

# Draft Memorandum

date June 11, 2020; revised September and October, 2020

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from John Bourgeois and Jill Hamilton

subject College Lake Integrated Resources Management Project Adaptive Management Plan

## Introduction

On April 16, 2014, PV Water's Board of Directors adopted the mitigation monitoring and reporting program (MMRP) for the 2014 BMP Update PEIR. Mitigation Measure BIO-2i.1 (Develop Adaptive Management Plan for College Lake Waterfowl Management and Multi-Species Mitigation) was included in the *Final Environmental Impact Report for the Basin Management Plan Update (2014 BMP Update PEIR)* in response to public comment. PV Water is committed to preparing an Adaptive Management Plan (AMP) as part of the College Lake Project with the following criteria:

- Develop AMP through consultation with state and federal resource agencies and College Lake stakeholders through formation of an Ad Hoc Adaptive Management Plan Committee. Regarding technical expertise for support of AMP development, refer to the section below entitled Process for Engaging Stakeholders.
- Develop multi-year baseline waterfowl population and habitat use data for future project design, environmental permitting, and CEQA impact analysis of project-level alternatives.
- Integrate the results of ongoing College Lake hydrology and hydraulic analyses, as well as future consultations with state and federal agencies on fish flows and fish bypass criteria.
- Include terms and conditions from applicable permits and agreements as appropriate, and define provisions for monitoring assignments, scheduling, and responsibility.
- Include habitat replacement and revegetation, protection during ground-disturbing activities, performance standards, maintenance criteria, and monitoring requirements for temporary and permanent impacts consistent with mitigation in the DEIR and regulatory requirements during project-specific review.
- Be in conformance with the mitigation measures from the DEIR, and include terms and conditions consistent with regulatory requirements as applicable from permits.

Below is the summary text of the Mitigation Measures from the that reference the AMP:

**HYD-2a: Water Quality Adaptive Management for College Lake.** To learn about potential impacts of the Project on College Lake water quality and the quality of downstream water bodies, PV Water shall monitor College Lake water for indications of Cyanobacteria blooms. When the proposed weir crest is elevated to 62.5 feet NAVD88, PV Water shall monitor College Lake water temperature within the water column to establish whether a thermocline develops. PV Water shall use results of this monitoring to support the development of the Adaptive Management Plan (refer to Section 2.7) that establishes management actions to minimize the conditions that can contribute to algal blooms, including cyanobacteria blooms, such that this impact is mitigated.

**BIO-2i.1: Develop Adaptive Management Plan for College Lake Waterfowl Management and Multi- Species Mitigation.** To mitigate impacts to existing waterfowl or waterfowl habitat at College Lake, an Adaptive Management Plan for waterfowl management and multi-species mitigation will be developed with the consultation of the state and federal resource agencies and College Lake stakeholders. The Adaptive Management Plan for waterfowl management and multi-species mitigation at College Lake will develop multi-year baseline waterfowl population and habitat use data for future project design, environmental permitting and CEQA impact analysis of project-level alternatives. To the extent practical, it will integrate the results of ongoing College Lake hydrology and hydraulic analyses, as well as future consultations with state and federal agencies on fish flows and fish bypass criteria.

The Management Plan will be specific to the level of impact and mitigations under site-specific and project implementation conditions. However, the following standards will apply as defined during project-level design, regulatory review and CEQA analysis: The Management Plan should include terms and conditions from applicable permits and agreements as appropriate and define provisions for monitoring assignments, scheduling, and responsibility. The Management Plan should also include habitat replacement and revegetation, protection during ground-disturbing activities, performance standards, maintenance criteria, and monitoring requirements for temporary and permanent impacts consistent with mitigation in this EIR and regulatory requirements during project- specific review. The Management Plan will be in conformance with the biology mitigation measures from this EIR, and will also include terms and conditions consistent regulatory requirements as applicable from the U. S. Fish and Wildlife Service (USFWS), National Marine Fisheries Services (NMFS), U. S. Army Corps of Engineers (USACE), California State Water Resources Control Board, (SWRCB), Central Coast Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) permits during project design and permitting as applicable. The Management Plan will be prepared for project level project implementation as determined needed through future CEQA review and consultation with agencies as required under the California Endangered Species Act (CESA) and federal Endangered Species Act (ESA).

**Mitigation Measure BR-2: Invasive Fish Species Control Plan.**

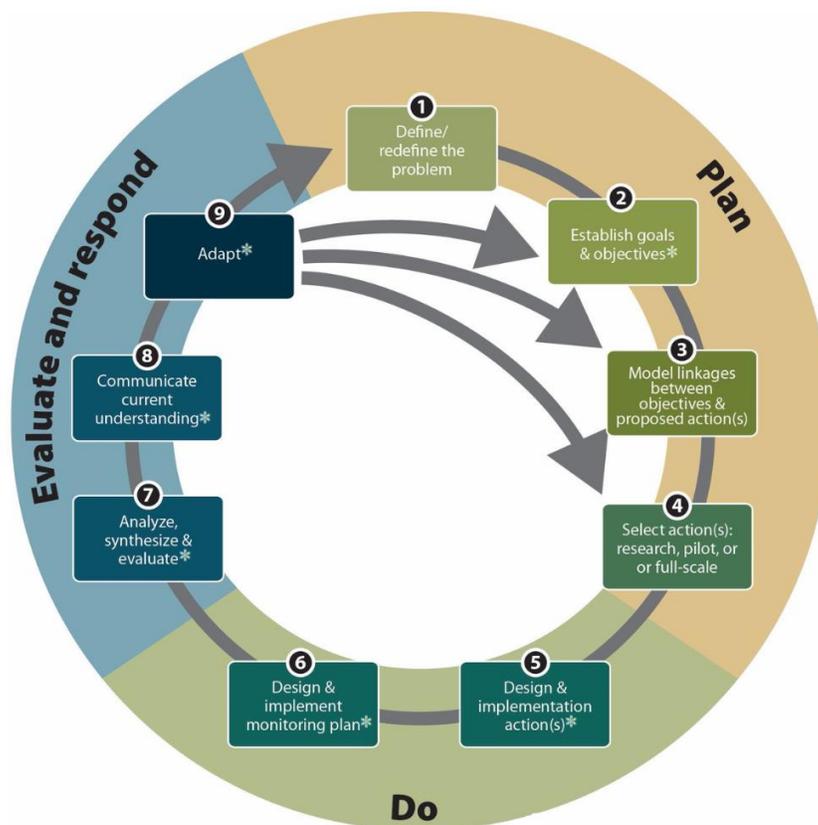
PV Water shall develop an Invasive Fish Species Control Plan. PV Water would submit the plan to the appropriate resource agencies (CDFW, USFWS, and NMFS) for approval within one year of Project implementation. The Fish Species Control Plan shall be implemented at College Lake within two years of Project implementation. The Fish Species Control Plan shall include, at a minimum:

1. Measures describing PV Water’s methods of draining College Lake to the greatest extent feasible;

2. Measures describing PV Water’s methods, equipment, and timing of invasive species eradication efforts to be conducted in association with lake drawdown efforts;
3. Measures describing the frequency at which invasive species control efforts are to be implemented.

## What Is Adaptive Management?

Adaptive management is defined as "a framework and flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation leading to continuous improvements in management planning and implementation of a project to achieve specified objectives."<sup>1</sup> An adaptive management approach provides a structured process that allows for taking action under uncertain conditions based on the best available science, closely monitoring and evaluating outcomes, and re-evaluating and adjusting decisions as more information is learned.<sup>2</sup> **Figure 1** graphically depicts a version of the adaptive management planning process.<sup>2</sup>



\* Potential point of stakeholder input

SOURCE: California Department of Fish and Wildlife, Adaptive Management, No date. Available online at [https://www.dfg.ca.gov/erp/adaptive\\_management.asp](https://www.dfg.ca.gov/erp/adaptive_management.asp). Accessed on August 6, 2019.

**Figure 1**  
Adaptive Management Plan Process

A large part of any successful AMP is thorough planning using the best available information. To ensure a project’s AMP’s objectives are attainable, a project should begin with clearly defined, measurable targets and triggers that are linked to those objectives. Targets are typically defined as the quantitative goals or outcomes to meet project objectives, while triggers are thresholds at which adaptive management interventions need to take place. Triggers should be established in a manner that precedes undesirable outcomes, unintended consequences, or negative impacts so that corrective measures can be taken to re-direct the trajectory of the project before such results would occur.

<sup>1</sup> 2011 California Water Code, Division 35. Sacramento-San Joaquin Delta Reform Act of 2009, Chapter 4, Section 85052.

<sup>2</sup> California Department of Fish and Wildlife, Adaptive Management. Available online at [https://www.dfg.ca.gov/erp/adaptive\\_management.asp](https://www.dfg.ca.gov/erp/adaptive_management.asp). Accessed on August 6, 2019.

Adaptive management encourages an ecosystem-level approach to resource management and promotes collaboration among scientists, managers, and other stakeholders on decisions. To be effective, that decision-making processes must be flexible enough to adjust in the face of uncertainties, variances or other unforeseen outcomes from management actions and other external events. With an established AMP, the project would be set up to use tools such as monitoring, modeling, or other applied studies to generate the science-based information that managers need for decision-making. Once this information is available, managers can “Adapt” a project (Figure 1). If needed, possible adaptive management actions include additional studies or monitoring and corrective on-the-ground actions. It is imperative when approaching a project with significant uncertainties, that all stages of the “Plan” phase are open to adaptive management consideration.

## Content of the AMP

The AMP should at a minimum include the following sections; additional sections may also be deemed necessary as the AMP process of stakeholder engagement is undertaken.

### Goals and Objectives

The primary goal is to develop an AMP that would meet multiple objectives while minimizing or mitigating impacts to existing waterfowl or waterfowl habitat, as well as other wildlife (fish, shorebirds, etc.) and habitat at College Lake, resulting in a multi-species plan. The first step in developing the College Lake AMP will be to confirm specific College Lake operations and maintenance goals and objectives. The following initial concepts for AMP objectives are presented in the EIR, and reflect the goals of the proposed operations and maintenance procedures:

- **Fish passage:** Improve fish passage between Salsipuedes Creek and College Lake.
- **Water Storage:** Preserve water storage capacity within College Lake.
- **Flooding:** Avoid exacerbating existing flood hazards outside the proposed water storage area.
- **Farming:** Promote farming within the College Lake basin between 59 feet and 63 feet elevation NAVD88.
- **Waterfowl management:** Support continued waterfowl use of College Lake.

In addition, Mitigation Measures HYD-2a and BR-2 identified in the DEIR warrant inclusion of the following concepts for AMP objectives:

- **Water Quality:** Minimize conditions that can contribute to algal blooms, including cyanobacteria blooms.
- **Invasive Species:** Control invasive fish species pursuant to a plan approved by the appropriate regulatory agencies.

PV Water would solicit input on the draft AMP objectives from state and federal resource agencies, as well as local stakeholders. For each specific objective, PV Water would then develop monitoring criteria, data gathering methods, evaluation procedures, action triggers based on the evaluation results, and management actions. In addition, fundamental to any AMP is a commitment to periodically re-evaluate objectives in the presence of new data. PV Water would be responsible for re-evaluating and updating the objectives in a manner consistent with requirements in permits and other approvals. Developing and prioritizing specific AMP objectives and

management actions may include modifying the proposed operations and maintenance activities (DEIR Section 2.7) to conform with permits and other agreements.

After developing and prioritizing specific AMP objectives, PV Water would then develop monitoring criteria, data gathering methods, evaluation procedures, action triggers based on the evaluation results, and management actions.

### **Organization**

At its core, an AMP is an agreed upon decision-making structure. The AMP should clearly outline the various stakeholders and their roles, and the organizational structure for receiving and disseminating information as well as where the decision-making authority lies. The project Goals and Objectives outlined in the previous section are foundational to guiding these decisions, and subsequent sections outline the technical processes by which information is garnered to address the uncertainty surrounding the project.

### **Performance Measures and Monitoring Criteria**

To understand a project's performance relative to the Goals and Objectives, the AMP will outline a series of (preferably quantitative) performance measures, and the monitoring methods and criteria used to measure them. The project participants chose monitoring parameters they believe are the most effective and efficient way to assess change with respect to the project objectives. Variables to be measured and a basic monitoring approach should be outlined. Specific methods are given only when needed to make the approach clear. The parameter, method, spatial scale, and timing of monitoring must be adequate to detect change.

### **Evaluation Procedures**

To evaluate site performance, one of the first critical steps is to establish relevant and measureable baselines. These can include previously-collected data on resources or parameters of importance (such as historic waterfowl use trends, water quality standards, etc.), but can also extend to specific regulatory requirements of the project. Once baseline conditions are defined, the AMP process should describe how the Performance Measures and Monitoring Criteria are to be evaluated in the decision-making process.

### **Action Triggers**

Although detailed action triggers have not yet been developed for the objectives, they would constitute thresholds that when evaluated and determined to be exceeded, would require management actions. For example, if waterfowl numbers were to fall below a certain pre-determined threshold, this would trigger an action such as additional/refined monitoring, habitat modification/restoration, or perhaps a direct change in water management. PV Water would be responsible for reporting action triggers and implementing management actions based on these triggers as part of the development of the AMP.

### **Management Actions**

In the event that an Action Trigger is tripped, the decision-making body will need to take action based on the available information. Typical classes of management actions available to the resource managers should be outlined (e.g., water management, invasive control, etc.) with some specific examples of likely actions. The exact management action will depend on the nature of the problem and the appropriate remedies available. Typically, the first management action will be to conduct a thorough review of the available information that can inform project managers on the trigger. Often, technical experts (both associated with and external to the project, as

warranted) will be consulted before taking a management action to analyze the relevant information and provide a range of appropriate management actions, including their risks and costs.

### **Relationship to Other Plans**

The College Lake Project is also generating numerous other plans that are related to adaptive management. These include a Water Quality Plan, Steelhead Monitoring Plan, Invasive Species Plan, Compliance Plan, and Operations and Maintenance Plan. All of these plans have a role in the project process and will need to be comprehensively considered in the adaptive management process. Therefore, the Organization section above will also have to address the interdependence of some of these plans on decision-making. The intention would be for the AMP to serve as an umbrella document where these various elements can be evaluated holistically in the context of the project Objectives. The AMP therefore will become a critical process document and serve as the central organizing “spine” of most of these other plans. Since most of these other plans will already be complete prior to the development of the AMP (with the exception of the Compliance Plan), the process needs to include a feedback process to each of those plans to account for any future management decisions that have the potential to ripple through various other documents. Since these other plans are driven largely by the regulatory process, the AMP will have to account for a process by which stakeholder education and feedback are incorporated back into those plans through the adaptive management process if warranted.

**Table 1** below outlines the Drivers for each of the plans mentioned above, as well as their suggested relationship to the AMP.

**TABLE 1**  
**RELATIONSHIP OF OTHER PLANS TO THE ADAPTIVE MANAGEMENT PLAN**

<b>Plan</b>	<b>Driver</b>	<b>Schedule Considerations</b>	<b>Notes, Relation to the Adaptive Management Plan</b>
<b>Water Quality Monitoring Plan</b>	CDFW requested as condition to dismiss Water Right protest. Also required to comply with EIR Mitigation Measure HYD-2a (prevention of cyanobacteria formation).	CDFW may want more information for the Streambed Alteration Agreement. Water Right Permit order (WRP) expected to be issued in 2021. (Can work on Plan ahead of Water Right hearing [August 2020] but not important that it be finished by then.)	Mike Podlech will prepare. The Water Quality Plan will address general ecological functions of the lake (e.g., monitor dissolved oxygen, temperature), supplementing PV Water's existing water quality monitoring for the lake. Much will be covered under PV Water's existing Basin-wide water quality monitoring program.  <b>Relation to AMP:</b> The Water Quality Plan will provide data for the AMP. The Plan will be appended to the AMP and the AMP can be a vehicle for modifying WQ Plan.
<b>Steelhead Monitoring Plan</b>	NMFS requested in part as a condition to dismiss Water Right protest, but also because PV Water had already committed to implementing this in 2014.	Monitoring has started, but we are limited to what we can do in College Lake without property access.	Monitoring has started. <b>Relation to AMP:</b> Same as Water Quality Plan.
<b>Invasive Species Plan</b>	CEQA requirement, dismissal of Water Rights protest.	We are limited to what we can do in College Lake without property access.	Similar to above plans. <b>Relation to AMP:</b> Same as Water Quality Plan
<b>Compliance Plan</b>	SWRCB requirement	Cannot be finalized until after receipt of the WRP.	Will describe how compliance with each term in the WRP will be determined, including diversion terms and how much water PV Water needs to release from the Lake at a given point.  <b>Relation to AMP:</b> the Compliance Plan will be its own separate entity.
<b>Operations and Maintenance Plan</b>	Needed to provide basic guidance for reservoir operations including timing of annual weir raising.	Could come after all permits including Water Right Permit are secured.	Operations Plan will have overlap with Compliance Plan (e.g., when/how water can be diverted, operations of fishway passage structure, when water goes over weir versus through the fishway passage structure, how fishway passage structure will be maintained). Resource agencies may request additional detail, which would be provided as part of agency consultations. (We're seeking coverage for O&M activities for 5-10 years in permit application materials.) <b>Relation to AMP:</b> Assume that the O&M plan is a living document developed and periodically revised by pursuant to the AMP decision process.
<b>Adaptive Management Plan (AMP)</b>	Mitigation measure from PEIR, resource agency permit conditions related to operations, stakeholder expectation.	Begin process in 2020. Completion is dependent on other plans being completed and then the timing of stakeholder process.	A lot of the information from the AMP will be in other plans. While the AMP will be based on the requirements of permits and approvals and the above plans, some aspects of the AMP will not be driven by permits (e.g., waterfowl). Regarding maintenance activities, certain elements must be covered in the AMP; that is the expectation of NMFS as well as stakeholders. Adaptive management activities constitute key "knobs to turn" to adjust the site conditions to meet project goals and objectives. <b>Relation to Other Plans:</b> The AMP can serve as an umbrella document for decision-making. The AMP would provide a feedback loop to revise other plans. If one the above plans needs to be revised based on AMP findings, that would be done in consultation with regulators.

## **Draft AMP Road Map**

### **Overall Schedule for Development of the AMP**

AMP development will be initiated during permitting and design beginning in 2020. Mitigation Measure BIO-2i.1 requires that the AMP include applicable terms and conditions from the USFWS, USACE, SWRCB, and CDFW, which we anticipate will be obtained in 2021.

### **Funding the AMP**

PV Water has allocated funds for initiating development of the AMP in Fiscal Year 2020/2021.

### **Process for Engaging Stakeholders**

#### Regulatory Stakeholders

Regarding stakeholder engagement, consistent with adopted Mitigation Measure BIO-2i.1, PV Water will first engage with state and federal resources agencies (NMFS, USFWS, RWQCB, and CDFW) to develop and prioritize specific AMP objectives, including making minor modifications to the proposed operations and maintenance described in EIR Section 2.7.2 to conform with anticipated conditions in permit and other agreements.

In response to comments from the RWQCB, we propose to prepare an Initial Management Procedures memorandum for submittal to the regulatory agencies for the College Lake Project (RWQCB, USACE, CDFW, and USFWS). The purpose of the memorandum is to solicit early input from permitting agencies, particularly the RWQCB, regarding adaptive management as well as to provide regulatory coverage for basic operations and maintenance measures for the first few years of the project while the more robust adaptive management process can move forward (see below).

#### Community Stakeholders

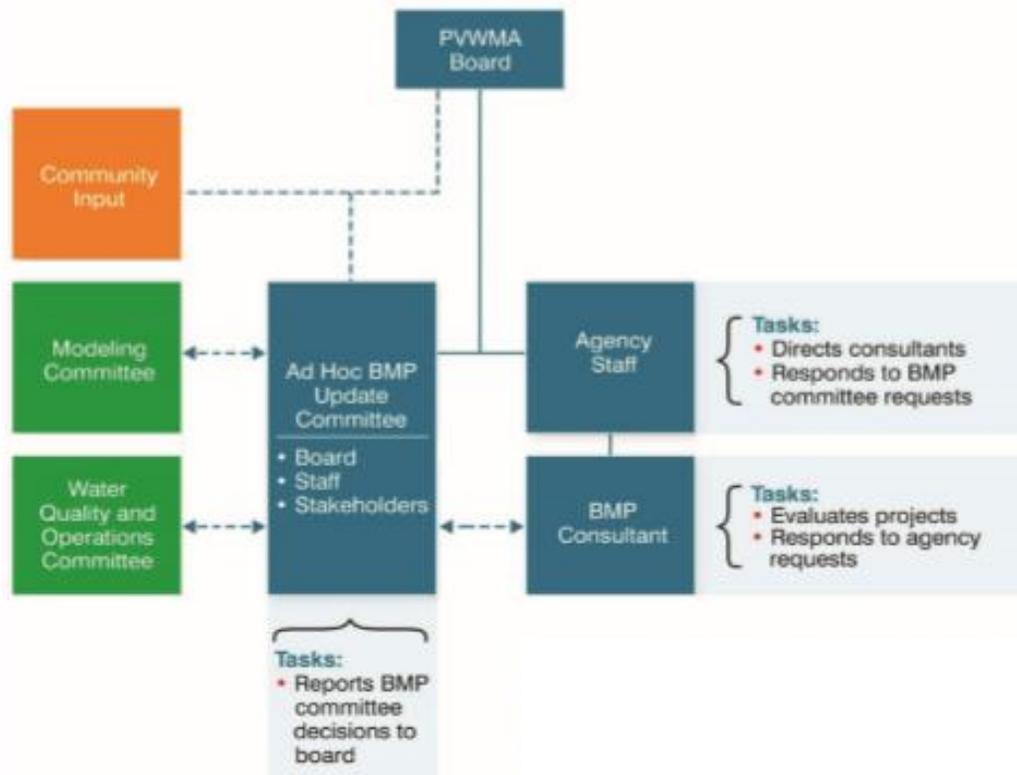
Once PV Water has a clear understanding of how permit obligations and other approvals governing Project operations and maintenance would be incorporated into the AMP, PV Water can then consider input on draft objectives from local stakeholders; review of the Initial Management Procedures memo could provide community stakeholders with an opportunity to provide input earlier in the process.

To serve this role, PV Water anticipates forming an Ad Hoc Adaptive Management Plan Committee, similar in approach to the Ad Hoc Basin Management Plan (BMP) Committee that the PV Water Board of Directors formed to help increase the Pajaro Valley community's participation in developing the BMP Update. For reference, the Ad Hoc BMP Committee worked with PV Water and its consultants to identify, analyze, short-list, and ultimately recommend to the Board of Directors a portfolio of projects and programs to "solve" sea water intrusion and basin overdraft. To facilitate and encourage diverse stakeholder representation, the 21-member Committee was composed of representatives from PV Water and many other interests (e.g., municipal, agricultural, environmental) and met over an 18-month period. The Committee provided input on the BMP programs, projects, and policies; basin management strategies; project screening and ranking; and schedules. Committee support was provided by PV Water staff and consultants.

The Ad Hoc BMP Committee model (illustrated below in **Figure 2**, copied from the BMP Update) could be used as a means of providing technical and community input on implementation of the AMP for the College Lake project. Likely points of input for an Ad Hoc AMP Committee could include the following (refer to Figure 1 regarding the steps shown in parentheses):

- Developing and refining AMP objective(s) in a manner consistent with proposed operations, permits and approvals to reflect (for example) desired outcomes for seasonal waterfowl usage (Step 2);
- Designing and implementing monitoring plans and/or applied studies to address the project-specific technical issues (Steps 5, 6, and 7);
- Reviewing, interpreting, and communicating information on monitoring plan results to PV Water and other stakeholders (Step 8), and
- Advising on potential adaptations, if needed, based on outcomes of the evaluation steps of the AMP (Step 9).

Use of technical experts to educate and advise the Ad Hoc AMP Committee on certain resource issues is a potential approach for stakeholder engagement. Technical experts could bring unique knowledge and skills to advise the governing body. For the College Lake Project, expertise in fisheries, terrestrial wildlife, botany and wetlands, and hydraulic/hydrologic modeling may be desirable.



**Figure 2**  
Basin Management Plan Example of Using an Ad Hoc Committee

There have been requests to establish an ongoing management or participatory committee of interested landowners and stakeholders to have ongoing input and review of the AMP and its implementation. These requests should be taken into consideration during development of the AMP process.

### Conceptual Schedule for AMP Process

**Table 2** as well as the bullets below shown a conceptual schedule of what the AMP process could look like. We are open to working with PV Water more closely on the details and goals of each meeting, as well as the anticipated timing. This schedule is intended to be a starting point for a conversation on the process.

- **Formation of Ad Hoc Committee:** The goal is to ensure all critical parties are at the table, but that they are represented in a manageable way so as to facilitate positive outcomes. This will be a critical step and PV Water will want to consider how to solicit participation (mailings, publish ads, direct calling, etc.). Processes similar to those used to establish other ad hoc committees such as the previously mentioned BMP, or the Sustainable Groundwater Planning Advisory Committee, should be utilized as a model for committee formation. Suggestions on membership include assembling a 13-member committee as follows:

#### By Appointment:

- PV Water Board members (3) to act as a liaison to the rest of the Board
- Regional Water Quality Control Board (1)
- National Marine Fisheries Service (1)
- CA Department of Fish and Wildlife (1)

#### By Application:

- Agricultural interests (1)
- At-large Pajaro Valley community member (1)
- Local scientist, Environmental Resource Experience Preferred (1)
- Neighboring land owners (2)
- Non-Governmental Organization (NGO) representatives (2)
- **1<sup>st</sup> Meeting:** Background, adaptive management overview, project goals and objectives, review of Initial Management Procedures memorandum (containing existing plans, monitoring elements)
- **2<sup>nd</sup> Meeting:** Review of agency permit conditions, review of existing plans and monitoring elements (outline competing interests), and propose a decision-making and communication structure (Step 2, Step 8), Monitoring Plan and Performance Measures (Steps 5 and 6). Note that permits are expected by August 2021.
- **3<sup>rd</sup> Meeting:** Action Triggers and Management Actions (Steps 7 and 9)
- **4<sup>th</sup> Meeting:** Review of Draft AMP, receive additional input
- Draft and Revised AMP (AMP 2021) submitted to PV Water for review<sup>3</sup>

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<sup>3</sup> It is anticipated that this will be a long-term planning and implementation process. The result of this present effort will be the College Lake Integrated Resources Management Project Adaptive Management Plan 2021.

**TABLE 2**  
**DRAFT TIMELINE FOR ADAPTIVE MANAGEMENT PROCESS**

	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	June 2021
Form Ad Hoc Committee	Board Meeting	Form Committee							
Meeting 1									
Meeting 2									
Meeting 3									
Meeting 4									
Draft AMP							Review		
Revised AMP									Revised Report

Note: Permits are expected to be in hand by August 2021. If the agenda for Meeting 2 includes briefing the Committee on permit conditions, then that and subsequent meetings would shift to later in the year.