearly comparable lands[53] having like optimum uses. Differences shall be weighed and explained to show how they indicate the value of the land being appraised. Items of comparison shall include property rights conveyed, financing terms, conditions of sale, market conditions, location, and physical characteristic. The appraiser shall provide adequate information concerning each comparable sale used and the comparative analysis to enable the reader of the report to follow the appraiser's logic.[54]"

The above is only the first paragraph of Section A-15. The rest of the text deals with the *development approach* to land valuation which is not relevant.

Sections A-14 and A-15 are particularly relevant to water rights appraisals with locations that are disconnected from the water delivery infrastructure from which potential urban buyers draw their water supplies. If delivery to an urban entity is either not physically possible or not financially feasible due to the infrastructure (e.g. pipeline construction) costs, then the highest and best use cannot involve the sale of the water right to an urban entity. Therefore, water rights sales to urban entities are not appropriate comparable transactions to use in the valuation.

51 bid.

52 See Section B-3 for the legal basis and reasoning for this standard.

53 For a discussion of what legally constitutes a comparable sale and the admissibility of comparable sales information, see Section B-4 of these Standards.

54 For a discussion of comparable sales documentation and information required and the requirements for comparison, see Section A-17 of these Standards.

From a wildlife perspective, the need for water in a refuge or stream may be equally critical in two separate locations, one where there are a variety of economic uses for water (including urban purchase) and another where only irrigation is an economic use for water. Even though the wildlife need is the same, the water value will probably not be.

A-16. Value Estimate by the Cost Approach.

> "….Entrepreneur's profit, as an element of reproduction or replacement cost, must be considered and discussed, and if applicable, should be derived from market data whenever possible. If the appraiser will place considerable weight on this approach to value in reaching a final value estimate, consideration should be given to retaining the services of a contractor or professional cost estimator to assist in developing the reproduction or replacement cost estimate."

The rest of the section is applicable mainly to improvements to land such as structures.

If the potential of replacing surface water with groundwater exists, then the cost of developing the groundwater resource can be considered a "replacement cost" for the surface water. If one is to take this approach, knowledge must be gained regarding:

- the legal restrictions associated with groundwater use;
- the depth to usable groundwater and how much it varies from season to season;
- typical drawdown during pumping;
- if there is a trend evident in the level of groundwater over recent years;
- pumps and fuel that are common in the area and associated costs both initially and of operation, generally on a per acre-foot basis;
- life expectancy of pumps and well casings; and
- amortization rate appropriate for use in estimating depreciation.

One or more local experts may be required to develop credible information. These experts could include local well drillers, irrigation districts and farm organizations. The Department of Water Resources may have information regarding groundwater conditions. Every five years the DWR publishes Bulletin 160 which gives regional groundwater conditions as well as other useful information. Bulletin 118, *California's Groundwater*, was updated in 2003 and is also an important reference.

There is another potential water source that could supply replacement cost information, i.e. desalination. The cost of this process appears to be decreasing significantly in recent years. It is still generally one of the most expensive options available. However, there are some urban agencies along the Pacific Ocean that are incorporating desalination into their overall water supply. It is conceivable that in the future desalination plants could move inland and be used to deal with high salt concentrations of surface waters in the Central Valley. This would in effect be a new water source that could be sold in the market. Until that time, desalination costs would only be relevant in highly select situations where such development were proven to be feasible. Salt disposal costs would also have to be considered.

Entrepreneurial profit should be included in any final cost estimate, because an alternate supply would be developed by someone only if it were a profitable endeavor.

As in the case of typical real estate appraisals, the cost approach is generally not as well received as the sales comparison approach, but it can provide important supplemental information. There are occasions when it may be the only approach applicable due to the absence of similar market sales.

> **"A-17. Value Estimate by the Sales Comparison Approach.** Since any recent and unforced sale of the property under appraisal can be the best evidence of its value,[62] any such sale is treated as a *comparable sale* in this approach to value. It shall be analyzed like any other comparable sale and given appropriate weight by the appraiser in concluding a final estimate of value of the property. As noted in Section A-13e of these Standards, an unsupported claim that a sale of the subject property was a *forced* sale or not indicative of its value is unacceptable.
>
> All comparable sales used shall be confirmed by the buyer, seller, broker or other person having knowledge of the price, terms, and conditions of sale.[63] When a comparable sale is of questionable nature and/or admissibility (e.g., sales to a government entity) special care must be taken in the verification of the circumstances of the sale.[64] A narrative comparative analysis of each comparable sale shall be made explaining how the sale relates to the property under appraisal in respect to those features which have an effect on market value.
>
> In selecting the comparable sales to be used in valuing a given property, it is fundamental that all sales have the same economic highest and best use as the property under appraisal and that the greatest weight be given to the properties most comparable to the property under appraisement. In this regard, appraisers must recognize that, when valuing a property with a highest and best use for some form of development that will require rezoning or extensive permitting, sales of similar properties may require extensive analysis and adjustment before they can be deemed economically comparable. The analysis and adjustment of such sales is discussed in Section D-9 of these Standards.
>
> Each appraisal must contain a sufficient description of the comparable sales used so that it is possible for the reader to understand the conclusions drawn by the appraiser from the comparable sales data. ~~Photographs of the comparable sales are valuable visual aids that indicate the comparability of the property recently sold with the property under appraisal. Such photographs must accompany each~~

62 See Section B-5 of these Standards.

63 These Standards require that sales verification be conducted by competent and reliable personnel, and if the case goes into condemnation, the sale must be personally verified by the appraiser who will testify. However, appraisers should recognize that some agencies may require in their appraisal contracts that initial verification be made by the appraiser who will sign the appraisal report.

64 For a description of the verification process required by these Standards for such sales see Section D-9.

~~appraisal report not only to aid the reviewing appraiser but also for the agency's records and for later use in possible condemnation trials. In addition to the identification of the property, every photograph should show the date taken and the name of the person taking the photograph.~~

The preferred method of adjusting comparable sales is through the use of quantitative adjustments whenever adequate market data exists to support them: "[q]uantitative adjustments are developed as either dollar or percentage amounts. Factors that cannot be quantified are dealt with in qualitative analysis."[65] Only when adequate market data does not exist with which to support quantitative adjustments should the appraiser resort to qualitative adjustments (i.e., inferior, superior).[66] Appraisers must bear in mind that quantitative and qualitative adjustments are not mutually exclusive methodologies. Because one factor of adjustment cannot be quantified by market data does not mean that all adjustments to a sale property must be qualitative. All factors that can be quantified should be adjusted accordingly. When quantitative and qualitative adjustments are both used in the adjustment process, all quantitative adjustments should be made first.[67] When using quantitative adjustments, appraisers must recognize that not all factors are suitable for percentage adjustments. Percentage and dollar adjustments may, and often should, be combined.[68] Each item of adjustment must carefully be analyzed to determine whether a percentage or dollar adjustment is appropriate.

When appraisers must resort to qualitative adjustments, they must recognize that this form of comparative analysis will often require more extensive discussion of the appraiser's reasoning. This methodology may also require the presentation of a greater number of comparable sales. It is essential, of course, that the appraiser specifically state whether each comparable sale is generally either overall superior or inferior to the property under appraisal. To develop a valid indication of value of the property under appraisal by the use of qualitative analysis, it is essential that the comparable sales utilized include both sales that are overall superior and overall inferior to the property being appraised. If this is not done, the appraiser will have merely demonstrated that the property is worth more than a certain amount (if all of the sales are inferior to the subject property) or less than a certain amount (if all of the sales are superior to the subject property).

65 The Appraisal of Real Estate, 11th ed. (Chicago: Appraisal Institute, 1996), 414.

66 The decision whether to use quantitative or qualitative adjustments should be based on the question of availability of data to support quantitative adjustments. Using qualitative adjustments for the purpose of obscuring the appraiser's complete reasoning and analysis from opposing parties in litigation is an unacceptable practice and, in the view of the Department of Justice, is contrary to the intent of Rule 26(a)(2)(B) of the Federal Rules of Civil Procedure.

67 The Appraisal of Real Estate, 11th ed. (Chicago: Appraisal Institute, 1996), 440.

68 For instance, a percentage adjustment for market conditions (time) may be appropriate, but an adjustment for the fact that the property under appraisal (delete: is 300' from a sewer connection) needed a pipeline constructed to allow the buyer to take delivery and all of the comparable sales (delete: are connected to sewer) did not, should often be made in a lump sum dollar amount to reflect the cost to cure the subject property's comparative deficiency. If a percentage adjustment were applied to the price per unit (e.g., per acre-foot (delete:, per sq. ft.)) of each comparable, the adjustment to each of the comparables would vary, depending on the price per unit of the comparable, and might have no relationship to the cost to cure subject's deficiency.

In developing a final value estimate by the sales comparison approach, the appraiser shall explain the comparative weight given to each comparable sale, no matter whether quantitative or qualitative adjustments, or a combination thereof, are used. A comparative adjustment chart, or graph, is recommended and may assist the appraiser in explaining his or her analysis in this regard.

Documentation of each comparable sale shall include the name of the buyer and seller, date of sale, legal and water right description,[69] type of sale instrument, document recording information, price, terms of sale, location, ~~zoning~~, present use, and highest and best use~~, and a brief physical description of the property. A plot plan, or sketch, of each comparable property should be included, not only to facilitate the reader's understanding of the relationship between the sale property and the subject property, but also to locate the sale property in the field~~. This information may be summarized for each sale on a *comparable sales form* and included in this section or in the addenda of the report. ~~As noted, a photograph of each comparable sale shall also be included~~. A comparable sales map, showing the relative location of the comparable sales to the property under appraisal[70] shall be included, either in this section or in the addenda of the report. Inclusion of a copy of the transfer document (e.g., deed, contract) in the report is neither required nor desirable, unless there is something in the document that is unusual or particularly revealing.

The definition of market value used in these Standards requires that the estimate of value be made in terms of cash or its equivalent.[71] Therefore, the appraiser must make a diligent investigation to determine the financial terms of each comparable sale. When comparing the sale to the property being appraised, the appraiser shall analyze and make appropriate adjustments to any comparable sale that included favorable or unfavorable financing terms as of the date of sale. Such adjustment must reflect the difference between what the comparable sold for with the favorable or unfavorable financing and the price at which it would have sold for cash or its equivalent.

While cash equivalency of favorable or unfavorable financing can be estimated by discounting the contractual terms at current market or yield rates for the same type of property and loan term over the expected holding period of the property, the preferred method of estimating a proper cash equivalency adjustment is by the analysis of actual market data, if such data is available."

If a *before and after* analysis is being done where sales of land with and without water rights are being compared to the subject, then the UAS requirements regarding sale documentation and inspection must be adhered to. If water rights are being valued on a *stand-alone* basis, where the purchasers in the sales were motivated by the acquisition of the

69 This may be abbreviated if lengthy(delete:, or reference may be made to a tax parcel number).

70 It is important that the locations of the comparable sales and the subject property are shown on the same map so that a reader of the report, not familiar with the area, can understand the relative proximity of the properties and locate them in the field.

71 See Section B-2 of these Standards.

water right, then physically viewing the historical place of use contributes little to the analysis and could cause substantially higher fees. The appraiser must, however, understand all aspects of the water right purchased, including how the transfer was legally and physically accomplished.

A-18. Value Estimate by the Income Capitalization Approach.

Valuing water rights by the income capitalization approach would be a rare event. If the situation calls for it, then all of the items addressed in this section of the UAS are relevant. Care must be taken to insure that only the income from the water rights themselves are being included in the valuation, not the income from crops grown or some other business enterprise for which water is only one of the inputs. See the definition of Business Enterprise Value. See Section B-7 of the UAS for further discussion on this issue.

Using a foregone-net-income approach for valuing water is particularly tempting in an annual leasing situation or even a lease involving only a portion of the growing season. A farmer may take the position that if he has use of the water he will farm his land and will probably produce income within a specified range. Therefore, he will not sell the water for less than the expected income.

However, a private buyer of the water who intended a similar use of the water would be faced with a financially infeasible situation if he purchased that same water. The reason being that there would be no opportunity for profit since the price of the water already had the projected profit included.

If the buyer had a dissimilar use in mind such as growing a crop with higher profit margins, or was an urban entity that was evaluating the purchase on some other basis than income, then it may be feasible for the buyer to pay the seller's profit based price.

As inconvenient as it may be, there is no escaping the fact that market value of a real property interest can not be based on the net income derived from a business enterprise wherein the property being appraised is only one of the agents of production. If such entities have entered the market, then their sales transactions may be appropriate for use in establishing the annual value of the water, but that is different than a "farm budget" net income analysis.

Another income situation may exist for a water right being valued. The Environmental Water Account and Dry Year Purchase Programs by various entities may provide annual water sale opportunities. Whatever actual or potential sales that take place in these programs must be viewed in light of the risk associated with the income generated. Typically, the buyer pays an option price every year to those sellers that have entered into contractual relationships with them. At the buyer's discretion, usually based upon hydrologic conditions, the seller may exercise a purchase option. The initial option price is credited toward the final sale price. Hydrologic risks as well as the termination of the programs must be taken into consideration if this income is to be the basis of a water right valuation.

The most straightforward and appropriate income based valuation of water rights lies in examining the differential between the lease rates for dry land versus irrigated land. This would be suitable for establishing an annual water right lease rate. If this annual rate is to be the basis of developing a present net value conclusion, then obviously the selection of a discount rate becomes critical which must also include consideration of variability in the annual lease rate.

A-19. Correlation and Final Value Estimate.

> "The appraiser shall explain the reasoning applied to arrive at the final opinion of value and how the results of each approach to value were weighed in that opinion, and the reliability of each approach to value for solving the particular appraisal problem.
>
> The appraiser shall also state his or her final estimate of value of all of the property under appraisal as a single amount, including the contributory value of fixtures, timber, minerals, and **water rights**, if any. The appraiser must avoid making a summation appraisal.[75] The appraiser is solely responsible for the final estimate of value. If that value estimate includes elements of value which were based on estimates developed by others (e.g., timber cruisers, mineral appraisers), the appraiser cannot merely assume their accuracy. The reasonableness of the subsidiary estimates must be confirmed in accordance with Section D-4 of these Standards."

[75] See Sections B-13 and D-4 of these Standards

Parts IV, V and VI

These sections apply when a "before and after" analysis is required in the case of a partial taking. If that situation does arise, then the principles in these sections should be adhered to with appropriate modification for water rights valuation.

Part VII – Exhibits and Addenda

Modifications or omissions of the items referenced are fairly obvious, e.g. floor plan.

A-38. Other Pertinent Exhibits.

> "These would include, for example, any written instructions given the appraiser by the agency or its legal counsel, any specialist reports (such as timber appraisals, environmental studies, mineral or **water rights studies** or appraisals, reproduction cost estimates, cost to cure estimates, fixture valuations), any pertinent title documents (such as leases or easements), and any charts or illustrations that may have been referenced in the body of the report."

It is absolutely critical that any written instructions and legal opinions provided to the appraiser be included with the report. Clarity must exist as to what the Extraordinary Assumptions and Hypothetical Conditions of the report were. Remember, an appraiser may not modify the assignment by means of Extraordinary Assumptions or Hypothetical Conditions.

Any conclusions reached by the appraiser regarding the validity of the water rights or the quantity of water associated with the water right must be well supported. In order to utilize a specialist's report, the appraiser must be convinced of its validity. See Section D-4.

B-3. Highest and Best Use.

This section presents fundamental principles that must be applied in valuing water rights. Whenever "land" is encountered in the text, "water rights" can be effectively substituted.

B-14. The Commerce, or "Navigational Servitude."

Water rights are not specifically mentioned in this section, however, riparian lands are. If an appraisal involves riparian lands, then this section should be reviewed for applicability. The appraiser should always request a legal opinion before proceeding with an appraisal based on his or her own conclusion that this section applies to the situation at hand.

B-18. Price Paid by a Governmental Entity for Similar Property.

Before utilizing a comparable water rights sale where a government agency was a participant, this section and Section D-9 should be reviewed and adhered to.

B-23. Zoning and Permits.

Water rights are not zoned. Water rights do typically have restrictions on how and where they can be exercised. When considering the information and direction in this important section, "zoning," or "zoning restrictions," and "zoning regulations" should simply be replaced by "legal restrictions."

ADDENDUM 7

Report Structure

ADDENDUM 7

Report Structure

The report presentation indicated below is taken directly from the Uniform Appraisal Standards for Federal Land Acquisitions, pages 9 to 27. Comments are inserted to alert the appraiser to certain aspects of the report under any particular heading. **Significant additional comments are presented in the previous section of the addenda – "UAS References."**

Introduction

1. **Title Page**
2. **Letter of Transmittal**
3. **Table of Contents**
4. **Appraiser's Certification**
5. **Summary of Salient Facts and Conclusions**

Include Extraordinary Assumptions and Hypothetical Conditions

6. **Photographs of Subject Property**

Pictures associated with historical use including water extraction and distribution facilities, as well as land where water was applied.

7. **Statement of Assumptions and Limiting Conditions**

Any Extraordinary Assumptions and Hypothetical Conditions should be displayed prominently in this section as well as wherever value conclusions are presented. The assignment cannot be changed by the appraiser through Extraordinary Assumptions and Hypothetical Conditions. The client must communicate these to the appraiser in writing.

8. **Scope of the Appraisal**
9. **Purpose of the Appraisal**
10. **Summary of Appraisal Problems**

Factual Data – Before Acquisition

11. **Legal Description**

For land and water right or entitlement. Most preliminary title reports exclude water rights from the items covered by title insurance. Other documentation should be reviewed carefully and discussed here. Any Extraordinary Assumptions and Hypothetical Conditions must be directed by the client and presented.

12. Area, City, and Neighborhood Data

These sections should not be generic, but must present relevant information regarding the markets for the interests being appraised. Market trends for water rights and potential buyers of the water right should be discussed in this section.

13. Property Data

- **a. Site**
- **b. Improvements**

  A water right can be considered as an improvement to the land because it is appurtenant to it.

- **c. Fixtures**
- **d. Use History**
- **e. Sales History**
- **f. Rental History**
- **g. Assessed Value and Annual Tax Load**
- **h. Zoning and Other Land Use Restrictions**

  The process involved in transferring a water right, including obstacles and opportunities for the subject, should be addressed. As in cases with zoning change, if a transfer is going to be the basis of valuation, then the probability of approval of the transfer must be addressed and risk of failure incorporated into the analysis.

Data Analysis and Conclusions – Before Acquisition

14. Analysis of Highest and Best Use
15. Land Valuation
16. Value Estimate by the Cost Approach
17. Value Estimate by the Sales Comparison Approach
18. Value Estimate by the Income Capitalization Approach
19. Correlation and Final Value Estimate

Factual Data – After Acquisition

20. Legal Description
21. Neighborhood Factors
22. Property Data

- **a. Site**
- **b. Improvements**
- **c. Fixtures**
- **d. History**
- **e. Assessed Value and Annual Tax Load**
- **f. Zoning and Other Land Use Restrictions**

Data Analysis and Conclusions – After Acquisition

23. Analysis of Highest and Best Use

24. Land Valuation
25. Value Estimate by the Cost Approach
26. Value Estimate by the Sales Comparison Approach
27. Value Estimate by the Income Capitalization Approach
28. Correlation and Final Value Estimate

Acquisition Analysis

29. Recapitulation
30. Allocation and Explanation of Damages
31. Explanation of Special Benefits

Exhibits and Addenda

32. Location Map
33. Comparable Data Maps
34. Detail of Comparative Data
35. Plot Plan
36. Floor Plan
37. Title Evidence Report
38. Other Pertinent Exhibits
39. Qualifications of Appraiser

ADDENDUM 8

California Water

ADDENDUM 8

California Water

This section of the report presents an overview of the history and infrastructure of California water. It is intended to help the reader understand the overall situation as it relates to the subject.

California Water

The vast majority of California is technically either semi-arid or a desert. In "normal" years, the Coast Range in the northern portion of the state has significant precipitation, as does the Sierra-Nevada Range that runs north and south along the state's eastern edge. Most of the rest of the state gets rainfall amounts generally in the range of 10 to 20 inches annually. Precipitation that falls on the interior of Northern and Central California feeds the drainage systems of the Sacramento and San Joaquin Rivers. Both of these rivers flow into the Sacramento-San Joaquin Delta. The water in the Delta flows into Suisun Bay, and then into San Pablo and San Francisco Bays. The Delta is influenced by the tides, with salt and fresh water mixing either in the Delta or Suisun Bay depending upon the volume of the outflow. California's river system and water project facilities are displayed on the following page (Exhibit A9-1).

Two-thirds of Californians get all or part of their drinking water from the Delta by virtue of local, state, or federal water projects that pump Delta water to the San Francisco Bay area, as well as central and southern California. Most of the cities in Northern California rely to a large extent on the Sacramento River for their water supply.

In a normal precipitation year, approximately half of the state's available surface water (35 million acre-feet) is collected in 1,313 local, state and federal reservoirs. This water is called "developed water" because it is managed, stored, diverted from rivers, or otherwise developed for human consumptive or environmental use.

Another source of water other than surface runoff from rainfall is groundwater. A large percentage of the state's water supply in a normal year comes from groundwater, but groundwater usage can increase during drought years. There are some potential problems associated with using groundwater. Anytime more water is extracted from a groundwater basin than is replenished on a long-term basis, that basin is in an "overdraft" situation. Problems associated with long-term overdraft include lowered water tables with resulting higher pumping costs, salt water intrusion if the basin is near an ocean or bay, and subsidence. Subsidence occurs when water is extracted from a basin and the earth compresses, or collapses, and fills the void left by the removal of the water. When this happens, the storage capacity of the basin is lost and cannot be recovered.

Agriculture

California agriculture is estimated to use approximately 80 percent of the developed water for irrigation. Most of the land suitable and available for irrigated crop production has already been developed for that purpose.

The Projects

While approximately 75 percent of the water usage occurs in the southern portion of the state, 75 percent of the precipitation in California falls in the northern portion of the state. Obviously, a significant water transportation and storage system must be in place to maintain this population/precipitation situation. The two main water projects in the state consist of the CVP (Central Valley Project) and SWP (State Water Project), which will be discussed in greater detail in the following paragraphs. As part of their operations, both of these projects extract water from the Delta for delivery to the end users south of the Delta. The Delta is the hub of California's water system.

The U.S. Bureau of Reclamation administers the system of dams, canals, pumping stations and hydroelectric power plants that comprise the CVP. The California Department of Water Resources (DWR) administers the SWP.

There have been smaller, though still significant, water projects developed by other public entities. Examples of these are San Francisco's development of Hetch-Hetchy; MWD's (Metropolitan Water District) construction of the Colorado aqueduct; and Los Angeles' acquisition of Owens Valley's water rights and construction of the Los Angeles Aqueduct. Numerous other smaller projects exist throughout the state that have been predominantly developed by local water districts.

Central Valley Project: The CVP became operational in the early 1950s with its first water rights permit issued in 1958, while its principal permits were issued in 1961. Lake Shasta on the Sacramento River, Folsom Reservoir on the American River, New Melones Reservoir on the Stanislaus River, and Friant Dam on the San Joaquin River are some of the largest water capture and storage facilities comprising the CVP, though there are many others as well.

The CVP shares the San Luis Reservoir with the SWP. The reservoir is located south of the Delta and is primarily a storage facility. It is positioned in an area that receives approximately 10-15 inches of rain per year, with a very limited watershed, so it does not capture much water on its own. It has been the historical practice of the CVP and SWP to try to fill San Luis during the winter and spring with water extracted from the Delta. This stored water is then used to supplement Delta deliveries during the summer and fall to the San Joaquin Valley and Southern California.

The distribution system for delivery of the CVP's captured water includes hundreds of miles of canals. The primary use of the delivered water of the CVP is agricultural, specifically irrigating cropland and orchards. Some municipalities receive their water from the CVP as well. Total deliveries of the CVP prior to the drought were approximately eight million acre-feet per year throughout the state. Much of this water is provided to users north of the Delta. South of the Delta, the CVP supplies its contractors by extracting

EXHIBIT A9-1
California River Systems and Water Project Facilities
(Source: California Water Plan Update, Volume 1, Bulletin 160-93, Page 2)

water from the Delta at its Tracy Pumping Plant, which pumps water into the Delta-Mendota Canal. Also, several of the rivers flowing from the Sierra into the San Joaquin Valley have dams and reservoirs that are part of the CVP system. The primary canal that delivers water from these facilities to the end users is the Friant-Kern Canal.

State Water Project: The SWP became operational in 1967. The main reservoir in Northern California for the SWP is Lake Oroville on the Feather River, which is tributary to the Sacramento River. There are several other smaller reservoirs in the SWP system, but overall it is significantly smaller than the CVP system. Approximately 60 percent of the water delivered by the SWP is for urban uses, and the other 40 percent for agricultural uses. Much of the agricultural uses are in the Feather River area north of the Delta. The SWP Delta extraction facility, the H.O. Banks Pumping Plant, is located near the CVP's pumps. As indicated previously, the SWP and CVP share San Luis Reservoir.

The Relationship of the Delta and the Projects: The Sacramento River provides most of the water to the Delta, and enters the Delta from the north. The extraction facilities for the SWP and CVP projects are located in the south Delta near the city of Tracy. Approximately 15 to 20 percent of Sacramento River water flows toward the pumps naturally through Georgiana Slough. The Bureau of Reclamation constructed and operates the Delta Cross Channel to facilitate larger amounts of Sacramento River water reaching the pumps. This Cross Channel is closed when the flow volume down the Sacramento is large enough to prompt concerns of flooding or when out-migrating salmon are present. When the Cross Channel is open, it allows an additional 15 to 20 percent of Sacramento River water to flow into the central Delta.

"Reverse flows" occur when the pumps at the projects are extracting so much water that the flow in the San Joaquin River and interior Delta is toward the pumps and not toward Suisun Bay. Basically, anytime the pumps are extracting more water than is coming down the San Joaquin River, reverse flows occur. Pumping capacities in the south Delta in the mid-1990s were as follows: CVP 4,600 cfs (cubic feet per second); SWP 10,300 cfs; and Contra Costa 285 cfs. (One thousand cubic feet per second flowing for a full year would result in the movement of approximately 724,000 acre-feet total.)

In summary, a complex system of federal, state, and local water projects exists in California. One of the primary purposes of the larger projects is to move water from where it naturally occurs to where the demand for it exists. This means moving water from the north of the state to the south of the state. The main obstacle in this system is the Delta and its water quality and habitat requirements. Both the CVP and the SWP are constrained as to timing and amount of extractions from the Delta because of the Delta requirements. The CVP's Friant system deliveries to the Southern San Joaquin Valley do not come out of the Delta, but the SWP has no alternate source of surface water for its contractors south of the Delta.

ADDENDUM 9

Regional and Area Data

ADDENDUM 9

Regional and Area Data

Regional and area maps are displayed at the end of this addendum. Factors pertaining to the markets most relevant to the subject are presented below.

DWR designated the general area of the subject as being the Tulare Lake Region (see following maps). The following paragraphs describing this region are taken from DWR's Bulletin 160-93, *The California Water Plan Update, Volume 2*, beginning on page 179.

> The Tulare Lake Region includes the southern San Joaquin Valley from the southern limit of the San Joaquin River watershed to the crest of the Tehachapi Mountains. It stretches from the Sierra Nevada Crest in the east to the Coast Range in the west. Many small agricultural communities dot the eastern side of the valley, and the rapidly growing cities of Fresno and Bakersfield anchor the region, which encompasses almost 10 percent of the State's total land area….
>
> Four main geographical areas make up this mostly agricultural region: the western side of the San Joaquin Valley floor, the Sierra Nevada foothills on the region's eastern side, the central San Joaquin Valley floor, and the Kern Valley floor. The major rivers in the region, the Kings, Kaweah, Tule, and Kern, begin in the Sierras and generally flow east to west into the San Joaquin Valley. They are sustained by snow melt from the upper mountain elevations. The Kern River follows a more north-south alignment for much of its path. All of the rivers terminate on the valley floor in lakes or sinks: water does not find its way to the ocean from the basin, as it once did under natural conditions, except in extremely wet years. There is also a considerably large drainage area on the west and south sides of the valley, but scant rainfall has not produced water development there.
>
> The region's climate varies between valley and foothill areas. The valley areas experience mild springs and hot, dry summers. Winters are typically cold with some temperatures below freezing, but snowfall is rare. In some parts of the valley, thick tule fog is common at times during the winter. Climate in the foothills is typical of mountainous foothill areas where winters and springs are cold and where snowfall occurs at higher elevations.
>
> Most of the region's winter and spring runoff is stored for later use in the summer for supplying the drier valley floor areas. In most years, imported water from northern California supplements local supplies to meet the region's large agricultural water demand.

Population

Population in the region increased substantially in the 1980s, led by 50- to 60-percent growth in the Fresno, Bakersfield, and Visalia-Tulare urban areas. Fresno's population, which had one of the highest growth rates among large metropolitan areas in the United States during the 1980s, grew by more than 60 percent – from 217,000 in 1980 to 354,000 in 1990. A high birth rate contributed to this growth and relatively low-cost housing encouraged immigration from out-of-state as well as from the San Francisco Bay and Los Angeles areas….

Land Use

….Irrigated agriculture accounts for more than 3 million acres of the private land, while urban areas take up 176,300 acres. Other agricultural lands and areas with native vegetation cover an additional 1,400,000 acres. The principal crops grown in the region are cotton, grapes, and deciduous fruits. Substantial acreages of almonds and pistachios are also grown, as well as increasing acreages of truck crops, such as tomatoes and corn….

Water Supply

The main local surface water supplies in the Tulare Lake Region come from Sierra Nevada rivers. Imported water is by way of the federal Central Valley Project's Delta-Mendota Canal and Friant-Kern Canal, and the State Water Project's California Aqueduct, which enters the region as part of the Joint-Use Facilities with the CVP's San Luis Unit. Groundwater pumping meets the remaining water demands….

Supply with Existing Facilities and Water Management Programs

Local surface supplies on the western side of the region come from the Kings, Tule, Kaweah, and Kern Rivers. Excess flows from the Kings River flow through Fresno Slough to the Mendota Pool. Local supplies from snowmelt and runoff in Sierra Nevada systems are more plentiful than imported sources in the central portion and eastern edge of the valley, but not as reliable throughout the year….

Valley Area

…The SWP, through San Luis Reservoir and the California Aqueduct, provides an average of about 1,200,000 af of surface water yearly to the region. The U.S. Bureau of Reclamation supplies an average of 2,700,000 af during normal years from the CVP via Mendota Pool, the Friant-Kern

Canal, and the San Luis Canal of the CVP/SWP San Luis Joint-Use Facilities. The Friant-Kern canal receives water from Millerton Lake on the San Joaquin River; Mendota Pool and the California Aqueduct receive water from the Sacramento-San Joaquin Delta.

TABLE TL-3
Water Supplies with Existing Facilities and Programs
(Decision 1485 Operating Criteria for Delta Supplies)
(thousands of acre-feet)

	1990	
Supply	***average***	***drought***
Surface		
Local	2,398	1,239
CVP	2,705	1,288
Other federal	243	0
SWP	1,225	846
Groundwater	915	3,773
Overdraft	650	650
Total	8,136	7,796

(Only a portion of the table is replicated above. The omitted sections deal with future projections)

The valley floor overlies mostly one large groundwater basin that consists of alluvial sediments. In the western half to three quarters, the Corcoran clay layer, which generally lies at depths of 300 to 900 feet, divides the groundwater basin into two aquifers. South of the Kern River, the Corcoran horizon drops below well depths but other clay layers provide some confinement. On the eastern side of the valley, both north and south of the Kern County line, older formations are tapped by wells that usually exceed 2,000 feet in depth. A small groundwater subbasin, with little hydraulic connection to the main aquifers, exists on the western side of Fresno, Kings, and Kern counties from Coalinga to Lost Hills. Two other small subbasins in Kern County are separated from the main basin by the White Wolf and Edison faults. Productive aquifers with good quality water are the general rule, except in the Tulare Lake area where lakebed clays yield little water, along the extreme eastern edge of the region where shallow depth to granite limits aquifer yields, and along the western side where water quality is poor.

…The City of Bakersfield operates a 2,800-acre recharge facility southwest of Bakersfield where the city and some local water agencies recharge surplus Kern River and occasionally, SWP and Friant-Kern Canal water; this water then is 'banked' and withdrawn in drier years. The recharge facility is one of the largest single recharge areas in California, and during wet years, more than 100,000 af of water may be recharged.

Continuing on from The California Water Plan Update, Volume 2, from page 186.

Agricultural Water Use

Irrigated agriculture accounts for more than 95 percent of the 1990 level water use in the Tulare Lake Region. Many different crops are grown throughout the region. In the future, however, urbanization, increasingly high costs for water, and the reliability of water supplies could reduce the variety and acreages of crops and thus, ultimately, agricultural water use….

Climate, water supply, and salt buildup in the soils may limit the crops that can be grown profitably throughout the region. Most good irrigable land with access to dependable imported or local surface water has been developed. Crop acreages have generally declined in the region over the last decade, due to the limited availability of surface water and a drop in agricultural demand due to the sluggish economy. Cotton acreages, for example, declined from 1989 to 1992. Its price dropped from about 75 cents per pound in the late 1980s to about 50 cents per pound in 1992. In addition to decreased demand for cotton, the drought reduced SWP deliveries along the western side of the region….

TABLE TL-7
1990 Evapotranspiration of Applied Water by Crop

Irrigated Crop	Total Acres (1,000)	Total ETAW (1,000 AF)	ETAW * (AF per acre)
Grain	297	294	1.05
Rice	1	3	3.00
Cotton	1,029	2,569	2.50
Sugar Beets	35	91	2.60
Corn	100	199	1.99
Other Field	135	262	1.94
Alfalfa	345	1,045	3.03
Pasture	44	141	3.20
Tomatoes	107	245	2.29
Other Truck	204	275	1.35
Almonds/pistachios	164	392	2.39
Other deciduous	177	470	2.66
Vineyard	393	817	2.08
Citrus/olives	181	344	1.90
Total	3,212	7,147	2.23

*This column has been calculated from the information provided and does not appear in the original text.

Agricultural Drainage

On the western side of the valley, where groundwater quality is marginal to unusable for agriculture, farmers use good quality surface water to irrigate crops. This irrigation causes the shallow aquifer to fill, resulting in drainage problems. The high water table is exacerbated by clay-rich soils that slow drainage in some areas. Poor-quality groundwater in the unconfined aquifer in Westlands Water District is increasing by about 110,000 af per year. In Kern County, west of the California Aqueduct, the few available wells also show rising water levels. This marginal to poor quality groundwater has reached plant root zones in many areas along the western side and must be removed by drains if agriculture is to continue in these areas.

Additional regional water supply descriptive information comes from Bulletin 160-98, *The California Water Plan Update*, *Volume 2*, Department of Water Resources, 1998, the five-year update to the previously quoted Bulletin 160-93. The following quote is taken from page 8-44, where the Tulare Lake Region is being discussed:

> The majority of the region's SWP supply is contracted to Kern County Water Agency. KCWA's SWP supply is distributed to fourteen of its member agencies; the largest entitlements go to Wheeler Ridge-Maricopa Water Storage District, Berrenda Mesa Water District, Belridge Water Storage District, and Lost Hills Water District. Since these four districts have limited (or no) groundwater supply, each relies almost entirely on SWP supplies to meet its water demands. Most other KCWA member agencies have Kern River, Friant-Kern Canal, Cross Valley Canal, or groundwater supplies available. Part of the City of Bakersfield's water supplies come from the SWP via KCWA.
>
> The Friant-Kern Canal conveys CVP supply to 24 long-term contractors in the region. Among the largest contractors for Friant-Kern supply are Arvin-Edison Water Storage District, Lower Tule River Irrigation District, and Delano-Earlimart Irrigation District. The San Luis Canal also distributes CVP supply, most of which goes to Westlands Water District. With an allocation of 1,150 taf/yr, Westlands Water District is CVP's largest contractor. Westlands supplies primarily agricultural users; however, about 5.5 taf/yr is supplied to urban users such as Lemoore Naval Air Station. (Even with a full CVP contract supply, Westlands purchases about 200 taf/yr from other sources to meet its growers' normal crop needs.)
>
> Arvin-Edison Water Storage District and KCWA entered into agreements in 1974 for participation in the Cross Valley Canal. AEWSD also entered into water exchange agreements with ten agencies in the Friant-Kern Canal service area. The exchange water is delivered through the California Aqueduct and the Cross Valley Canal to AEWSD facilities. AEWSD receives 128 taf annually of exchange water and makes available to exchange entities the first 174 taf of its Class I and Class II CVP entitlements from the Friant-Kern Canal.

Regional Map

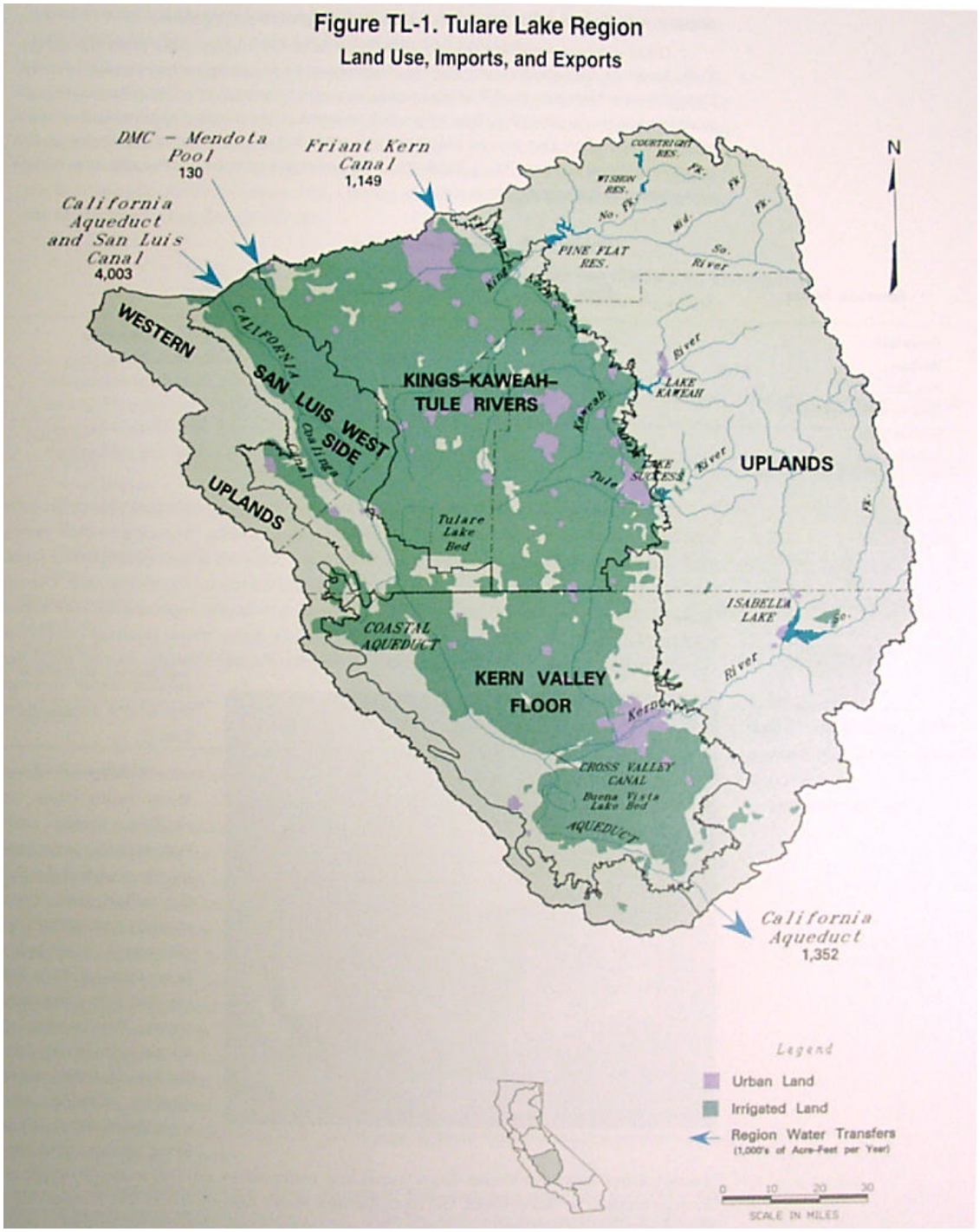
(Source: The California Water Plan Update, Volume 1, Bulletin 160-98, Page 1-9)

Area Map

(Source: The California Water Plan Update, Volume 2, Bulletin 160-98, Page 8-42)

Tulare Lake Region

(Source: The California Water Plan Update, Volume 2, Bulletin 160-93, Page 181)



ADDENDUM 10

Drought Water Bank

ADDENDUM 10

Drought Water Bank

1991

A report titled *The 1991 Drought Water Bank* was produced by the California DWR in January of 1992. The introductory remarks describe a critical time in California regarding water deliveries, causing the governor to establish a Drought Action Team. One of the recommendations of this team was the creation of the Drought Water Bank (DWB). The following is taken from page 2 of the report.

> The Department of Water Resources was responsible for organizing and implementing the Water Bank. Its primary role was to purchase water from willing sellers and sell it to entities with critical needs….The Water Purchase Committee and government agencies at all levels worked with DWR to negotiate contracts, provide centralized control of water transfers, and coordinate distribution.
>
> Sellers made water available to the Bank by: fallowing farmland (not planting or irrigating a crop) and transferring conserved irrigation water to the Bank, using groundwater instead of surface water, or transferring water stored in local reservoirs to the Bank. Within a month and a half, over 300 contracts were under way. No precedent existed for such an endeavor; consequently, procedures and guidelines were developed as the program progressed.

Water purchases totaled 820,805 acre-feet. About 41 percent of this came from sellers in the Delta, with approximately the same amount coming from the Yuba and Feather Rivers area. Over half of the water was freed up by fallowing land, approximately one-third came from groundwater, and the rest came from stored water. A total of slightly over 166,000 acres of land were fallowed. The types of crop grown prior to fallowing included corn (59,276 acres), wheat (43,584 acres), pasture (16,187 acres) and alfalfa (10,219 acres). These crops accounted for 78 percent of the total acreage fallowed.

There were no sellers south of the Delta, and the price paid to the sellers was $125 per acre-foot. In explaining how that price was arrived at, the report says on page 5:

> …At the start of the Water Bank program, purchases focused on water from fallowed farmland, a primary factor in arriving at a price. The intent was to offer a price that would yield a net income to the farmer similar to what the farmer would have earned from farming plus an additional amount to encourage the farmer to enter into a contract with a new and untried Water Bank.
>
> After taking a detailed look at farm budgets, talking to potential sellers and buyers, and getting advice from agricultural economists and others knowledgeable about crop water use, the price was set at $125 per

> acre-foot…Late in the year, the SWP negotiated contracts for the purchase of 10,000 acre-feet at $50 per acre-foot and 10,000 acre-feet at $30 per acre-foot. The price reduction reflected the more favorable water supply and demand conditions. Among the factors contributing to the improved conditions were the ample March rains, a mild summer, and the remarkable success of the Water Bank and urban water conservation measures.

Regarding the selling price (page 9 of the document):

> The price for water from the Bank was set at $175 an acre-foot for water delivered as far as the SWP Delta Pumping Plant. This price covered: The purchase price ($125 an acre-foot); outflow requirements to move the water through the Delta, which reduced the net amount of water available for delivery; and the costs of monitoring and contract administration. Additional costs were charged for conveying the water to the places of use…The SWP contractors who received water from the Bank paid primarily for the energy required to pump the water to the contractor's area.

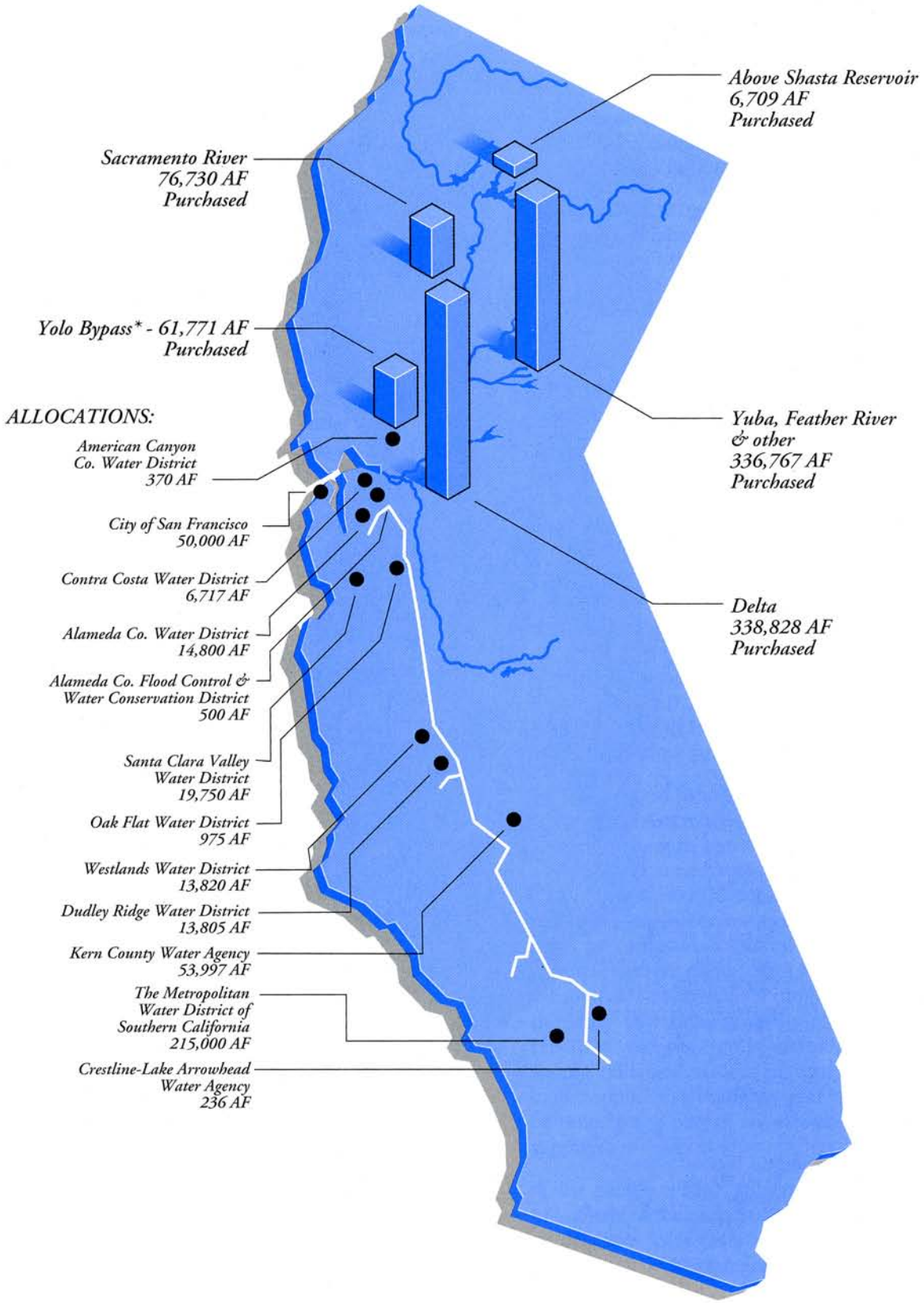
As of December 4, 1991, less than 400,000 acre-feet had been allocated to buyers. Since Bank purchases were not directly linked to buyers, the State wound up paying for a great deal of the water because of the short-fall in demand. Bulletin 132-92, *Management of the California State Water Project*, published in December of 1992, reported that a total of 429,470 acre-feet of 1991 DWB water had been purchased.

The figure on the following page is from the report and shows the locations and amounts of purchases and sales. Kern County Water Agency (KCWA) bought 53,797 acre-feet. Tulare Lake Basin Water Storage District (TLBWSD) did not buy any. Bulletin 132-92 reported that KCWA had purchased 53,997 acre-feet.

KCWA's *Water Supply Report 1991* makes the following statement on page 4 regarding its DWB purchases.

> The cost for water from the Bank was about $175 per acre-foot at the Delta pumps. Power costs to convey the water to Kern County was an additional $20 per acre-foot. Urban interests accounted for the bulk of State Bank purchases, about 307,000 acre-feet. The water was simply too expensive for most agricultural interest to afford ….about 54,000 acre-feet was purchased by Kern County agricultural interests, and was used to sustain high-value permanent crops on the west side of the County.

THE 1991 DROUGHT WATER BANK



1992

The DWB was activated again in 1992. A similar report was also created, *The 1992 Drought Water Bank*. Even though the water situation was not as dire as in the previous year, "conditions in Northern California watersheds remained far below normal." However, some changes were incorporated:

> As a result of the 1991 Bank experience, DWR implemented several major changes in the operation of the 1992 Bank. First, no water was acquired by the 1992 Bank until signed contracts were obtained from the members purchasing water. Second, to minimize third party economic and environmental impacts, water purchases were limited to groundwater substitution (using wells to extract groundwater to substitute for transferring surface water) and surface reservoir storage contracts; no water was purchased through fallowing of agricultural lands. Third, the purchase price of water was considerably lower than offered in 1991 primarily due to reduced demand and the fact that water was purchased only through groundwater substitution and reservoir storage contracts. Water from these sources is generally less expensive to produce compared to fallowing, which was reflected in the purchase price.

The exhibit on the following page shows the locations and amounts of the sellers and buyers.

Bulletin 160-93, *The California Water Plan Update, Volume 1*, previously referenced in this report, provided the following information regarding the operation of the 1992 Drought Water Bank (page 287).

Area Where Water Was Purchased	Amount Purchased (acre-feet)	Agency Water Was Allocated To	Allocation (acre-feet)
Sacramento River	12,302	City of San Francisco	19,000
Yolo Bypass	42,372	Contra Costa WD	10,000
Yuba, Feather Rivers	64,419	Westside San Joaquin Valley	4,530
American River	10,000	Department of Fish and Game	24,465
Delta	2,500	Westlands WD	51,000
Stanislaus, Merced Rivers	61,705	Tulare Lake Basin WD	31,550
		Kern County WA	8,170
		MWDSC	10,000
Total	**193,298**		**158,715**

More was purchased than was sold because of Delta water quality requirements and conveyance losses. The sellers were paid $50 per acre-foot, while the buyers were charged an initial $72 per acre-foot that was subsequently lowered to around $68 per acre-foot. The buyers once again had to pay for delivery costs.

1993

The DWB was not operational during 1993 because it was a year when 100 percent of SWP entitlements were delivered due to positive hydrologic conditions.

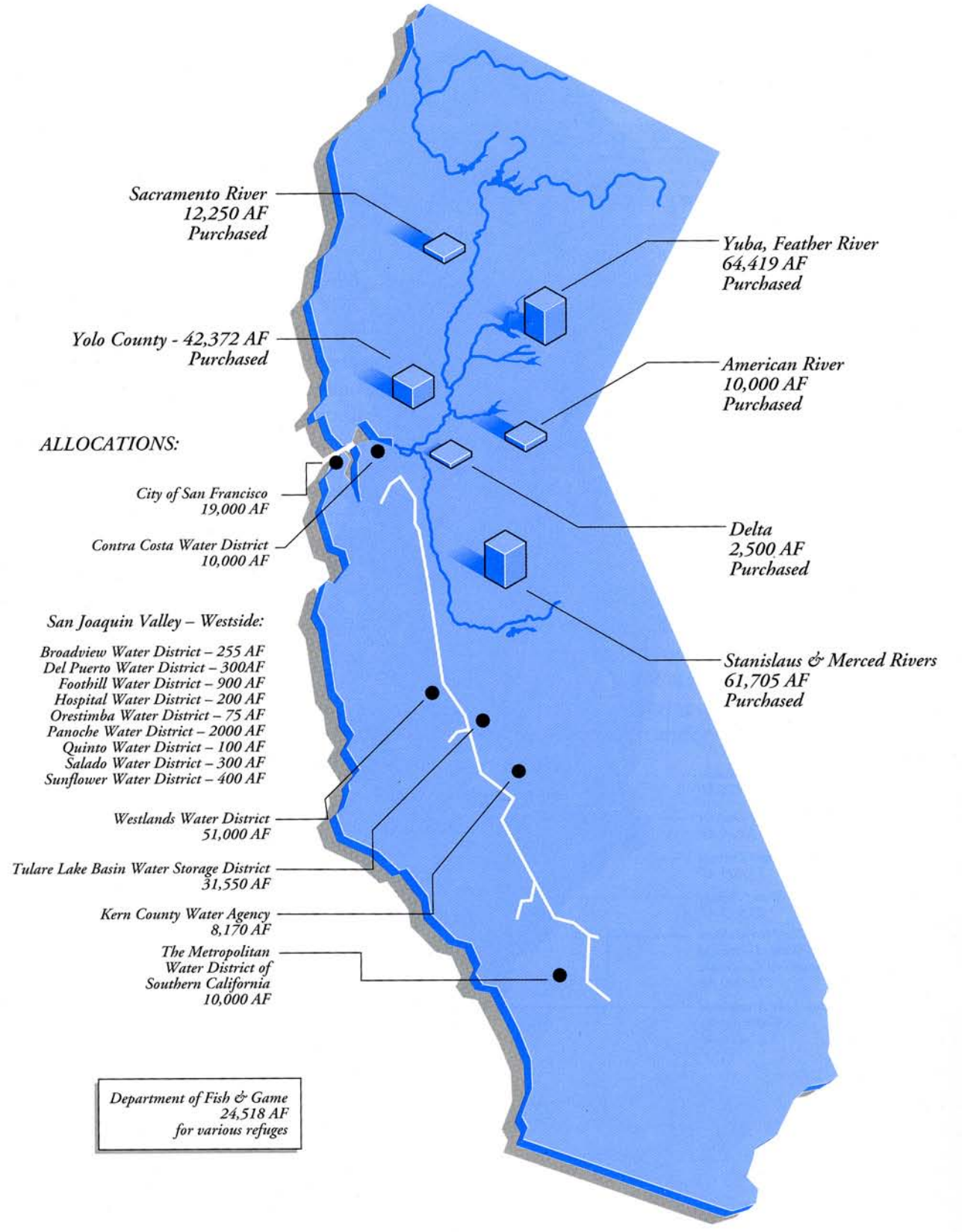
1994

The DWB became active again in June of 1994, but no report on its activities was issued.

Bulletin 160-98, *The California Water Plan Update, Volume 1,* page 3-57, reported that, in 1994, 222 taf (thousand acre-feet) were acquired, of which 48 taf went to water quality and habitat needs. The remaining 174 taf were sold to purchasers south of the Delta—150 taf to agricultural and 24 taf to urban. The reported sale price at the south Delta pumps was $68 per acre-foot. The buyers were not identified.

Bulletin 132-95 reported lower sales (115,083 acre-feet) for the 1994 DWB. Supplemental information from the State Water Project Analysis Office supports the higher Bulletin 160-98 figures, but indicates that the ultimate cost of the water to the buyers was slightly over $66 per acre-foot.

THE 1992 DROUGHT WATER BANK



ADDENDUM 11

Regional Groundwater

ADDENDUM 11

Regional Groundwater

Because so little rain falls during the growing season in the subject area, irrigation is required for agricultural production. Irrigation water generally comes from a combination of surface water (local, state, and federal project deliveries) and groundwater. Historically, groundwater has played a major role in irrigation in this region. In years when reduced surface water deliveries are available, the groundwater resource is relied upon even more. Therefore, a proper understanding of the groundwater characteristics is important to this valuation assignment.

Information on regional groundwater is presented in Bulletin 160-98, *The California Water Plan Update*, *Volume 1*, Department of Water Resources, 1998. Beginning on page 3-48:

> **Groundwater Supplies**
>
> In an average year, about 30 percent of California's urban and agricultural applied water is provided by groundwater extraction. In drought years when surface supplies are reduced, groundwater supports an even larger percentage of use. The amount of water stored in California's aquifers is far greater than that stored in the State's surface water reservoirs, although only a portion of California's groundwater resources can be economically and practically extracted for use.
>
> In evaluating California water supplies, an important difference between surface water and groundwater must be accounted for – the availability of data quantifying the resource. Surface water reservoirs are constructed to provide known storage capacities, reservoir inflows and releases can be measured, and stream gages provide direct measurements of flows in surface water systems. Groundwater basins have relatively indeterminate dimensions, inflow (e.g., recharge) to an entire basin cannot be directly measured, and total basin extractions and natural outflow are seldom directly measured. In addition to physical differences between surface water and groundwater systems, statutory differences in the administration of the resources also affect data availability. Entities who construct surface water reservoirs must have State water rights for the facility, and all but the smallest dams are regulated by the State's dam safety program. These requirements help define and quantify the resource. In contrast, groundwater may be managed by local agencies … but there are no statewide requirements that require quantification of the resource. Much of California's groundwater production is self-supplied, and is not managed or quantified by local agencies.
>
> The following description of groundwater supplies is presented in a more general manner than was used for surface water supplies, reflecting the difference in data availability. Much of the groundwater information in this

section is based on calculations, rather than on direct measurement. Estimating overdraft in a basin, for example, relies on interpretation of measured data (water levels in wells) and interpretation of calculated information (extractions from the basin). The ability to assess statewide groundwater resources would benefit greatly from additional data collection and better access to existing data.

Base Year Supplies

Table 3-14 summarizes estimated 1995 level groundwater supplies. The data represent current levels of groundwater production, and not necessarily the maximum potential of statewide groundwater supplies. The data include water reapplied through deep percolation and exclude groundwater overdraft.

TABLE 3-14
Estimated 1995 Level Groundwater Supplies by Hydrologic Region (taf)

Region	Average	Drought
North Coast	263	294
San Francisco Bay	68	92
Central Coast	1,045	1,142
South Coast	1,177	1,371
Sacramento River	2,672	3,218
San Joaquin River	2,195	2,900
Tulare Lake	4,340	5,970
North Lahontan	157	187
South Lahontan	239	273
Colorado River	337	337
Total (rounded)	**12,490**	**15,780**

To help put this information in perspective, the sidebar illustrates typical groundwater production conditions in three hydrologic regions that rely heavily on groundwater because their local surface water supplies do not fully support existing development. These regions – the San Joaquin, Tulare Lake, and Central Coast regions – all have alluvial aquifer systems that support significant groundwater development, as suggested by the information presented in the sidebar. (The data shown are typical of wells used for agricultural or municipal production. A well used to supply an individual residence would have a much smaller capacity. Over 90 percent of the groundwater use in each of these regions is for agricultural use.) In contrast, aquifer systems in fractured rock, such as those used to supply small communities in the Sierra Nevada foothills, can generally support only limited groundwater development.

In these hydrologic regions water users frequently take advantage of surface water available in wet years to recharge groundwater basins. In drought years when surface water is not

Available, water users increase groundwater pumping. For example, Friant-Kern CVP contractors maximize groundwater recharge with less expensive Class II supplies (wet weather water) when they are available. Member agencies of KCWA have developed extensive recharge facilities along the Kern River channel to take advantage of wet year flows.

The following information comes from page 3-49 of the Bulletin. It is the 'sidebar' referenced in the previous discussion.

Typical Groundwater Production Conditions

The Department collects data from a statewide network of wells to monitor long-term changes in groundwater levels. The network includes local agency wells and privately-owned wells. These data were combined with Bulletin 160 water use information to prepare the tabulation of typical groundwater production conditions shown below. Long-term water level data can show the effects of increased groundwater extraction in drought years; it can also show the effects of changing water management practices in a basin.

Local conditions within the tabulated basins may deviate greatly from the typical conditions shown below. In the Tulare Lake Region, for example, some groundwater production is occurring from wells with pumping lifts of over 800 feet.

Basin	Extraction (taf/yr)	Well Yields (gpm)	Pumping Lifts (feet)
San Joaquin River Region			
Madera	570	750-2,000	160
Merced	560	1,500-1,900	110
Delta Mendota	510	800-2,000	35-150
Turlock	450	1,000-2,000	90
Chowchilla	260	1,500-1,900	110
Modesto	230	1,000-2,000	90
Tulare Lake Region			
Kings	1,790	500-1,500	150
Kern	1,400	1,500-2,500	200-250
Kaweah	760	1,000-2,000	125-250
Tulare Lake	670	300-1,000	270
Tule	660	NA	150-200
Westside	210	800-1,500	200-800
Pleasant Valley	100	NA	350
Central Coast Region			
Salinas Valley	550	1,000-4,000	180
Pajaro Valley	60	500	10-300

Shallow Groundwater

The following text and maps are taken from *A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley, Final Report of the San Joaquin Valley Drainage Program*, September 1990. The document was prepared by U.S. Department of the Interior agencies (Bureau of Reclamation, Fish and Wildlife Service and Geological Survey) and California Resource Agency (Department of Fish and Game, and Department of Water Resources).

Beginning on page 15 of the document:

> **A Brief History**
>
> The conditions associated with agricultural drainage in the San Joaquin Valley are not new to the region. Inadequate drainage and accumulating salts have been persistent problems in parts of the valley for more than a century, making some cultivated land unusable as far back as the 1880s and 1890s (Ogden, 1988). Widespread acreages of grain, first planted on the western side of the valley in the 1870s and 1880s, were irrigated with water from the San Joaquin and Kings rivers. This type of farming spread until, by the 1890s, the rivers' natural flows were no longer adequate to meet the growing agricultural demand for water. Poor natural drainage conditions, coupled with rising ground-water levels and increasing soil salinity, meant that land had to be removed from production and some farms ultimately abandoned.
>
> The development of irrigated agriculture in the San Joaquin Valley since 1900 owes a great deal to the improvements in pump technology that took place in the 1930s. These achievements led to the development of large turbine pumps that could lift water hundreds of feet from below ground. In time, heavy pumping triggered severe groundwater overdraft because more water was being extracted than was being replaced naturally. Groundwater levels and hydraulic pressure fell rapidly, and widespread land subsidence began to occur. By the late 1950s, estimated overdraft in Kern County had reached 750,000 acre-feet per year.
>
> Initial facilities of the Federal Central Valley Project transported water from Northern California through the Sacramento-San Joaquin Delta and the Delta-Mendota Canal in 1951 to irrigate 600,000 acres of land in the northern part of the San Joaquin Valley. This water primarily replaced and supplemented San Joaquin river water that was diverted at Friant Dam to the southern San Joaquin Valley.
>
> The CVP's San Luis Unit and the State Water Project, each authorized in 1960, began delivering Northern California water to agricultural lands in the southern San Joaquin Valley in 1968. Together they provide water to irrigate about 1 million acres. Authorization of the San Luis Unit also mandated construction of an interceptor drain to collect irrigation drainage water from its service area and carry it to the Delta for disposal. The Bureau

of Reclamation's 1955 feasibility report for the San Luis Unit described the drain as an earthen ditch that would drain 96,000 acres. By 1962, Reclamation's plans had changed to a concrete-lined canal to drain 300,000 acres. In 1964, alternative plans added a regulating reservoir to temporarily retain drainage (USBR, 1964). A decision was made in the mid-1970s to use the reservoir to store and evaporate drainage water until the drainage canal to the Delta could be completed.

At this same time, questions were raised about the potential effects of untreated agricultural drainage on the quality of water in the Delta and San Francisco Bay. This concern was reflected in a rider added to the CVP appropriations act by Congress in 1965, which stated that "…the final point of discharge for the interceptor drain for the San Luis Unit shall not be determined until development by the Secretary of the Interior and the State of California of a plan which shall conform with the water quality standards of the State of California as approved by the Administrator of the Environmental Protection Agency." This proviso remains in effect today.

Initially, the San Luis Drain was conceived as a State/Federal facility, but the State twice declined to participate. The Bureau of Reclamation began construction in 1968 and, by 1975, had completed 85 miles of the main drain, 120 miles of collector drains, and the first phase of the regulating reservoir (Kesterson). In 1970, Kesterson Reservoir became part of a new national wildlife refuge managed jointly by Reclamation and the U.S. Fish and Wildlife Service.

Federal budget constraints and growing environmental concern about releasing irrigation runoff into the Delta halted work on the reservoir and the drain.

In 1975, the Bureau of Reclamation, the California Department of Water Resources, and the State Water Resources Control Board formed the San Joaquin Valley Interagency Drainage Program to find a solution to valley drainage problems that would be economically, environmentally, and politically acceptable. The group's recommendation was to complete the drain to a discharge point in the Delta near Chipps Island (IDP, 1979). In 1981, Reclamation began a special study to fulfill requirements for a discharge permit from the State Water Resources Control Board.

The 1983 discovery of deformities and deaths of aquatic birds at Kesterson Reservoir altered the perception of drainage problems on the western side of the valley. Selenium poisoning was determined to be the probable culprit. In 1984 the San Joaquin Valley Drainage Program was established as a joint Federal and State effort to investigate drainage and drainage-related problems and to identify possible solutions.

In 1985, the Secretary of the Interior ordered that discharge of subsurface drainage to Kesterson be halted, and the feeder drains leading to the San Luis Drain and the reservoir were plugged in 1986. The reservoir is now closed. The vegetation has been plowed under, and low-lying areas were filled in 1988.

Contamination-related problems similar to those identified at Kesterson are now appearing in parts of the Tulare Basin, which receives irrigation water from the State Water Project, in addition to other surface and groundwater supplies. Wildlife deformities and deaths have been observed at several agricultural drainage evaporation ponds.'

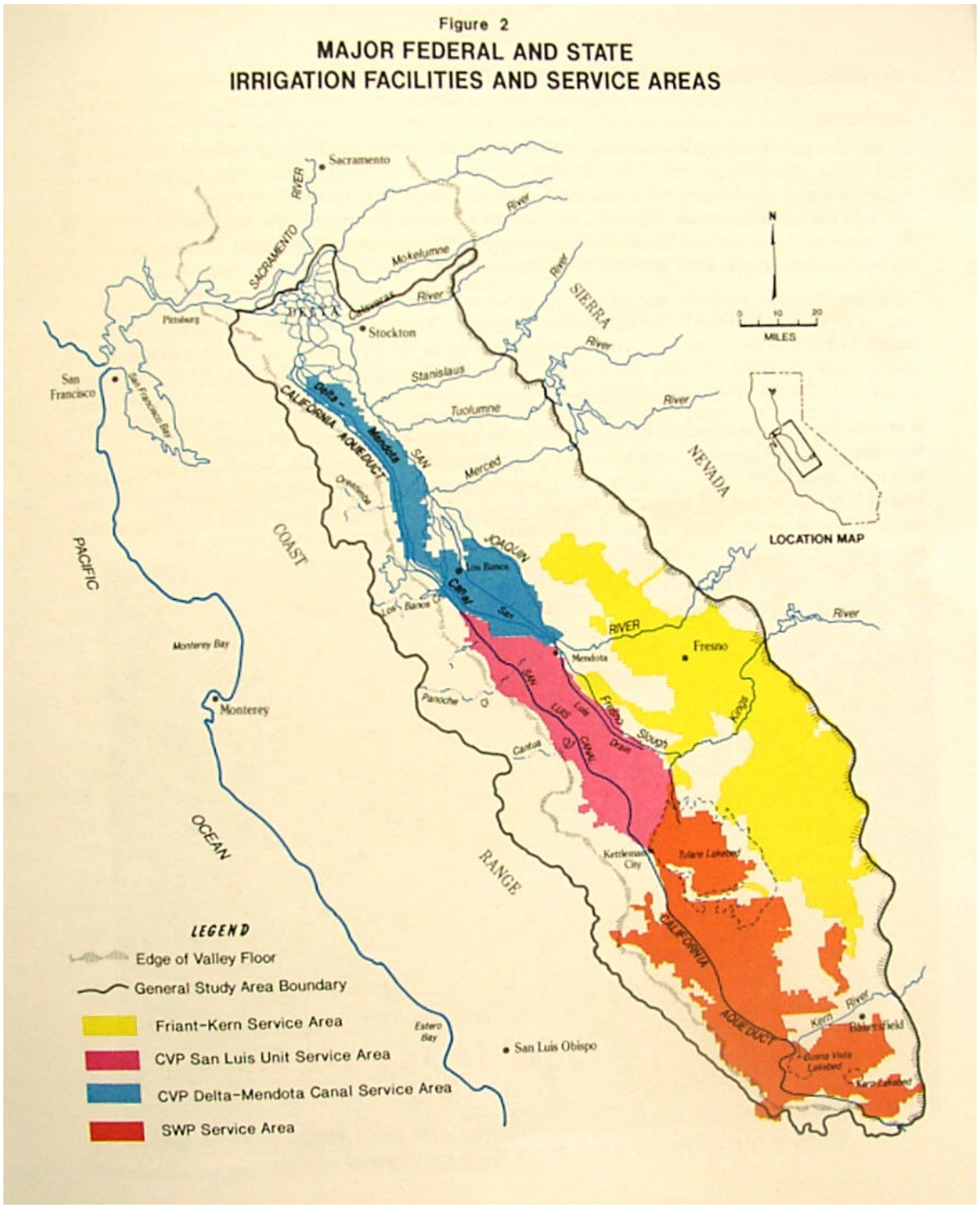
The following exhibit comes from page 19 of the document.

CVP and SWP Service Areas

(Source: A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley, Page 19)

Figure 2

MAJOR FEDERAL AND STATE IRRIGATION FACILITIES AND SERVICE AREAS



Continuing from page 25 of the document:

Geohydrology

Understanding the geologic makeup and hydrologic characteristics of the study area is necessary to understanding the cause of the drainage problem.

Geology

The Corcoran Clay, a clay layer 20 to 200 feet thick that underlies all but a small part of the study area, was formed as a lakebed about 600,000 years ago and is an important geologic feature of the San Joaquin Valley. Lying as much as 850 feet deep along the Coast Ranges and 200 to 500 feet deep in the valley trough, the Corcoran Clay effectively divides the ground-water system into two major aquifers – a confined aquifer below it and a semiconfined aquifer above it (Page, 1986).

In the San Joaquin Basin, the semiconfined aquifer can be divided into three geohydrologic units, based on the sources of the soils and sediments. These are Coast Range alluvium, Sierra Nevada sediments, and flood-basin deposits. The Coast Range alluvial deposits, which range in thickness from 850 feet along the slopes of the Coast Range to a few feet along the valley trough, were derived largely from the erosion of marine rocks that form the Coast Ranges and contain abundant salt. Some of the marine sediments contain elevated concentrations of selenium and other trace elements. The Sierra Nevada sediments on the eastern side of the valley generally do not contain elevated selenium concentrations. The flood-basin deposits are a relatively thin layer in areas of the valley trough that have been created in recent geologic time. These three geohydrologic units differ in texture, hydrologic properties, chemical characteristics, and oxidation state.

In the Tulare Basin, the semiconfined aquifer consists of the same three geohydrologic units found in the San Joaquin Basin, plus one additional unit, Tulare Lake sediments. The Tulare Basin is characterized by the presence of several dry lakebeds, including Tulare, Buena Vista, and Kern.

The marine sediments from which most soils in the study area are derived contain salts and potentially toxic trace elements, such as arsenic, boron, molybdenum, and selenium. When these soils are irrigated, the substances dissolve and leach into the shallow groundwater (Gilliom, et al., 1989a). Selenium is largely a Westside phenomenon. Soils derived from Coast Range sediments are generally far saltier than soils formed from Sierran sediments. In fact, selenium in livestock feed grown in some areas of the eastern side of the valley is so low that it must be added to the livestock diet. … Most soluble selenium has been leached from the soils over the past 30 to 40 years, and it now occurs in solution in the shallow groundwater. It is drained from there when growers attempt to protect crop roots from salts and a high water table. Generally, growers need not be concerned about protecting crops from selenium.

Surface Water

Precipitation in the study area is low, ranging annually from 5 inches in the south to 10 inches in the north. Virtually all rainfall occurs from November through April, and, by midsummer, the small natural flows in most Westside streams have ended or dwindled to little more than trickles. Storage and development of irrigation facilities on eastside streams have reduced inflow to once-large lakes such as Tulare and Kern. Now water reaches their dry lakebeds only in extremely wet years, such as 1983.

The San Joaquin River and its major Westside tributaries, Salt Slough and Mud Slough, are important to the study area because they convey drainage water away from the Northern and Grasslands subareas. San Joaquin River flows are controlled by dams on tributaries and on the main stem upstream from Fresno. Water stored in Millerton Reservoir is diverted through the Friant-Kern and Madera canals. Irrigation water historically diverted from the lower reaches of the San Joaquin River was replaced with Central Valley Project water provided through the Delta-Mendota Canal, beginning in 1951. Now, the San Joaquin River is essentially dry much of the year from below Gravelly Ford to the point at which irrigation return flow and local runoff replenish the river. Development on major eastside tributaries has also reduced the flow on the San Joaquin River. The combination of these actions causes problems in water quantity and quality, both for fish and for other downstream river users, especially in the South Delta area.

Groundwater

Pumping of groundwater for irrigation from 1920 to 1950 drew ground-water levels down as much as 200 feet in large portions of the study area (Beltiz, 1988). High pumping costs, land subsidence, and declining water quality created a need for new water supplies. By 1951, Federal Central Valley Project water was being pumped from the Delta and delivered to the Northern and Grasslands subareas through the Delta-Mendota Canal. By 1968, water was being delivered to the Westlands, Tulare, and Kern subareas through facilities of the CVP's San Luis Unit and the State Water Project.

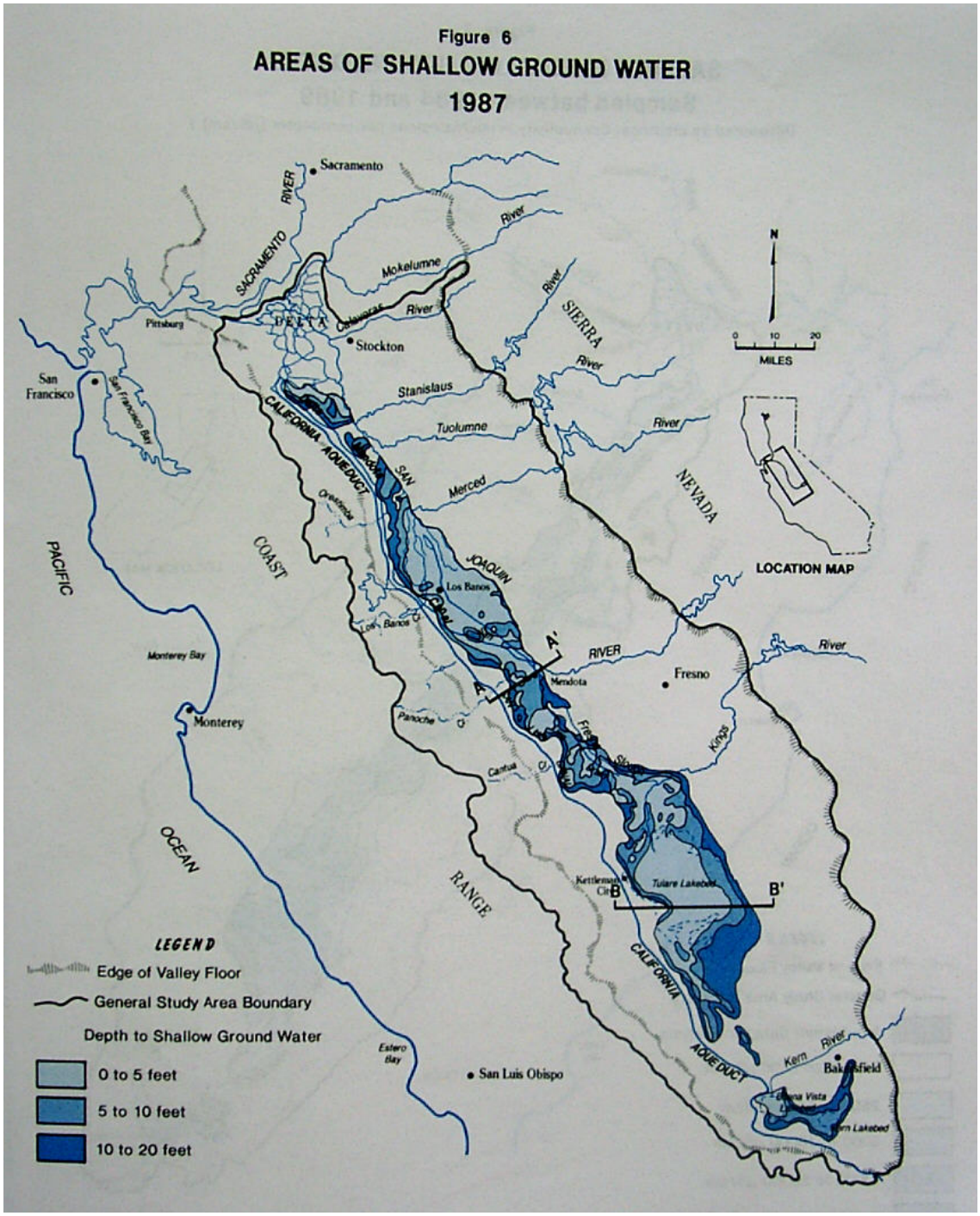
With a reliable supply of surface water, ground-water pumping for irrigation lessened and the ground-water reservoir gradually began to refill. The semiconfined aquifer above the Corcoran Clay is now fully saturated in much of the Westside area. Water tables continue to rise, and the waterlogged area is expanding. During the period 1977-1987, the 0-to-5 foot area expanded from 533,000 acres to 817,000 acres (W.C. Swain, 1990a)…

Irrigation-induced leaching of the soil and accumulation of salts from both the leaching and from imported water has concentrated dissolved salts in the upper portion of the semiconfined aquifer. Most of these salts are now located in a zone 20 to 150 feet below the ground surface (DuBrovsky and Neil, 1990). Ground-water quality is generally better above and below this zone.

The following exhibit shows the areas of shallow groundwater and comes from page 31 of the document.

Areas of Shallow Groundwater

(Source: A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley, Page 31)



Groundwater Production Costs

Referencing from Bulletin 160-93, *The California Water Plan Update, Volume 1*, (page 172):

Agricultural Groundwater Production Costs

As with urban areas, agricultural groundwater costs vary considerably throughout California. Many factors influence these costs, including depth to groundwater, pump efficiencies, and electricity rates. Another factor was the drought which lowered groundwater levels and increased pumping costs. Table 7-10 represents a range of averages for agricultural groundwater costs for the hydrologic regions. The costs include capital, operation (including pumping energy costs), maintenance, and replacement costs. Costs were determined from a survey of well drillers in the hydrologic regions and from DWR district files.

TABLE 7-10
Typical Agricultural Groundwater Production Costs in 1992 by Hydrologic Region

Region	Groundwater Costs ($/acre-foot)*
North Coast	10-70
San Francisco Bay	60-130
Central Coast	80
South Coast	80-120
Sacramento River	30-60
San Joaquin	30-40
Tulare Lake	40-80
North Lahontan	60
South Lahontan	20
Colorado River	90

*The range represents the average cost at specific locations within a region, and includes capital, operation, maintenance, and replacement costs.

ADDENDUM 12

U.S. Bureau of Reclamation Guidelines for Water Right Appraisals

ADDENDUM 12

U.S. Bureau of Reclamation Guidelines for Water Right Appraisals

Appraisal of Water Right Acquisitions. The acquisition of water rights will be appraised in compliance with the same authorities as those cited above for acquisition appraisals. When acquiring water rights, the following directives apply:

1. Reclamation acquires storage and/or natural flow water for specific purposes by purchase of permanent water rights, leasing, or dry year options (options to use water for certain seasons over a period of time).
2. Only established and legally approved water rights are to be appraised and acquired.
3. Typically, such water rights are only acquired from voluntary sellers.
4. An appraisal shall be performed to estimate the fair market value of water rights.
5. The appraisal shall be prepared by an appraiser knowledgeable in water rights appraisals.
6. The most common method to appraise acquired water rights is the sales comparison approach of irrigated and non-irrigated land sales, along with a "before" and "after" method of valuation. Irrigated land sales with water rights are used to estimate the fair market value of the property in the "before" condition, while dry land sales without water rights are used to estimate the fair market value in the "after" condition.
7. If water rights are bought and sold in the open market in the area, then such sales will be considered in the appraisal. They may be used as supporting data or in lieu of the "before" and "after" method.
8. The appraiser must consider the salvage value of any irrigation equipment which is no longer needed in the "after" condition.
9. The appraiser must consider the ownership and rights to be acquired and the sales in terms of the same use, a different use, and/or a change of use. The value may change significantly as the use changes and is legalized.
10. Values of water rights shall not be established by negotiations or by economic determinations not common in market established acquisitions.

R. Appraisal of Water Right Leases. The value of leasing of water rights shall be established by comparing recent water leases that have occurred in the market place to those of the property being appraised. The value of leasing water shall not exceed the combined value of leasing both the land and water.

Appraisal Process and Approaches. One or more appraisal approaches and methods shall be used to estimate fair market value. The three basic approaches to value are the Sales Comparison Approach, the Cost Approach, and the Income Approach. Modified versions of these approaches and methods may be developed and used by the appraiser to solve unusual appraisal assignments. The approach or combination of approaches shall be selected which best suits the appraisal assignment and provides the strongest evidence and support for value conclusion. The following directives relate to fair market value, highest and best use, and appraisal approaches and procedures.

A. Fair Market Value. With few exceptions, the basis for Reclamation appraisals is the "fair market value" of the property, as of the effective date of the appraisal (UASFLA, 1992, pp. 3-8). Where title transfer of land and facilities from Reclamation to an entity is authorized by some other Federal authority, a value other than fair market value may be the basis for the transfer and compensation to the United States. Other possible exceptions to this may be recreation concession rates and recreation user fees. The latter which provide special benefits to the general public may be based on considerations not included in 43 CFR 429 and a value other than fair market value.

B. Highest and Best Use. Fair market value will be determined with reference to the subject property's highest and best use. Ample evidence must be provided to support and substantiate the highest and best use. This will enable the appraiser to testify with sincerity and confidence that the estimated value represents the fair market value of the property, based on market data and information (UASFLA, 1992, pp. 8-11).

C. Three Basic Approaches to Value.

1. **Sales Comparison Approach.** Using this approach, a value indication is derived by comparing the property being appraised to similar properties that have recently been sold, applying appropriate units of comparison, and making adjustments to the prices of the comparable sales based on elements of comparison. Comparable sales used in this approach shall be physically inspected and, if possible, shall be confirmed by the appraiser with the buyer, seller, closing agent, broker, or other individuals having direct knowledge of the transaction. Sale prices must be verified to ascertain whether terms and conditions of sales were conventional and occurred under open competitive market conditions. Forced sales, distress sales, sales to a condemning authority, sales between members of a family or closely related business entities, sales involving the exchange of property, and sales after the date-of-taking are either inadmissible or avoided. Although sometimes incorporated in this approach, asking prices for listings are generally considered to reflect the high end of a value range for a particular property and are therefore only occasionally used as a basis for estimating fair market. Certain care should also be exercised when using bank foreclosure sales and estate sales. This approach is the most common and preferred method of valuation when comparable sales data are available.

2. **Cost Approach.** This approach to value is derived from the current cost to construct a reproduction or replacement of the improvements, minus the amount of depreciation evident in the structures from all causes, plus the value of the land and entrepreneurial profit. This approach is particularly applicable when the property being appraised involves relatively new improvements which represent the highest and best use of the land, or when relatively unique or specialized improvements are located on the site and for which there exist no comparable properties on the market.

3. **Income Approach.** This approach converts anticipated future benefits or returns in dollars from the ownership of a property into a value estimate. Anticipated future income and or reversions are discounted to a present worth value through the capitalization process. This approach is widely used in appraising income-producing properties.

D. Other Approaches and Procedures.

1. **Before and After Procedure.** This procedure is principally used to appraise partial acquisitions, disposals, and leases. Just compensation is derived by first estimating the market value of the entire or larger parcel before the transaction and then subtracting from it the estimated market value of the remaining parcel after the transaction, including a consideration of severance damages and special benefits.

2. **Subdivision/Development Approach.** This approach is used to appraise an undeveloped property having a highest and best use for subdivision development (UASFLA, 1992, pp. 25-26). In this approach, an indication of value is derived by first estimating the market values of the total number of lots into which the property would most likely be divided. Development costs, including a reasonable profit for the developer, are then deducted from this value.

3. **Going Rate Method.** Using this method, an indication of value is based on rates being paid by utility companies to private and other entities for rights-of-way or easements on a per foot or rod basis. These rates reflect acquisitions in the same general area as that of the appraised property. If such rates are not available within the locality, market rates from outside the area or even the State can be considered for a particular use. When using this method, the appraiser must make adjustments for differences in the factors of value between markets.

4. **Farm Budget Study.** This method analyzes gross income, expenses, and net income for a farm over a specified period of time. This procedure is used to appraise excess lands. In Reclamation appraisals, it is mostly used to determine highest and best use of excess lands, without reference to project benefits, as either irrigated land or dry land.

ADDENDUM 13

Section 3405. Water Transfers, Improved Water Management and Conservation

ADDENDUM 13

Section 3405. Water Transfers, Improved Water Management and Conservation

Water Transfers

In order to assist California urban areas, agricultural water users, and others in meeting their future water needs, subject to the conditions and requirements of this subsection, all individuals or districts who receive Central Valley Project water under water service or repayment contracts, water rights settlement contracts or exchange contracts entered into prior to or after the date of enactment of this title are authorized to transfer all or a portion of the water subject to such contract to any other California water user or water agency, State or Federal agency, Indian Tribe, or private non-profit organization for project purposes or any purpose recognized as beneficial under applicable State law. Except as provided herein, the terms of such transfers shall be set by mutual agreement between the transferee and the transferor.

1. **Conditions for Transfers.** - All transfers to Central Valley Project water authorized by this subsection shall be subject to review and approval by the Secretary under the conditions specified in this subsection. Transfers involving more than 20 percent of the Central Valley Project water subject to long-term contract within any contracting district or agency shall also be subject to review and approval by such district or agency under the conditions specified in this subsection:

   A. No transfer to combination of transfers authorized by this subsection shall exceed, in any year, the average annual quantity of water under contract actually delivered to the contracting district or agency during the last three years of normal water delivery prior to the date of enactment of this title.

   B. All water under the contract which is transferred under authority of this subsection to any district or agency which is not a Central Valley Project contractor at the time of enactment of this title shall, if used for irrigation purposes, be repaid at the greater of the full-cost or cost of service rates, or, if the water is used for municipal and industrial purposes, at the greater of the cost of service or municipal and industrial rates.

   C. No transfers authorized by this subsection shall be approved unless the transfer is between a willing buyer and a willing seller under such terms and conditions as may be mutually agreed upon.

   D. No transfer authorized by this subsection shall be approved unless the transfer is consistent with State law, including but not limited to provisions of the California Environmental Quality Act.

E. All transfers authorized by this subsection shall be deemed a beneficial use of water by the transferor for the purposes of section 8 of the Act of June 17, 1902, 32 Stat. 390, 43 U.S.C. 372.

F. All transfers entered into pursuant to this subsection for uses outside the Central Valley Project service area shall be subject to a right of first refusal on the same terms and conditions by entities within the Central Valley Project service area. The right of first refusal must be exercised within ninety days from the date that notice is provided of the proposed transfer. Should an entity exercise the right of first refusal, it must compensate the transferee who had negotiated the agreement upon which the right of first refusal is being exercised for that entity's total costs associated with the development and negotiation of the transfer.

G. No transfer authorized by this subsection shall be considered by the Secretary as conferring supplemental or additional benefits on Central Valley Project water contractors as provided in section 203 of Public Law 97-293 (43 U.S.C. 390(cc)).

H. The Secretary shall not approve a transfer authorized by this subsection unless the Secretary has determined, consistent with paragraph 3405(a) (2) of this title, that the transfer will not violate the provisions of this title or other Federal law and will have no significant adverse effect on the Secretary's ability to deliver water pursuant to the Secretary's Central Valley Project contractual obligations or fish and wildlife obligations under this title because of limitations in conveyance or pumping capacity.

I. The water subject to any transfer undertaken pursuant to this subsection shall be limited to water that would have been consumptively used or irretrievably lost to beneficial use during the year or years of the transfer.

J. The Secretary shall not approve a transfer authorized by this subsection unless the Secretary determines, consistent with paragraph 3405(a) (2) of this title, that such transfer will have no significant long-term adverse impact on groundwater conditions in the transferor's service area.

K. The Secretary shall not approve a transfer unless the Secretary determines, consistent with paragraph 3405(a) (2) of this title, that such transfer will have no unreasonable impact on the water supply, operations, or financial conditions of the transferor's contracting district or agency or its water users.

L. The Secretary shall not approve a transfer if the Secretary determines, consistent with paragraph 3405(a) (2) of this title, that such transfer would result in a significant reduction in the quantity or decrease in the quality of water supplies currently used for fish and wildlife purposes, unless the Secretary determines pursuant to finding setting forth the basis for such determination that such adverse effects would be more than offset by the benefits of the proposed transfer. In the event of such a determination, the Secretary shall develop and implement alternative measures and mitigation activities as integral and concurrent elements of any such transfer to provide fish and wildlife benefits substantially equivalent to those lost as a consequence of such transfer.

M. Transfers between Central Valley Project contractors within countries, watersheds, or other areas of origin, as those terms are utilized under California law, shall be deemed to meet the conditions set forth in subparagraphs (A) and (I) of this paragraph.

2. **Review and Approval of Transfers. -** All transfers subject to review and approval under this subsection shall be reviewed and approved in a manner consistent with the following:

   A. Decisions on water transfers subject to review by a contracting district or agency or by the Secretary shall be rendered within ninety days of receiving a written transfer proposal from the transferee or transferor. Such written proposal should provide all information reasonably necessary to determine whether the transfer complies with the terms and conditions of this subsection.

   B. All transfers subject to review by a contracting district or agency shall be reviewed in a public process similar to that provided for in section 226 of Pub. L. 97-293.

   C. The contracting district or agency or the Secretary shall approve all transfers subject to review and approval by such entity if such transfers are consistent with the terms and conditions of this subsection. To disapprove a transfer, the contracting district or agency or the Secretary shall inform the transferee and transferor, in writing, why the transfer does not comply with the terms and conditions of this subsection and what alternatives, if any, could be included so that the transfer would reasonably comply with the requirements of this subsection.

   D. If the contracting district or agency or the Secretary fails to approve or disapprove a proposed transfer within ninety days of receiving a complete written proposal from the transferee or transferor, then the transfer shall be deemed approved.

3. **Transfers executed after September 30, 1999 shall only be governed by the provisions of subparagraphs 3405(a) (1) (A) -(C), (E), (G), (H), (I), (L), and (M) of this title, and by State law.**