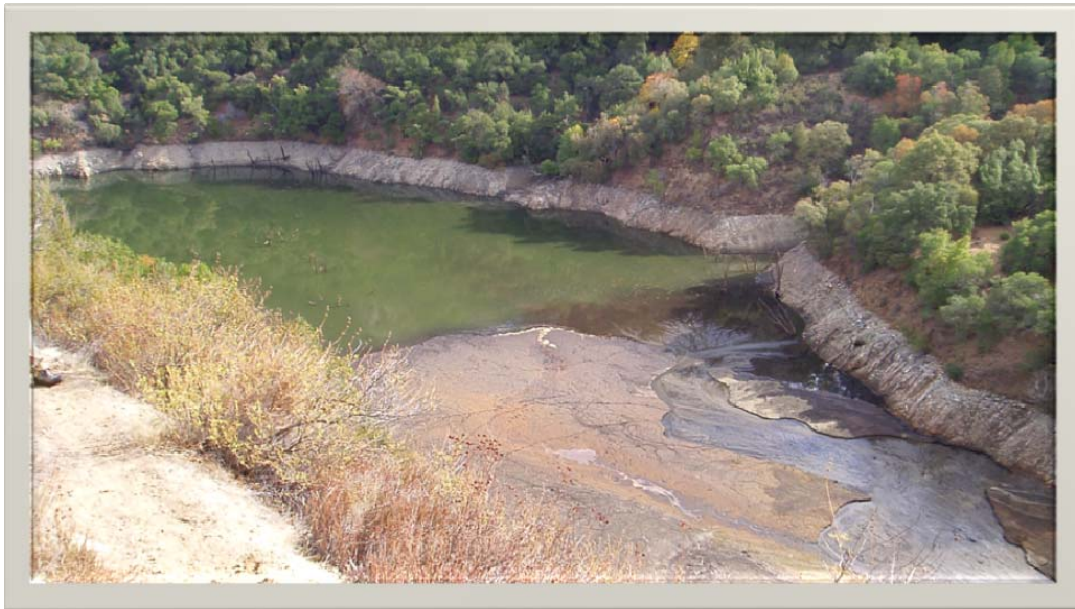


Los Padres Dam and Reservoir

Long-Term Strategic and Short-Term Tactical Plan

Monterey Peninsula Water Management District
April 2014 Draft



Executive Summary

The Monterey Peninsula Water Management District (“MPWMD”) is currently engaged in arguably one of the largest and most significant challenges of its history; **staving off critical anticipated shortfalls, ensuring continued water reliability, and implementing a long-term regulatory solution for the Carmel River watershed.** To be sure, the multitude of technical issues, overlapping institutional influences, increasingly stringent regulatory framework, and diversity of stakeholder interests make this challenge quite complicated. A critical component of MPWMD’s long term responsibilities for the Carmel River watershed involves its planned actions and management prescriptions for the *upper* watershed; the hydrological source area for the Peninsula’s freshwater resources. This document, the *Los Padres Dam and Reservoir - Long-Term Strategic and Short-Term Tactical Plan* (the “Plan”) is intended to provide a new perspective on water resource development in the upper watershed and use the pending fate of Los Padres Dam and Reservoir as the impetus for discussion.

Prompted in part by the State Water Resources Control Board’s (“SWRCB”) order for a new water supply to be developed for the Peninsula, much effort and resources have gone into developing an innovative and large scale water supply project that can meet the SWRCB’s requirements within the aggressive timetable provided **under** the current Cease and Desist Order. The Monterey Peninsula Water Supply Project (“MPWSP”) including its various functional elements (e.g., **Groundwater Replenishment, “GWR” and Aquifer Storage Recovery, “ASR”**) is the long-term water supply solution for the Peninsula.

This Plan supports the MPWSP and is complimentary to all of its goals and objectives. However, by design, this Plan turns focus back on the *upper* watershed and revisits issues central to the various benefits/constraints associated with developing and relying on upper basin hydrology as a sustainable part of any long-term water resource solution of the Peninsula.

While reconfirming much of the hydrological and climatological characteristics of the basin, as well as the institutional and regulatory constraints that define operational functionality within the watershed, the Plan focuses on identifying new options for water development in this, the most hydrologically active part of the basin. The Plan acknowledges the unique role of the watershed and attempts to demonstrate how the basin’s hydrology can serve an array of increasingly complex water needs. In this context, the Plan centered around three prescient questions:

Has MPWMD maximized the potential for water resources development within the watershed?

What new options or water development strategies are possible that, given today’s growing requirements (e.g., **consumptive demands, instream flows, fish bypass, water quality, climate change sensitivity, etc.**) can serve a wider range of beneficial uses and better prepare for an uncertain future?

How can any new water resource development effort integrate the current challenges and constraints posed by the basin’s existing facilities?

Within the perspective of these questions, the matter of Los Padres Dam and Reservoir is addressed. What is the long-term disposition of this long-time facility? Can it meet the long-term objectives of the watershed and MPWMD’s vision of how it perceives future water resources within the basin to be managed? Are the various interim plans and strategies for Los Padres Dam and Reservoir such as

dredging and dam raises effective means of ensuring long-term sustainability; or are they only temporary measures? Finally, the desired level of interactive collaboration between MPWMD and Cal-Am regarding the dam is considered as it represents a keenly important dynamic in upcoming deliberations and representations before adjudicating bodies (e.g., [California Public Utilities Commission](#), "CPUC").

MPWMD has recognized the need to undertake several component studies that, together, fully evaluate the various options available for Los Padres Dam. These include:

Unimpaired Flow Analyses

Flow Analyses associated with Alternatives

Updated Instream Flow Study (IFIM)

Steelhead Habitat Evaluation for the Carmel River Watershed

Yield and Cost/Benefits Analysis for the Alternatives

Environmental Fatal Flaw Impact Analysis

Sediment Management for the Alternatives

MPWMD has already initiated work on several of these additional studies. The results of such studies will help provide the necessary foundation for making a long-term strategic decision on the future of Los Padres Dam and Reservoir.

The Plan identifies key MPWMD planning principles; around which any and all strategies must be developed. The Plan then identifies and discusses a number of water development alternatives. Several alternatives have been addressed in previous efforts and are well known. Others identified in the Plan are completely new. As the alternatives were developed; a primary theme emerged - **the development of new storage "off-mainstem"**.

By capturing excess watershed runoff in surface water impoundments in one of the basin's many tributaries, key MPWMD planning principles could be met while also providing significant augmentation to the watershed's many water resource obligations and requirements. Capitalizing on the watershed's surplus flows, existing water right provisions, locational preference facilitating gravity flow, and drainage topography, new basin yield could be developed. Two such "off-mainstem" alternatives are particularly notable from this effort; **a new Pine Creek Dam and Reservoir (20,000 AF of storage) and a new San Clemente Creek Dam and Reservoir (13,000 AF of storage)**.

New yield development opportunities provided by these potential reservoirs then served as the foundation for the Plan and were supported by a detailed alternative screening discussion and selection of high priority alternatives. While the alternatives discussion formed the back bone of the Plan, short-term tactics were identified that included various technical and institutional rationale statements capable of supporting anticipated upcoming discussions and negotiations. Key to these discussions was the Los Padres Dam and Reservoir *question*. Any upper basin water supply development initiative would need to determine the ultimate fate of this facility. A tactical decision process (or "if-then") sequence of steps was developed to demonstrate the interactive complexity of issues between the primary parties; MPWMD, Cal-Am, the SWRCB, and National Marine Fisheries Service ("NMFS") related to Los Padres Dam and Reservoir.

A hybrid alternative consisting of both the removal of Los Padres Dam and new off-mainstem storage development was determined to best meet the long-term needs of water supply, instream flows, and

fish passage within the watershed and represented the most effective means of maximizing beneficial use of the basin's available hydrology.

A strategy that proposes new upper basin water storage development, while perhaps questionable in the past, must be considered in a different light today. Here in 2014, much has changed since the 1990s. We are facing one of the State's worst droughts on record, an increasing recognition of the uncertain effects of future climatic changes, and the Statewide acknowledgement from both the regulatory agencies and water industry of the high priority being placed on developing new water storage. Fortunately for Carmel River watershed, the *hydrology is on their side* – there is uncaptured water available in many years. New water storage development is no longer the flawed concept based on adverse environmental effects that it once was.

This Plan can hopefully provide the impetus to help rekindle interest in upper basin priorities and opportunities within the Carmel River watershed. As the established water resources management entity for the basin and, therefore, unlike other more specifically focused agencies, MPWMD is the best suited to **see all of the values, possibilities, and options available** in creating a solution that can serve all water resource interests, public and private, both now and into the future.

This Plan can provide critical guidance to:

- A. Support negotiations with Cal-Am, NMFS, other public trust resource agencies (e.g., SWRCB, CDFW, etc.), and vested watershed stakeholders, and,**
- B. Provide an immediate near-term and longer-term planning and options strategy in the form of a tactical “road-map”.**

It is envisioned to represent an ongoing dynamic document that can be constantly updated, reconfigured, and reevaluated to ensure that MPWMD retains effective oversight of its various options and most importantly, does so with the full breadth of knowledge of the various interrelated issues.

9. Alternatives Screening Process

This chapter presents the process upon which the alternatives identified in the previous chapter were screened. The screening process involves a multiple step process applying a hierarchical evaluation. As noted earlier, the project objective is to prepare a **multi-faceted long-term strategic and short-term tactical plan** for the District. The Plan, through an evaluation of the various factors that have made Los Padres Dam and Reservoir such a critical facility to water resources management in the basin, will generate technical and institutional information that can be used as valuable guidance to:

- A. *Support negotiations with Cal-Am, NMFS, other public trust resource agencies (e.g., SWRCB, CDFW, etc.), and vested watershed stakeholders, and,*
- B. *Provide an immediate near-term and longer-term planning and options strategy in the form of a tactical “road-map”.*

The alternatives identified in the Plan represent a wide range of potential options that can help MPWMD meet both the near- and long-term water supply and water resource needs in the Monterey Peninsula. The alternatives can serve as both a contingency to the MPWSP and act as the long-term **upper basin solution** to this vital area of natural water production (e.g., seasonal runoff).

As noted at the beginning of the Plan, MPWMD’s current challenges are guided by several key planning principles. Each of these principles represents the primary standards upon which MPWMD desires to pursue any long-term water supply solution. These have been previously identified as:

- A. Water Supply Security and Sustainability
- B. Enhanced Fish Passage
- C. Implementation of Effective Sediment Management
- D. Maintenance of Target Instream Flows
- E. **Consideration of non-Cal-Am water rights holders**

Accordingly, any potential alternative must be capable of meeting each of these key planning principles. Each of these planning principles, therefore, for the purposes of this screening process are converted into primary screening criteria and are briefly described below:

A. Water Supply Security and Sustainability

This primary screening criteria represents the focal point for water purveyors and those agencies having responsibility for water supply security. Any alternative must help MPWMD meet the current and anticipated future water supply needs on the Monterey Peninsula both the near- and long-term.

B. Enhanced Fish Passage

Improved fish passage in the Carmel River watershed has long been recognized as an essential requirement to help the listed South Central Coast steelhead *O. mykiss* fully utilize the existing habitats for their various life cycle stages. Any alternative must provide an effective means to improve fish passage within the watershed.

C. Implementation of Effective Sediment Management

The historic accumulation of naturally eroding riverine sediment in the two Carmel River mainstem impoundments has resulted in chronic operational issues both in the reservoirs and downstream. Any alternative must provide an effective means of addressing this long-standing issue.

D. Maintenance of Target Instream Flows

As a primary watercourse within the National Marine Fisheries Service (NMFS) South Central California Coast Steelhead Recovery Plan, maintaining appropriate target instream flows for various life cycle stages of listed anadromous *O. mykiss* is of paramount importance. Such flows must be fully integrated with projected and planned instream flow needs for consumptive use purposes. Any alternative must demonstrate the ability to meet established instream flow targets at select locations and across as many water year types as possible.

E. Consideration of Non-Cal-Am Water Rights Holders

Water rights holders within the Carmel River watershed other than Cal-Am hold important entitlements that are needed to meet existing and future beneficial uses. Their inclusion in any consideration of how the river system is ultimately managed in the long-term is essential.

The preceding primary screening criteria represent only the first tier. Additional screening criteria that cover the range of other issues, needs, and constraints are also applied.

9.1 Contextual Background

Similar to the CEQA Guidelines, it is appropriate to require that a reasonable range of alternatives feasibly attain *most* of the proposed project's basic objectives (see CEQA Guidelines § 15126.6). As noted previously, this Plan does not purport a distinct project and is outside the purview of CEQA. Nevertheless, it considers a *reasonable range* of alternatives in order to help encourage informed decision-making and public participation.

The alternatives identified and subject to this screening process shall be centered on those that would:

- a. Attain most of the proposed project's basic objectives;
- b. Avoid or substantially lessen one or more notable or significant environmental impacts; and
- c. Be potentially feasible, technically, institutionally, and economically¹.

The following factors may be generally considered when evaluating feasibility: site suitability, economic viability, availability of infrastructure, general plan consistency, consistency with other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control or otherwise have access to alternative site locations (see CEQA Guidelines § 15126.6(f)(1)).

¹ Economic criterion under a fully developed cost/benefit economic analysis was not part of this effort.

Unlike a NEPA or CEQA process, there is no “preferred alternative” or “proposed project”. There is a current project defined for the previously as the MPWSP.

9.2 Screening Criteria

Various screening criteria have been identified for the initial listing of potential alternatives. These criteria are presented in **Table 9-1**.

Ideally, screening criteria should be developed prior to the identification and development of alternative upon which the screening criteria would be applied. This avoids preset bias in the identification of the screening criteria.

Table 9-1 Identification and Description of Screening Criteria	
Criterion	Description
A. Technical and Engineering Feasibility	An alternative must be technically and physically feasible. An alternative must be based on existing and accepted state-of-the-art engineering concepts and cannot be based on experimental technologies. Also, an alternative must not be dependent upon either the availability or acquisition of site locations that cannot be reasonably assured.
B. Climate Change Adaptation	An alternative must provide the capability of adapting to, or provide a direct adaptation benefit to known factors associated with projected climatic changes.
C. Environmental Fatal Flaw	An alternative cannot have environmental impacts that are so significant as to negate the positive attributes of the alternative or, simply transfer potential environmental impacts from one location to another.
E. Long-term Reliability	An alternative must be capable of supplying water reliably year round and on a long-term basis.
F. Public Health and Safety	An alternative should be able to meet all existing and anticipated future State and federal health and safety requirements.
G. Timing	An alternative must be capable of being implemented within a reasonable timeframe such that the benefits and needs of the proposed project are not unduly delayed.
H. Institutional	An alternative cannot possess significant uncertainty that would prohibit the reasonable expectation that all permits, licenses, or other logistical requirements can be obtained.

9.3 Applied Screening

Each of the potential alternatives identified and described previously (Chapter 8 – District Alternatives) were evaluated against the screening criteria listed in Table 9-1, covering a range of standards (e.g., existing and emerging industry norms). Alternatives that met the various screening criteria also had to be able to attain *most* of the key planning principles identified earlier (e.g., *Consideration of Non-Cal-Am water rights holders*).

Results from the screening process are shown in **Table 9-2** and the notable conclusions discussed below. The discussions follow explanations of how the alternatives either met (or did not meet) the screening criteria presented from left to right in Table 9-2 (e.g., discussions start with the primary planning principles). The first tier screening criteria are discussed followed by the second tier screening criteria.

Most of the alternatives met the primary planning principles. **The Los Padres Dam Removal alternative, however, did not.** Removing the dam would not meet **four of the five** defined Primary Planning Principles. While it may have institutional support from some agencies (e.g., NMFS), it clearly cannot meet important planning principles including; the Water Supply Security and Sustainability; Implementation of Effective Sediment Management; the Maintenance of Target Instream Flows principles **or, Consideration of Non-Cal-Am Water Rights Holders**. More on the Los Padres Dam Removal alternative is discussed later.

The larger proposed new reservoirs were ranked higher than other alternatives for the Primary Planning Principles. This was based on the assumption that the larger the storage, the greater the ability to meet two important yet co-equal objectives; water supply security and sustainability and the maintenance of downstream target flows. With new structures, there is no removal, retrofit, or remediation work necessary to meet known operational criteria, whether it is fish passage or sediment management. The issues of fish passage and sediment management do not disappear; but there is no *recovery* element associated with new facility construction.

Table 9-2 Screening Results of Alternatives								
Alternative	Planning Principles	T&E Feasibility	Climate Change	Environ. Fatal Flaw	Long-Term Reliability	Public H&S	Timing	Institut.
Los Padres – Storage Enhanced								
In Situ Dredging Only	Light Green	Light Green		Red		Light Green	Dark Green	Light Green
Dam Raise	Light Green			Red		Light Green	Light Green	
Ownership Variation	Light Green			Red				
Los Padres Dam – Removal		Light Green		Red		Light Green	Light Green	Dark Green
New Los Padres Dam and Reservoir	Dark Green	Light Green	Dark Green	Red	Dark Green	Light Green	Light Green	Dark Green
Tributary Dam and Reservoirs								
Pine Creek Dam	Dark Green	Light Green	Dark Green		Dark Green	Light Green		
Boronda Creek Dam	Light Green	Light Green			Light Green	Light Green		
San Clemente Creek – Off Mainstem	Light Green				Dark Green	Light Green		
Imported Water Transfer		Light Green		Red		Light Green		
Hybrid Alternatives – Combined with MPWSP	Light Green		Light Green		Light Green	Light Green	Light Green	Dark Green
New Water Rights		Light Green		Red	Light Green	Light Green		
No-Action		Light Green		Red		Light Green	Dark Green	Dark Green
Notes: Dark Green – Clearly met the screening criteria. Light Green – Would meet the screening criteria under certain conditional requirements. Red – This highlight is for the Environmental “Fatal Flaw” criterion only. See discussion for explanation. It is colored red to indicate that the Alternative failed this criterion.								

The screening process made the assumption that all construction-related alternatives could meet the Technical and Engineering Feasibility criterion. All alternatives, through their design, are considered

technically feasible. Even the Imported Water Transfer alternative, while likely requiring significant engineering innovation and design considerations to move CVP/SWP contract water from San Luis Reservoir, is technically feasible.

The Climate Change Adaptation criterion deserves explanation. The criterion is defined as; *“An alternative must provide the capability of adapting to, or provide a direct adaptation benefit to known factors associated with projected climatic changes.”* It was intended that this criterion focus on the ability of alternatives to provide direct adaptation benefit to the watershed based on known changes brought about by climatic forcings. This meant, in other words, ***“Which alternative was capable of meeting the largest array of hydrologic (instream) requirements given that the Carmel River watershed is and will continue experience hydroclimatic shifting into the future?”*** Therefore, this came down to a matter of which alternative possessed the largest potential to store or retain annual runoff, as the best means to convert this naturally and annually available “asset” to beneficial use – water supply, instream flow/habitat, groundwater replenishment, and riparian aquatic needs.

Most of the new storage projects passed this criterion on the basis that they, by design, are intended to capture a larger portion of each year’s annual runoff – a positive and direct adaptation to known hydroclimatic changes. The In-Situ Dredging Only alternative, while also generating “new” storage does so as a “recovery” project; it only offers to return storage to historical conditions.

The Environmental Fatal Flaw criterion was structured to depict a worst-case condition. Since none of the alternatives really possess a **definitive** environmental “fatal flaw”, the criterion assumed that all alternatives would have **some** environmental issues requiring mitigation, but that they would differ in degree. **The primary thresholds applied were 1) did the alternative return fish passage in the mainstem to its original state (a long-standing desire of NMFS), 2) did the alternative provide the capability for increased releases from storage (another NMFS requirement) and 3) did the alternative avoid the need to fully petition the SWRCB for a new.**

The only alternatives that could realistically meet these requirements were the new off-mainstem storage reservoirs. By design, they avoid the Carmel River mainstem, they each generate additional storage significantly above what is current available at Los Padres Reservoir, and each capitalize on the existing authorized SWRCB points of diversion.

Interestingly, typically a No-Action alternative can claim no net harm to the environment. That position was not taken for this analysis. The do-nothing option in this case poses very real risks, including those to the environment. The potential exists for dam removal at Los Padres to proceed forward under the No-Action alternative. **Without MPWMD collaboration and involvement in this process, including oversight as the watershed *management* agency for the basin, potential environmental effects associated with dam removal could be greater than they might be otherwise.**

Both the dam storage enhancement alternatives (e.g., In-Situ Dredging Only and the Dam Raise) also were deemed to fail the Environmental Fatal Flaw criterion. This decision was partly based on the limited offsetting benefits that these alternatives would provide, relative to potential environmental damage that they would cause. **Moreover, the view was taken that any activity on the Carmel River mainstem should be avoided to the extent possible.** This was reflected in the suite of new storage alternatives that were developed for this Plan; all new alternatives were proposed as “off-mainstem”.

From a Long-Term Reliability perspective, only the new major new storage reservoirs were deemed to clearly pass this criterion. Again, reliability was based on the ability to generate the maximum amount of additional storage – a key criterion to demonstrate reliability: *The greater the supply; the greater the reliability.* Since these would be new facilities, new sediment management strategies would likely be a project component. None of the existing storage enhancement alternatives claim a long-term permanent strategy to address sedimentation. The dredging alternative, for example, admits to a 20-30 year limitation of its proposed benefit. *While an in situ dredging program together with an ongoing maintenance program may be technically feasible, it does not necessary address the fish passage issue and the magnitude of benefit (i.e., derived new yield) would be relatively small compared to the new off-mainstem storage options.*

Like the Technical and Engineering Feasibility criterion, the Public Health & Safety criterion was also passed by all alternatives *with the following caveat. Dam removal from the mainstem would result the restoration of the natural sediment load to the lower 16 miles of the river. Such restored natural sediment transport could result in a higher risk to flooding over time due to aggradation of the stream profile in these downstream areas. Such effects, however, would likely be manageable as the inter-annual peak flow cycles would remove comparable amounts of sediment as it would deposit. Moreover, any chronic increase in flooding risk would be subtle, thus allowing ample opportunity for protection of community properties and structures that might find themselves in zones of higher potential flood risk.*

All of these options are raw water supplies and there is no differential in the source area influence for water delivery to a range of differing water treatment facilities. Unlike an urban water development project or a project accessing multiple water sources from numerous disparate watersheds, the water supply contemplated in this Plan emanates largely from the headwaters of the Carmel River mainstem.

The Timing criterion also requires some explanation. This criterion was intended to illustrate which of the alternatives was most likely to be implemented the fastest. Ultimate project approvals depend on a whole host of factors, not the least of which include, technical complexity, institutional/financial constraints, environmental sensitivity (and related mitigation commitments), resource agency approval and support, public sentiment (represented by input, comment, and legal challenges within the review processes), and many more.

Most of the storage enhancement alternatives (e.g., In-Situ Dredging and Dam Raise) passed this criterion because, in relative comparison, they can be completed much quicker than the other alternatives, especially those involving new storage facilities.

The only reason why the New Los Padres Dam alternative did not fail this criterion when all other new storage alternatives did was that this project had undergone significant scrutiny, outreach, and development in the past. All resource agencies working in the watershed knew and know about the project. In fact, the SWRCB's progression of conditions associated with the original 20808 permit issued on October 25, 1995 was specifically granted for the New Los Padres Reservoir, originally for 24,000 AFA. This permit was modified recently on November 30, 2011, with the currently applicable Permit (20808-B) providing 18,674 AFA at a 42 cfs diversion rate between the period January 1-December 31 of each year. Granted, the right is junior to riparian, overlying, pre- and post-1914 rights, **but it nevertheless demonstrates that a significant hurdle, water rights, has been addressed, a major milestone from a timing perspective in any new water development project.** It was the intent to illustrate this advantage in the screening results for the New Los Padres Dam alternative.

Finally, the Institutional criterion was intended to show which of the various alternatives possessed at least tacit support from the regulatory agencies and in-basin stakeholders. Again, the Los Padres Dam Removal alternative was shown to have passed this criterion by virtue of NMFS' ongoing preference for this alternative (e.g., South Central California Coast Steelhead Recovery Plan). The New Los Padres Dam alternative also fit into this category owing again, to the SWRCB's acquiescence to a new water right permit for the project. Both the Hybrid Alternatives and the No-Action alternative also passed this criterion.

The Hybrid Alternatives – Combined with MPWSP passed all of the criteria. **This really represented the ability of the ultimately selected alternative, when combined with the existing MPWSP, to provide a workable, environmentally acceptable, and well supported project by the resource agencies and interested parties on the Peninsula.**

Interestingly, though not surprising, the Los Padres Dam Removal alternative ranked the lowest of all the in-basin alternatives. Based solely on a single purported advantage, *fish passage*, this alternative was not considered well suited as a long-term option or solution for the Carmel River watershed. All other alternatives offered some element of water development or yield enhancement. **The Los Padres Dam Removal alternative, however, is the only alternative (other than the No-Action alternative) that does not offer any ability to help meet the long-term sustainable water resource management objectives for the watershed. It is solely focused on only one aspect in a multi-aspect watershed.**

Most significantly, the Los Padres Dam Removal alternative ignores the hydrologic reality that characterizes the Carmel River watershed. Highly seasonal runoff, regardless of water year type, and the pressing need to retain vital storage to meet later season instream, consumptive, and groundwater replenishment needs are overlooked by this alternative. **By itself, this alternative provides the least benefit to the overall watershed and should be discarded as a stand alone solution for the basin.**

When combined, however, with other in-basin storage alternatives (e.g., Pine Creek Dam, San Clemente Off-Mainstem, Boronda Creek, etc.) the Los Padres Dam Removal alternative becomes acceptable. Why? Because it transfers its storage capabilities to another impoundment within the watershed and, therefore, preserves the ability to continue to meet seasonal instream, consumptive, and groundwater replenishment needs. Its removal also opens up the entire upper Carmel River watershed to fish passage.

Two alternatives were conspicuous in this process; the Ownership Variation and No-Action alternatives. As described in Chapter 8 – District Alternatives, these two options represent unique conditions from the more facility/operationally oriented alternatives. The No-Action alternative was clearly the easiest to implement since it requires doing nothing. Similarly, the Ownership Variation alternative, it is assumed, would meet all of the planning principles by whomever ultimately acquires ownership of Los Padres Dam in the long-term.

It should be noted that the application of the screening criteria and the rationale given were subjective in nature. A fully quantifiable, weighted analysis, was not performed. Such quantifiable metrics themselves, however, are also subject to bias and predispositions. In many ways, this process mimics those current efforts of the California Water Commission as it proceeds with development of its Guidelines for Public Benefits; a document whereby new water storage projects applicable for potential

Water Bond monies under the Safe, Clean Drinking Water Act of 2009 (amended in 2012) can be evaluated against each other to determine relative value in the generation of public benefits.

This has been a complex process and emphasizes the difficulties in appropriately addressing all of the available public benefits associated with projects, their perceived weightings, how to avoid double-counting overlapping benefits, and ensuring that a common baseline for comparison is required between all project alternatives. The only **crit**erion that requires and is set up to accommodate detailed quantification is an economic or cost criterion. Economics were not part of this *hydrological feasibility* investigative effort.

10. Discussion of High Ranking Priority Alternatives

From the alternatives screening process, several alternatives stand out, relative to the others. These were alternatives that were deemed applicable for further consideration by MPWMD.

From Table 9-2 in the preceding Chapter, the new storage projects emerged as possessing clear advantages over the others. In order of priority, based on the screening criteria results, the following projects are ranked in descending order.

1. Pine Creek Dam
2. San Clemente Creek Off-Mainstem Dam
3. Boronda Creek Dam

The Hybrid Alternatives with a fully implemented MPWSP provides the best means of achieving long-term water supply security, in-basin water resource protections, and establishes the flexibility to attend to the existing uncertainties surrounding the Water Purchase Agreement associated with the GWR. This Agreement will dictate the ultimate size of the desalination component of the MPWSP. Storage quantities proposed under these priority alternatives offer significant enhancement in the ability to meet a broad and growing array of downstream water needs. Capturing the seasonally plentiful Carmel River runoff, in larger, updated, and off-mainstem tributaries offers a solution to several contemporary issues not considered when the original facilities were built in 1921 and 1947.

Design storage of the existing impoundments on the river, 2,140 AF at San Clemente Dam and 3,030 AF at Los Padres Dam (both before sedimentation) clearly did not anticipate, at the time of their construction, the need for additional storage nor the reduction in active storage; both acting to make the two facilities obsolete by today's standards. **The Pine Creek Dam alone offers up to 20,000 AF of new storage that can be filled and spilled within existing carryover requirements and between water years such that significantly improved operational flexibility is afforded water managers within the Carmel River watershed.**

Paramount with these alternatives is the need to also proceed with the Los Padres Dam Removal. As discussed in Chapter 9 – Alternatives Screening Process, while the Los Padres Dam Removal alternative was not considered an appropriate alternative by itself, **when combined with other new storage development projects, it can provide significant benefits as part of a hybrid multi-element project.** As explained in the previous chapter, removing Los Padres Dam opens up the entire upper basin through Bruce Fork, Miller Fork, Ventana Mesa Creek, and Blue Creek up to the triple Ventana Cones at the watershed divide. With the pending removal of San Clemente Dam, unrestricted fish passage to these high elevation zones, barring any natural barriers (e.g., hydraulic steps, waterfalls, etc.) is possible with the removal of the existing Los Padres Dam.

When the removal of Los Padres Dam is combined with a new “off-mainstem” storage project; two vital needs of the resource agencies are provided. **First, as noted, is the opening up to fish passage of the entire upper Carmel River watershed. Second, is maintaining the ability to meet downstream flow and habitat needs, as well as water supply diversions, from new storage developed on a tributary to the Carmel River (hence, the “off-mainstem” label).** As explained earlier, even with storage fully returned to Los Padres Reservoir through costly dredging, the benefits to which themselves are only

temporary (e.g., 20-30 years), the Carmel River cannot remain wetted along its entire river profile in all water years. Clearly, if continuous flow maintenance is desired, additional upstream storage is necessary.

The other new storage alternatives (e.g. Boronda Creek Dam) and Tularcitos Creek Dam, and Chupines Creek Dam (the latter two which were added later and did not have time to get into this Draft of the Plan) provide some notable advantages as well but are, for the latter two at least, limited to yield generation from the Tularcitos Creek watershed. The Tularcitos Creek watershed in the Sierra de Salinas highlands receives about half the precipitation as the high elevation slopes of the Santa Lucia Range; as the variation in orographic effects over short distances are particularly notable in this watershed.

The Boronda Creek Dam, while importing water from the Carmel River above Los Padres Dam is constrained by the topography of Boronda Creek to its confluence with Cachagua Creek. Accordingly, storage behind the Boronda Creek Dam would be about 3,500 AF. Based on the natural hydrology of the watershed, it is preferable to situate new impoundments downstream of the highest runoff generating areas (i.e., the upper Carmel River watershed from the Ventana Wilderness). **Storage at the Pine Creek and San Clemente Off-Mainstem reservoirs would be 20,000 and 13,000 AF, respectively.**

The further upstream storage is located in the watershed, the more valuable dry season releases become. For example, from an instream flow perspective, storage in the Boronda Creek subwatershed is probably worth more to main stem flow in the summer than storage in the Tularcitos Basin.

The enhancements at the existing Los Padres Dam and Reservoir site offer benefits, but as explained, do not provide the scale of storage enhancement generated by the other larger, new storage projects. Moreover, the Los Padres Dam enhancements do not directly address a key fisheries management issue; that is, to remove impoundments from the Carmel River mainstem. In that regard, these alternatives indirectly perpetuate a long-standing and chronic issue in the eyes of many public trust resource agencies (e.g., avoidable blockage of passage for listed anadromous fish and their habitat/flow sensitive life cycles).

For the dam raise option, limited storage gains are envisioned without dredging; a 20-foot dam raise for example, would only generate storage up to 2,754 AF (assuming no dredging operations). Again, this likely costly activity, combined with an equally costly dredging project, provides only marginal (and indeed temporary) storage increases, relative to the larger, and newer off-mainstem storage projects. **Moreover, under the new storage options, future hydropower (with pumped storage capabilities) in the steeper and more enclosed tributary valleys could prove highly opportunistic should MPWMD wish to explore such options as part of any water development initiative.**

In contemporary California and indeed western U.S. water resources management planning, *having the hydrology on your side* has become a credo that is manifesting itself into a growing interest in new storage development. The examples are credible;

- ◆ California Water Commission's new surface water storage Guidelines and facilitation of the pending Water Bond vote in November 2014;
- ◆ U.S. Bureau of Reclamation's fully developed Basin Studies program across the western States under the SECURE Water Act of 2009 where a key priority is developing new non-federal storage projects;

- ◆ California Department of Water Resources' ongoing CalFED Surface Storage Investigations;
- ◆ Delta Stewardship Council's recent foray into new storage development (as introduced by Vice Chair Fiorini) and their recognition of the importance of new storage in meeting whatever in-Delta standards ultimately are prescribed as part of the Delta Plan and BDCP;
- ◆ SWRCB's own interest in exploring whether (and how) new storage can help meet their mandated requirements to establish new water quality flow "objectives" across the 127 priority streams listed in California;
- ◆ ACWA's own recent Strategic Action Plan which includes new storage as an important priority.

No doubt, this current upcoming water year, once again will elevate the discussion of new storage when operators look back in hindsight at *what could have been*. They will remember the rule curve releases made in the immediate previous years and wonder if additional storage capabilities present at the time could mitigate or otherwise avoid what is generally accepted as California's third consecutive, and very likely, critically dry year.

As this Plan is being finalized, efforts are already underway to convince the U.S. Bureau of Reclamation to relax its reservoir release requirements over this winter in view of the low carryover in many CVP reservoirs across the Mid-Pacific Region and in light of the extremely low projected seasonal inflows that are anticipated. They are facing an immediate quandary; seek conference year status and relaxation on many of the NMFS imposed Biological Opinion **or risk significantly greater cutbacks throughout the remainder of the year on contracted water deliveries.**

Clearly, from these examples, times are changing when it comes to the acceptance of new storage. The need has always been there, but public perception has been sensitized. Despite the earlier NMFS position that the New Los Padres Dam project would unlikely receive necessary federal approvals, much has changed since then and continues to change. **What is often overlooked is that the NMFS statement was made in the context of a proposed new "on-stream" impoundment. This Plan, and the alternatives identified, developed, and presented herein offer a tangible and multi-beneficial alternative; off-mainstem storage.** It can meet the co-equal objectives of both the environment (*i.e., restored fish passage to the mainstem and instream flow augmentation*) and water supply demands. Public trust resource agencies, regulatory bodies, elected officials, and stakeholders, need to be fully educated on what this new opportunity represents and what it can provide.

For MPWMD to embrace a genuine *watershed-level solution*, it is felt that they must not be fixated by short-term solutions to existing facilities. These very same facilities have attracted the unnecessary attention of certain resource agencies. It makes little sense to spend time and effort on an interim temporary solution (e.g., dredging), when the long-term sustainable answer is simply deferred, the chronic environmental issue in eyes of the regulatory agencies is largely ignored (e.g., mainstem fish passage), and the benefits from the temporary solution are small, compared to other alternatives.

Rather, MPWMD should endeavor to seek innovative and permanent answers to the long storied challenges that continue to affect the Carmel River valley. Much like its commitment on the MPWSP, ASR, and GWR, where MPWMD has shown impressive leadership and unwavering dedication, **it must also look at its upstream watershed with similar aplomb.** For the Carmel River watershed, fortunately, hydrology is on its side. Any basin that experiences unattenuated and uncontrolled surplus flows at any time of the year is ripe to capitalize on that untapped resource asset. The only question that remains to be seen is how?

11. Tactical Decision Analysis (“If-Then” Sequencing)

11.1 Contextual Background

For MPWMD, the salient question(s) related to this Plan and the scope defined by its purpose are related to four key external players. They are Cal-Am, the CPUC, NMFS, and the SWRCB. Not surprisingly, three are regulatory bodies and the other is the primary water purveyor for the Peninsula. **In addition, public input has been a critical factor in shaping MPWMD’s decisions on both water supply projects and environmental restoration of the Carmel River.**

The issues are complex and non-linear. Each issue is interwoven among a host of interrelated and interdependent factors, and each involving direct and indirect parties that are influenced by an active, informed, and passionate stakeholder base.

Before getting too deep into the “if-then” decision matrices, it is helpful to set out the general progression of steps that are involved in the decision making process and identify some of the typical issues that arise. The Heinz Center (2002) model provides a logical sequence of steps involved in an agency’s decision regarding dam removal. At the outset is the identification of the various goals and objectives for either keeping or removing a dam; these can be also viewed as the advantages and disadvantages associated with the dam. The following listings are from the Heinz Center (2002).

<u>Keeping the Dam</u>	<u>Removing the Dam</u>
Water Supply	Safety & Security
Irrigation	Legal & Liability
Flood Control	Ecosystem restoration
Hydropower	Site Restoration
Navigation	Recreation
Flat Water Recreation	Water Quality
Waste Disposal	

For Los Padres Dam, most of these goals do not apply, primarily due to the relative small size of the reservoir. Distilled down to its two primary competing objectives – the conflicting objectives become one of water supply (in keeping the dam) versus ecosystem restoration (in removing the dam). The water supply objective really represents multiple objectives since it means (or should mean) basin water “assets”. These additional “assets”, held back or retained by Los Padres Dam or some other impoundment (see Chapter 8 – District Alternatives), can provide benefits to the watershed later in the year. These include water supply (including small irrigation), instream flows for various aquatic species and their flow sensitive life stages (an ecosystem benefit), water quality enhancement (through maintenance of a stream wetted perimeter), and recreational benefits (as an aesthetic condition of the riverine parkway). **From a water supply perspective alone, consideration must also be given to non-Cal-Am water rights holders within the watershed as well as other institutional commitments (e.g., ASR).**

So, strict application of those models that define what factors favor or disfavor dam removal must be looked at cautiously. Specific factors must be developed for the watershed in question.

All too often, it is assumed that dams provide only a water supply, hydropower, and flood control function. Regarding ecosystem function and restoration, dams have been labeled as environmentally damaging and wholly unsuited to meet these requirements. The truth, however, is quite different. In California, without dams, there would be little if any ability to manage for instream thermal conditions and virtually no way of managing for flow. All instream functions on impaired systems (i.e., those with dams) depend on the regulating effect of reservoir operations to meet their needs. Highly seasonal streamflows, as is characteristic in Mediterranean semi-arid climates, can only be moderated through dams which control releases so that the instream response is “smoothed” out; a condition unattainable in semi-arid unimpaired streams.

For the Carmel River watershed, with a current surface storage capacity that is a small fraction of the average flow to the ocean, it is less clear that increasing the water supply is necessarily in conflict with ecosystem restoration.

11.2 The NMFS Challenge

Climate change is placing NMFS in a challenging position. In many ways, they are in a quandary. As part of the National Oceanic and Atmospheric Administration (NOAA), they are part of a broader organization that is a leader in climate change science and applied water resources in the U.S. NOAA is one of the original five federal agencies making up the Climate Change and Western Water Group (“CCAWG”), an influential federal agency group working on climate change related adaptations for water resource management applications.

Recent studies are emerging that confirm the vital role of dams in offsetting the adverse hydrological shifting brought about by climate change (e.g., Hatcher and Jones, 2013). As noted by co-author Julia Jones at Oregon State University, “...dams are doing what they are supposed to do, which is to use engineering – and management – to buffer us from climate variability and climate change.” As the 2014 Columbia River Treaty undergoes formal review this year, studies such as these may continue to encourage regulatory agencies to view contemporary hydrology and its action-oriented regulatory provisions in a new light. Previous studies had already shared these same observations and there exists an expansive research base that illustrate the effects of dams on watershed response under a changing climate (e.g., Vicuna, 2006; Vicuna et al., 2007).

At the field level, however, this robust archive of new information is not always transferred down to NMFS staff. In past ESA consultations for example, NMFS staff were not necessarily apprised of or aware of what their broader NOAA colleagues were developing and advocating. Climate adjusted hydrologic simulation modeling, before any reservoir/instream water temperature or early life-stage salmon mortality models can be run, have not been consistently used by NMFS in their Biological Opinions. Moreover, for large system simulation models such as those used for the Central Valley, NMFS does not require or guide federal lead agencies to address upper basin hydrology changes due to climate change; a significant shortcoming in the effects analyses of their Biological Opinions since so much of what is evaluated depends on the upper reservoir inflows to these broad system wide models. Using historic data to “run” these mass balance system routing models without inflow refinements based on both climatic forcings and the empirical responses of the watershed to those new inputs, means that climate change is largely ignored.

The NMFS 2007 Biological Opinion on the Long-Term Operation of the Central Valley Project and State Water Project (also known as the “OCAP BiOp”) is arguably the most comprehensive Opinion prepared by NMFS. It documents the potential effects on listed anadromous fish from the long-term continued operation of the two largest water projects in California. While the Delta pumps, invasive species, in-Delta water quality, ocean conditions, habitat flows, fish passage were all identified by NMFS as contributing factors to their threatened status, water temperature was one of the most significant adverse effects that they addressed. Without dams, and their proper operational integration into reservoir coldwater pool management, downstream temperature targets so necessary for certain fish life cycles could not be met under many natural flow situations.

A growing number of Statewide water initiatives have begun to discuss and explore what such changes in baseline hydrology really means to existing (and in many cases, entrenched) protocols for regulatory approval. Regulatory transitioning under climate change has emerged as a new prescient theme in the Bay-Delta debate, SWRCB water rights processes, California Water Commission new water storage interests, and throughout the water industry (Shibatani, 2013a; Shibatani, 2013b; Shibatani, 2012).

The NMFS “challenge” as noted in this sub-section will be to use contemporary climate change science, a more integrated view towards balancing multi-watershed beneficial uses, parallel support from other regulatory agencies (e.g., SWRCB), and the growing support for new storage across all segments of society to help redefine for NMFS what contemporary off-mainstem dams can provide. Across the world and indeed California and the western States, *the second era of dams is over; the negative perceptions tied to past environmental issues related to fish passage, downstream sediment starvation, riverine thermal management, etc.* These long-standing issues can now be better addressed with new contemporary siting philosophies, improved technological advancements involving the dam facilities themselves (e.g., temperature control devices, fish ladders, improved spillway design, reconfigured power penstock shutters, etc.), as well as an updated appreciation for shifting hydrologic regimes and the need to re-address collective reservoir operations from both a flood control and water yield generation perspective.

11.3 Decision Making Considerations

Once the broad goals of the dam management effort are identified, the second step in the decision making process typically involves the identification of specific issues related to the dam and the collection and evaluation of the available information that can help support and/or refine any of the specific issues. For the Los Padres Dam discussion, these issues are well known and have been documented in numerous studies, reports, and raw data.

The decision to remove a dam or select an appropriate set of decommissioning prescriptions requires a complex evaluation involving numerous factors. Finding an effective and efficient means of analyzing the information and in a manner easily understood by decision makers has always been a challenge. Matrices are often used in this regard and have the advantage of summarizing data in a format that facilitates analysis (Loucks and Costa 1990). Matrices can accommodate the fact that all the possible combinations of events and strategies may not be realistic at the time of the decision-making and therefore must include a temporal view. Two common rubrics take the form of spotlight matrices and scaled matrices (Brauner et al, undated). For the spotlight matrix, which is the visually more discernible of the two, one can see how each of the evaluation criteria (rows) are projected over time (1-40 years) for each of the potential decommissioning options (columns) (Figure 11-1).

DECOMMISSIONING OPTIONS					
Dredge to Continue Operation	Cease Current Operations	Full Notch (no dredge)	Full Notch (dredge)	Partial Notch (no dredge, fish ladder)	Partial Notch (dredge, fish ladder)
Year 1 5 10 20 40	Year 1 5 10 20 40	Year 1 5 10 20 40	Year 1 5 10 20 40	Year 1 5 10 20 40	Year 0 5 10 20 40
● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●

Source: Excerpt from Brauner et al. (n.d.), Table 11-1, Summary of Spotlight Matrix 7, pg.168.

Figure 11-1.
Spotlight Matrix – For Environmental Criteria Showing Thresholds Achievement For Each Decommissioning Option Over Time

A stoplight matrix, while appropriate for dams under single entity governance and interest, may not be appropriate in this case. For Los Padres Dam, the issues are more complex. For one, both MPWMD and Cal-Am have vested and legitimate interests in the ultimate management option selected for this facility. Second, and not to be discounted, decommissioning or removal does not hold the same import with Los Padres as it does with other dams.

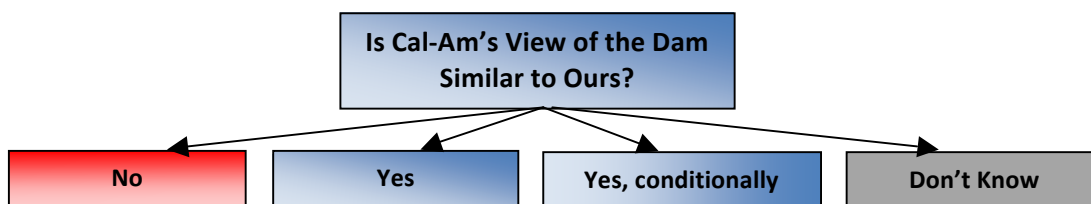
Fish passage is the primary reason behind the long time advocacy for removal of this facility. **However**, with state-of-the-art fish passage designed and incorporated into a new downstream facility, fish passage need not be a fatal flaw when designed at a new facility.

11.4 Los Padres Dam and MPWMD/Cal-Am

While the questions involving long-term water supply security and sustainability on the Peninsula are almost too numerous to list, this current Plan is the *Los Padres Dam and Reservoir – Long-Term Strategic and Short-Term Tactical Plan*. It is important to keep focused on that objective since it is easy to get overwhelmed by the larger suite of interconnecting issues and uncertainties. The overarching issue that is driving the need for this Plan focuses on the prescient question; ***What is to be the ultimate fate of Los Padres Dam?***

The answer to this represents the objective of the Long-Term *Strategic* Plan. The means to get there through the following series of discussions and schematics represents the Short-Term *Tactical* Plan. All of the preceding technical information supports these two Plan elements.

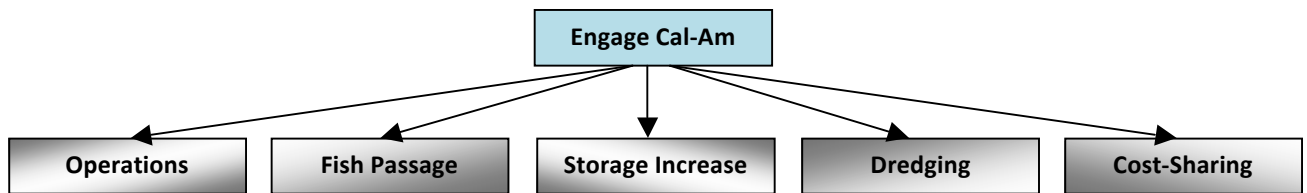
The answer to that question is influenced in part by the effectiveness of a number of unfolding processes and pathways. MPWMD is aware of each these processes and action pathways. Since Cal-Am is the owner of the facility, the decision tree for MPWMD must start there. The initial set of queries schematically presented might look something like this:



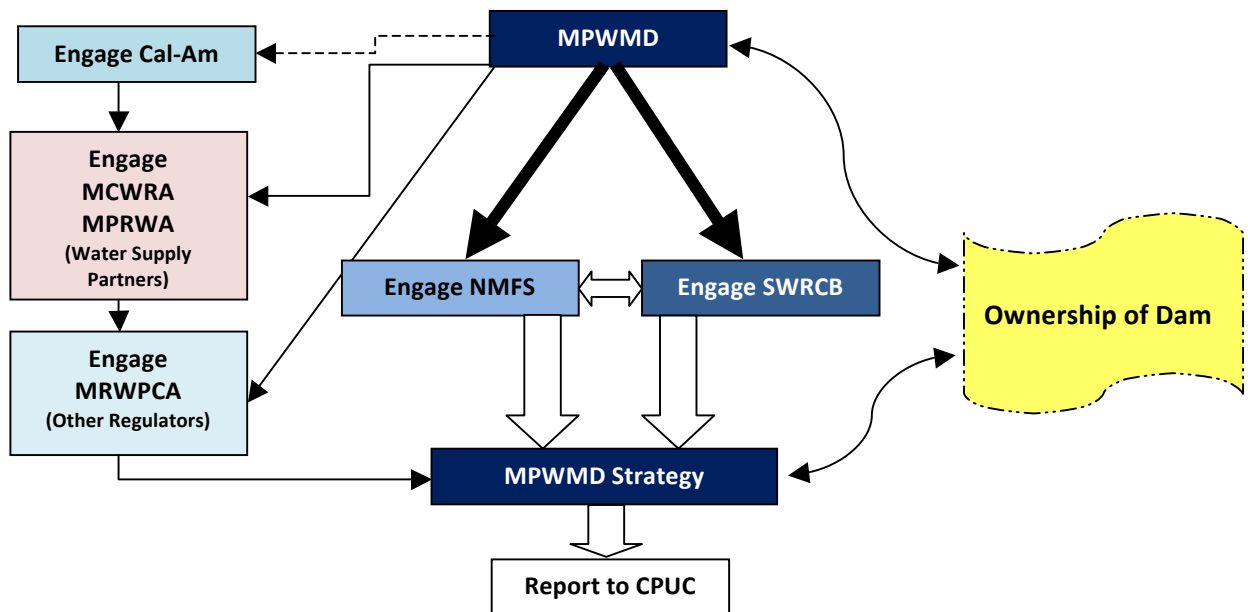
Each of these answers generates its own set of subsequent proposed actions. Assuming that MPWMD chooses to initiate some level of action depending on the above answer, the range of potential follow-ups set up the next tier of questions. For example, under the “Yes” answer, MPWMD could leave everything completely up to Cal-Am, choosing not to engage in any manner. However, the assumption is made that MPWMD would engage in some fashion even under the “Yes” answer.

The easiest of the above answers to follow through is the “Don’t Know”. Direct and immediate engagement with Cal-Am to get to the first step is straightforward (or should be).

With the “No” answer and assuming its unacceptability to MPWMD, the follow up reply by MPWMD comes in an escalating scale of responses. Two categories of response are relevant here, depending on the degree of disagreement. If the degree of disagreement is minor or low, then the actions for MPWMD would seem straightforward with the range of potential minor issues identified below:



If, alternatively, the degree of disagreement is high or, if it is apparent to MPWMD that Cal-Am is fixed on a current solution counter to MPWMD’s vision, then a wider range of potential actions could ensue. **At some point, MPWMD would have to determine how willing, if at all, it is prepared to push its agenda and under what context.** Continual engagement with Cal-Am is a given, but the necessity for parallel engagements with other agencies/parties is also evident.



This process requires keeping genuine channels open with Cal-Am in the hopes of coming to a mutually acceptable understanding and agreement. The two primary public trust resource agencies of significant importance are NMFS and the SWRCB. Their influence, ultimately, will help frame the final solution for Los Padres Dam and Reservoir. Collateral issues concerning both agencies are relevant and ideally should be carefully aligned so that progress from discussions with one agency can be effectively used in deliberations with the other (Figure 11-2). Ultimately, from these discussions, MPWMD would craft a

strategy that conveys an effective solution for Los Padres Dam including a range of technical and institutional/legal (and financial) prescriptions. It is *this* solution that would be presented to the CPUC in any of the upcoming formal and informal opportunities related to their continuing jurisdiction on this matter.

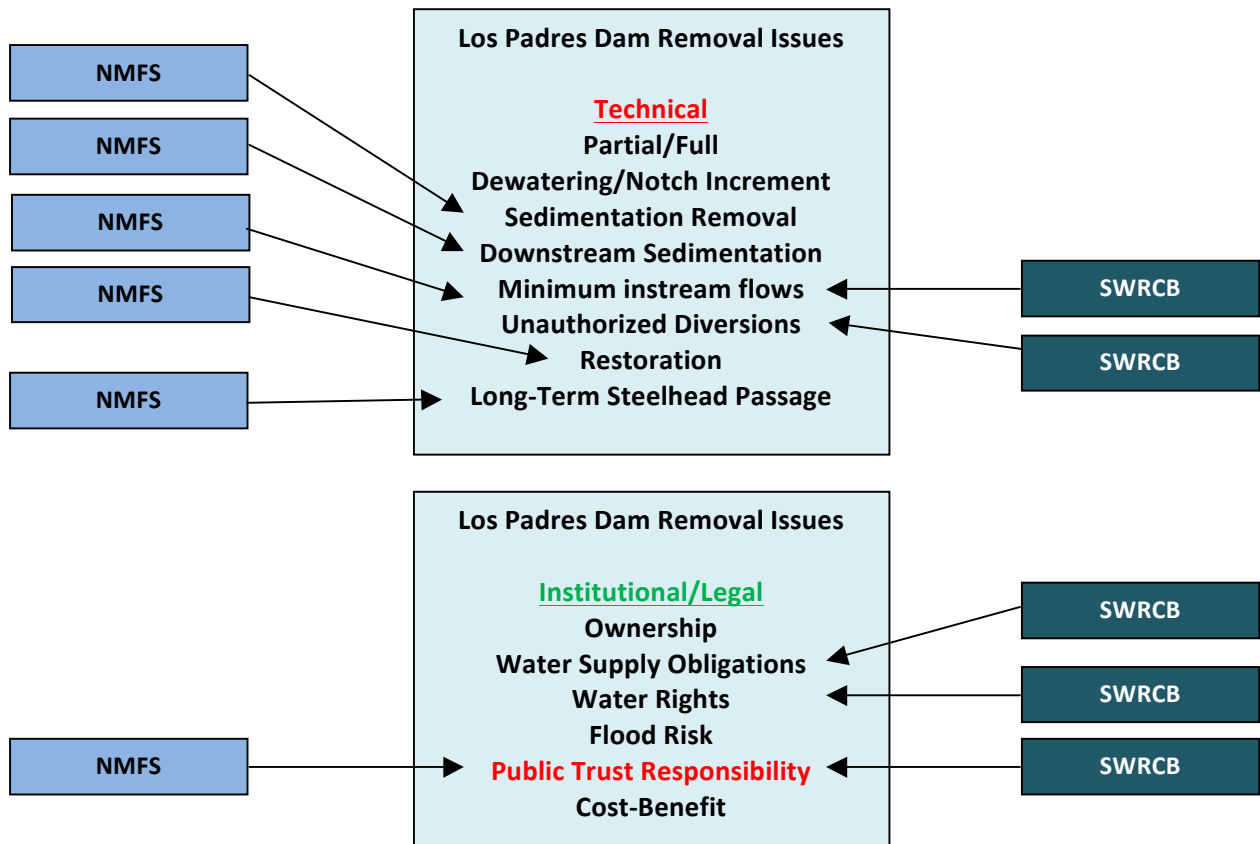


Figure 11-2.
Coincident Issues of the SWRCB and NMFS Regarding Los Padres Dam
Technical and Institutional/Legal Issues

As shown in Figure 11-2 above, some issues are germane to both the SWRCB and NMFS, while others hold mere tangential relevancy. Interestingly, based on this subjective pairing, it appears that the focus of NMFS’ interests are on those issues identified under the Technical category whereas for the SWRCB, the focus seems to be more directed towards those under the Institutional/Legal category.

MPWMD’s recognition of these issues, both those specific to one agency and those where collateral interest is present is important to help craft the initial consultation tactics. For example, both agencies have an interest in maintaining minimum instream flows. Yet, the reasons and objectives behind their interests differ.

From MPWMD’s perspective, approaching either NMFS or the SWRCB on the issue of minimum instream flows really diverts back to the fundamental question as to what the district’s ultimate

objective is for this facility. **What is MPWMD's preferred option regarding Los Padres Dam?** If, as the previous discussions in this Plan have set out, Los Padres Dam represents but one element in a larger multi-faceted solution for the watershed, then the strategy for MPWMD would be cast in a certain light. If, however, Los Padres Dam represents the sole facility-solution for the watershed in the longer-term, then the options for MPWMD would differ. See **Figure 11-3** for a generalized schematic.

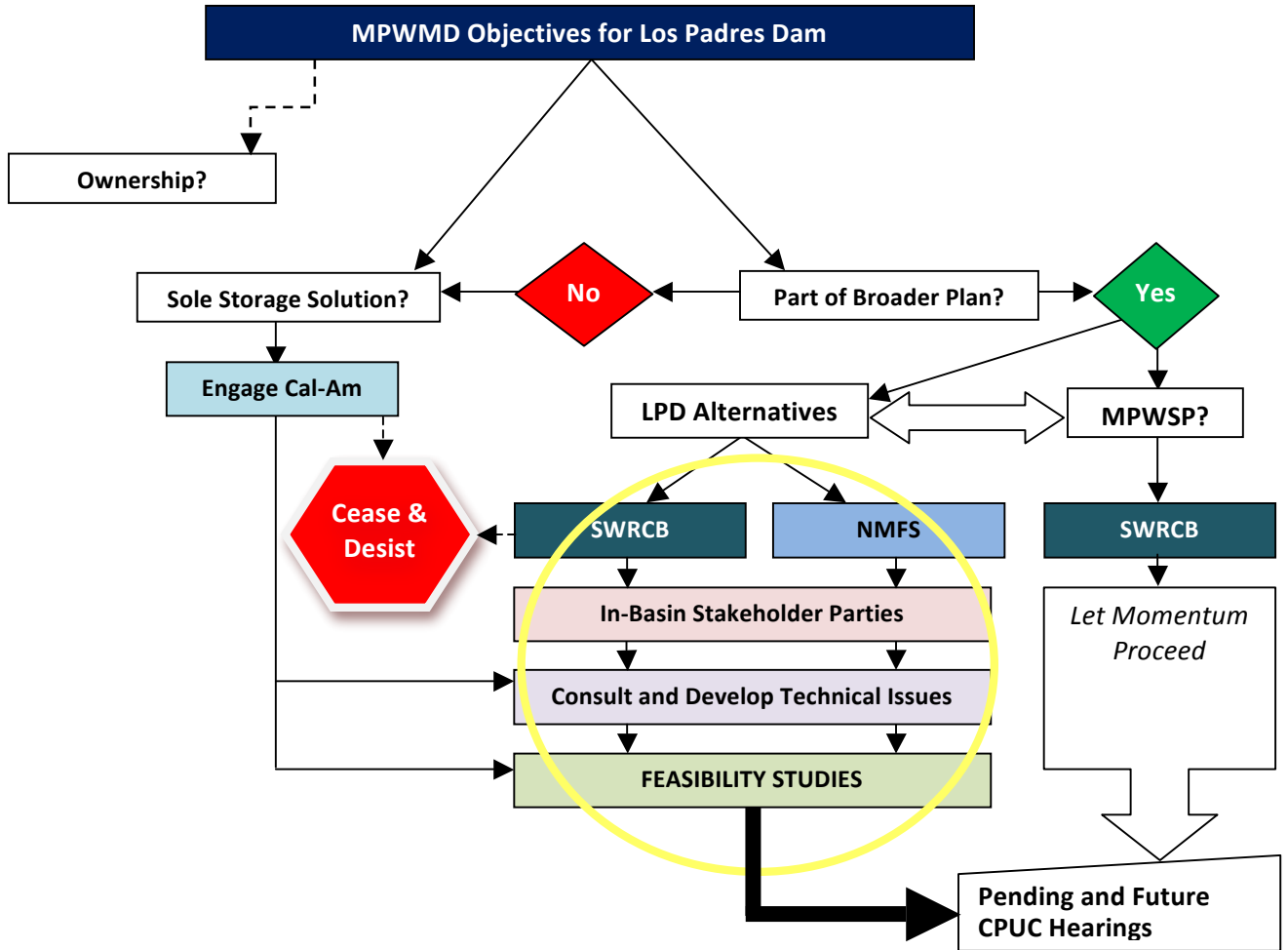


Figure 11-3.
Generalized Schematic of Decision Points Related to Los Padres Dam Objective
Sole Storage Solution or Part of Broader Plan

From Figure 11-3, in this simplistic visualization, depending on how MPWMD views Los Padres Dam within the longer term context of the Carmel River watershed solution framework, various steps and engagements would occur. While the Figure identifies two of the primary public trust resources agencies (i.e., NMFS and SWRCB) others would be involved including California Department of Fish & Wildlife, Regional Water Quality Control Board, U.S. Army Corps of Engineers, U.S. Forest Service, and others. **Notable in this illustration is the need to allow the MPWSP to proceed forward unaffected by the deliberations regarding Los Padres Dam.**

On this latter point, care must be exercised to ensure no inadvertent obstacles or unnecessary impediments are generated that would impair or otherwise delay full processing and approval of the

MPWSP. This is a delicate prerequisite since neither project (e.g., MPWSP or Los Padres Dam) can be exclusively isolated. To be sure, there is support, commitment, and optimism, albeit guarded, that the MPWSP can be effectively and successfully implemented within the time horizons necessary. As alluded to frequently in the previous discussions, it is incumbent upon any water purveyor and/or water resources management agency to ensure that the widest possible suite of water assets, facilities, and operational contingencies are available. Keeping a Los Padres Dam or some form of storage capability in the upper Carmel River watershed will be important, if nothing more than a safeguard against future water resource and water supply threats. Sole reliance on a single project in these times of growing uncertainty, both natural and regulatory, is very risky.

The next tier of questions following identification of MPWMD’s objectives is to identify the sequence of steps or processes that would occur once a preference is noted. **Figure 11-4** differentiates between scenarios where Los Padres Dam is continually owned and operated by Cal-Am or by MPWMD. The “Leave as Is” option under MPWMD ownership identifies two possible outcomes for the dam; leaving it in place for inundation under the larger potential New Los Padres Dam alternative (see Subchapter 8.4 – New Los Padres Dam and Reservoir) or orphaning it. Under the Cal-Am ownership scenario which is the default condition, engagement with Cal-Am can provide opportunities for collaboration on either the Dam Removal or Reservoir Enhancement options. The third option under the Cal-Am ownership scenario is complete disengagement by MPWMD with Cal-Am on plans for the final disposition of the facility.

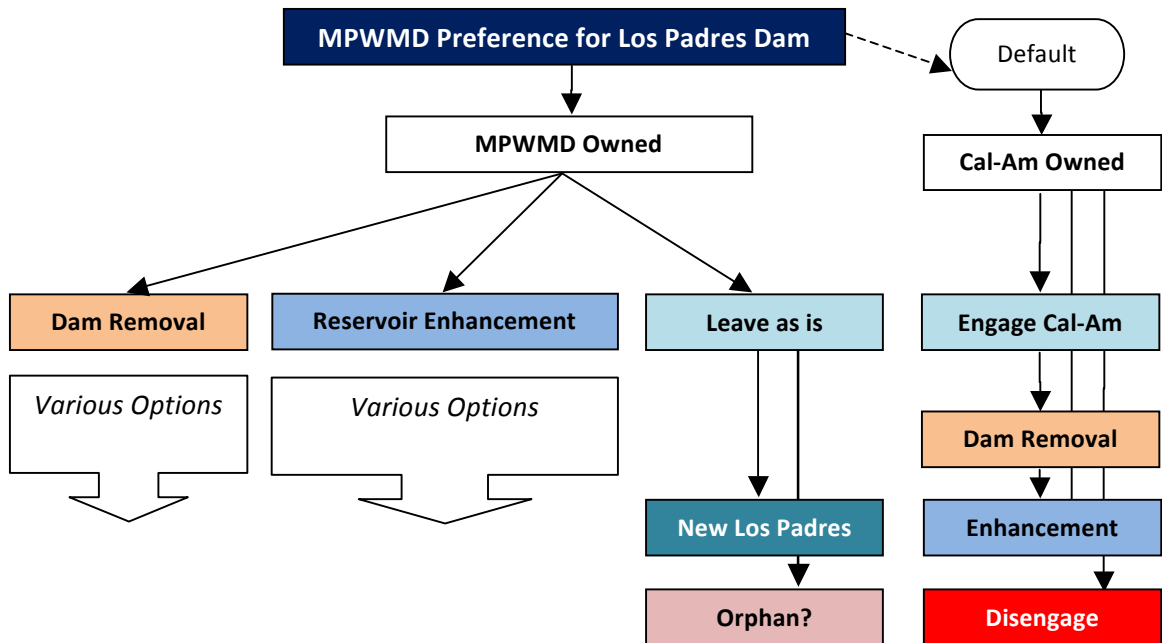


Figure 11-4.
Ownership Scenarios for Los Padres Dam

The notion of transferring all ownership of water resource facilities, be they for water supply or instream flows, over to public oversight and control is always a sensitive one. For Los Padres Dam, this could be a short-lived concern as one has to question whether ownership of an impending decommissioning is a judicious means of expending effort. **The larger issue, however, is who will have ultimate responsibility and management guidance over the storage and operational control of water storage within the Carmel River watershed.** Still, it is a real issue and one that certainly cannot be avoided in the upcoming CPUC hearings. There does not seem to be clear inclination from either NMFS or the

SWRCB as which scenario they would favor if given the choice. They may, and likely do, have their own preferences, but these have not been overtly stated in the public record. All else being equal, it is not stretching the truth to suggest that they would lean towards ownership by a notable *public* agency.

Accepting that MPWMD does not know the *true* intentions of Cal-Am regarding Los Padres Dam, continued engagement in light of the NMFS request for a plan of action regarding the facility and Cal-Am's initial response is highly desirable.

In Figure 11-4, the options for Los Padres Dam technically are shown as identical between the two ownership scenarios. While the oversight, administration, and certain implementation procedures would differ, the technical issues associated with any of the dam options would be consistent regardless of ownership.

The requirement for consultation and development of the technical issues shown in Figure 11-3, as depicted by the yellow circle **would represent the key activities should New Storage actions be deemed the appropriate course to pursue**. Much of **these activities would fall** under the New Storage action, but **they are** also applicable under the Sole Storage solution. The distinction, however, is that for the Sole Storage solution, many of the studies, options, and technical details associated with such activities as dredging, in-reservoir sediment management, downstream sedimentation, capacity increases, and related fish passage and instream habitat quality issues **have been investigated at least to some level in the past**. **What is less known are all the technical details associated with the development of new storage within the Carmel River watershed**.

Using the subjective dam removal issues from Figure 11-2, and taking minimum instream flows as an example, a conceptual schematic is provided that illustrates potential process steps that could be followed with NFMS and the SWRCB. The fundamental motivation behind any NMFS requirement for instream flows is related to fisheries life cycle needs in the various streams under their jurisdiction. For the SWRCB, however, the legislative mandates are broader and focus more on acceptable beneficial uses. For simplicity, **Figure 11-5** labels these two requirements differently, distinguishing between an *environmental* driver (e.g., NMFS) and a *regulatory* driver (e.g., SWRCB).

Within the Carmel River, NMFS clearly has identified instream flow needs that include a number of flow-related prescriptions tied to such things as timing (seasonal periods), flow rate, location, water year types, etc. To meet such important instream hydrologic needs, it is essential that an upstream "supply source" be available; one that has the ability to manage, schedule, and retain inter-annual runoff so that such requirements can be consistently met, to the best extent possible.

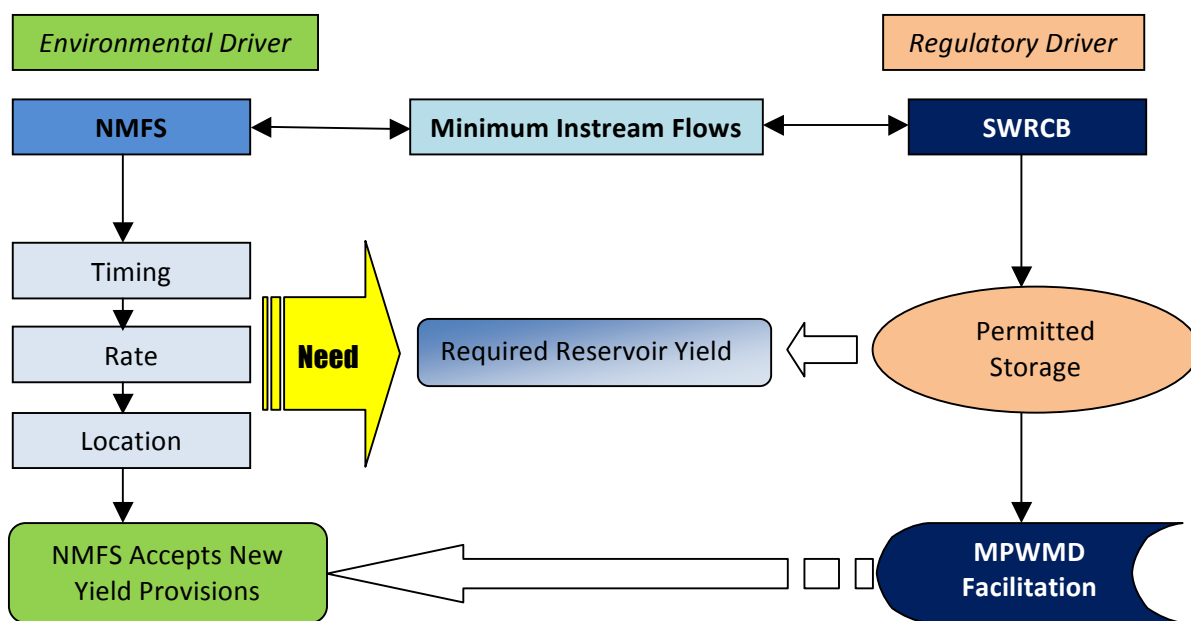


Figure 11-5.
Example Facilitation Process Between NMFS and SWRCB
Regarding Minimum Instream Flows

This requires a dedicated and firm yield source **in order to meet dry season instream flow recommendations and winter season minimum flows for river diversions to the Seaside Basin**; one that is more secure than relying on the natural unimpaired runoff of the watershed as already discussed in earlier sections. The SWRCB, through its permitting approvals has the authority to approve the right to storage of such yield (and has done so in the past with the New Los Padres Dam and Reservoir **and permits for ASR**). To continue to meet instream flow needs downstream, long established riparian water rights, diversions for regional groundwater recharge, and direct diversions to Cal-Am’s WTPs, the SWRCB has the capability of facilitating the vital upstream storage necessary to meet these requirements. The SWRCB, through its broader regulatory interests, can potentially help provide MPWMD with the necessary leverage and facilitatory assistance to meet the more focal objectives of NMFS with regard to Los Padres Dam.

As noted at the outset of this Plan, the months ahead will be an active time for various institutional, regulatory, and legal proceedings regarding long-term water resources management on the Peninsula. While the focus will be on the MPWSP and its various elements; ASR, GWR, water purchase agreement, etc., the implications to the upper Carmel River watershed and, particularly, the fate of Los Padres Dam and Reservoir should not be overlooked.

As noted previously, MPWMD has embarked upon an aggressive schedule of new studies to help support its overall decision-making process regarding Los Padres Dam and Reservoir. There are several components studies to MPWMD’s long-term strategy that should be carried out in order to evaluate the various options available for this facility. These include:

Unimpaired Flow Analysis – this analysis would be used as the “baseline” for comparing changes in flow with various alternatives. The most recent analysis of unimpaired flows was in 2002 using MPWMD’s Carmel Valley Simulation Model (CVSIM). This model is no longer available and is proposed to be replaced with a linked, surface-groundwater model for the Carmel River Basin. Flow analyses are combined with aquatic habitat information to characterize the availability and quality of steelhead habitat under various flow conditions.

Flow Analyses associated with Alternatives – several flow analyses involving different levels of diversions would be required in order to evaluate alternatives including: existing conditions and Cal-Am operations; future Cal-Am operations as proposed in the MPWSP; and, the alternatives identified in this Plan. It is likely that a change petition to the SWRCB involving Permit 20808B would result in a new Permit that includes maintaining minimum instream flow requirements.

Updated Instream Flow Study – NMFS completed recommendations for maintaining instream flows in 2002. A modified version of those recommendations is currently being attached by the SWRCB to all new permits issued for the Carmel River. The 2002 NMFS study does not accurately reflect significant changes in river habitat conditions and Cal-Am operations over the past 25-years. MPWMD staff is currently working with a consultant to develop an updated instream flow analysis using the Instream Incremental Flow Method (IFIM). The study will likely take two years to complete.

Steelhead Habitat Evaluation of the Carmel River Watershed – MPWMD’s 2004 evaluation of steelhead habitat in the watershed estimated that 50% of the spawning habitat in the watershed was upstream of Los Padres Dam. Similarly, MPWMD estimated that 42% of the suitable rearing areas in the watershed were above Los Padres Dam and that it was of exceptional quality due to its location within the Ventana Wilderness. These estimates were based on habitat conditions between the 1980s and early 2000s and included the effects of unauthorized diversions.

The value of steelhead habitat both upstream and downstream of Los Padres Dam should be re-evaluated in the context of improvements to habitat in the mainstem due to removal of San Clemente Dam, stream restoration in the lower 15 miles of the river, proposed reductions in Cal-Am diversions, and any proposed gravel replenishment projects associated with sediment management at Los Padres Reservoir. A combination study using IFIM and habitat suitability index (HSI) assessments should be used to better understand the value of each reach of the river and each tributary and the potential for improvements downstream of Los Padres Dam.

Yield and Cost/Benefit Analysis – Each alternative identified in this Plan should be evaluated for costs and benefits to water supply.

Impacts Analysis – Each alternative would have varying environmental benefits and impacts that may make them infeasible to permit. An initial screening of alternatives (beyond that undertaken here in this Plan) should be carried out to rank alternatives and determine if there are genuine fatal flaws.

Sediment Management – Additional study on the various effects and options regarding both interim and long-term sediment management under each of the alternatives in this Plan should be performed.

11.5 Recommendations

It is **recommended that MPWMD hold a series of internal and open public meetings to engage the public, develop a strengthened administrative record, and work through each of the potential avenues of pursuit described herein and elsewhere.** Ideally, this would best occur in two phases. Initially, staff, management, and legal counsel should convene and confer over the implications and directions of these various elements. As part of that exercise, the internal “team” would work through an immediate near-term action plan; triaging immediate activities, relative to those on a longer timeframe. The pendency of the CDO December 31, 2016 deadline, however, presupposes any prolonged deferral.

Once management and staff have agreed on a definitive set of actions, Board workshops could be scheduled at key junctures. These would be determined by management and senior staff. All of these activities would occur under a dynamic and highly fluid process. Mapping out the key elements of this exercise early in 2014 and securing acceptance and commitment by the Board is deemed essential. There will likely be little time for hesitation and uncertainty as these 2014 dates rapidly emerge.

An important recommendation is for the District to undertake and complete the various studies earlier in this section. The anticipated new information from these (and perhaps other necessary studies) will provide the Board with valuable details regarding the potential alternatives, affected environments, and integrative capacity with other initiatives ongoing within the Peninsula (e.g., MPWSP, ASR, GWR, etc.).

Elements of this Plan can help serve as guidance to assist MPWMD management, staff, and the Board in viewing the Los Padres Dam issue, **perhaps in a different light, but certainly with the benefit of having the latest alternatives and options scenarios before them. The manner with which the Los Padres Dam issue is ultimately integrated into the broader water supply security and resource protection objectives of the Peninsula at large will depend on how concisely the issues and alternatives have been set out and how assertively MPWMD chooses to act upon them.**