MEMORANDUM

Montgomery & Associates
Castroville & Eastside Canals and Alternatives Study – 1447-0005

Date: October 9, 2025

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Montgomery & Associates

From: Greg Hulburd, P.E., Travis Vazquez, P.E.
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Subject: Castroville & Eastside Canals Study –
Project Evaluation Considerations

This memorandum identifies potential project components and describes preliminary technical considerations for subsequent evaluation of projects under Phase 2 of the Salinas Valley Groundwater Sustainability Agency's (GSA) Castroville and Eastside Canal Study and Alternatives project. The project considers use or modification of the Monterey County Water Resources Agency's (MCWRA) Permit 11043 or other river diversion options as a water supply source to advance groundwater sustainability goals for the GSA within the 180/400-Foot Aquifer (180/400), Eastside Aquifer (Eastside), and Langley Area (Langley) Subbasins. The Castroville and Eastside Canals and Alternatives Study is a multi-phased study; Wallace Group's scope of work in Phase 1 includes the following components:

- Historical documents review
- Summarize potential project components and technical considerations

Future phases of the project will include project concept definition(s), screening, pre-feasibility evaluation of project options, and feasibility evaluation(s) of the highest ranked project alternatives.

This memorandum focuses on a summary of findings resulting from Wallace Group's review of historical documents and information regarding availability of flow and water rights through the analyses performed by Montgomery & Associates and MBK Engineers, respectively. In addition, it summarizes technical considerations for each of the main components of a project.

The list of potential projects has been compiled from previous concepts identified in historical documents and studies of the Salinas Valley groundwater basin. Wallace Group has reviewed the following documents (ordered chronologically):

1. DWR (California Department of Water Resources). 1946. *Salinas Basin Investigation Summary Report*, Bulletin No. 52-B.

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2. SWRCB (State Water Resources Control Board). 1956. *Salinas River Basin Investigation, Bulletin No. 19*. February 1956.
3. MCFC&WCD (Monterey County Flood Control & Water Conservation District). 1968. *Investigation of an Eastside Canal Project, Salinas Valley*.
4. Boyle Engineering Corporation. 1991. *Water Capital Facilities Plan*. Volumes 1 and 2. July 1991.
5. EDAW. 1998. *Draft Master Environmental Impact Report for the Salinas Valley Water Project* (preliminary draft).
6. EDAW. 2001. *DRAFT Environmental Impact Report/Environmental Impact Statement for the Salinas Valley Water Project*. SCH #2000034007. June 2001.
7. RMC Consulting Engineers. 2003. *Salinas Valley Water Project Engineer's Report.* To Support and Assessment for the Salinas Valley Water Project of the Monterey County Water Resources Agency. January 2003.
8. MCWRA (Monterey County Water Resources Agency). 2005. *Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River*. October 11, 2005.
9. GEOSCIENCE. 2013. *Protective Elevations to Control Sea Water Intrusion in the Salinas Valley, CA*, Technical Memorandum. Prepared for Monterey County Water Resources Agency. November 19, 2013.
10. SWRCB (State Water Resources Control Board). 2013. *Right to Divert and Use Water Permit 11043*.
11. MCWRA (Monterey County Water Resources Agency). 2014. *Salinas Valley Water Project, Phase II – Timeline of Relevant Events*.
12. MCWRA (Monterey County Water Resources Agency). 2014. *Notice of Preparation Salinas Valley Water Project, Phase II.*
13. MCWRA (Monterey County Water Resources Agency). 2017. *Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin*. Special Reports Series 17-01. October 2017
14. SVBGSA (Salinas Valley Basin Groundwater Sustainability Agency) and M&A (Montgomery & Associates). 2022. *Salinas Valley Groundwater Basin Eastside Aquifer Subbasin Groundwater Sustainability Plan.* January 2022.
15. SVBGSA (Salinas Valley Basin Groundwater Sustainability Agency) and M&A (Montgomery & Associates). 2025. *Preliminary Feasibility Study Aquifer Storage and Recovery Project Concepts to Address Seawater Intrusion*. January 2025.
16. Salinas Basin Water Alliance. 2025. *Salinas River Pipeline Alternatives.*

Background

Beginning with the 1946 Bulletin 52 from the California Department of Water Resources (DWR), there have been numerous studies and projects proposed for alleviating the dropping groundwater levels and mitigating seawater intrusion in the Eastside and 180/400 Subbasins of the Salinas Valley.

The scope of projects being considered in this study focuses on projects that utilize the existing water right permit held by MCWRA, Permit 11043. This permit authorizes diversions on the Salinas River at two locations, referred to as the Castroville and Eastside Canal intake locations. In addition, the study also considers other project concepts that would divert excess flow from the Salinas River that has not previously been stored in the Nacimiento or San Antonio Reservoir.[1]

Projects proposed in the historical documents reviewed, which focus on surface water diversions from the Salinas River, are summarized in a table provided in Attachment 1. The table excludes Phase 1 of the Salinas Valley Water Project (Salinas River Diversion Facility) as that project has been constructed and relies upon re-diversion of stored water from MCWRA's Nacimiento and San Antonio reservoirs. Similarly, other projects including previously proposed dam sites on tributaries to the Salinas River and water conservation programs are not evaluated as part of this study. Attachment 1 provides information from the documents for the following components for each project:

- Estimated Annual Yield, Acre-Feet
- Diversion Location
- Diversion Method
- Diversion Capacity
- Conveyance Method
- Storage
- Storage Capacity
- Treatment Requirements

Attachment 2 provides a visual overview of the previous project concepts as well as the permitted points of diversion and other points of interest.

Permit 11043 Utilization

Permit 11043 authorizes a maximum diversion rate of 400 cubic feet per second (cfs) and a total annual diversion volume of 135,000 acre-feet per year (afy) at two defined diversion locations for irrigation and municipal beneficial uses. The permit constrains diversions through establishment of minimum flow thresholds set for each month that must be met at the Salinas River at the Eastside Canal intake (near the USGS Salinas River near Soledad gage station) whereby diversions are only allowable when natural flows (i.e., total river flow less reservoir release flows) exceed these minimum thresholds. In-depth discussion of the

[1]Non-stored water includes water from upstream reservoirs that has been stored for less than 30 days.

existing Permit 11043 history and constraints are provided in separate reports by MBK Engineers.[2,3]

Under the existing permit constraints, any project will be limited in scale due to the following:

1. Generally, water is available to be diverted between January – April based on Montgomery & Associates' (M&A) historical flow analysis.[4]
2. Storage of diverted water for more than 30-days is not allowed under the existing permit.

Generally, there is little to no agricultural irrigation during the winter months with demand dependent on availability of seasonal precipitation to satisfy crop demand. Intuitively, there would be an inverse relationship between days when water is available to be diverted, and days that require irrigation, as the river will have its highest flows following storm events when growers will not be irrigating.

Key Conclusions

The Phase 1 study revealed the following significant findings related to infrastructure requirements:

1. **Without storage, the project will be limited by end user demand.** The historical flow analysis showed flows are available for diversion under Permit 11043 primarily from January – April, and on average less than 40% of the days within this period. This average availability represents less than 15% of the time throughout the year (the average number of days with flows available for diversion were 46 days at Soledad and 42 days at Chualar). Note that excess flows have large year-to-year variation; the statistics are outlined in detail in the historical flow analysis. In addition, it is expected that there will be little to no agricultural irrigation demand during the January to April period, leaving municipal demand as the primary potential on-demand end use. Municipal use would trigger the need for treatment to drinking water standards, adding expense and complexity to the project. Although the agricultural growing season remains active during winter in the Salinas Valley, these months experience the highest rainfall and lowest crop evapotranspiration rates. Irrigation needs, if any, will be minimal and highly sporadic as the timing will be dependent on unpredictable storm patterns. Lastly, Permit 11043 does not allow for water to be stored for more than 30 days, which limits the ability to use this water after April when irrigation water demands increase.
2. **A consistent theme in the previously proposed projects is diverting water from the Salinas River and conveying it to the subbasins in overdraft**, the Eastside and 180/400 Subbasins, either for in-lieu use or direct recharge to alleviate overdraft and

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[2]MBK Engineers, 2025. *History of Water Rights – A013225 (Permit 11043), A032263C, A032263D, and A032263E*.
[3] MBK Engineers, 2025. *Evaluation of Salinas River Water Rights and Alternatives.* (under development)
[4] Mongomery & Associates, 2025. *Task 5a – Historical Salinas River Flow Analysis*, Technical Memorandum. (under development)

mitigate seawater intrusion. Excerpts from a subset of these studies are included in Attachment 3a.

3. **Diversion Facility:** Multiple methods of diversion have been proposed in the historical documents. It is anticipated that the following three factors will be the biggest drivers in selecting a diversion method:
    a. Diversion Flow rate
    b. Environmental constraints
    c. Cost
4. The unpredictability and seasonality of the flows available for diversion under Permit 11043 creates operational and planning difficulties, such as scheduling water deliveries, developing agreements with end users, and supplying a stable flow needed for efficient treatment operations.
5. Several of the historical projects are near duplicates; evaluating each separately would be redundant. Therefore, this memorandum drew upon the historical projects to identify various options for key components of a conceptual Salinas River diversion project. Considerations and constraints are provided for each component.

Future Phases Conceptual Project Development Approach

There are several potential project components and factors to consider as part of the project evaluation. Figure 1 organizes these options into a component consideration framework. The intent of this graphic is not to provide a comprehensive list of all factors related to this project evaluation, but rather to organize the key project alternatives in a logical way to understand the options and how various project components are inter-connected. Each option will have unique considerations; these considerations are summarized in tables in the following sections. Additionally, a discussion section is included following the table, where needed, to elaborate on some key considerations.

The potential project components are split into three primary categories:

1. Diversion
2. Conveyance
3. End Uses

Each category includes a dedicated section to provide basic background and context for each option, followed by the outline of considerations. These considerations are based on Wallace Group’s review of the historical documents, discussions with the project team, and engineering experience. The intent is to provide high-level, preliminary engineering guidance in preparation for project selection/evaluation in future phases.

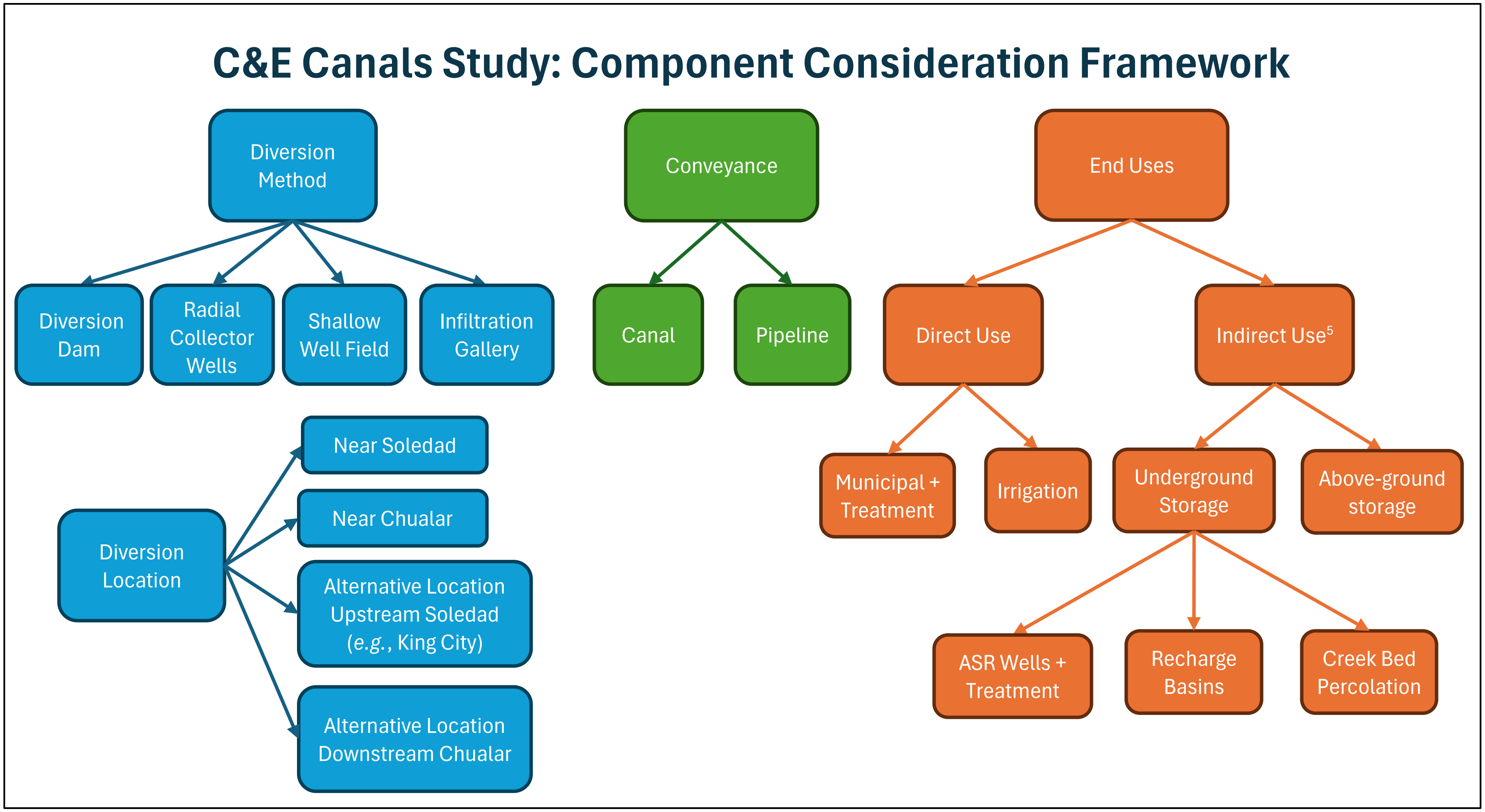

Figure 1. Infrastructure Component Consideration Framework.[5]

[5]The graphic is simplified being that under indirect use, the extraction after storage and final beneficial use is not shown for each option. This is discussed further in a later section.

Diversion

Four primary diversion methods have been proposed in the historical conceptual projects. All diversion concepts will require pumping, as there were no suitable gravity diversion sites identified in the studies. The list includes one surface diversion method (diversion dam) and three sub-surface methods.

- **Diversion Dam** – it is envisioned that the diversion dam would utilize the same configuration as the existing Salinas River Diversion Facility (SRDF), completed in 2010 approximately five miles upstream of the ocean. The facility consists of:
    - An adjustable spillway gate operated via an inflatable bladder (*i.e.*, Obermeyer Gate also known as rubber dam/inflatable dam)
    - A screened intake to the diversion pump station
    - A bypass fishway for fish passage during migration periods which coincide with stream diversions
- **Radial Collector Wells** – also known as Ranney collector wells. A radial collector well consists of a central concrete caisson, typically 16 feet in diameter, installed adjacent to the river. The caisson is excavated to a target depth (previous studies have identified 40 feet), from which well screens are projected out laterally in a radial pattern beneath the riverbed. The wells are designed to maximize the yield per well by maximizing the screened length with multiple laterals as well as leverage the natural filtration provided via the riverbank.
- **Shallow Well Field** – first identified in the 1946 DWR Bulletin 52, this concept is to utilize multiple shallow wells, drilled to an average depth of 200 feet, next to the river. Previous studies identified a location in the Forebay subbasin about three miles southeast of Soledad.
- **Infiltration Gallery** – The configuration consists of screened pipes installed beneath and perpendicular to the river channel using traditional open-trench construction methods. The trenches for the perforated pipes would be backfilled with coarse granular material to improve permeability and induce surface water flow into the system. The perforated pipes from several infiltration galleries would be connected to a common manifold for collection and gravity conveyance to a pumping station located at the downstream end of the infiltration galleries.

Additionally, several diversion locations have been proposed in the previous studies.

- **Near Soledad** – for purposes of this memorandum, this is the name assigned for the location consistent with the point of diversion for the “Eastside Canal Intake” defined in Permit 11043. It is located approximately three miles southeast of Soledad, at a point where the Salinas River changes direction from the east side of the valley toward the west. This location is consistent with the following historical documents reviewed:
    - 1946 Bulletin 52, DWR
    - 1968 Investigation of an Eastside Canal Project, MCFC&WCD
- **Near Chualar** – for purposes of this memorandum, this is the name assigned for the location consistent with the point of diversion for the “Castroville Canal Intake” defined in Permit 11043. It is located approximately halfway between the town of Spreckels and Spence Road.

  - We note that the coordinates defined in the water right permit indicate a location approximately 1,200 feet north of the riverbank.
  - Three conceptual projects from the historical documents were found to have diversions in this vicinity, within a few miles of the location defined in Permit 11043. These locations were not considered separate options for this analysis; the primary considerations will be the same as for the "Chualar" location. The following historical documents include diversion locations near this point:
    - 1991 Water Capital Facilities Plan, Boyle Engineering – Project #31 East Side Irrigation Water Supply Project. The diversion location identified in this report is about 2.4 miles upstream from the 11043 Permit location.
    - 1998 SVWP Draft Master EIR, MCWRA. Located about 3.5 miles downstream from the 11043 permit location.
    - 2022 Eastside Subbasin GSP, SVBGSA– Project C1 Eastside Irrigation Water Supply Project. Same location as Project #31 from the 1991 Water Capital Facilities Plan, but with a smaller scale diversion utilizing shallow wells rather than a surface diversion.
- **Alternative Location Upstream of Soledad (*e.g.*, King City).** This category is a catchall for several of the alternative locations identified which are not consistent with the two diversion locations defined in Permit 11043. Previous locations identified include:
  - 1956 Bulletin 19, SWRCB – envisioned a diversion approximately three miles downstream of San Lucas. Included two alternatives – the first designed on the assumption that San Lucas Reservoir was constructed, a dam envisioned on the Salinas River to create a new 225,000 acre-feet reservoir. The second alternative assumed a diversion in the same location without construction of the San Lucas Reservoir.
- **Alternative Location Downstream of Chualar**. This category is another catchall for any potential diversion location downstream of the Chualar location. Although Wallace Group's review of historical project concepts did not identify any locations in this category, it is included in this memorandum for the sake of completeness.

Figure 2 shows the component consideration framework associated with the diversion along with summarized versions of Tables A.1 and A.2. Tables A.1 and A.2 summarize the detailed considerations of each component shown in Figure 2, with variations of the component along the top, and their respective considerations along the left side of the table.

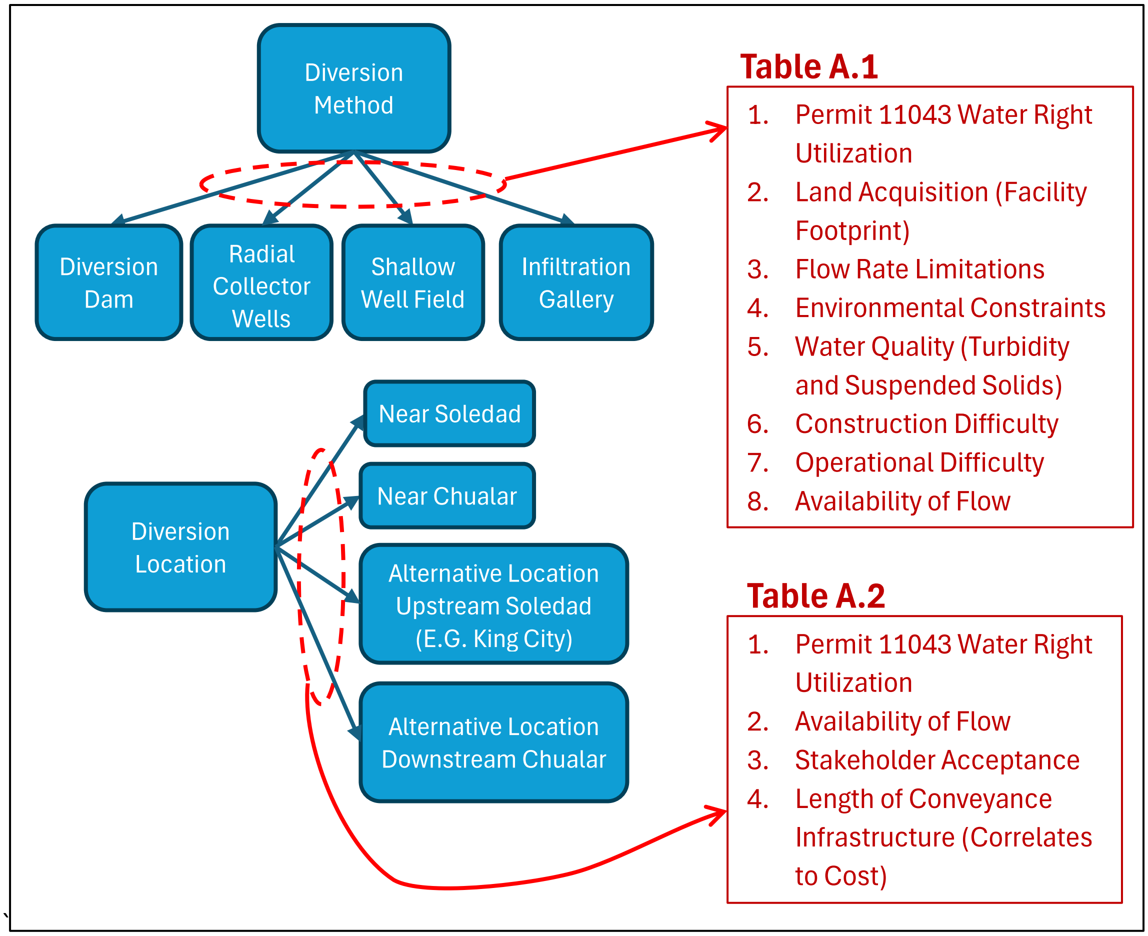

Figure 2. Diversion Component Consideration Framework.

Table A.1. Considerations for diversions.

Table A.1 Diversion Methods				
	Diversion Dam*	**Radial Collector Wells**	**Shallow Well Field**	**Infiltration Gallery**
Permit 11043 Water Right Utilization	Common diversion method that is compatible with the permit.	It is assumed that the radial collector wells are a surface water diversion method, and thus compatible with the permit.	It is assumed that the shallow wells are a surface water diversion method, and thus compatible with the permit.	Common diversion method that is compatible with the permit.
Land Acquisition (Facility Footprint)	Footprint for the diversion dam and pump facility itself is the smallest of all options. Additional riparian land will be impacted due to the river water impoundment; the size of this area will be site specific depending on dam elevation and upstream terrain.	Per the 2001 SVWP EIR, assumed 3.3 cfs per collector well. For 80 cfs, 24 wells spaced over 4.3 mi (3.3 cfs per well, spaced 1,000' apart).[6] As the diversion size increases, the land required increases.	Historical documents with the Forebay well field diversion concept (1946 Bulletin 52, 1968 East Side Canal) did not include drawdown tests or estimations of area needed for well fields. Spacing not specified.	Considerations are similar to those of the radial collector wells.
Flow Rate Limitations	Well suited for high diversion flows. Less space required compared to other options. The dam footprint will largely remain the same regardless of diversion flow. The size of the pump sump and associated facilities can scale up or down. There are many examples of river surface diversions capable of 400+ cfs in California.	Highly dependent on the site-specific subsurface conditions which will determine yield per well. Better suited for low diversion flows, assuming 3.3 cfs per well as identified in a 1998 study. Projects at other locations (not on the Salinas River) have indicated much higher flow rates per well (e.g., 6 to > 20 cfs per well).	Highly dependent on the site-specific subsurface conditions which will determine yield per well.	Considerations are similar to those of radial collector wells.

[6] The 1998 preliminary draft EIR references a study, *Draft Project Plan, Salinas Valley Water Project* (MW & RMC, 1998) which developed borings to investigate the feasibility and hydrologic parameters associated with the proposed location. Wallace Group has not obtained a copy of this report.

Table A.1 Diversion Methods				
	Diversion Dam*	**Radial Collector Wells**	**Shallow Well Field**	**Infiltration Gallery**
Environmental Constraints	Most difficult. Construction will be invasive to the riverbed and require a temporary river diversion. During operation, a water impoundment area will be created upstream.	Minimal impact in the riverbed – temporary river diversion not needed during construction.	Minimal impact in the riverbed – temporary river diversion not needed during construction.	Construction will be invasive to the riverbed due to trenching and require temporary river diversions. During operation, river will be undisturbed.
Water Quality (Turbidity and Suspended Solids)*	Worst, raw river water does not receive any natural filtration.	Good, river water is naturally filtered through the riverbank filtration.	Best, assuming proper screening and well development.	Receives less filtration than radial collector wells, more than diversion dam.
Construction Difficulty	Highly specialized	Highly specialized	Less specialized; conventional well construction methods	Less specialized; conventional construction methods
Operational Difficulty	Due to diversions occurring over winter, this facility type involves the most complexity. Further study is needed on how practical it would be to operate this dam during winter without increasing upstream flood control levels .It may not be feasible to operate a diversion dam at any point during the winter.	Backwashing needed every 1 to 5 years per the 1998 SVWP Draft EIR. This period is highly dependent on water quality.	Least complex.	Considerations are similar to those of radial collector wells.
Availability of Flow*	More flow will be available for diversion during high river flows due to the buffer capacity/regulation from the water impoundment created by the dam.*	Neutral – facility would capture excess flows on days when bypass requirements are met.	Neutral – facility would capture excess flows on days when bypass requirements are met.	Neutral – facility would capture excess flows on days when bypass requirements are met.

*See discussion section for more information.

Discussion – Diversion Method

Additional discussion is included related to cost, diversion dams, water quality, and availability of flow.

Cost: While cost is a key consideration, Table A.1 does not include a row for cost; the cost will be highly variable depending on the factors outlined in the technical considerations. Relative cost for the four methods cannot be directly compared without defining the project further. Diversion size will be a key factor; for example, relatively small diversions may favor the radial collector wells for cost. However, larger flow rates may require an unreasonable number of radial collector wells, increasing the facility footprint/land acquisition, which then could cause the diversion dam to be a more cost-effective option. Additionally, the water yield for the sub-surface diversion methods, and thus the quantity of facilities needed, will be dependent on local site conditions which are unknown at this time.

Diversion Dam: Conceptual projects in previous studies, as well as the existing SRDF, have all included the combination of a diversion dam along with an intake pump station. It is presumed that a diversion dam has been necessary due to the shallow and even periodically dry nature of the Salinas River driving the need to build up the water level and create a consistent pool from which the intake pumps can pull , which also provides buffer capacity (discussed in the following section). However, another potential concept that may be worth investigating is constructing a screened intake and pump station without the use of a diversion dam. This idea stems from the fact that the permit constraints and historical flow analysis showed that diversion will only be available primarily from January-April, when flows in the river are high enough to satisfy the Permit bypass requirements. Because this period coincides with higher river flows (and river water levels), it may be feasible to build a river diversion pump station that does not need a diversion dam to raise the river water level.

Water Quality: Water quality as referred to in Table A.1 refers to turbidity and suspended solids of the diverted water. Essentially, this compares how much natural filtration is received from the underlying sediments. The subsurface collection methods benefit from this natural filtration while the surface diversions do not. Turbidity will be a factor when considering the need for downstream treatment processes (*e.g.*, coagulation, flocculation, sedimentation, and filtration). Water with high turbidity is more likely to cause issues with clogging ASR wells, reducing the infiltration rate of recharge basins, reducing capacity in surface reservoirs (silting) and requiring pre-treatment for direct use. This consideration does not address any potential dissolved constituents that exist in the aquifer (*e.g.*, nitrate). Site specific water quality investigations are required to evaluate potential contaminants.

Diversion dam, availability of flow: The diversion dam configuration provides a unique benefit in that it creates a small regulating reservoir/impoundment upstream of the dam. During high flows which are above the capacity of the diversion pump station, this regulating reservoir provides an opportunity to capture some of these peak flows that would have otherwise passed by. As an example, if there was a 48-hour period during which the river flow rate was 20 cfs higher than what could be captured from the diversion pumps, an 80 acre-foot regulating reservoir would be able to capture this water during the peak, allowing for diversion of this regulated water after the peak passes. The magnitude of this additional water captured would depend on:

- The scale and timing of these fluctuations in the river flow rate, and how this matches up with the diversion pump station capacity.
- Volume of buffer storage offered by the water impoundment.

In practice, the actual operations of an inflatable dam are complicated due to the fact that it will be operating during the winter, the high flow period when diversion dams, such as the SRDF, are retracted to prevent damage. Typically, an inflatable river diversion dam would be in operation during lower flow periods. Further investigation is needed into how the dam would operate in conjunction with maintaining flood capacity. **It may not be practical to operate a diversion dam at any point during the winter due to the need for maintaining flood capacity in the river.**

Availability of Flow: The potential project and its associated benefits/yield are dependent on other projects in the basin. This factor is not specific to any particular diversion method but rather applies to all options under consideration. The historical flow analysis conservatively did not include the winter flood releases when estimating the diversion flow available; however this could be a significant volume. Any future analyses that may account for the winter flood releases should also consider potential changes to those flows due to other proposed projects currently being developed as well as modeled future climate change projections.

Diversion Location

Table A.2. outlines the considerations for diversion location.

Table A.2. Considerations for diversion location

Table A.2 Diversion Location				
	Near Soledad	**Near Chualar**	**Alternative Location Upstream of Soledad (e.g. King City)**	**Alternative Location Upstream of Chualar**
Permit 11043 Water Right Utilization	Consistent with Permit 11043 point of diversion location.	Consistent with Permit 11043 point of diversion location.	Requires a Petition for Change, which allows for a protest process.	Requires a Petition for Change, which allows for a protest process.
Availability of Flow	The M&A historical flow analysis showed that approximately the same amount of flow is available at Soledad and Chualar for diversions less than 200 cfs. For larger diversions, there is slightly more flow available at Chualar due to Arroyo Seco River inflows.		Uncertain, the Petition for Change process would likely include review and possible re-evaluation of the bypass flow requirements.	Uncertain, the Petition for Change process would likely include review and possible re-evaluation of the bypass flow requirements.
Stakeholder Acceptance	Unknown	Unknown	Moving the diversion point upstream is likely to be a contentious issue as more water users are potentially impacted.	Moving the diversion point downstream is expected to be less contentious than moving it upstream, as it is not increasing the number of impacted water users.
Length of Conveyance Infrastructure (Correlates to Cost)	Approximately 2.5 times longer than the Chualar diversion, assuming termination point east of Salinas.	Shortest length. Conveyance lengths for the other diversion locations are compared to this one.	Approximately 10 times longer than the Chualar diversion, assuming termination point east of Salinas.	Specific location not identified, but conveyance length for this option is expected to be similar to the Chualar diversion, assuming termination point east of Salinas.

Conveyance

Any conceptual project is likely to include large conveyance facilities in the form of either an open-channel canal or buried pipeline from the point of diversion to the place of use. Previous studies which include a canal as the means for conveyance include:

- 1946 Bulletin 19, DWR
- 1956 Bulletin 52, SWRCB
- 1968 Investigation of an Eastside Canal Project, MCFC&WCD

Previous studies which proposed a pipeline for conveyance include:

- 1991 Water Capital Facilities Plan, Boyle Engineering: Project #31 East Side Irrigation Water Supply Project
- 1998 SVWP Draft Master EIR, EDAW
- 2022 Eastside Subbasin GSP, Project C1 31 East Side Irrigation Water Supply Project

Options and considerations for selecting an alternative are illustrated in Figure 3 and summarized in Table B.1.

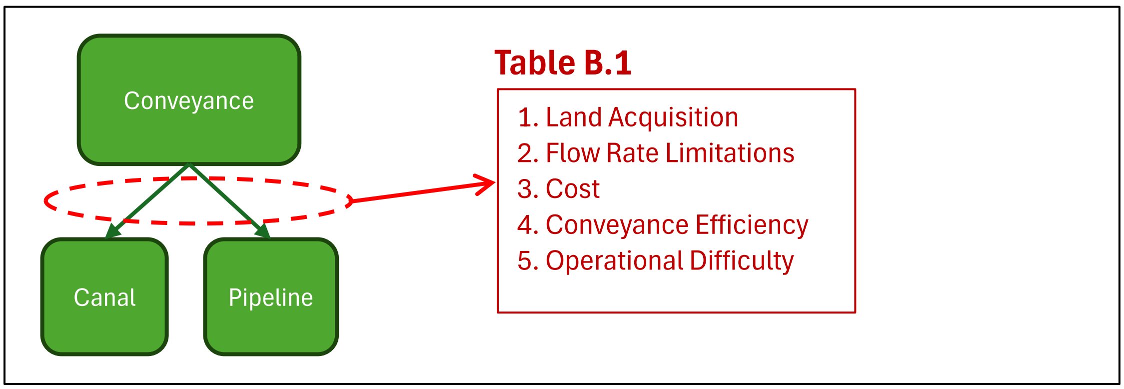

Figure 3. Conveyance Component Consideration Framework.

Table B.1 Considerations for pipelines vs. canals

Table B.1 Conveyance		
	Pipeline	**Canal**
Land Acquisition	More feasible. Portions of the pipeline could be constructed within county/city roads (*i.e.*, public right of way). In other areas, land rights would be easier to obtain; an easement for buried pipe would prevent agricultural land from being taken out of production. However, easement negotiations would potentially involve dozens of landowners. A pressurized pipeline would allow more flexibility for the alignment routing; the pipeline would not need to strictly follow the terrain to achieve a steady downhill slope, as a canal or gravity pipeline would.	Expected level of difficulty, duration, and cost of land acquisition process anticipated to be more than that for a pipeline. Acquiring land and constructing a canal will cause prime farmland to be taken out of production. This process would involve negotiations with dozens of landowners with potential to add time and complexity.
Flow Rate Limitations	Will likely be cost prohibitive at higher flow rates, perhaps > 100 cfs (assuming > 60 inch pipe is cost prohibitive). Economic analysis is needed.	Scalable up to any flow rate.
Cost	Higher capital cost, lower operations and maintenance (O&M) costs.	Lower capital cost, higher O&M costs (operating canal control structures, vegetation control, lining, rodent management, etc.)
Conveyance Efficiency	Minor losses associated with breaks or leakage.	Will experience seepage and evaporation loss (although seepage loss may provide benefit as a mechanism for groundwater recharge in areas without the Salinas Valley Aquitard) .
Operational difficulty	Potential for on-demand water delivery with a pressurized pipeline system, adding flexibility for water users and potential energy savings.	Less flexibility for water deliveries and higher level of effort operationally for scheduling deliveries and operating the canal to match demand.

End Uses

The third category of the component consideration framework is end use. This section addresses what happens to the water after it is conveyed (*i.e.*, how the water will be used whether for immediate direct use for irrigation or municipal purposes or indirect use requiring storage and later extraction). This is the most complex component of the framework as there are many sub options and decision levels. Additionally, for simplification the framework does not capture the final end use (extraction) under each option.

Under the indirect use branch, it is assumed that the end use is storage, without necessarily accounting for extraction that would occur after storage. For considerations of final end use which would occur after extraction of the stored water, refer to the municipal versus irrigation uses presented in Table C.2.

Most of the historical projects featured a mix of direct agricultural use along with some form of groundwater storage/recharge. Unlike the current constraints regarding the seasonality of available diversion flows, most of the previous conceptual projects were focused on diversion during the irrigation season, to be used for irrigation purposes.

Options for **direct use** are split into municipal and agricultural. Direct use is considered in-lieu groundwater recharge, as the surface water provides an alternative source of water to users who would otherwise be extracting groundwater.

Options for **indirect use** are split into underground (aquifer recharge) and above ground (surface reservoir).

Above-ground storage/surface reservoirs in this context refer to large reservoirs for long-term and seasonal water storage. Smaller regulating reservoirs (buffer reservoirs, balancing reservoirs, or operational storage) will likely be needed for nearly all end use options to absorb the daily differences in diversion flow versus end use demands, but do not constitute storage as long as residence time is 30 days or less.

Aquifer storage and recovery (ASR) wells include direct injection of the diverted water through ASR wells, which may also serve as the extraction wells during groundwater recovery. For more information, refer to the preliminary feasibility study on ASR wells to address seawater intrusion, published in January 2025.[7]

Due to injection well requirements, ASR wells typically require treatment to drinking water standards per the SWRCB Water Quality Order 2012-0010. This requirement drives the need for a water treatment plant. However, one program in the state, known as the Ag-ASR program implemented in the Westlands Water District, injects surface water through several Ag-ASR wells where treatment is limited to sand media filtration and chlorination at each wellhead. This program presents a more cost-effective solution than constructing a new water treatment plant

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[7] SVBGSA (Salinas Valley Basin Groundwater Sustainability Agency) and M&A (Montgomery & Associates), 2025. *Preliminary Feasibility Study Aquifer Storage and Recovery Project Concepts to Address Seawater Intrusion*. January 2025.

that treats to drinking water standards. The Ag-ASR program is approved by the Central Valley Regional Water Quality Control Board (CVRWQB) and is subject to strict monitoring and reporting requirements to ensure it is not degrading water quality and affecting nearby municipal and industrial wells.

Recharge basins are basins which receive diverted surface water dedicated to percolation into the underlying aquifer. The area needed for a recharge basin may require taking farmland out of production. One option to consider, which would avoid the need for dedicated land for recharge basins, is direct spreading onto working agricultural fields (active farms). This practice requires coordination with participating landowners and would only be suitable for certain crops and growing practices. Although the Salinas Valley has nearly a year-round growing season, this may be a favorable option for growers who could modify practices for certain years to accommodate this recharge method (such as fallowing or forgoing double-cropping) rather than permanently taking farmland out of production. Crop compatibility for the prolonged saturated conditions during the wet season must be further investigated.

Creek bed percolation refers to releasing diverted water directly into natural stream channels to percolate and provide groundwater recharge. This concept would likely be used in conjunction with other end uses/facilities; it could be achieved by providing turnouts from the pipeline/canal at creek crossings to take advantage of natural creek beds for use as recharge facilities. As Permit 11043 diversion flows are likely only available during the winter, the diversion timing may be problematic as the creeks will likely be flowing over this period. Several of the historical studies include this concept; excerpts are provided in Attachment 3b.

The component consideration framework and technical considerations for end uses are shown in Figure 4.

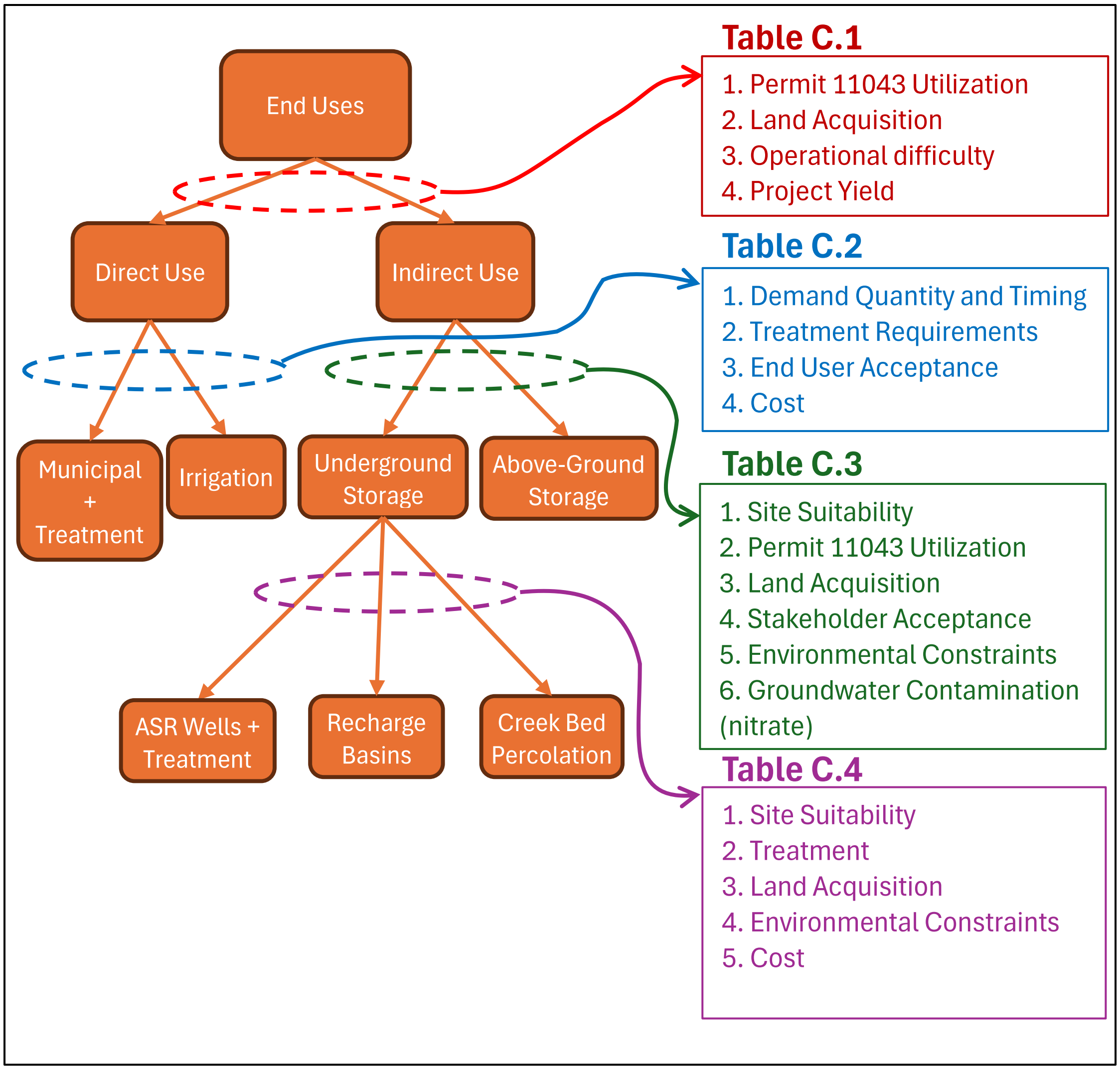


Figure 4. Component Consideration Framework for end uses along with their considerations.

Table C.1 summarizes the technical considerations for direct use versus indirect use.

Table C.1 End Uses

Table C.1 End Uses		
	Direct Use	**Indirect Use**
Permit 11043 Water Right Utilization	Consistent with the purposes of use defined in the water right.	Requires storage – this triggers a permit change to the type of right/method.
Land Acquisition	Less land is needed than most storage options in the indirect use category. Will likely need smaller buffer reservoirs to handle daily supply fluctuations (not for seasonal storage).	Highly dependent on sub-category choices (see Table C.3 and C.4). A surface reservoir for seasonal storage will require the most land, followed by recharge basins. Recharge basins can consist of multiple smaller basins, making land acquisition more feasible.
Operational Difficulty	Coordination needed for the fluctuating diversion flows and matching with demand.	Generally, simpler operationally to divert to storage.
Project Yield*	Very limited without seasonal storage due to low demand during the wet season.	Higher yields available with seasonal storage to make up for low demand during the wet season.

*See discussion section for more information.

Discussion – End Uses

Project Yield: To achieve significant yield during winter when diversion flows are available, additional storage is needed to seasonally hold water until demand increases; demand under direct use only will be limited. This storage can be either in the form of surface reservoirs or groundwater storage/banking.

Direct Use

Table C.2 summarizes the technical considerations for the direct use options.

Table C.2 Direct Use

Table C.2. Direct Use		
	Municipal + Treatment	**Irrigation**
Demand Quantity and Timing*	Without seasonal storage, it is assumed that municipal use is the only option for direct use. Municipal/urban water use makes up less than 10% of groundwater extractions in the Salinas Valley.	Diversion flows are available during the winter, when there will be little to no irrigation occurring. Without seasonal storage, it is assumed that agricultural use of the diversion water will be impractical.
Treatment Requirements*	New treatment plant required to meet drinking water standards. The complexity/level of treatment may differ depending on diversion type.	No additional treatment is required from a regulatory standpoint. Each grower will have different needs dependent on irrigation methods and practices as well as water quality from the river (filtration, fertigation, etc.). The diversion method will affect the water quality as described in Table A.1. Additionally, disinfection requirements for irrigating leafy greens is another consideration which will be addressed in future phases.
End User Acceptance*	Due to the unpredictability and variability of diversion flows, it may be difficult to partner with municipalities.	No issues foreseen for use as agricultural supply; acceptance driven by cost of this source.
Cost	The need for water treatment will make this option more expensive.	Lower cost.

*See discussion section for more information.

Discussion – Direct Use

Additional discussion is provided below regarding demand quantity and timing, treatment requirements, and end user acceptance.

Demand Quantity and Timing:

According to the 2024 Groundwater Extraction Summary Report,[8] which captures data from wells with discharge pipes over 3-inches in diameter, agricultural pumping makes up 90.8% of groundwater extractions in the Salinas Valley, with municipal pumping making up the remaining 9.2%. The urban extractions by City or Area are included below as Table 1 Figure 5. Note that the seasonality of the demand must be kept in mind; the urban pumping volume is summarized

[8] MCWRA (Monterey County Water Resources Agency), 2025. *Groundwater Extraction Summary Report.* June 2025.

in annual acre-feet per year; only a fraction of this demand will occur when diversion flows are available January-April. The average flow for diversion (cfs) column is useful for a direct comparison to diversion flow rates being contemplated.

Depending on the number of municipal end users and their demand, it is likely that the total municipal delivery demand would be less than the target diversion flow rates (*i.e.*, there may not be sufficient municipal demand to justify diversions of 30 cfs or higher – unless a long-term storage facility is possible).

Additionally, the distance between the urban areas is significant and will be a factor driving the cost of supplying more than one of the urban areas listed. For instance, Soledad is 25 miles southeast of Salinas. Other cities such as Greenfield and King City are further upstream than the two Permit 11043 diversion points, as well as outside the target sub basins. Although more demand could theoretically be collected by supplying diverted water to several of the urban areas, the most economical option is likely targeting Salinas (highest urban water use area) and adjacent surrounding areas.

Table 1. 2024 Urban groundwater extractions by city/area.

2024 Urban Groundwater Extractions			
City or Area	**Urban Pumping (AF/year)**	**Percentage of Total Urban Groundwater Extractions**	**Average Flow for Diversion (cfs)[9]**
Salinas	18,249	48.9%	25.2
Marina	3,404	9.1%	4.7
OA[10] – Pressure	2,567	6.9%	3.5
Soledad	2,176	5.8%	3.0
Greenfield	1,993	5.3%	2.8
Gonzales	1,921	5.1%	2.7
King City	1,873	5.0%	2.6
Soledad Prisons	1,380	3.7%	1.9
OA – East Side	1,159	3.1%	1.6
OA - Forebay	1,073	2.9%	1.5
Castroville	811	2.2%	1.1
OA - Upper Valley	564	1.5%	0.8
Chualar	102	0.3%	0.1
San Lucas	41	0.1%	0.1
San Ardo	No Data		
Total	37,313		51.5

[9] Average cfs was not included in MCWRA's report table; it was added by Wallace Group for comparison to potential diversion flow rates. Note that urban water use is typically lower than the annual average during winter months.
[10] OA – Other Areas

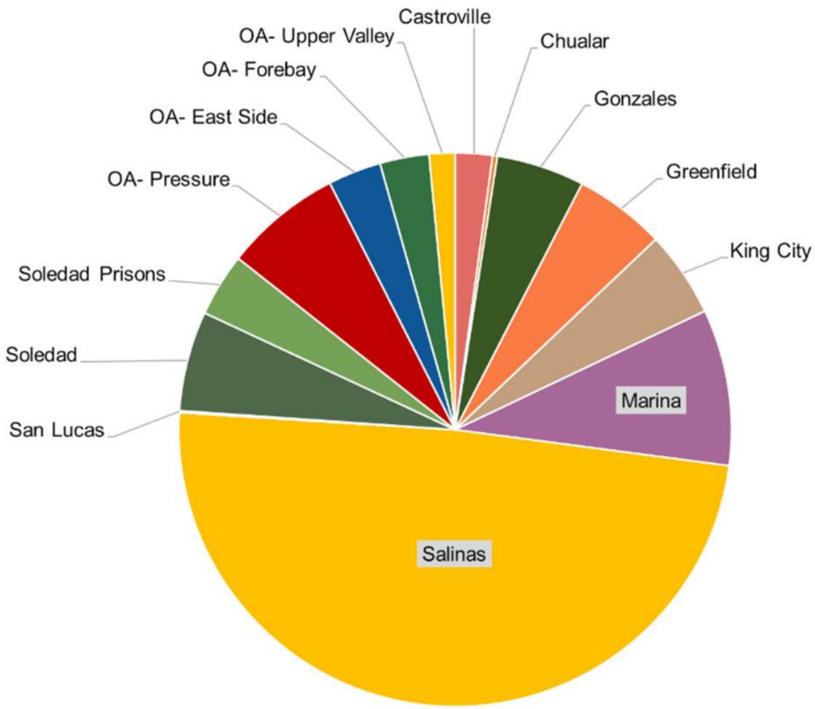


Figure 5. Pie chart summarizing 2024 urban groundwater extractions. Source: MCWRA, 2024 Groundwater Extraction Summary Report.

Treatment Requirements: Municipal water providers in the lower Salinas Valley are supplied via groundwater; there are no large-scale existing surface water treatment plants. Therefore, municipal water use will require a new water treatment plant to produce water meeting Title 22 drinking water standards. Note, there may be some potential to reduce the level of treatment required based on diverted water quality where riverbank filtration yields high quality raw water; however, at this stage we assume surface water treatment will be required. This need for treatment is highlighted in the component consideration framework (Figure 4), as it is a major factor in infrastructure required and, therefore, cost.

Given the proposed flow rates contemplated for the potential projects (*e.g.*, 50 cfs or higher), the need for treatment greatly increases the cost compared to direct irrigation use or most indirect uses. The unpredictability and seasonality of the water availability creates operational and planning difficulties such as scheduling water deliveries and developing agreements with end users concerned with reliability. Additionally, treatment operations benefit from stable influent flow rates requiring upstream buffering storage capacity for stable delivery to the treatment facility.

End User Acceptance: Municipal use would require agreements with the participating water providers to take water diverted from the conceptual project when available, rather than rely on existing wells. Therefore, delivered costs to municipal water suppliers would need to be competitive with the costs of their extracted groundwater sources. Water suppliers will also be concerned with supply reliability to facilitate predictability in their operations.

Indirect Use

Technical considerations for options for indirect use are summarized in Table C.3.

Table C.3 Indirect Use

Table C.3. Indirect Use		
	Underground Storage	**Above-ground storage**
Site Suitability	Sites must be identified by characterizing near-surface and subsurface properties to assess whether a site would be appropriate for a storage project (e.g., infiltration capacity, permeability of the vadose zone, the presence of extensive fine-grained zones, and aquifer transmissivity, etc.). Suitable sites may be limited.	Several sites have been identified in previous studies, but most were not advanced for further consideration; more investigation is needed for the few remaining proposed sites.
Permit 11043 Utilization	Requires modification to include storage, or potentially a modification to add groundwater recharge for a beneficial use to combat seawater intrusion or raise groundwater levels.	Requires modification to include storage.
Land Acquisition	Varies depending on option (see Table C.4), but all options require less land than above-ground storage.	Requires the most land out of all options. Will likely be very difficult to obtain the land needed for a reservoir large enough to store seasonal water. For context, the historical flow analysis showed the annual average volume that could have been diverted was 31,700 acre-feet[11], assuming the maximum diversion size of 400 cfs. There is large year-to-year variability, and this could be significantly larger during wet years. To store this water seasonally until the irrigation season, a reservoir with capacity greater than this volume is needed.

[11] For comparison, Santa Margarita Lake (Salinas Reservoir) at the head of the Salinas River in San Luis Obispo County has a capacity of approximately 22,300 acre-feet with a surface area of 730 acres.

Stakeholder Acceptance	Stakeholders may voice concerns about land use, water quality, contaminant mobilization, or how the water may travel in the subsurface. Until a project is presented, it is difficult to anticipate all concerns at this time.	Selection of potential reservoir sites will likely be controversial. In-stream reservoirs on tributaries in the foothills will be difficult from an environmental and public acceptance standpoint. Off stream reservoirs in the valley (*e.g.*, Merritt Lake) will be limited in capacity and require taking agricultural land out of production. Further investigation would be needed into the feasibility of using sites for seasonal water storage that are currently used for drainage/flood control purposes.
Environmental Constraints	Generally, fewer environmental constraints.	As noted above, in-stream reservoirs will likely be very difficult for environmental reasons. Off stream reservoirs may have less environmental impact, but due to the large footprint required, would still likely raise environmental impact concerns.
Groundwater Contamination	Groundwater recharge risks contaminant mobilization, further investigation is needed.	Potentially reduced risk of groundwater contaminant mobilization.

Underground Storage

Table C.4 summarizes the technical considerations for the underground storage options.

Table C.4 Underground Storage

Table C.4 Underground Storage			
	ASR Wells + Treatment	**Recharge Basins**	**Creek Bed Percolation**
Site Suitability	At a minimum, siting an injection location requires suitable subsurface hydraulic properties, and an assessment of injected and native compatibility.	Land availability and favorable subsurface sediment properties and hydraulic connection to underlying aquifers requires investigation.	Due to the seasonality of diversion flow only being available during the winter, utilizing creek beds for recharge may not be practical due to existing flow in the creeks.
Treatment	Typically, treatment to drinking water standards is required. The Ag-ASR program in the Westlands Water District allowed injection of surface water with lower treatment requirements.[12]	Treatment typically not required.	Treatment typically not required.
Land Acquisition	Less land required. Will be dependent on if a water treatment plant is required prior to distributing to ASR wells, or if local treatment can occur at each ASR wellhead site.	Most land physically required if utilizing dedicated recharge basins. Alternatively, options for partnering with landowners to implement periodic flooding on farmland should be investigated; this route would not require land acquisition but would require land owner agreements.	Land acquisition would be minimal as deliveries are made to existing creek beds. Footprint would be limited to canal or pipeline and turnout facility.
Environmental Constraints	Environmental constraints would be driven by need for a centralized water treatment plant which will increase the project footprint.	With largest footprint, recharge basins are anticipated to have the greatest potential for environmental impact.	Environmental impacts will largely include temporary construction impacts when constructing facilities. Due to reduced facility footprint, this option would have lower long-term environmental constraints.
Cost	The need for a water treatment plant will greatly increase the cost.	Diversion and site suitability will dictate the area required. This will drive the cost.	Minimal.

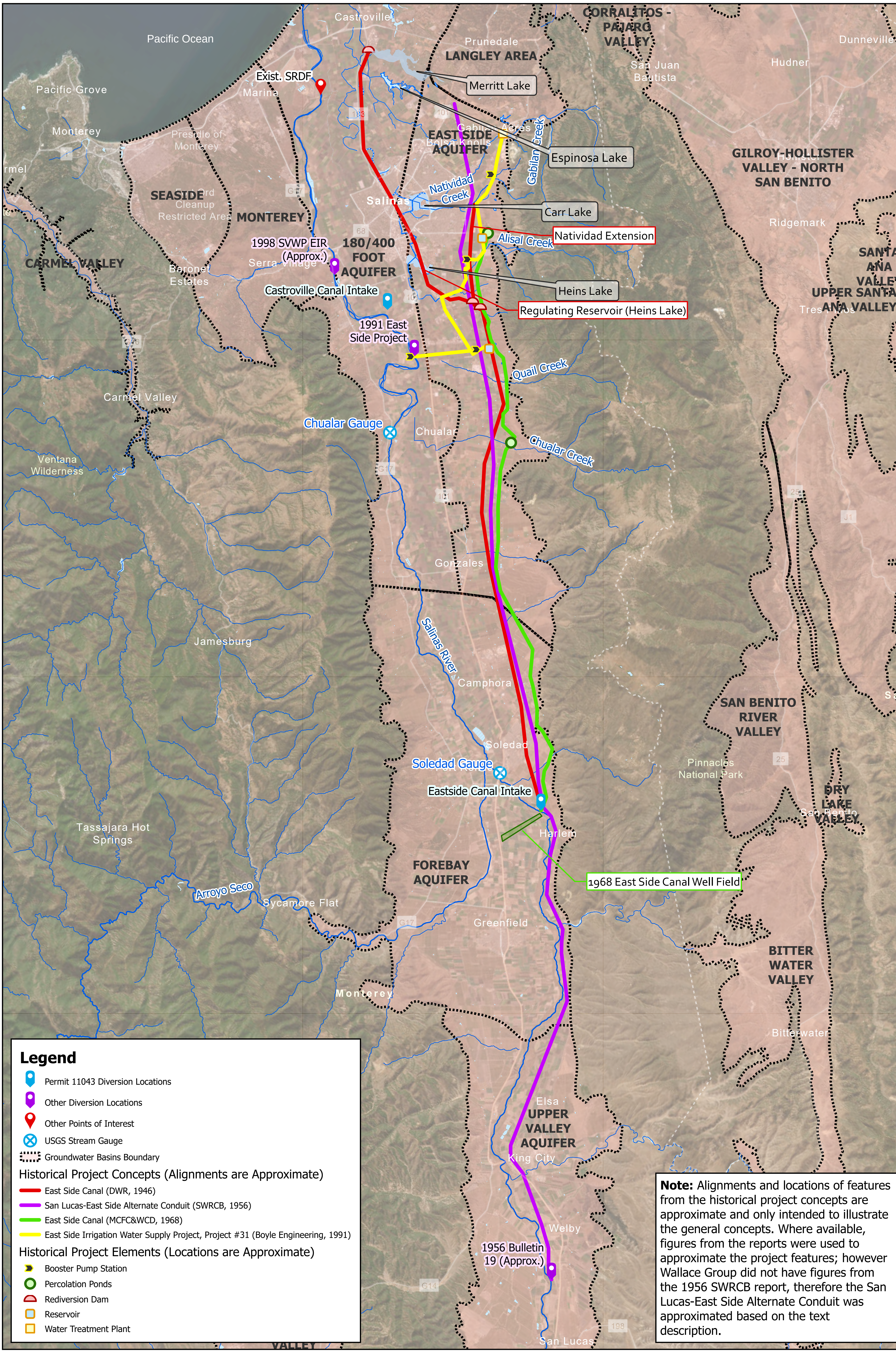
[12] Westlands Water District Ag-ASR program, began operation in 2020.

Attachments

Attachment 1. Table Summarizing River Diversion Projects from Previous Studies
Attachment 2. Overview Of Previous Project Concepts and Points of Interest (Figure)
Attachment 3. Excerpts From Previous Studies

Attachment 1. River Diversion Projects from Previous Studies

Castroville and Eastside Canals Study - List of River Diversion Related Projects from Prior Studies												
Report	Date	Project Title	Estimated annual yield, AF	Diversion Location (Approximate)	Method of diversion	Diversion Capacity, cfs	Conveyance	Storage	Storage capacity	Treatment Required	Infrastructure Notes	Additional Notes
Bulletin 52 - DWR	1946	Proposed Diversion System	45,000	Soledad	Shallow well field	250 cfs	Concrete canal to East Side and Pressure units	Regulating Reservoir	Heins Lake - 300 AF	None	- 36 diversion wells, 16" casings, 200' deep - Conveyed to regulating reservoir , where concrete pipe used for tie in to distribution systems. Also utilize Espinosa Slough to the Salinas-Castroville Hwy crossing	For direct use in overdaft areas in lieu of local groundwater pumping
Bulletin 19 - SWRCB	1956	San Lucas-East Side Alternate Conduit	86,000	San Lucas	Surface River Diversion	250 cfs	Concrete canal 63 mi to East Side and Pressure units	Several Reservoir sites identified, majority in upper basin	Varies by site	None	- This is an alternative to exclude the San Lucas Dam, which would be an in-stream Salinas River reservoir - Location is much further south than Bulletin 52 diversion (San Lucas) - Appears to be gravity diversion	This report also notes that Forebay well field not desirable
East Side Canal - Monterey County Flood Control & Water Conservation District	1968	East Side Canal	Not Quantified	Soledad	Surface River Diversion and well field	220-400 cfs	37 mi long canal, concrete lined for first 19.5 mi, earth lined through the Chualar-Qual and Alisal fans to help aquifer, distribution system for direct use	Utilizes underground storage	Not quantified	None	- Low diversion dam 3 mi SE of Soledad, pumping plant to lift water to head of canal - 50' long concrete lined intake channel off side of river - Direct use via pipes to fields - 3 plans varying on direct delivery, percolation ponds and natural stream channels to replenish aquifers - Well field used when river is low, pumps into the reservoir behind the diversion dam	- Groundwater levels in pressure unit would be improved - In lieu surface delivery in the Chualar-Quail and Alisal fan areas could be percolated to replenish the underground water supply
Capital Facilities Plan - Boyle Engineering	1991	#29 Salinas Valley M&I Water Delivery Project	33,227	Chualar	Surface River Diversion	85 cfs	Looped pressure pipeline system	x3 storage tanks	3 MG each (28 AF combined)	Potable water treatment plant, 54.7 mgd, near diversion site	- Four booster pump stations (x4) - Backup wells for years of prolonged drought	The estimated annual yield may include construction of other projects, such as the Jerrett Site Resrvoir (unclear).
Capital Facilities Plan - Boyle Engineering	1991	#31 East Side Irrigation Water Supply Project - Alt A	21,000	Chualar	Surface River Diversion	128.9 CFS intake pumping plant	15" to 60" pipelines	x2 Regulating Reservoirs	90 AF combined	None	Intermediate booster stations (x3)	Assumes water for project purposes is released from the upstream reservoirs on a continuous 24 hour/day basis. Assumes operational storage in the Salinas River upstream of dam to buffer daily demand
Capital Facilities Plan - Boyle Engineering	1991	#31 East Side Irrigation Water Supply Project - Alt B	34,000	Chualar	Surface River Diversion	200 CFS intake pump station	15" to 72" pipelines	x2 Regulating Reservoirs and groundwater recharge	90 AF combined	None	Intermediate booster stations (x3) Turnouts for groundwater recharge at Gabilan Creek, Natividad Creek, Alisal Creek, and Quail Creek	Larger diversion and service area than Alt A.
Capital Facilities Plan - Boyle Engineering	1991	#32 North County M&I Water Supply Project	6,500	Assumes joint use with Project #31 diversion and conveyance			Looped pressure pipeline system	x2 storage tanks	3 MG each (18 AF combined)	Potable water treatment plant, 9 mgd, near Gabilan acres	-Two booster pump stations - Backup wells for years of prolonged drought	This project assumes joint use with Project #31 facilities.
SVWP Draft Master EIR - MCWRA	1998	Salinas River Conveyance & Diversion	Up to 22,000	Chualar	Radial Collectors Wells and/or Infiltration Galleries	80 cfs	Pipeline	Balancing reservoir up to 3,000 AF	Merritt Lake ~3,000 AF to 9,600 AF, dam-location dependent	End-use dependent, but likely	-Ranney Collector proposal estimated at $36 million (1998) -Infiltration Gallery proposal estimated at $58 million (1998) -Total construction timeline ~2-3yr	-Subsurface collector types selected to accommodate for endangered fish species in River - Assumes diversion of reservoir releases
Project C1 Eastside Irrigation Water Supply Project	2022	Eastside Aquifer Subbasin GSP	3,000	Chualar	3 Wells up to 350' deep, 1,000 gpm each	7 cfs	Pipelines	Regulating Reservoirs or Steel Tanks	Not quantified	Although primarily intended for direct agricultural use, injection wells are also mentioned as a possibility which would require treatment	- Extracting during typical 6-month irrigation season. - Concept is that the extracted water will create space in the aquifer for additional storage during winter flows	This is a modified version of Project #31 from the 1991 Capital Facilities Plan (Boyle Engineering). Key differences include: 1. Well field instead of surface diversion 2. Much smaller scale (7 cfs compared to 130 or 200 cfs)
ASR Feasibility Study - M&A	2025	ASR Feasibility Study	12,900	Exist. SRDF	Surface River Diversion	Utilize exist SRDF, about 36 cfs	Pipelines from SRDF to storage and treatment, to ASR wells, and to to CSIP system	Utilizes underground storage	N/A	Potable Water Treatment Plant Required	16 ASR wells, 8 in each aquifer Initially proposed shifting reservoir releases to winter/spring. Divert to treatment plant to be conveyed to ASR wells in both 180/400 aquifers, and direct municipal use.	Addn'l groundwater pumping would be needed to meet CSIP demands since SRDF would no longer be used for CSIP supply.
ASR Feasibility Study - M&A	2025	ASR Feasibility Study - Alt 1	6,700	Diversion site was not evaluated	Radial Collector wells	Up to 45 cfs	Pipelines from radial well to storage and treatment, to ASR wells, and to to CSIP system	Utilizes underground storage	N/A	Potable Water Treatment Plant Required	Diversion site and radial well capacities requires further evaluation.	New diversion facility instead of changing SRDF and reservoir operations
ASR Feasibility Study - M&A	2025	ASR Feasibility Study - Alt 1A	6,700	Diversion site was not evaluated	Radial Collector wells	Up to 45 cfs	Pipelines from radial well to storage and treatment, to ASR wells, and to to CSIP system	Utilizes underground storage	N/A	Potable Water Treatment Plant Required	Diversion site and radial well capacities requires further evaluation.	Same as above, except 1A only injects into 400 ft aquifer as seawater intrusion has slowed in the 180 ft aquifer



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ATTACHMENT 2
DIVERSION PONTS AND HISTORICAL PROJECT CONCEPTS
CASTROVILLE AND EASTSIDE CANAL STUDY

JOB NO: 1447-0005
MAP DOC: Castroville and Eastside Canal Study
CREATED BY: TBV
DATE: 9/24/2025

EXHIBIT NOTES:
WALLACE GROUP DID NOT PERFORM SURVEY SERVICES FOR THIS MAP. NOT A LEGAL DOCUMENT.

Attachment 3. Excerpts from Previous Studies

Attachment 3a.

Excerpts related to the following point in the key conclusions:

> ***A consistent theme in the previously proposed projects is diverting water from the Salinas River and conveying it to the subbasins in overdraft (the Eastside and 180/400 Subbasins).***

- **1946 Bulletin 52, DWR**:
    - *An accumulation of cyclic underground storage in the Eastside Area would reverse the present direction of ground water movement from the Pressure to the Eastside Area. The Eastside Area may eventually assume its former capacity of serving as a lateral forebay to the Pressure Area thereby causing an increase in present flow of water through the partially confined aquifers. This would result in escape of some cyclic underground storage, but such outflow would not be wasted.*
- **1956 Bulletin 19, SWRCB:**
    - *It is indicated that lands in the Pressure and Eastside Units now requiring supplemental water should be supplied by means of a conduit system from an upstream surface reservoir or reservoirs. The long distance of pervious stream channel between such upstream reservoir sites and the Pressure Unit would result in excessive transmission losses if the released waters were conveyed down the natural channel of the Salinas River to serve those lands. For this reason, probably the most feasible method of serving the Pressure and Eastside Units, and adjacent hill and bench lands in the Lower Basin, would involve a diversion of water from the Salinas River at the San Lucas dam site and conveyance to the service areas in a conduit system.*
- **1968 Eastside Canal Project, Monterey County Flood Control & Water Conservation District:**
    - ***Salinas Valley Eastside Aqueduct and Ground Water Recharge Study, by Soil Mechanics and Foundation Engineers, Inc., June 1967:*** *This study found that groundwater is generally interconnected throughout the Salinas Valley; therefore, local overdrafts adversely affect adjacent areas. The overdraft on the Eastside has reversed natural gradients and has caused groundwater to flow from the Pressure Unit to the Eastside. Groundwater recharge for the Eastside is supplied by Eastside streams and the Salinas River. However, the recharge from these sources is insufficient to support the pumping draft, especially in years that the larger Eastside streams do not flow. The Johnson fan, a critical problem area, has an insufficient supply of groundwater to irrigate all of the developed irrigable farmlands. The study proposed that additional recharge is possible by percolation in selected areas on the Chualar-Quail and Alisal fans; however, large-scale long-term tests should be made in selected areas to verify percolation potentials and evaluate possible*

types of recharge facilities before any permanent recharge facilities are constructed.

- **2013 Technical Memorandum – Protective Elevations to Control Sea Water Intrusion in the Salinas Valley, GeoScience:**
    - *Ground water recharge (direct and in lieu), could be used to replenish storage and maintain a seaward hydraulic gradient. Additional recharge in the Forebay area would result in additional recharge to the northern pressure zone as underflow. Artificial recharge in the East Side Subarea would reduce subsurface inflow from the Pressure Subarea and eventually restore the historical northeast to southwest recharge. Both northwest underflow from the Forebay Subarea as well as southwest recharge from the East Side Subarea would help control seawater intrusion.*
    - *At one time (before excessive pumping), the Eastside Subarea was one of the natural sources of recharge to the adjacent Pressure Subarea with ground water flowing from the northeast to the southwest. However, historical ground water level declines have resulted in a reversal of the gradient. That is, ground water now flows from the Pressure Subarea to the Eastside Subarea (i.e., from the southwest to the northeast…).*

Attachment 3b.

Excerpts related to creek bed percolation as a method of groundwater recharge:

- **1956 Bulletin 19, SWRCB:** *Turnouts would be provided at Quail, Alisal, Natividad, and Gabilan Creeks for releases intended for percolation into the stream channels*
- **1968 East Side Canal Project, Monterey County Flood Control & Water Conservation District:**
    - Plan II –
        - *Water would be discharged by gravity from the canal into the constructed percolation pond, which would cover 23 acres of land, including dikes. It is estimated that the two Chualar Creek percolation ponds would percolate a continuous flow of 12 cubic feet per second.*
        - ***Water would also be percolated in the natural channels of Quail and McCallum Creeks.*** *Minimal channel treatment prior to percolation would consist of clearing undesirable brush, trees and debris out of the segment of the channels to be utilized for percolation. It has been estimated that a continuous flow of 14 cubic feet per second could be percolated in these two stream channels.*
        - *If 26 cubic feet per second of water were percolated on the Chualar-Quail Fan, the present and projected overdraft on the aquifer would be satisfied.*
    - Plan III –
        - *Approximately 17,200 acres of land would be irrigated with canal water, and land in the Chualar-Quail and Alisal Fans would have*

supplemental ground water recharge by percolation of canal water. Percolation at strategic areas on the two fans would eliminate present and projected overdrafts. The percolation areas on the Chualar-Quail Fan would be the same as for Plan II. ***In addition water would be percolated in Alisal Creek*** *and in a 51 acre percolation pond constructed adjacent to Alisal Creek. It is estimated that a total of 7 cubic feet per second could be percolated in the Alisal Creek channel and percolation pond.*

    - *The canal would terminate at the Alisal percolation pond approximately 4,000 feet southeasterly of Williams Road. The concrete lined segment of the canal would have a capacity ranging from 250 to 100 cubic feet per second, and the dirt lined segment's capacity would range from 50 to 10 cubic feet per second.*

- **1991 Capital Facilities Plan, Boyle, Project 31**: *"Turnouts for groundwater recharge purposes have been provided at points where system pipelines cross Gabilan Creek, Natividad Creek, Alisal Creek and Quail Creek (13,600-acre service area only)"*