DRAFT Memorandum

To:	Salinas River Long-Term Management Plan Planning Group
From:	Consultant Team
CC:	Monterey County Water Resources Agency
Date:	November 9, 2018
Re:	**Salinas River Long-Term Management Plan Management Considerations**

Monterey County Water Resources Agency (MCWRA) is leading development of a long-term management plan (LTMP) for the Salinas River. The LTMP will include a comprehensive set of management objectives and actions for the Salinas River system. These management objectives and actions will be informed by key management considerations.

The purpose of this memorandum is to provide a summary of these key management considerations. The management considerations presented in this memorandum were compiled based on various meetings convened in support of LTMP development. In particular, this memorandum draws from discussions held at two Planning Group Meetings (held August 2[1] and September 14), three Working Group meetings (held August 3, August 22, and October 2), and one public meeting (held June 20).This memorandum will be presented and discussed at the November 16 Planning Group meeting. Finally, this memorandum—including feedback received on November 16—will be incorporated into Chapter 4 of the LTMP.

Management Considerations

There is No One Agency or Landowner to Implement the LTMP

- The land use authorities of the Salinas Valley include cities, the County, state and federal agencies. The Salinas River channel and floodplain is owned by hundreds of private parties.
- No single entity currently has the authority to implement all the different types of management activities identified in the LTMP.

[1] All meeting dates in this paragraph are 2018.

- Under the forthcoming Groundwater Sustainability Plans (GSP), the associated Groundwater Sustainability Agencies (GSA) will have broad authority and flexibility in approach to ensure the Salinas Valley Basin achieves sustainable groundwater management.
- There is interest in establishing a non-profit or other impartial agency to lead implementation of the LMTP.

What Does this Mean for the LTMP?

- There are three options for LTMP implementation: an existing agency is identified to lead and oversee implementation; a new entity is created; or the LTMP is implemented by multiple entities, none of which has an overarching authority to oversee LTMP implementation.

Many People Expect MCWRA to do More Than It Can or Has the Authority to Do

- The Monterey County Water Resources Agency Act (Agency Act) establishes MCWRA as a flood control and water agency, and defines the authorities of MCWRA. These authorities include, but are not limited to, the following as necessary and proper to carry out the Agency Act.
    - Establishment of zones within which it may institute projects with specific benefits for the zone.
    - Acquire, use, exchange, transport, or sell property of every kind, including water.
    - Construct, repair, remove, or otherwise improve any work as authorized by the Agency Act.
    - Prevent degradation of water quality.
    - Control flood and storm waters.
    - Incur indebtedness and issue bonds.
    - Levy taxes or assessments.
- While MCWRA has broad authority under the Agency Act, it has not historically utilized all of its authorities.
- MCWRA is a special district, not a County department, and must develop all of its own funding. MCWRA does not receive funding from the County's General Fund.
- MCWRA only has authority over the benefit zones. Funding is tied strictly to the benefit zones.

What Does this Mean for the LTMP?

- MCWRA has the authority to do more, but exercising these authorities requires the support of the community and funding. For example, while MCWRA does implement sandbar breaching, sandbar management is not specifically described as an activity in a benefit zone and therefore is funded by limited discretionary funds.

Money is Limited, Unpredictable, and Often Obligated

- While MCWRA has broad authority in management of water resources within the county, its funding tools are outdated. Property assessment revenue, MCWRA's principal source of income,

is dedicated to the repayment of costs of specific projects or services that confer special benefits to the assessed properties (a "Zone of Benefit"). This revenue source is not general-purpose revenue available for discretionary purposes. MCWRA's property assessments are subject to Proposition 218[2]. Property assessments can be used to pay for discretionary projects or services (or the subcomponents of these projects), but are a limited portions of the annual budget.

- Proposition 218 has sharply restricted the discretionary use of assessment revenue by MCWRA and has made it harder to accommodate unanticipated project costs. This is especially relevant to MCWRA in relation projects that are implemented over multiple years incur significant and unanticipated environmental monitoring and compliance costs beyond the costs covered by the original assessments.
- A number of grant programs exist to support design and implementation of environmental enhancement activities. However, funding through these programs is typically limited to actions that do not, in whole or in part, serve as mitigation. These programs are also typically competitive, and unlikely to be available over the long term.
- Several new funding mechanisms are currently becoming available that could be used to fund bigger infrastructure projects, particularly those with components benefiting the environment (including Proposition 68, passed in June 2018).
- Implementation of the GSPs is also expected to provide a program through which many actions directly or indirectly proposed by this LTMP can be implemented. Funding of these projects is anticipated to require a Proposition 218 vote.
- The Salinas Valley, often called "the Salad Bowl of the World," supports a $9 billion agricultural industry. Growers have indicated their willingness to vote in favor of a package of actions to support improved water resource management, so long as the package contains a clear connection to the benefits for the greater community.

What Does this Mean for the LTMP?

- New funding sources must be secured for LTMP implementation. These sources must be reliable enough to implement the LTMP over the long term.

Water Management Facilities are Outdated, Inflexible, and Undersized

- MCWRA owns and manages many facilities to help move water through the management area. Key facilities include the Nacimiento and San Antonio dams, the Salinas River Diversion Facility, the Old Salinas River (OSR) slidegate, and various facilities in the Reclamation Ditch system. Many of these facilities were not designed to address current or potential management needs.
- The OSR slidegate was designed to release up to 120 cubic feet per second (cfs), but it would cause downstream flooding at that rate. This reduces the ability of MCWRA to manage lagoon levels, particularly when inflows to the lagoon are high.

[2] Passed by California voters in 1996. Proposition 218 amended the California Constitution to require that all new or increased property assessments (as well as taxes and fees) follow prescribed assessment calculation and election requirements.

- The capacity of the tide gates are too small to reliably provide sufficient flooding relief. Even during a relatively modest storm even (e.g., 2-year storm), flooding can occur if tides are high and stormwater has nowhere to go. Conversely, it is critical that the tide gates continue to prevent seawater from moving into agricultural areas on a daily basis, or allowing a tidal surge during storm events that could exacerbate flooding.
- Debris (e.g., dead trees, trash) in the system can affect the successful operation of the tide gates. At times, the trash racks are overcome and trash plugs the culverts.
- Overall, there are relatively few canals or pipelines in the study area with which to move surface water around. As such, the Salinas River acts as the primary "trunk line" for the entire system.

What Does this Mean for the LTMP?

- If we want to meet many of the goals of the LTMP, the facilities should be re-evaluated and, in some cases, retrofitted or rebuilt.
- Work on these facilities will require regulatory permits. These efforts can be time consuming and costly, making assured funding sources an important component of this consideration.

The Financial Burdens and Benefits of Managing the River are not Equitably Shared

- The costs of projects and programs are typically born by the agency or individual responsible for implementing the action, even if the action benefits a larger community.
- This is particularly true for the private landowners that are members of the River Management Unit Association and participants in the Salinas River Stream Maintenance Program. The costs of implementing stream maintenance actions includes not only conducting the work, but also reporting on the work conducted and, for some activities, funding mitigation projects. These private individuals are not only preventing flooding and erosion on their own lands and adjacent lands, but they are creating channel capacity to accommodate floodwaters. They are also creating a smoother path for water to move downstream, and reducing the abundance of water-consuming *Arundo donax* (Arundo). These actions have significant benefits for flood management and groundwater recharge throughout the watershed, yet the cost of implementing these actions fall on a limited group of individuals and agencies.
- New permits or permitting programs are needed (e.g., long term Biological Opinions for reservoir operation and sandbar breaching), but the cost of establishing new programs (separate from the cost of implementing programs), is time-consuming and costly.
- Long-term cost of program implementation—mitigation, monitoring, and reporting—can be hard to accurately define during project planning and therefore implementation costs often fall short of funding available.

What Does this Mean for the LTMP?

- The LTMP should identify mechanisms for equitable cost distribution that aligns the cost of projects across those that benefit from the work.

Flooding Affects the Livelihoods of the Community

- Flooding from extreme floods (such as those experienced in 1995 and 1997), as well as from smaller 5- and 10-year storms, requires the community to rethink how it approaches stormwater management.
- The type of flooding addressed by the Salinas River LTMP is flooding associated with riverine flooding (a high elevation of water within a watercourse) or inland flows of ocean water (associated with storm surges and/or high tides). Landowners also experience flooding associated with poor drainage associated with a specific site. This type of flooding requires site-specific retrofits to improve drainage and reduce pooling or ponding of water in relatively discrete locations.
- The location of flooding is highly variable, and is driven by where precipitation falls, tides, available capacity of local watercourses, and quantity of debris moving through the system.
- When agricultural lands are flooded, it can destroy or degrade crops such that they cannot be sold, wash away topsoil, and/or change the chemical composition of the soil. Food safety regulations prohibit replanting for a period of 60 days or more for certain crop types.
- During large storm events, flooding can also inundate homes and threaten infrastructure including roads and bridges, which affects the livelihood and transportation needs of the community.
- During times of drought, vegetation dies back and is washed down the river creating flood hazards (e.g., tree trunks or large branches catch on bridges and back up the channel).
- Backwater flooding (upstream flooding that occurs as a result of downstream conditions) is typically less damaging to adjacent lands due to slower velocities.
- The region should consider redesigning flow pathways so that it can begin making progress in reducing flooding and improving water quality. Options include:
    - Evaluating the known and likely future flood zones (water pathways) and use this information to inform where flood management project can be installed; and
    - Working with landowners to repurpose lands in flood zones that are not currently in use/ production, or are not profitable, to create flexible flood space.
- A Storm Water Resource Plan (SWRP) for the Greater Monterey County Integrated Regional Water Management (IRWM) Region is under development, with an expected completion date in June 2019. As required by regulations, the SWRP will include approaches for diverting runoff from existing storm drains, channels, or conveyance structures to sites (particularly publicly owned sites) that can clean, store, infiltrate and/or use the runoff. This SWRP will identify specific projects to address flooding.
- When planning for the future, it is important to acknowledge future weather projections, which anticipate prolonged periods of drought and increased intensities of storms. Projections also indicate that average mean sea level is increasing; together with increased intensity of storms, this may result in flooding beyond that caused by precipitation alone.

What Does this Mean for the LTMP?

- Addressing flooding is one of the primary goals of the LTMP. As such, it is important that we understand all of the issues surrounding flooding, as well as existing programs that are also designed to address flooding. The LTMP should be developed to address these landowner concerns and identify opportunities to be consistent with other planning efforts.

Wildlife need Good, Connected Habitat at the Right Times

Connecting the Ocean and the River

- Steelhead are anadromous fish (having a lifecycle that begins in fresh-water streams, transitioning to the ocean).
- Steelhead entering the Salinas River from Monterey Bay can use one of two routes: direct access from the ocean to the Salinas River if the sandbar at the mouth of the river is open; or through the Potrero Road tide gates, the OSR, and finally the OSR slidegate. The mouth of the Salinas River is often separated from the sea by a sandbar, which requires flows high enough to naturally breach the sandbar, or manual efforts to open. Natural breaches generally mean the neighboring agricultural lands are flooded. Neither the Potrero Road tide gates nor the OSR slidegate were designed to support fish passage, although fish passage is possible under certain conditions.
- The slidegate is not ideal for lagoon habitat management because it allows the fresh, oxygenated surface water to exit the lagoon, which slows or stops the conversion of the lagoon from a salinity stratified system with poor bottom water quality to a more uniformly freshwater system. Allowing more freshwater to remain in the lagoon could slowly convert the lagoon to a freshwater system, maximizing habitat quantity and quality for rearing steelhead.
- The timing of sandbar breach affects successful migration into the river. If the sandbar is not breached until later in the winter or spring season, this can delay adult steelhead migration which begins at the end of December and continues through April. Similarly, if the sandbar closes early in the spring, the number of out migrating juveniles that reach the ocean will be limited. In dry years, river flow events may not be large enough to trigger sandbar breaching (natural or artificial), leaving the sandbar in place for a year or more. This most recently occurred when the sandbar was closed between January 2013 to January 2017.
- Sandbar management during the late spring or early summer may affect the breeding season for tidewater goby. In addition, tidewater goby overwintering survival is highly dependent on a large population going into the fall and winter; because large flood events often sweep most individuals out to the ocean, a large population increases the potential for some individuals to survive winter events. These survivors comprise the initial breeding population the following summer.
- The implications for sea level rise and how it might affect sandbar breaching needs should be considered.

Connecting the Lagoon to Headwaters

- Once in the Salinas River, steelhead must also be able to migrate to headwater streams which typically support the best spawning habitat (gravel substrate, well-oxygenated flows, cold water, and cover).
- Steelhead generally migrate inland December–March annually and out-migrate February–April. As such, they need surface flow connectivity during the winter months in order to travel between the ocean and headwaters.
- Under current reservoir operations, water is released primarily in the summer when irrigation water demand is the highest. At times, MCWRA must release up to 800 cfs at the dams to achieve 2 cfs at the Salinas River Diversion Facility. Flows are lost to evaporation, in-channel vegetation, percolation, and diversions.
- The Upper Valley basin reaches are generally losing reaches (water readily percolates into the groundwater basin). As such, winter flows that recharge the groundwater basin are typically sufficient to sustain summertime pumping and irrigation. However, the lower watershed basins require summer stream flow to provide irrigation water through pumping and river diversions.
- The Arroyo Seco, the Salinas River tributary thought to provide the best accessible spawning habitat for steelhead, drains into the Forebay subbasin in an area of high permeability. Depending on the groundwater levels in this area (known as the Arroyo Seco cone), even high flows up to 20,000 cfs may not establish surface flow connectivity to the main stem of the Salinas River.
- Projected changes in weather (increased intensity of storms resulting in higher peak flows, and more frequent and prolonged periods of drought) should be considered in long term planning for water availability for steelhead.
- Areas along the Salinas River are believed to have once supported wooded riparian areas thousands of feet wide, and in some places as much as a mile wide (San Francisco Estuary Institute 2009). While some riparian remains, there may be opportunities for restoration.
- Arundo is one of the worst plant invaders of California's riparian and wetland communities. As of 2011, the Salinas River supported 23% of known Arundo stands in all of coastal California. Thick stands of Arundo are impenetrable for many wildlife species and prevent movement across the Salinas River corridor.

What Does this Mean for the LTMP?

- Managing for steelhead on the Salinas River will require an assessment of the intersection between reservoir releases, groundwater levels, and potential in-channel barriers (e.g., invasive vegetation).
- Establishing programs for listed species will require collaboration with regulatory agencies that have authority over these species. National Marine Fisheries Service regulates activities that affect listed anadromous fish, including steelhead. U.S. Fish and Wildlife Service regulates activities that affect terrestrial species, including plover, and freshwater fish including tidewater goby.

The Lagoon Sandbar must be Actively Managed to Achieve Other Goals

- Water levels in the Salinas River Lagoon are managed by MCWRA to limit flooding of adjacent agricultural lands and homes. When the sandbar is in place, lagoon elevation is managed between 3.0 and 3.5 feet above sea level; flooding of adjacent lands begins when elevation reaches approximately 5.5 feet.
- The slidegate connecting the Salinas River Lagoon to the OSR channel is the primary mechanism for lagoon water level management. The slidegate cannot always sufficiently manage lagoon levels either because the gate is too small to pass the quantity of flow entering the lagoon from the Salinas River, or because the OSR channel is already at capacity due to flows in other systems that drain to the OSR.
- When the lagoon elevation reaches 5 feet and inflows to the lagoon are predicted to increase (as a result of a storm event), MCWRA begins preparation to release lagoon water through a lowering of the sandbar that often persists at the mouth of the Salinas. Sandbar management involves grading or excavating a drainage channel across the sandbar to drain the lagoon. During preparations for sandbar breaching, lagoon elevation can reach 7 or 8 feet.
- The timing and location of an artificial sandbar breach must also consider the western snowy plover nesting season. Plovers nest on the beach near the mouth of the Salinas River between March 1 and September 30. If artificial sandbar breaching occurs during this time, the presence of people and construction equipment may cause plovers to either not nest or abandon their nests, or it may result in destruction of nests if they are washed away as the breach occurs. If a breach does not occur, then high lagoon elevations can flood plover's nest and habitat areas.
- During dry years, water quality in the lagoon is poor during dry years when the sandbar is closed and freshwater inflows are low or absent.
- Warm temperatures and stagnant water fosters "blooms" of rooted and floating vegetation that is exacerbated by nutrient inputs from agricultural and urban sources. Chemical toxins can concentrate in the system. Prior to 2010, freshwater inflows from the upper watershed were typically low or non-existent in the summer and fall. Since 2010 and the operation of the Salinas River Diversion Facility, freshwater inflows to the lagoon are a requirement of the Salinas Valley Water Project permits.

What Does this Mean for the LTMP?

- Future management of the lagoon and sandbar will need to balance habitat needs (e.g., migrating fish), flood control options and infrastructure, and community concerns related to flooding and salinity intrusion.

Flood Flows and Reservoir Releases: Where does the Water Go?

The Salinas Valley Supports Above AND Below-Ground Reservoirs

- Most people are aware of the surface water storage facilities on the Salinas River: Nacimiento and San Antonio Reservoirs, the Salinas River Diversion Facility, and Santa Margarita Reservoir (created by Salinas Dam) in San Luis Obispo County. Most are not aware that the Salinas Valley

groundwater basins provide vastly larger water storage capabilities; an estimated 16.4 million acre-feet of storage as compared to 0.7 million acre-feet in Nacimiento and San Antonio Reservoirs combined.

- The Salinas Valley groundwater basins are critical reservoirs for seasonal water storage. They recharge in the wet season when high river flows are available, and are pumped during the dry season when the agricultural water supply demand is greatest. The groundwater reservoirs also provide critical storage over multiple-year climatic cycles; drawn down in dry periods and replenished during wet periods.
- While we know geologically where the "good" substrate is for surface water percolation, we do not have a good understanding of which stream reaches are gaining (flow is enhanced by groundwater) and losing (flow is decreased by percolation into the ground), or how those reaches operate under different conditions.
- Groundwater basin recharge is not consistent along the Salinas River. The Upper Valley basin provides excellent substrate for percolation and readily accepts surface flows. The lower valley basins (the East Side Aquifer and 180/400 Foot Aquifer) support less percolation and are more inclined to flooding.
- Once the water goes underground, it is much harder to track. Until recently, there has been no State-level requirement to report water extracted through groundwater pumping.

River Flows are Highly Variable

- There are only four gauges on main stem of the Salinas River. Of the Salinas's undammed tributaries in the study area, only the Arroyo Seco and San Lorenzo are gauged.
- Flows released from reservoirs are ramped up and down to avoid causing erosion when ramped up and to avoid stranding fish when ramping down. In between, releases are relatively constant.
- Surface runoff varies depending on the amount of precipitation falling at a given time, as well as recent precipitation patterns. Early in the season, runoff may initially soak into the dry ground instead of running off through the channel. Once soil becomes saturated, the amount of runoff increases.

Water is not Where we Need it When we Need it

- Managing water supply along the Salinas River is challenging due differences in when water is naturally present (during the winter) and when it is generally needed for irrigation (during the dry season).
- Some believe that water that reaches the ocean is "wasted." This includes a considerable amount of stormwater runoff, which could be captured if we implemented projects designed to do so.

What Does this Mean for the LTMP?

- Understanding how water moves throughout the study area (above and belowground) is critical to meet the goals of the LTMP and GSPs. Development of the Salinas Valley Integrated Hydrologic Model will support this need.

Regulations are Expected to Drive Management for Improved Water Quality

- Groundwater quality is a concern. The Seaside, 180/400 Foot Aquifer, and Eastside subbasins are affected by seawater intrusion; the 180/400 Foot Aquifer and Eastside subbasins are affected by elevated nitrate and organic compounds from agricultural runoff, and the Upper Valley subbasin is affected by large dissolved solids (sulfate). The GSPs are required to address groundwater pollution.
- The Central Coast Regional Water Quality Control Board (Regional Board) is in the process of developing the region's next Agricultural Waiver, with a targeted adoption date of March 2020. Based on an analyses of surface water and groundwater data and trends in water quality status, Regional Board staff have concluded that, overall, water quality objectives are not being achieved and beneficial uses are not being protected in many agricultural areas of the Central Coast, primarily due to the impacts from agricultural discharges (Central Coast Regional Water Quality Control Board 2018 [Staff Report]).

What Does this Mean for the LTMP?

- Separate from the LTMP, both the development of GSPs and the future renewal of the Agricultural Waiver (Ag Waiver 4.0) will drive actions to improve ground and surface water quality. Projects implemented in support of the LTMP may be subject to these new requirements.

We Don't Know what "Natural" Means… and It's Probably No Longer Possible or Desirable

- Many people have expressed a desire for the river to operate more naturally.
- Historical accounts indicate "the river corridor consisted of a sandy active channel with little vegetation, bordered in many places by extensive stands of riparian thicket and forest. Above the riparian corridor, multiple terraces (i.e., abandoned floodplains) of different elevation and extent corresponded to different inundation frequencies and had different plant communities" (San Francisco Estuary Institute 2009).
- The primary drivers for a river's physical structure are its hydrology and its sediment supply. Prior to the construction of major reservoirs and diversion, the Salinas River experienced a dynamic system where seasonal high flows regularly scoured the sandy bars and channel bottom, transporting sediment and creating a wide and largely bare channel bed. Today, the operations of the Nacimiento and the San Antonio reservoirs have reduced peak flows, increased summer flows, and reduced the amount of sediment moving through the system. This has led to, among other things, establishment of vegetation on sand bars and the channel bottom.

What Does this Mean for the LTMP?

- Returning to this "natural" state of the 1700 and 1800s is no longer possible due to conversion of riparian corridors to agricultural fields and population growth that has driven a need to manage the river for flood control. However, a "naturalized" management approach, particularly

regarding reservoir releases, could help reestablish some of the historical Salinas River characteristics while still meeting flood control needs.

There is Support for Recreation throughout the Salinas River Watershed

- LTMP stakeholders have expressed a desire to maintain access for recreation on public lands, including the Salinas River Lagoon.
- Nacimiento and San Antonio Reservoirs provide recreation opportunities such as boating and camping.

What Does this Mean for the LTMP?

- Projects implemented in support of the LTMP should consider potential impacts on recreation.