

# Appraisal of California Water Rights

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## 2.1 Existing Guidelines

The UAS (Uniform Appraisal Standards for Federal Land Acquisition) and USPAP (Uniform Standards of Professional Appraisal Practice) are the overall guides to appropriate appraisal procedures and methodology. Water right appraisal analysis and report presentation should adhere to the UAS recommended structure detailed on pages 9 through 27 of the UAS.

Recommendations as to how the UAS should be modified or interpreted when water rights are being valued are included in the addenda. Instead of an outright modification of the UAS, this set of guidelines could be considered as a water rights “companion” to the UAS. Additional comments and suggestions as to how water right reports may differ from more typical land valuation reports are presented in the addenda in the section titled “Report Structure.”

Without the legal references and discussion previously presented, one could easily reach the conclusion that water and water rights frequently would be appropriately classified as personal property rather than real property. On the contrary, the courts have consistently held that water rights are appurtenant to the land and should, therefore, be valued as a property interest in real estate. This is true even when the water right can be moved to a different parcel of land, as in the case of appropriative rights. Standard 1 of USPAP then applies for the appraisal and Standard 2 applies for the report.

A unique situation exists when the water right has been dedicated to instream flow, also referred to as 1707 water. This was discussed in Section 1.2.2 of these Guidelines. Even though it appears that a dedication to instream flow for a water right severs it from the real estate to which it was appurtenant, it does not take on the characteristics of personal property. Its economic use would depend upon it being reattached to a parcel of real estate, and it should be valued accordingly. As above, Standard 1 of USPAP then applies for the appraisal and Standard 2 applies for the report.

Contractual entitlements are intangible assets. USPAP Standards 9 and 10 are the guides for the appraisal and report.

Reclamation has existing water right appraisal guidelines. These are rather cursory in nature and are included in the addenda. Nothing in the Reclamation guidelines conflicts with these guidelines.

The American Society of Farm Managers and Rural Appraisers (ASFMRA) presents a course entitled “Resource Valuation.” The appraisal of water rights is one of the topics addressed in this course. A review of the course material indicates that this is a broad overview of water right appraisal principles for the United States but with greater emphasis on the Western U.S. The cost approach is not presented as one of the valuation options. One of the highest and best use options is environmental/governmental, which must be approached

with care because the use to which the government intends to put the property should generally not be an indicator of the highest and best use of it.

No formal guidelines for water right valuations were discovered in interviews with the various water agencies and irrigation districts contacted while performing research for these guidelines.

## 2.2 Methodology

A clear understanding of the property interest being appraised is foundational to the entire process. Appraising the fee simple estate to a tract of land which has an appurtenant water right means that the water right property interest is included in the entire “bundle of rights” being valued. The other typical ownership positions, such as leasehold and leased fee, can apply in the valuation of tracts of land with appurtenant water rights as well.

If one is appraising only the water rights that are appurtenant to a tract of land, then a *partial interest* in real estate is being valued.

**Partial interest.** Divided or undivided rights in real estate that represent less than the whole.<sup>1</sup>

The following excerpts are taken from the UAS, pages 50 and 51:

In partial acquisitions, these Standards require with the exceptions noted below and in Section B-14, application of the *before and after* method of valuation<sup>2</sup> in which the appraiser estimates both the market value of the whole property before the government’s acquisition and the market value of the remainder property after the government’s acquisition. [footnote omitted] Requiring this method of valuation allows acquiring agencies, the Department of Justice, and the courts to calculate a reasonable measure of compensation by deducting the appraiser’s estimated remainder or after value from the appraiser’s estimate of the larger parcel’s before value. The result of this method is a figure that automatically includes the value of the land [or water right] actually acquired as well as any severance damages and/or special benefits to the remainder property.

Notwithstanding the foregoing, to assist acquiring agencies in meeting their obligations under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, [footnote omitted] appraisals must contain an allocation of the difference between the before and after value estimates between the contributory value of the land [or water right] acquired and damages to the remainder. (See A-30, “Allocation and Explanation of Damages.”)

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<sup>1</sup> Appraisal Institute, *The Dictionary of Real Estate Appraisal*, 4th ed., (Chicago: Appraisal Institute, 2002), p. 209.

<sup>2</sup> Often referred to as the before and after rule, or the federal rule.

In another approach, the appraiser estimates the contributory value of the part of the whole property to be acquired and adds to or subtracts from that figure an allowance for damages and/or special benefits in value to the remainder. [footnote omitted] This method may or may not be more complicated, but it usually is more subject to error and more apt to result in duplication, [footnote omitted] sometimes referred to as *double damages*. When this *taking + damages* method is employed, the value of the part acquired is its value as a part of the whole (i.e., larger parcel), not its value as a separate parcel. Also, if this method of valuation is employed, the appraiser must affirmatively address the issue of possible damages and/or special benefits to the remainder of the larger parcel in the appraisal report. This second taking + damages method should not be used by appraisers without the express written authorization from the acquiring agency, or the Department of Justice trial counsel, to employ it.

However, acquiring agencies should bear in mind that there are situations in which insistence upon strict adherence to the before and after rule would impose costly and sometimes nearly impossible burdens upon appraisers. Examples of such situations, in which this second taking + damages method may be applicable, are minor fee or easement acquisitions (for flowage, wetland or habitat protection, roads, pipelines, transmission lines, etc.) from large ranches, industrial complexes, etc., where the cost of valuing the whole unit before and after the acquisition is simply unwarranted in view of the minor nature of the acquisition. Use of this method, however, is generally limited to those instances wherein there are no damages to the remainder property. In short, where its application would be logical, practical, and capable of understanding, the before and after method of valuation in partial acquisitions is preferred. The taking + damages method shall not be used without concurrence of the client agency.

In certain circumstances, damage to the remainder may be *cured* by remedial action taken by the owner. The *cost to cure*, however, is a proper measure of damage only when it is no greater in amount than the decrease in the market value of the remainder if left as it stood. [footnote omitted] When the cost to cure is less than the severance damages if the cure were not undertaken, the cost to cure is the proper measure of damage, and the government is not obligated to pay in excess of that amount. [footnote omitted] See additional discussion of the cost to cure measure of damage in Section D-4.

The preceding text and guidance is appropriate both in a *takings* and in a *willing seller* situation.

It should be kept in mind that both a *before and after* analysis and a *takings plus damages* analysis measures the impact on the market value of the original bundle of rights caused by the taking or sale of one or more of the rights in the bundle. This estimated impact may or may not coincide with the market value of the rights taken or sold on a stand-alone basis. For instance, a *before and after* analysis may indicate that removing a water right from an irrigated agricultural ownership has an impact on the ownerships market value equivalent to \$1,000 per acre-foot of the water right. Similar water rights may sell in the open market

for the same value. In this case the impact on market value caused by the removal of the water right is the same as the value of the water right on a stand-alone basis. If, however, the same market value impact is indicated as in the previous example but the water right is riparian, there may be no value for this water right on a stand-alone basis because riparian rights cannot be transferred. This approach conforms to the Internal Revenue Service (IRS) tax code for contributions associated with conservation easements. A conservation easement placed on a parcel of land to prevent subdivision may have a significant impact on the market value of that parcel, but the easement itself may have no resale value at all on a stand-alone basis. The IRS uses the terminology “impairment of market value.”

The highest and best use analysis should include sufficient information to reach conclusions regarding whether the water right is worth more on the open market than its contributing value to the larger parcel that it is currently a part of under the existing use. If this situation exists, then the strong potential exists that the highest and best use of the larger parcel is not its historical or current use, but a use transition has taken place. The larger parcel definition is:

The larger parcel, for purposes of these Standards [UAS], 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.<sup>3</sup>

If the highest and best use analysis indicates that the greatest value is achieved by selling the water right, then the larger parcel may be different than what was initially anticipated. There can be multiple highest and best uses and multiple larger parcels present in an assignment. By application of the previous definition, there can be no fewer larger parcels than there are highest and best uses.

If the water rights being valued comprise only a small portion of the larger parcel, then it is doubtful that a complete *before and after* valuation would be warranted. This may be the situation if a portion of the water rights associated with a large irrigated agricultural ownership were involved. In this case a *taking + damages* approach would generally be warranted. If a *before and after* analysis is used in this situation, it would be limited to that area on which the water had been applied, not the entire ownership. In such cases, as the UAS indicates, the agency should agree to the valuation approach in advance.

At a minimum, even when the *takings + damages* approach is taken, when the water right being valued has a historical use of irrigating agricultural land, general value indicators should be presented for both dry land and irrigated lands. This information will aid in establishing a test of reasonableness for the value conclusions regarding the water right being analyzed.

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<sup>3</sup> 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.

In all situations, the three standard approaches to arriving at an opinion of value still apply – the sales comparison approach, the cost approach and the income capitalization approach. When water rights are being valued on a *takings + damages* basis, the comparison factors applied to market data and the subject are somewhat different than in situations where land and improvements are being valued.

## 2.3 Consultant's Reports

It is common for the appraiser to require the assistance of another expert to complete the appraisal assignment. The services of hydrologists, engineers, well drilling contractors, salvage specialists and others may provide assistance. Section D-4 (page 81) of the UAS must be kept in mind when using consultant's reports. The appraiser cannot merely accept their conclusions, but has a responsibility to develop a confidence level that the consultant's conclusions are reasonable before incorporating them into the analysis.

## 2.4 Sales Comparison Approach

### 2.4.1 Summary

In the sales comparison approach, the appraiser develops an opinion of value by analyzing similar properties and comparing these properties with the subject property.

...an opinion of market value is developed by comparing properties similar to the subject property that have recently sold, are listed for sale, or are under contract.

...A major premise of the sales comparison approach is that the market value of a property is related to the prices of comparable, competitive properties.

Comparative analysis of properties and transactions focuses on similarities and differences that affect value, which may include variations in the following:

- Property rights appraised
- Size
- The motivations of buyers and sellers
- Location
- Financing terms
- Physical features
- Market conditions at the time of sale
- Economic characteristics if the properties produce income.<sup>4</sup>

When truly comparable properties are available, this approach generally results in the most reliable indicator of value.

Also refer to comments and analytical techniques in Sections A-15 and A-17 of the UAS.

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<sup>4</sup> The Appraisal of Real Estate, Twelfth Edition, The Appraisal Institute, Chicago, 2001, p. 417.

## 2.4.2 Application

The following text is taken from the UAS, page 19, with suggested modifications made for water rights valuations on a *takings + damages* basis:

**A-15. Water Rights Valuation.** The appraiser shall estimate the value of the water rights for their most optimum use, as if available for such use. In doing so, the appraiser's opinion of value shall be supported by confirmed sales of comparable or nearly comparable water rights<sup>5</sup> having like optimum uses. Differences shall be weighed and explained to show how they indicate the value of the water rights being appraised. Items of comparison shall include property rights conveyed, financing terms, conditions of sale, market conditions, location, physical characteristics, history of use, seniority of water right, delivery reliability, season of use, and intended use of the buyer. 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.<sup>6</sup>

A highest and best use conclusion and an identification of the *larger parcel* are always required. A water right itself cannot be the *larger parcel*. The larger parcel will always be the land to which the water right is appurtenant. The highest and best use must also always be for the land. A highest and best use conclusion could be, "sell the appropriative water right for urban use and convert the land to dry land grazing."

Property rights conveyed should be similar if at all possible. For example, using a contractual entitlement sale as a comparable for appraising an appropriative right is problematic because an intangible asset is being compared to a property right.

Any financing terms involved in water rights sales must be carefully considered. Many of the buyers of water rights and contractual entitlements are public entities such as urban water districts. These buyers may be deciding on a purchase price based on an availability of funds at rates below those available to a private party.

Location considerations are very important. Ideally, the comparables will come from the same watershed. At the very least, sales from south of the Delta should not be used as comparables for appraising a water right north of the Delta, and vice versa. This is true because of the dramatic differences that exists in demand and supply of water between the north and the south of the state, combined with the obstacles and uncertainties associated with moving water through the Delta.

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<sup>5</sup> For a discussion of what legally constitutes a comparable sale and the admissibility of comparable sales information, see Section B-4 of these Standards.

<sup>6</sup> For a discussion of comparable sales documentation and information required and the requirements for comparison, see Section A-17 of these Standards.

Water quality considerations fall into the category of physical characteristics. Any buyer that is interested in treating the water for urban consumption is very interested in higher quality water to minimize treatment costs. Low salt content and the absence of other dissolved solids, minerals, and chemicals makes for higher quality water. Irrigators concerned about long term build up of salts and other substances in the soil may also pay a premium for high quality water.

Seniority of the water right and delivery reliability may be directly linked. However, reliability could also be impacted by local hydrological conditions.

A water right that has a season of use in the winter when there tends to be an abundant amount of water available could be expected to be worth significantly less than a water right that has summer season of use but is similar in other aspects.

The history of use must be presented, as well as the intended use of the buyer, on all comparable sales. If the buyer's intended use is different than the historical use, (such as agriculture to urban, then that could indicate a change in the optimum use of water in the market area. However, such an indicator must also be viewed in the light of the demographic, land use, and water use trends in the area before reaching conclusions. The potential also exists that past urban buyers now have their projected needs satisfied and are no longer in the market.

The suggested adjustment items and the sequence of adjustments recommended for the various types of water rights that exist can be found in Section 3 of these Guidelines.

## 2.5 Cost Approach

### 2.5.1 Summary

The cost approach is based on the understanding that market participants relate value to cost. In the cost approach, the value of a property is derived by adding the estimated value of the land to the current cost of construction a reproduction or replacement for the improvements and then subtracting the amount of depreciation (i.e., deterioration and obsolescence) in the structures from all causes. Entrepreneurial profit and/or incentive may be included in the value indication. This approach is particularly useful in valuing new or nearly new improvements and properties that are not frequently exchanged in the market.<sup>7</sup>

Obviously, the cost approach has more frequently been applied in valuing land with structures on them rather than in valuing water rights. Nevertheless, water rights are usually an "improvement" to the land and there are situations where the cost approach is applicable in estimating the value of water rights.

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<sup>7</sup> The Appraisal of Real Estate, Twelfth Edition, The Appraisal Institute, Chicago, 2001, p. 63

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.

Unless there are unique circumstances that cause the client to direct that a *reproduction* cost approach be taken, *replacement* cost would always be used.

It is important to keep in mind the following from Section A-16 of the UAS:

...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.

Refer to Section A-16 of the UAS in its entirety for more on the cost approach.

## 2.5.2 Application

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 5 years the DWR publishes Bulletin 160 listing 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 have decreased 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 was proven to be feasible. Salt disposal costs would also have to be considered.

The costs associated with conservation measures can provide indicators of water value. Such activities could include canal lining and modification to irrigation methods.

The costs public agencies are prepared to spend on enhancing project yield through constructing reservoirs or improving flows in rivers and channels could also be relevant, though non-market goals of such agencies must always be understood before this information is used.

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.

## 2.6 Income Approach

### 2.6.1 Summary

The following overview pertains to the income capitalization approach:

Income-producing real estate is typically purchased as an investment, and from an investor's point of view earning power is the critical element affecting property value. One basic investment premise holds that the higher the earnings, the higher the value, provided the amount of risk remains constant. An investor who purchases income-producing real estate is essentially trading present dollars for the expectation of receiving future dollars. The income capitalization approach to value consists of methods, techniques, and mathematical procedures that an appraiser uses to analyze a property's capacity to generate benefits (i.e., usually the monetary benefits of income and reversion) and convert these benefits into an indication of present value.<sup>8</sup>

The following UAS extraction comes from pages 43 and 44 of Section B-7. Income Capitalization Approach:

In using the income capitalization approach, care should be taken to consider only income that the property itself will produce—not income produced from a business enterprise conducted on the property. When the public requires the land upon which a business is located, the business is not taken and the value estimate developed by the appraiser should include no incremental value for loss of the business or its profits. [footnote omitted] Accordingly, the rule against admitting evidence of profits or income, either past or future, from a business conducted on the property condemned has been applied to farmlands as well as to other lands. [footnote omitted] It is

<sup>8</sup> The Appraisal of Real Estate, Twelfth Edition, The Appraisal Institute, Chicago, 2001, p. 471.

not improper, however, to consider the uses to which a property can be put, including the character and extent of the business carried on, as distinguished from the profits from that business, the facilities for doing the business, and location of the property as a point commanding trade from the surrounding area, or otherwise. [footnote omitted] Therefore, when valuing property that typically sells on the basis of income production, it is appropriate to consider the amount of business conducted on the site. For instance, one common unit of comparison in valuing service stations is price per gallon of gasoline pumped; for taverns a unit of comparison is often price per keg of beer sold; and for funeral home the price per case. Also, of course, many commercial properties will be rented based on a percentage of the gross sales of the business located on the property. In these situations, business volumes may be considered but with the sole reference to the market value of the land. [footnote omitted]

The income to be capitalized in the income capitalization approach is the market or economic rent of the property being appraised. The appraiser should not consider the fact that a property may be under lease to a third party, except to the extent that the rent specified in the lease may be indicative of the property's market rent. The value to be estimated is the market value of the property as a whole, not the value of the various interests into which it may have been carved. This topic is discussed in greater detail in Section B-19.

The following UAS extraction comes from pages 57 and 58 of Section B-15:

**B-15. Noncompensability of Consequential Damages.** It is a firmly established principle of federal law that certain damages which may occur by reason of a government acquisition of land are not compensable and, therefore, must be disregarded by appraisers when estimating market value for such acquisitions. Such damages are classified as *consequential* or *incidental* damages. “[T]he Fifth Amendment does not require any award for consequential damages arising from a condemnation.” [footnote omitted]

Loss of business and relocation expenses has been determined to be consequential, and therefore noncompensable. [footnote omitted] Other damages classified as consequential include: damage to business, loss of or damage to goodwill, future loss of profits, expenses of moving removable fixtures and personal property, depreciation in value of furniture and removable equipment, frustration of plans, frustration of contractual expectations, loss of customers, and the expense of having to readjust manufacturing operations. [footnote omitted]

The basic federal law in this respect has been stated by the Supreme Court as follows:

The sovereign ordinarily takes the fee. The rule in such a case is that compensation for that interest does not include future loss of profits, the expense of moving removable fixtures and personal property from the

premises, the loss of good-will which inheres in the location of the land, or other like consequential losses which would ensue the sale of the property to someone other than the sovereign. No doubt all these elements would be considered by an owner in determining whether, and at what price, to sell. No doubt, therefore, if the owner is to be made whole for the loss consequent on the sovereign's seizure of his property, these elements should properly be considered. But the courts have generally held that they are not to be reckoned as part of the compensation for the fee taken by the government. We are not to be taken as departing from the rule they have laid down, which we think sound. Even where state constitutions command that compensation be made for property "taken or damaged" for public use, as many do, it has generally been held that that which is taken or damaged is the group of rights which the so-called owner exercises in his dominion of the physical thing, and that damage to those rights of ownership does not include losses to his business or other consequential damage. [Footnotes omitted.]

The Court went on to state, at page 382:

Whatever of property the citizen has the government may take. When it takes the property, that is, the fee, the lease, whatever he may own, terminating altogether his interest, under the established law it must pay him for what is taken, not more; and he must stand whatever indirect or remote injuries are properly comprehended within the meaning of "consequential damage" as that conception has been defined in such cases. Even so the consequences often are harsh. For these, whatever remedy may exist lies with Congress.<sup>9</sup>

The Supreme Court later gave further guidance with respect to noncompensable consequential damages by stating:

Since "market value" does not fluctuate with the needs of the condemnor or condemnee but with general demand for the property, evidence of loss of profits, damages to good will, the expense of relocation and other consequential losses are refused in condemnation proceedings. [footnote omitted]

In the absence of a statutory mandate, the United States must pay only for what it takes, not for opportunities that the owner may lose. [footnote omitted] It is critically important that appraisers objectively estimate market value, without attempting to include any consequential damages in those estimates. To do so would not result in an accurate reflection of market value and, in addition, could result in double recovery of damages reimbursable under the Uniform Act.

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<sup>9</sup> Congress did, in fact, subsequently enact the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, P. L. 91-646, as amended, 42 U.S.C. §4601, et seq, which provides for extensive recovery for replacement housing, moving expenses, and relocation advisory services. However, the reimbursement of these consequential damages fall under the Uniform Act and is outside of the scope of the appraiser's assignment, which is limited to the estimation of market value.

## 2.6.2 Application

It is clear from the preceding text that using foregone net business income from a farming operation (farm budget analysis) incurred by foregoing the application of irrigation water is not an acceptable method of estimating the value of water. This is so because the overall net income from a farming operation involves all of the factors of production, including the efforts of the farmer, to produce the income. The income is not exclusively associated with the water.

An analysis focused on foregone net income from agricultural production may serve as an indicator of the upper limit on the value of the water and may be useful in that regard, but should not be the primary value indicator.

Some individuals advocate a “residual farm budget analysis” where all non-water production costs are subtracted from the gross farm income to obtain the portion of the income attributable to water. This figure would indicate an annual lease rate for the water or it could be capitalized if a water right was being valued. This process is even more complex than estimating the overall net income to the farm. The accuracy of the result depends on the appraiser’s ability to accurately estimate all of the non-water production costs.

A better indication of the contributing value of the water can be obtained by comparing the income from leasing non-irrigated land with the income from leasing irrigated land. In this manner, the value contribution of the water is isolated from the other agents of production. If water is purchased for only a portion of the growing season, then a pro-rating analysis could be done.

Another indicator of the annual value of water comes directly from annual (short-term) water sales. Such transactions are frequently referred to as water leases.

One of the first public agency efforts at acquiring a large amount of water through single season sales was the State of California’s Drought Water Bank activities in 1991. The State offered \$125 per acre-foot of water to sellers north of the Delta. The sources of the water came from land fallowing, groundwater pumping, and storage releases. The State then transported it through the Delta and charged buyers \$175 per acre-foot at the pumps in the South Delta. The State acquired significantly more water than it sold. Subsequent north-of-the-Delta prices were at \$50 per acre-foot with land fallowing not being an option. In subsequent years, the Bank initiated option agreements wherein potential sellers received a \$5 per acre-foot option price. If the State exercised its option, then it paid an additional \$30 to \$40 per acre-foot to receive the water. When the drought ended, the Drought Water Bank ceased its activity.

In recent years the DWR has initiated a “Dry Year Option Water Purchase Program” as well as an “Environmental Water Account” (EWA). The EWA utilizes money from Cal-Fed. For 2005, the option price was \$10 per acre-foot and the call price is based on the hydrologic year type. A “wet” year price is \$25 while a “critically dry” year price is \$125. The agreement terms are located in the addenda. There is an effort to establish a longer-term agreement between DWR and the sellers.

These programs are tending to set the market for short-term sales north of the Delta. The Dry Year Option Water Purchase Program will also tend to set the upper end of the market for short-term sales south of the Delta by the price paid at the pumps. Wheeling costs would be added on to the pump price.

The income from these purchase programs will vary by year type and not all potential sellers will be able to avail themselves of this sale opportunity. Some of the sellers have been large irrigation districts which tend to be more efficient for DWR to work with, compared to numerous small land owners. Research would have to be done on a case by case basis for each appraisal.

However, it would be wrong to apply the call price every year in a valuation. At a minimum, the hydrologic variability has to be considered. Any “front loading” in a discounted cash flow would also be inappropriate. An analysis that projects income from the call price for the first 5 years followed by 5 years of option price will yield a much higher conclusion than the reverse approach. A discounted cash flow analysis based on annual water sales should develop a value range based on best case and worst case scenarios which consider the hydrologic record for California.

Without a doubt, the best indicator of the annual value of a water right comes from the lease rate differential between irrigated lands and dry lands where similar water rights are involved compared with the subject lands.

It should also be kept in mind that the approaches to value are supposed to reflect the perspectives of buyers and sellers. The income approach is generally applied in situations where the property being appraised is viewed as an investment vehicle. If that is not the case, the income approach and its conclusion should be used with caution. An argument in favor of using it, even when the water right is clearly not an investment vehicle, is as a check on reasonableness on the conclusions from the other approaches. Frequently, market data is so sparse that every avenue for analysis must be used.

## 2.7 Public Interest Value

The Dictionary of Real Estate Appraisal defines public interest value as:

A general term covering a family of value concepts that relate the highest and best use of property to noneconomic uses such as conservation and preservation. The term originated in the 1970s in federal legislation involving public-private land exchanges deemed to be in the public interest and tax write-offs for certain donations or dedications of private lands for public purposes.<sup>10</sup>

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<sup>10</sup> Appraisal Institute, The Dictionary of Real Estate Appraisal, 4th ed., (Chicago: Appraisal Institute, 2002), p. 225

In recent years, there have been a significant number of published articles on both sides of the issue of whether or not “public interest value” ought to be included in the appraised value. That is, are there instances where the value conclusion should be a composite of economic and noneconomic values? This question could arise when the economic value of a property derives from its agricultural production potential but it is also critical habitat to some endangered species or provides general habitat benefits to fish and wildlife. Given how important water is to many threatened and endangered species, this question can be expected to arise frequently when appraising water rights.

The following is extracted from the UAS, Section B-3, pages 34-35:

A proposed highest and best use cannot be the use for which the government is acquiring the property (e.g., missile test range, habitat conservation, airfield, park), unless there is a prospect and competitive demand for that use by others than the government: [footnote omitted]

The Supreme Court has recognized the existence of a “principle which excludes enhancement of value resulting from the government’s special or extraordinary demand for the property.”...The focal point of the “special or extraordinary” standard is that values resulting from the urgency or uniqueness of the government’s need for the property or from the uniqueness of the use to which the property will be put do not reflect what a willing buyer would pay to a willing seller.... [I]t is clear that government projects may render property valuable for a unique purpose. Value for such a purpose, if considered, would cause “the market to be an unfair indication of value,” because there is no market apart from the government’s demand. [footnote omitted]

Likewise, “[t]he benefit a real estate development produces for a community or the amenity contribution provided by a planned project (i.e., the public space in a park-like area) is not considered in the appraiser’s analysis of highest and best use. Highest and best use is driven by economic considerations and market forces, not by public interest.” [footnote omitted] Therefore, “a non-economic highest and best use is not a proper basis for the estimate of market value [thus] a highest and best use of conservation, preservation, or other use that requires the property to be withheld from economic production in perpetuity, is not a valid use upon which to estimate market value.” [footnote omitted]

The Department of Justice’s “view is that an appraisal premised on a highest and best use of ‘preservation,’ ‘conservation,’ ‘natural lands’ and the like is not an appraisal of ‘fair market value’ and is unacceptable for both direct purchase and eminent domain acquisitions. That view is largely based on the principles of eminent domain law from which we conclude that a non-economic use is not a proper basis for assessing fair market value, that a value premised on a highest and best use of ‘preservation’ or the like does not represent a ‘market’ value, and certainly does not represent a ‘fair’ value.” [footnote omitted] Therefore, the Department of Justice will not

approve any appraisal report for federal acquisition purposes wherein the value estimate is based upon an uneconomic highest and best use. Nor will it approve any appraisal report that incorporates a definition of highest and best use that includes the concept of non-economic uses. (See A-14, "Analysis of Highest and Best Use.")

Based on the preceding statements, there can be little doubt that an appraisal that conforms to the UAS cannot incorporate public interest value into its ultimate value conclusions.

If public interest value does exist for a property over and above market value, then alternate valuation techniques and funding sources may be needed to appraise and pay for such properties. The methodology for actually placing a dollar figure on public interest value is still in its infancy. The question comes down to, "How much is an additional salmon or Delta smelt worth to society?" In truth, the estimation of the public interest value of a property is far beyond the ability of most appraisers, and the USPAP Competency Rule would and should be applied.

If a property is critical to acquire for the good of society, then special action may be required by congress to allocate the money necessary over and above the market value of the property.

These guidelines do not incorporate any public interest value in the derivation of market value.

The next section gives an overview of typical approaches taken in analyzing a project that is being considered by the federal government. Such analyses are frequently performed in support of the expenditure of public money. In those situations, all aspects of public benefit, or public interest value, can be included. This section is included for informational purposes only and was provided by CH2M HILL, a company with significant amount of experience in performing cost/benefit analyses.

### **2.7.1 Social Values in Water Right Appraisal and Economic Analysis**

The federal government acquires real property for environmental or social uses to address needs that would not be otherwise addressed by private market transactions. An example of this is the acquisition of land or easements to preserve unique or scenic lands, such as national parks. Another example is the acquisition of water to enhance endangered species habitats or to meet water quality standards. In these cases, the real property is not used for economic purposes, but used to preserve or protect environmental resources for society's benefit.

In the appraisal process established by the UAS, highest and best use is determined by economic considerations and market forces, and, therefore, non-market values, like social values, are not accounted for in appraisals. Environmental or governmental uses of water are generally not used to produce goods that are bought and sold in markets and, as such, do not have prices associated with them. Without market prices, the UAS appraisal process cannot attribute a value to water used for environmental purposes or for public benefit. This creates a conundrum because one of the many roles of government is to protect society's interest and, as such, the methodologies used to evaluate public projects allow the inclusion of non-market values.

Many economic analysis methodologies required by the federal government for project evaluation include social value. Water rights acquisitions by the U.S. Fish and Wildlife Service and Reclamation would be evaluated in accordance with the U.S. Water Resources Council's *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (Principles & Guidelines)*. *Principles & Guidelines* provides instructions for the formulation and evaluation of water and related land resources implementation studies. The primary and required analysis is to determine a project's contribution to National Economic Development (NED). Page iv of *Principles & Guidelines* defines NED as<sup>11</sup>:

Contributions to national economic development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed.

*Principles & Guidelines* provides three techniques on page 68 that can be used to estimate non-market values for NED analysis, particularly those associated with water supply benefits to recreation (e.g., swimming and fishing at a reservoir) and the environment (e.g., increased flows in rivers that lower water temperatures to benefit fish habitats in warm weather or reduce salinity in estuaries during low flow periods). These techniques are:

- (1) Travel cost method. The basic premise of the travel cost method is that per capita use of a recreation site will decrease as out-of-pocket and time costs of traveling to the site increase, other variables being constant. TCM consists of deriving a demand curve by using the variable costs of travel and the value of time as proxies for price. This method may be applied to a site-specific study or a regional model.
- (2) Contingent valuation method. The contingent valuation method estimates NED benefits by directly asking individual households their willingness to pay for changes in recreation opportunities at a given site. Individual values may be aggregated by summing willingness to pay for all users in the study area. This method may be applied to a site-specific study or a regional model.
- (3) Unit day value. The unit day value method relies on expert or informed opinion and judgment to estimate the average willingness to pay of recreation users. By applying a carefully thought-out and adjusted unit day value to estimated use, an approximation is obtained that may be used as an estimate of project recreation benefits.

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<sup>11</sup> U.S. Water Resources Council. 1983. *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*. March 10. Available at [www.iwr.usace.army.mil/iwr/pdf/p&g.pdf](http://www.iwr.usace.army.mil/iwr/pdf/p&g.pdf).

Supplemental and optional analyses are also outlined in *Principles & Guidelines* with respect to project implementation studies. They include analysis of regional economic impacts, environmental quality impacts (ecological, cultural, and aesthetic), and other social impacts (urban and community, health and safety). The above non-market techniques may also be used for these analyses.

A 1992 memorandum issued by the Office of Management and Budget (OMB) titled Circular No. A-94 “Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs” provides guidance for performing the following analyses in Section 4 Scope<sup>12</sup>:

1. Benefit-cost or cost-effectiveness analysis of Federal programs or policies.
2. Regulatory impact analysis.
3. Analysis of decisions whether to lease or purchase.
4. Asset valuation and sale analysis.

Benefit-cost analysis (BCA) is recommended by OMB as the primary economic analysis technique to be used for formal economic evaluation of government programs and projects. Cost-effectiveness analysis can be used when the benefits from all project alternatives are the same or when a policy mandates that certain levels of benefits must be provided. Cost-effectiveness analysis is less comprehensive than BCA, but is often applied to evaluation projects that provide an essential commodity or service to the public. Examples are water supply and national security.

Circular A-94 applies to all agencies of the Executive Branch of the federal government and requires the agencies to monetize positive and negative impacts to the extent possible or identify them in other units (Section 5 General Principles):

1. A comprehensive enumeration of the different types of benefits and costs, monetized or not, can be helpful in identifying the full range of program effects.
2. Quantifying benefits and costs is worthwhile, even when it is not feasible to assign monetary values; physical measurements may be possible and useful.

OMB provides explanation as to how market transactions can fail to capture all components of social value, and, when they do, alternative methods must be employed to estimate the total value of a project or program (Section 6 Identifying and Measuring Benefits and Costs):

**6. Identifying and Measuring Benefits and Costs.** Analyses should include comprehensive estimates of the expected benefits and costs to society based on established definitions and practices for program and policy evaluation. Social net benefits, and not the benefits and costs to the Federal Government, should be the basis for evaluating government programs or policies that have effects on private citizens or other levels of government. Social benefits and costs can differ from private benefits and costs as measured in the marketplace because of imperfections arising from: (i) external economies or diseconomies where actions by one party impose benefits or costs on other groups that are not compensated in the market place; (ii) monopoly power

<sup>12</sup> Office of Management and Budget. 1992. Circular No. A-94 Revised Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs. October 29. Available at [www.whitehouse.gov/omb/circulars/a094/a094.html](http://www.whitehouse.gov/omb/circulars/a094/a094.html).

that distorts the relationship between marginal costs and market prices; and (iii) taxes or subsidies.

**a. Identifying Benefits and Costs.** Both intangible and tangible benefits and costs should be recognized. The relevant cost concept is broader than private-sector production and compliance costs or government cash expenditures. Costs should reflect the opportunity cost of any resources used, measured by the return to those resources in their most productive application elsewhere....

**b. Measuring Benefits and Costs.** The principle of *willingness-to-pay* provides an aggregate measure of what individuals are willing to forego to obtain a given benefit. Market prices provide an invaluable starting point for measuring willingness-to-pay, but prices sometimes do not adequately reflect the true value of a good to society. Externalities, monopoly power, and taxes or subsidies can distort market prices.

Taxes, for example, usually create an *excess burden* that represents a net loss to society. (The appropriate method for recognizing this excess burden in public investment analyses is discussed in Section 11.) In other cases, market prices do not exist for a relevant benefit or cost. When market prices are distorted or unavailable, other methods of valuing benefits may have to be employed. Measures derived from actual market behavior are preferred when they are available....

In the case of water rights acquisition, the Department of Justice requires market-based appraisals, while *Principles & Guidelines* and Circular A-94, which govern the project evaluation processes of federal projects and programs, require the inclusion of positive and negative non-market values. To comply with both sets of requirements and the federal government's responsibility to protect the public interest, close coordination is necessary between water rights appraisers and economists. Both the fair market value of a water right, as well as its social and non-market value, should be documented for each proposed water rights acquisition. This provides comprehensive information to agency personnel and to Congress for the purposes of budget requests and justification.

In the long run, it may be necessary for agencies involved in acquiring water for environmental purposes and for meeting federal legislative requirements such as the National Environmental Policy Act (NEPA) and the Central Valley Project Improvement Act (CVPIA) to provide policies and guidance to coordinate and accommodate both types of values for program and project evaluations.

## 2.8 Application of Methodology

### 2.8.1 Research and Inspection

A complete inspection of the current point of diversion, if dealing with surface rights as well as the on-site distribution infrastructure, should be done. The appraisal report must describe the historical use of the water right. The lands to which irrigation water has been applied, the delivery system, the season of use, and the crops grown must all be described.

Periods of non-use of the water right should be identified. Any reports that have been filed with the Board in recent years (5 years minimum) as to the amount of water diverted should be reviewed.

A copy of the License to Divert, issued by the Board, should be reviewed and included in the report. This will only apply to surface water rights that are post-1914. Pre-1914 water rights must be documented by whatever means are available. Any legal opinions provided to the appraiser regarding the validity of the water right should also be included.

If the historical use of the water right is irrigation, then an engineer's report that reaches conclusions regarding consumptive use must be available to the appraiser. This report should deal with the amount of applied water, evaporation and transpiration of applied water, what happens to the water that percolates into the soil, and the amount of surface run-off (tailwater). Non-agricultural uses, such as industrial use, will also have a consumptive use history that must be addressed.

Published information that would provide an estimate of the consumptive use should be referenced. If the water that percolates into the ground goes to a salt-sink, then it is being "consumed" as well and may be available for transfer. If it recharges a usable groundwater basin, then it may not be available for transfer (see page 1-14).

The reliability of the water supply must be addressed and will require research into the local hydrology and the seniority of the water right.

The natural and man-made infrastructure that exists that would allow the physical transfer to a potential buyer must also be addressed. This is fundamentally important in identifying potential buyers.

In analyzing the subject, one of the primary questions to answer is, "How would a transfer take place?" In researching comparable sales, the question is, "How did a transfer take place?" In order to be confident in the appropriate use of a sale or lease in the valuation of the subject, a knowledgeable individual must be interviewed. An understanding of the water right that was sold or leased and the factors that entered into the price paid must be obtained before meaningful comparisons can be made to the subject.

Physical inspection of either the historical point of diversion and place of use or the proposed diversion point and place of use is not important for the *sales*. This is a deviation from the UAS requirement of physically inspecting all of the sales used in a typical land valuation. What is important is that the appraiser gains an understanding of how the transfer took place. This may require a physical inspection or it may not. If, based on past experience, the appraiser already has an understanding of the waterways involved and

man-made infrastructure used for the transfer, then little is gained by making the appraiser view the old and new diversion points and places of use. As a matter of fact, forcing the appraiser to do so could increase the cost of the appraisal dramatically given the wide geographical area over which comparables may exist for any water right valuation.

## **2.8.2 Groundwater Rights**

If a groundwater basin has been adjudicated, then the rights of the overlying landowners have been quantified. The sum of the allocated rights equals the long-term annual yield of the basin in the court's judgment.

It is common in this situation for any urban entity in the basin to purchase these groundwater rights from the historical agricultural water users. In many cases, the market is well established. Upon sale of the right, a change in point of use is effected by simply terminating the extraction at the old location and increasing it elsewhere in the basin. This could involve drilling a new well, or it may be as simple as increasing the rate or duration of pumping at a different well in the basin.

*A before and after* valuation of the water right for its agricultural use, compared with prices being paid for just the water right should show if there is a premium being paid in the market over and above its use value for agriculture. Any additional costs that the buyer paid, such as drilling a new well or installing pipelines, should be researched and considered.

If an adjudicated water right is being valued, then a copy of the court decree should be obtained that should quantify the right of the current owner and any restrictions that could be relevant.

In non-adjudicated situations, overlying landowners have correlative rights to the groundwater underneath their lands. If the long-term annual yield of a groundwater basin exceeds the needs of the overlying landowners, then the additional yield may be available for appropriation. Any such appropriation could be reduced if overlying landowners' needs increase or if adjudication takes place.

Groundwater has been sold on a short-term basis in the past. Many groundwater sales took place during the early years of the Drought Water Bank. EWA purchases in recent years have involved groundwater sales. Currently, groundwater sales can only take place to the State if there is relative certainty that the groundwater is disconnected from the surface water in the area. Otherwise, holders of surface water rights could be negatively impacted by the sales of groundwater. The State has detailed the requirements for groundwater to be considered as a new source of water, not simply the same source extracted at a different location. Before any valuation of groundwater is commenced, the client should have ascertained that the groundwater being purchased is disconnected from surface water.

In recent years, the EWA purchases have tended to set the market for annual sales. A property owner who has wells that have been previously approved for water sales to EWA will be in a superior position to an owner who is simply proposing to engage in such sales because of the costs associated with meeting the requirements of proof of no impact on surface water supplies.

The willingness of property owners to sell groundwater at historical prices may depend on the market for crops that would otherwise be produced. If water sales took place during a period of depressed produce prices, then they may serve only to set the lower end of the value range for the groundwater if the produce market has improved.

The soil production capacity of the land could impact the owner's willingness to sell as well. An owner of land with poor soils may be willing to sell for lower prices than the owner of land with better soils. Even though the projected net income from a farming operation cannot be the basis of estimating the value of water, the water value may correlate to (track) expected net income.

Depth to groundwater can vary dramatically from one location to another even though the distance between the well sites may not be far. Of course, the deeper the groundwater, the more expensive it is to extract. A groundwater right which can be accessed with a 100-foot lift could be expected to be more valuable than one that requires a 400-foot lift, all other things being equal.

The quality of groundwater is also significant. In an area of perched water tables, sitting on top of impervious clay layers, the water may be unsuitable for irrigation or any other purpose. High salt or selenium concentrations may severely limit groundwater usability. Before comparisons can be made, sufficient knowledge must be gained regarding the subject's and the comparable's water quality.

Typically, the groundwater right runs with the land and is sold with the land. *Before and after* valuations would be the best approach in most groundwater right valuations. If there is evidence that land is being purchased with the intent of exporting the water, great care must be exercised in the selection of comparables with particular attention paid to similarity of highest and best use issues. Many counties have restrictions on groundwater export, and there may also be groundwater management plans in place which pose restrictions.

If one believes it is appropriate to use a surface water right as a comparable in estimating the value of a groundwater right, and there are no restrictions on the sale and export of the groundwater right, several things must be kept in mind. Assuming the well is deep enough, groundwater tends to be 100 percent reliable, though there are exceptions. A surface water rights' reliability will depend on hydrology, seniority, and legal season of use. Endangered species may impact surface water diversions. Pumping costs associated with surface water are usually significantly less than with groundwater. There may also be water quality differences.

### 2.8.3 Riparian Rights

Many of the comments regarding groundwater rights apply to riparian rights because they too run with the land.

Unlike groundwater rights, there are no situations where riparian rights can be appropriated (though they can be dedicated to in-stream flow). Clearly, the best valuation approach in determining the contributing value of the riparian right is the *before and after* approach. Since the riparian right can not be transferred, there may be no value for this right on a stand-alone basis.

In estimating the *after* value of land without the riparian right, it must be kept in mind that the aesthetic value of being next to a watercourse would still exist even when the riparian water right is lost. If dry land sales away from a watercourse were used as comparables, then a danger of undervaluing the property in the *after* condition would exist. This would lead to an overvaluation of the water right.

If comparison is made to irrigated lands that have appropriative rights, then a variety of factors would have to be considered and potentially adjusted for. The cost and reliability of water delivery, and whether or not transferable water rights are contributing value over and above their use value for irrigated agricultural production, would be significant items that may require adjustments.

### **2.8.4 Appropriative Rights**

The vast majority of appropriative water rights are associated with surface water. There are a few instances where groundwater exists essentially in an underground stream, and other cases where percolated groundwater can be appropriated, but these are rare exceptions.

The primary valuation factors in appraising an appropriative water right include:

- Seniority,
- Amount of water that can be legally diverted,
- Season of use,
- Consumptive use,
- Reliability associated with hydrologic conditions, and
- Highest and best use or optimum use

Comparable sales of land with water rights should have a similar highest and best use. If direct comparison is made with water right sales, then the sales and the subject should have similar optimum uses. It is completely inappropriate to use comparable sales where the buyer was an urban entity for appraising a water right where such buyers are not a factor in the market, either because urban demand does not exist or delivery of the water would not be physically possible or financially feasible.

All adjustments should be made from the “market’s” perspective, not that of the specific buyer or seller. The only exception to this may be when a single buyer dominates the market and effectively sets the price.

When a market area is transitioning from strictly agricultural use to one where urban buyers exist, the *before and after* valuation approach for irrigation will yield a “use” value for agriculture which will tend to set the lower end of the value range for the right being appraised. Special care must be exercised in performing the highest and best use analysis in transitioning markets to insure that “market value” is being estimated by considering all potential uses for the property being appraised, including sale of the water right to an urban entity.

Superior seniority and dry-season legal diversions can have significant positive value implications for a water right. Consumptive use will be the foundation for the amount of water that can be transferred without harming other water right users.

In some cases, the amount of water that can be legally diverted is much higher than the consumptive use that has taken place. There may be some positive value impact from this, but it will be very hard to prove and quantify. First and foremost, the subject and all sales must be compared on a consumptive use basis, not the amount of water that could be diverted.

The highest and best use analysis must take all restrictions regarding water transfers into consideration. These restrictions include both legal and physical ones. The Delta poses an enormous obstacle for private party water transfers. Therefore, every effort should be made to not use comparables from one side of the Delta for appraising a water right on the other side. This is especially dangerous when appraising a water right north of the Delta because of the great potential of overestimating its value if comparables from south of the Delta are used.

### **2.8.5 Contractual Entitlements**

A contract for water delivery is an intangible asset. Transfers of contractual entitlements are not constrained to the amount of water that has been consumptively used; the entire amount of the entitlement can be transferred for delivery at another location.

Transfers within an irrigation district are usually quite straightforward and require only the cooperation of the district. Transfers between districts require the cooperation of both districts. Frequently, transfers that take place involve lands within two districts that have the same owner. The landowner is simply repositioning the water use from one land to another with the only financial obligation associated with the differential in delivery and administrative costs. This is not a sale situation.

The two largest water projects in the state are the CVP and the SWP. Short-term transfers between contractors (districts) within each system are relatively straightforward. The SWP currently requires that if a district is not going to use its allocation completely for that year, the excess goes into a turn-back pool where it is available for other SWP contractors to purchase. The CVP does not have such a system, but districts within the CVP can arrange for reallocation between themselves with the operational branch of the CVP kept informed. Central Valley Project Improvement Act (CVPIA) transfer guidelines apply specifically Section 3405 (a) of the Act which is included in the addenda.

Outright sales of contractual entitlements have taken place from one CVP contractor to another and from one SWP contractor to another, but not to outside entities. Such outside-buyer proposed sales have been strongly resisted with no expectation of change in that regard. Because of the limited buyer-seller pool, contractual entitlement sales in these projects should be used with caution. Also, the buyer may incur additional infrastructure expenses in order to take delivery of additional entitlement water. The buyer also absorbs all annual project expenses that the seller had other than energy costs for delivery to the old location.

The CVP and the SWP do actively facilitate short-term transfers between projects in cases that involve substitution. As an example, the SWP may deliver water to a CVP contractor at one location while another CVP contractor allows an equal amount of their entitlement to be put into the SWP system at another location. The interconnectivity of the water delivery infrastructure south of the Delta allows for such substitution transfers to take place.