Executive Summary

Introduction

The purpose of this North-of-the-Delta Offstream Storage (NODOS) Investigation Draft Feasibility Report is to evaluate new offstream surface storage north of the Delta. This Draft Feasibility Report was completed by the United States Department of the Interior, Bureau of Reclamation (Reclamation), the California Department of Water Resources (DWR), and the Sites Project Authority (Authority), in coordination with cooperating agencies, other resource agencies, Native American tribes, stakeholders, and the public. New storage north of the Sacramento–San Joaquin River Delta (Delta) (Figure ES-1) offers the potential to provide additional water reliability to complement the existing Federal Central Valley Project (CVP) and State Water Project (SWP) systems, which are relied on for the water supply, water quality, and environmental needs of California and the nation.

This Draft Feasibility Report presents the results of planning, engineering, environmental, social, economic, and financial analyses. It describes the potential physical accomplishments, benefits, and impacts of the NODOS alternatives for Sites Reservoir. The Environmental Impact Report / Environmental Impact Statement (EIR/EIS), which complies with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) is a companion document published under separate cover. The Draft Feasibility Report and the Draft EIR/EIS will be used by the Department of the Interior and the United States Congress to determine the Federal interest in a NODOS project.

The NODOS feasibility study began in 2005, and was performed in accordance with the 1983 United States Water Resources Council (WRC) *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (P&Gs). In 2014, the WRC subsequently developed *Economic and Environmental Principles, Requirements, and Guidelines*, and these were followed for the latter stages of the study. *Reclamation Manual: Directives and Standards* (CMP 09-02) establishes requirements and procedures for feasibility-level planning or reports.

Study Authorization

The Federal government received initial study authorization in 2003 under Public Law (P.L.) 108-7, which states,

> "The Secretary of the Interior, in carrying out CALFED-related activities, may undertake feasibility studies for Sites Reservoir, Los Vaqueros Reservoir Enlargement, and Upper San Joaquin Storage projects. These storage studies should be pursued along with ongoing environmental and other projects in a balanced manner."

Additional authorizations included P.L. 108-361 (2004), which authorized subsequent project-specific "planning and feasibility studies" for both surface and groundwater storage, including Sites Reservoir in Colusa County.

Figure ES-1. Setting for NODOS Feasibility Study

The "completion of the feasibility study" was most recently authorized in P.L. 114-113 (2015), Division D (Energy and Water Development and Related Appropriations Act, 2016), Title II (Department of the Interior), Section 205 (General Provisions) of the *Consolidated Appropriations Act, 2016*.

DWR received authorization to study the NODOS alternatives beginning in 1996, under State of California (State) Proposition 204, the Safe, Clean, Reliable Water Supply Act, which provided funding for feasibility and environmental investigations of offstream storage projects upstream of the Delta.

Additional California authorizations included the following:

- State Budget Act of 1998 authorized DWR to continue feasibility and environmental studies.
- Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002, authorized funding for surface water storage and feasibility studies under the CALFED Bay-Delta Program.

Proposition 84, The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Act of 2006, as amended in 2009 and 2012, authorized funding for DWR to complete feasibility studies of the CALFED Bay-Delta Program, including the NODOS/Sites Reservoir Project.

Sites Project Authority

The Authority was formally established on August 26, 2010, as a joint exercise of powers authority in conformance with State law, following the passage of the 2009 Comprehensive Water Package, which included Senate Bill 2. This bill allowed the formation of local joint powers authorities with the intent to govern, manage, and operate water storage projects.

The current Authority membership (12 members) consists of:

Colusa County, Colusa County Water District, Glenn-Colusa Irrigation District (GCID), Glenn County, Maxwell Irrigation District, Orland-Artois Water District, Placer County Water Agency/City of Roseville, Proberta Water District, Reclamation District 108, Tehama-Colusa Canal Authority (TCCA), Western Canal Water District, and Westside Water District.

In November 2000, members of what would become the Authority were signatory, along with Reclamation, DWR, Federal and State resource agencies, and others, to a Memorandum of Understanding to advance the Sites Reservoir Project in a manner consistent with CALFED's recommendation that development be conducted as a partnership consisting of Federal, State, and local agencies.

Many of the Authority members are also CVP Water Contractors.

On July 14, 2015, Reclamation and the Authority signed a Memorandum of Understanding to cost-share the completion of feasibility studies and related environmental documents to support State and Federal decision making.

Public Involvement

Public involvement activities have been performed in support of the development of the Draft Feasibility Report and EIR/EIS. These activities enrich the planning process and meet the requirements of NEPA, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and the Presidential memorandum regarding the engagement of Federally recognized tribal governments.

The Federal Notice of Intent (NOI) was published in the Federal Register on November 9, 2001, and the Notice of Preparation (NOP) was filed with the State Clearinghouse on November 5, 2001, to inform the public about the feasibility study and environmental documentation process, consistent with NEPA and CEQA.

Formal scoping for NEPA was performed from November 2001 to February 2002. The process began with the publication of the NOP and NOI, and concluded on February 8, 2002. During the scoping period, one tribal and three public scoping meetings were held. The Scoping Report includes a complete summary of the comments received during the scoping period.

The comments received from the scoping process addressed a variety of program issues. These comments have been considered in the definition of problems, needs, and opportunities; the development of the planning objectives; and the identification of measures to meet those objectives. This effort is documented in the *North-of-the-Delta Offstream Storage Investigation Final Initial Alternatives Information Report* (IAIR).

In December 2013, Reclamation released a progress report on the feasibility study. In May 2014, a Preliminary Administrative Draft EIR and Engineering Design and Cost Estimate Reports were released to the public on DWR's Surface Storage Program website for the NODOS Investigation. DWR also periodically posts frequently asked questions (FAQs) regarding the Sites Reservoir to its website.

In 2016, Reclamation contacted local tribes (Cortina Rancheria of Wintun Indians, Grindstone Rancheria of Wintun-Wailaki, Yocha Dehe Wintun Nation, Paskenta Band of Nonlaki Indians, Cachil DeHe Band of Wintun Indians of the Colusa Indian Community Council of the Colusa Rancheria, Enterprise Rancheria of Maidu Indians, and the Mechoopda Indian Tribe of Chico Rancheria) to provide information regarding the project. On January 31, 2017, the Authority released a Supplemental NOP for the preparation of an EIR under CEQA. Two scoping meetings (one in Sacramento and one in Maxwell) were held during the scoping period between February 2, 2017, and March 2, 2017. The purpose of these meetings was to receive input and comments on the scope and contents of the environmental analysis in the Draft EIR/EIS. A summary of the comments received during the supplemental CEQA process is included in the 2017 Draft EIR/EIS Appendix 36A Scoping Report.

Additional outreach activities have included regular coordination with and input from public agencies, including DWR and other resource agencies.

Project Purpose and Planning Objectives

Need for Study

The Preferred Program Alternative in the August 28, 2000 CALFED Bay-Delta Programmatic Record of Decision (CALFED ROD) identified a need for up to 6 million acre-feet (MAF) of new storage in California—including up to 3 MAF of storage north of the Delta—to restore flexibility and adaptability to CVP and SWP operations. This report focuses on opportunities for fulfilling a portion of the recommended 3 MAF of storage north of the Delta.

The operation of the CVP and SWP systems has become increasingly constrained. These increasing constraints threaten the ability of the two systems to meet water use needs while protecting ecosystems and water quality.

According to the *California Water Plan Update 2013*,

> "There is broad agreement that the state's water management system is currently unable to satisfactorily meet both ecological and human needs, too exposed to wet and dry climate cycles and natural disasters, and inadequate to handle the additional pressures of future population growth and climate change. Solutions are complex and expensive, and they require the cooperation and sustained commitment of all Californians working together. To be sustainable, solutions must strike a balance between the need to provide for public health and safety (e.g., safe drinking water, clean rivers and beaches, flood protection), protect the environment, and support a stable California economy."

Purpose Statement and Planning Objectives for the Feasibility Study

The purpose of the NODOS feasibility study is to evaluate new offstream surface storage located north of the Delta. Primary and secondary planning objectives were developed based on identified problems, needs, and opportunities; and incorporate National, State, and study-specific goals. The NODOS alternatives were formulated to achieve the primary objectives, and evaluated to assess their effectiveness in achieving these objectives. The NODOS alternatives are not formulated to maximize the secondary objectives, but opportunities to achieve them were included in the alternatives and evaluated.

Improve Water Supply and Water Supply Reliability (Primary Objective)

There is a need for additional water supply and increased water supply reliability throughout California, especially during drought conditions. The NODOS feasibility study focuses on the use of offstream storage to provide increased water supply and improve the reliability of water deliveries for municipal, industrial, and agricultural uses. A new offstream reservoir could also supply water in the event of levee failures in the Delta to reduce the effects of highly saline water surging into the Delta.

Provide Incremental Level 4 Refuge Water Supply (Primary Objective)

Additional water is needed to meet the incremental Level 4 refuge water supply demands established in the Central Valley Project Improvement Act (P.L. 102-575, Title 34) for Federal and State wildlife refuges. This water is needed for optimum habitat management in refuges in

the Central Valley. Releases could be provided from new offstream storage north of the Delta to provide a more reliable and adequate supply.

Improve the Survival of Anadromous Fish and Other Aquatic Species (Primary Objective)
Improved environmental conditions are needed for anadromous fish and other aquatic species. New offstream storage north of the Delta could benefit anadromous fish (including endangered winter-run Chinook salmon) and other aquatic species by facilitating cooperative operations of existing reservoirs to improve temperatures and flows in the Sacramento, Feather, and American Rivers.

Improve Delta Environmental and Export Water Quality (Primary Objective)
Improved water quality in the Delta is needed for drinking water, agriculture, and the Delta ecosystem. Releases to augment outflow during summer and fall months are needed to increase estuarine habitat and shift the position for X2.[1] A NODOS project could improve water quality in the Delta by releasing flows of high-quality water during periods when water quality is impaired.

Provide Sustainable Hydropower Generation (Secondary Objective)
Hydropower generated at offstream reservoirs can support the development of renewable energy. Equipping an offstream reservoir with pumped storage capability supports the integration of other forms of renewable energy (e.g., wind and solar) into the power grid. The project could produce electricity to supply high-peak demands by releasing water. Water would be pumped into the reservoir during periods of low demand when the energy cost is reduced.

Provide Opportunities for Recreation (Secondary Objective)
The planning of a new reservoir provides an opportunity to develop new recreational facilities. Recreation in the immediate vicinity of a new reservoir would provide opportunities for hiking, fishing, camping, boating, and mountain biking.

Provide Flood Damage Reduction (Secondary Objective)
The Stone Corral Creek and Funks Creek watersheds are prone to periodic flooding, resulting in damages to local farms and communities. The NODOS project would provide an opportunity to reduce flooding in local watersheds.

Reservoir Location and Conveyance Measures

The NODOS alternatives require numerous facilities and operations that must work together effectively to achieve the full range of project objectives. Prior to developing alternatives, a two-step process was followed to evaluate potential reservoir locations and conveyance systems, which included several iterations.

1. Evaluate and determine a preferred reservoir location.
2. Evaluate and determine the preferred conveyance system to divert water into the reservoir and release the water for beneficial uses.

[1] X2 is a Delta management tool that is defined as the distance in kilometers from the Golden Gate Bridge to the location where the tidally averaged near-bottom salinity in the Delta measures 2 parts per thousand.

These steps are described in further detail in the following sections.

Evaluation of Reservoir Locations

The geographic scope of analysis for the NODOS feasibility study was narrowed from the area considered in the CALFED Programmatic EIS/EIR, which identified 52 potential reservoir locations throughout the state. Potential reservoir locations were further screened based on their ability to meet management measures and planning objectives to determine a final array of reservoir location measures. Six potential reservoir locations (Colusa Reservoir Complex, Cottonwood Reservoir, Red Bank Project, Thomes-Newville Reservoir, Sites Reservoir, and Veteran's Lake) were identified and evaluated.

Sites Reservoir and the Colusa Complex were the most favorable locations. Of these two, Sites Reservoir was much less expensive and more cost-effective on an acre-foot basis.

Evaluation of Conveyance Systems for Diversions and Releases

An array of 17 conveyance measures for filling and releasing water from Sites Reservoir were evaluated. Conveyance measures originating from the Sacramento River include the Tehama Colusa (T-C) Canal, the GCID Main Canal, and a new pipeline (called the Delevan Pipeline). Tributary source conveyance measures considered include a new pipeline from the Colusa Basin Drain (CBD) and a new pipeline from Stony Creek that would originate at the Black Butte afterbay, and connect to the T-C Canal below the city of Orland.

Figure ES-2 shows the conveyance management measures recommended for further consideration, based on the initial evaluation of costs, ability to meet water quality objectives, and environmental impacts. Conveyance options that used existing conveyance (T-C Canal and GCID Main Canal) greatly reduced the associated environmental impacts. The ability to release water directly into the Sacramento River was extremely important in achieving the primary objective for Delta environmental water quality improvement, and improved the performance with respect to all other primary objectives. Only the Delevan Pipeline conveyance measure would allow a direct release to the Sacramento River.

Development of Alternatives

This Draft Feasibility Report and its associated EIR/EIS develop, evaluate, and compare four action alternatives to the No Project Alternative. Each alternative addresses, in varying degrees, all of the NODOS planning objectives. The planning horizon for future conditions is assumed to be 100 years. The action alternative features are described in Table ES-1.

The action alternatives incorporate two reservoir sizes, two conveyance measures, two combinations of recreation areas, two access road alignments, and two transmission line routes. Alternatives A, B, and C have similar operational priorities, but Alternative D has significantly different operations with more water for agriculture and more water deliveries north of the Delta. Alternatives A, B, and C were developed by DWR and Reclamation. Alternative D has been developed by the Authority.

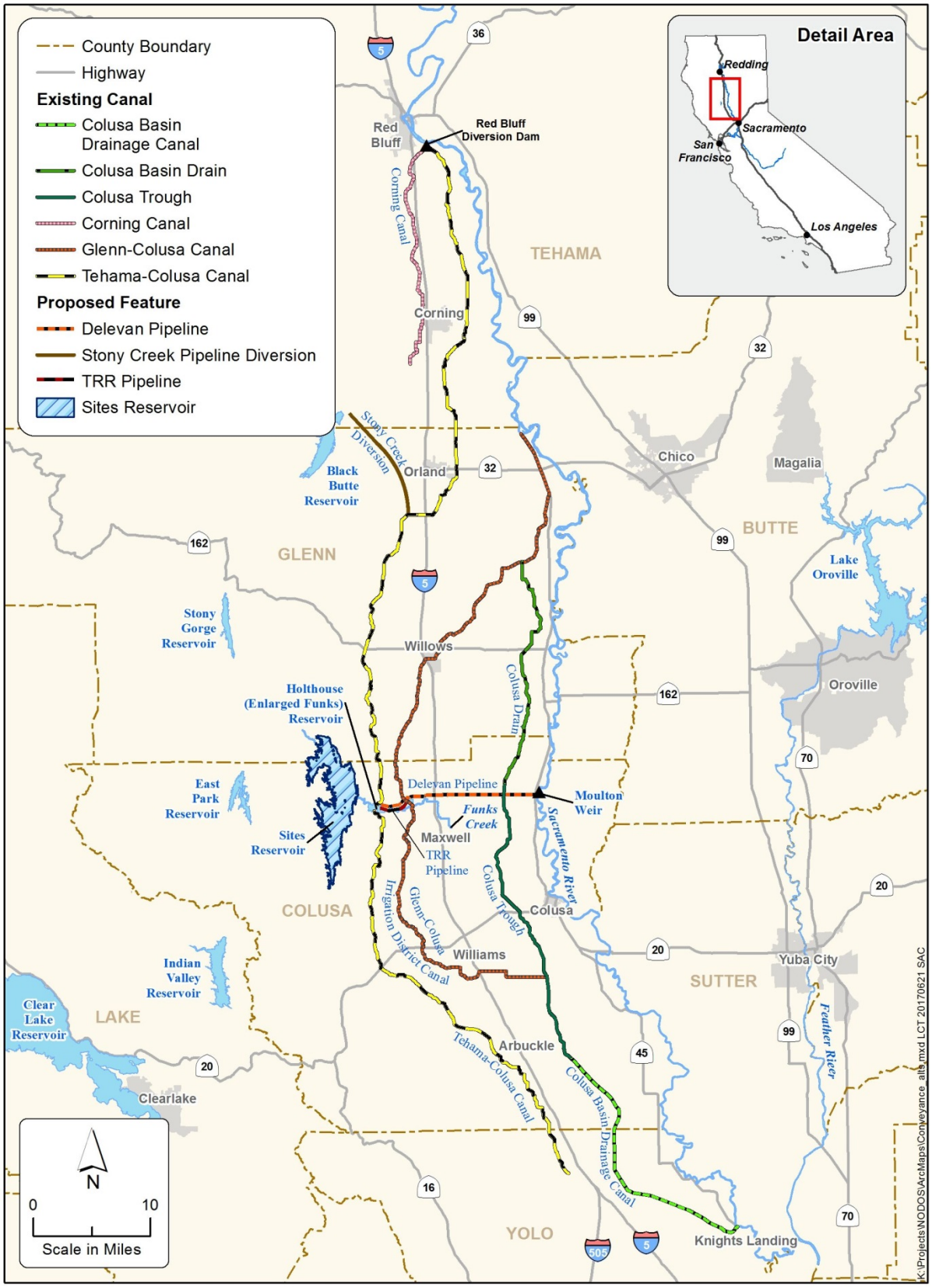

Figure ES-2. NODOS Project Conveyance Measures

Table ES-1. Summary of NODOS Alternative Features

Facility	Feature	Alternative A	Alternative B	Alternative C	Alternative D
Sites Reservoir	Gross Storage Capacity	1.3 MAF	1.8 MAF	1.8 MAF	1.8 MAF
	Water Surface Elevation	480 feet msl	520 feet msl	520 feet msl	520 feet msl
	Dam Crest Elevation	500 feet msl	540 feet msl	540 feet msl	540 feet msl
	Minimum Operating Pool	320 feet msl	320 feet msl	320 feet msl	320 feet msl
	Inundation Area (approximate)	12,500 acres	14,000 acres	14,000 acres	14,000 acres
	Inlet/Outlet Type	Multi-level inlet/outlet tower A low-level inlet/outlet structure	Multi-level inlet/outlet tower A low-level inlet/outlet structure	Multi-level inlet/outlet tower A low-level inlet/outlet structure	Multi-level inlet/outlet tower A low-level inlet/outlet structure
Golden Gate Dam (Sites Reservoir)	Location	Funks Creek	Funks Creek	Funks Creek	Funks Creek
	Type	Earth/Rockfill Embankment	Earth/Rockfill Embankment	Earth/Rockfill Embankment	Earth/Rockfill Embankment
	Crest Length	1,450 feet	2,120 feet	2,120 feet	2,120 feet
	Maximum Height	260 feet	310 feet	310 feet	310 feet
	Embankment Volume	5,987,000 cubic yards	10,590,000 cubic yards	10,590,000 cubic yards	10,590,000 cubic yards
Sites Dam (Sites Reservoir)	Location	Stone Corral Creek	Stone Corral Creek	Stone Corral Creek	Stone Corral Creek
	Type	Earth/Rockfill Embankment	Earth/Rockfill Embankment	Earth/Rockfill Embankment	Earth/Rockfill Embankment
	Crest Length	725 feet	850 feet	850 feet	850 feet
	Maximum Height	250 feet	290 feet	290 feet	290 feet
	Embankment Volume	2,853,000 cubic yards	3,836,000 cubic yards	3,836,000 cubic yards	3,836,000 cubic yards
Saddle Dams for Sites Reservoir	Location	North End of reservoir from Funks Creek to Hunters Creek	North End of reservoir from Funks Creek to Hunters Creek	North End of reservoir from Funks Creek to Hunters Creek	North End of reservoir from Funks Creek to Hunters Creek
	Type	Earth/Rockfill Embankments	Earth/Rockfill Embankments	Earth/Rockfill Embankments	Earth/Rockfill Embankments
	Saddle Dam Numbers	1, 6, 8b (<5 feet to 25 feet high) 3, 5, 8a (50 feet to 85 feet high)	1, 4, 9 (40 to 50 feet high) 2, 3, 5, 6, 7, 8 (70 to 130 feet high)	1, 4, 9 (40 to 50 feet high) 2, 3, 5, 6, 7, 8 (70 to 130 feet high)	1, 4, 9 (40 to 50 feet high) 2, 3, 5, 6, 7, 8 (70 to 130 feet high)
Emergency Spillway (Sites Reservoir)	Location	Saddle Dam 6	Saddle Dam 6	Saddle Dam 6	Saddle Dam 6
	Diameter	7-foot RCP	7-foot RCP	7-foot RCP	7-foot RCP
	Inlet Elevation	486.5 feet (top of PMF storage)	525.5 feet (top of PMF storage)	525.5 feet (top of PMF storage)	525.5 feet (top of PMF storage)

Table ES-1. Summary of NODOS Alternative Features

Facility	Feature	Alternative A	Alternative B	Alternative C	Alternative D
Sites Reservoir Inlet/Outlet Works	Type	Multi-level Inlet Tower and Low-Level Outlet	Multi-level Inlet Tower and Low-Level Outlet	Multi-level Inlet Tower and Low-Level Outlet	Multi-level Inlet Tower and Low-Level Outlet
	Capacity	15,200 cfs (emergency release)	15,200 cfs (emergency release)	15,200 cfs (emergency release)	15,200 cfs (emergency release)
	Size	30-foot-diameter concrete and steel-lined pressure tunnel	30-foot-diameter concrete and steel-lined pressure tunnel	30-foot-diameter concrete and steel-lined pressure tunnel	30-foot-diameter concrete and steel-lined pressure tunnel
Sites Pumping/ Generating Plant	Location	Downstream from Golden Gate Dam	Downstream from Golden Gate Dam	Downstream from Golden Gate Dam	Downstream from Golden Gate Dam
	Flow Capacity (Pumping)	5,900 cfs pumping	3,900 cfs pumping	5,900 cfs pumping	5,900 cfs pumping
	Flow Capacity and Head (Generating)	5,100 cfs generating 295 feet	5,100 cfs generating 295 feet	5,100 cfs generating 295 feet	5,100 cfs generating 295 feet
	Generating Capacity	123 MW at 5,100 cfs	123 MW at 5,100 cfs	123 MW at 5,100 cfs	123 MW at 5,100 cfs
Holthouse Reservoir	Maximum Height	45 feet	45 feet	45 feet	45 feet
	Max WSE	205 feet msl	205 feet msl	205 feet msl	205 feet msl
	Total Capacity	6,500 AF	6,500 AF	6,500 AF	6,500 AF
	Remaining Storage	6,500 AF	6,500 AF	6,500 AF	6,500 AF
Delevan Pipeline from Sacramento River to T-C Canal	Flow Capacities	2,000 cfs pumping 1,500 cfs releasing	No pumping 1,500 cfs releasing	2,000 cfs pumping 1,500 cfs releasing	2,000 cfs pumping 1,500 cfs releasing
	Length	13 miles	13 miles	13 miles	13 miles
	Size	Two 12-foot-diameter RCPs	Two 12-foot-diameter RCPs	Two 12-foot-diameter RCPs	Two 12-foot-diameter RCPs
	From/To	Sacramento River to Holthouse Reservoir	Sacramento River to Holthouse Reservoir	Sacramento River to Holthouse Reservoir	Sacramento River to Holthouse Reservoir
Delevan Intake Pumping/ Generating Plant	Location	West side of Sacramento River, near Highway 45	West side of Sacramento River, near Highway 45	West side of Sacramento River, near Highway 45	West side of Sacramento River, near Highway 45
	Flow Capacities	2,000 cfs pumping 1,500 cfs releasing	No pumping 1,500 cfs releasing	2,000 cfs pumping 1,500 cfs releasing	2,000 cfs pumping 1,500 cfs releasing sustainable releases with short-duration releases of 2,500 cfs
	Fish Screens Required	Yes	No	Yes	Yes

Table ES-1. Summary of NODOS Alternative Features

Facility	Feature	Alternative A	Alternative B	Alternative C	Alternative D
Terminal Regulating Reservoir	Capacity	2,000 AF	2,000 AF	2,000 AF	1,200 AF
	Footprint	191 acres	191 acres	191 acres	191 acres
	Depth	17 feet	17 feet	17 feet	17 feet
	Maximum Embankment Height	21 feet	21 feet	21 feet	21 feet
TRR Pumping/ Generating Plant	Location	TRR Reservoir	TRR Reservoir	TRR Reservoir	TRR Reservoir
	Capacity	1,890 cfs pumping 900 cfs generating	1,890 cfs pumping 900 cfs generating	1,890 cfs pumping 900 cfs generating	1,890 cfs pumping 900 cfs generating
	Pumping Head (Net)	900 cfs release	900 cfs release	900 cfs release	900 cfs release
	Generation	98 to 114 feet, 9.8 MW	98 to 114 feet, 9.8 MW	98 to 114 feet, 9.8 MW	98 to 114 feet, 9.8 MW
TRR Pipeline	Location	TRR Reservoir	TRR Reservoir	TRR Reservoir	TRR Reservoir
	Flow Capacities	1,890 cfs pumping 1,500 cfs releasing	1,890 cfs pumping 1,500 cfs releasing	1,890 cfs pumping 1,500 cfs releasing	1,890 cfs pumping 1,500 cfs releasing
	Length	5 miles	5 miles	5 miles	5 miles
	Size	Two 12-foot-diameter RCPs	Two 12-foot-diameter RCPs	Two 12-foot-diameter RCPs	Two 12-foot-diameter RCPs
	From/To	TRR Reservoir to Holthouse Reservoir	TRR Reservoir to Holthouse Reservoir	TRR Reservoir to Holthouse Reservoir	TRR Reservoir to Holthouse Reservoir
Power Transmission	Westside	WAPA or PG&E connection for Sites PGP and TRR	WAPA or PG&E connection for Sites PGP and TRR	WAPA or PG&E connection for Sites PGP and TRR	WAPA or PG&E connection for Sites PGP and TRR
	Delevan Intake Source	East/West Transmission to Delevan Intake	No new transmission to Delevan Intake	East/West Transmission to Delevan Intake	North/South Transmission to Delevan Intake
Recreation	Facilities	Stone Corral, Lurline Headwaters, Antelope Island	Stone Corral, Lurline Headwaters, Antelope Island	Stone Corral, Lurline Headwaters, Antelope Island	Stone Corral, Peninsula Hills

AF = acre- feet
cfs = cubic feet per second
MAF = million acre-feet
msl = mean sea level
MW = megawatt
NODOS = North-of-the-Delta Offstream Storage
PG&E = Pacific Gas and Electric Company
PGP = Pumping/Generating Plant
PMF = probable maximum flood
RCP = reinforced-concrete pipe
T-C = Tehama-Colusa
TRR = Terminal Regulating Reservoir
WAPA = Western Area Power Administration
WSE = water surface elevation

No Project Alternative

Under the No Project Alternative, reasonably foreseeable actions would be implemented, but new storage north of the Delta would not be developed to improve water supply, provide incremental Level 4 refuge water supply, enhance the survivability of anadromous fish, or improve Delta water quality. Reasonably foreseeable actions include actions that are currently authorized, have secured funding for design and construction, and for which environmental permitting and compliance activities are substantially complete. The No Project Alternative provides a basis of comparison for evaluating the potential benefits, and effects of the alternative plans.

Cooperative Operations for Action Alternatives

Alternatives A, B, C, and D—described in the following sections—would require cooperative operations with existing CVP and SWP facilities to achieve the estimated physical improvements and monetized benefits. All alternatives were developed on the premise that there will be no negative impacts to the CVP, SWP, or their contractors. Avoiding these impacts includes, but is not limited to, no negative operational, financial, or compliance impacts to the CVP and SWP.

All alternatives would provide water for water supply, incremental Level 4 refuge water supply, and Delta environmental water quality. Each alternative also includes coldwater pool improvements and augmentation of flows to support fish migration through exchanges of Sites Reservoir water for water in existing reservoirs.

Alternatives A, B, and C have similar operations that maximize deliveries to South Coast M&I users and dedicate significant releases to the Delta for water quality improvements. Alternative D operations reduce deliveries to South Coast M&I users and releases for Delta water quality, but provide more water for coldwater pool improvements and distribute water deliveries more equally between Northern and Southern California.

It has been assumed that all alternatives would be State-led projects, with the Authority leading the development, construction, and operations for the new facilities. The T-C Canal and Holthouse Reservoir (an expansion of the existing Funks Reservoir) would remain as part of the CVP system. Contracts would be required to store or convey water in Federal facilities (water would be stored in CVP reservoirs for anadromous fish benefits). A similar agreement would be required for storage in SWP facilities. Principles of Operation would need to be established between Reclamation, DWR, and the Authority to implement the alternatives as described. Additional details on water rights and Principles of Operation follow the alternative descriptions.

Small Reservoir with New Diversion (Alternative A)

Alternative A (Figure ES-3) is a 1.3 MAF reservoir with a new intake (2,000 cubic feet per second [cfs]) on the Sacramento River (Delevan Intake).

Alternative A operations would deliver water for agricultural and municipal and industrial (M&I) purposes (with approximately 90 percent export), incremental Level 4 refuge water supply, and Delta environmental water quality. Operations would be cooperative, with CVP and SWP operations to provide benefits to anadromous fish. Water stored in the reservoir during wet years would increase the reliability of water supply during dry years.

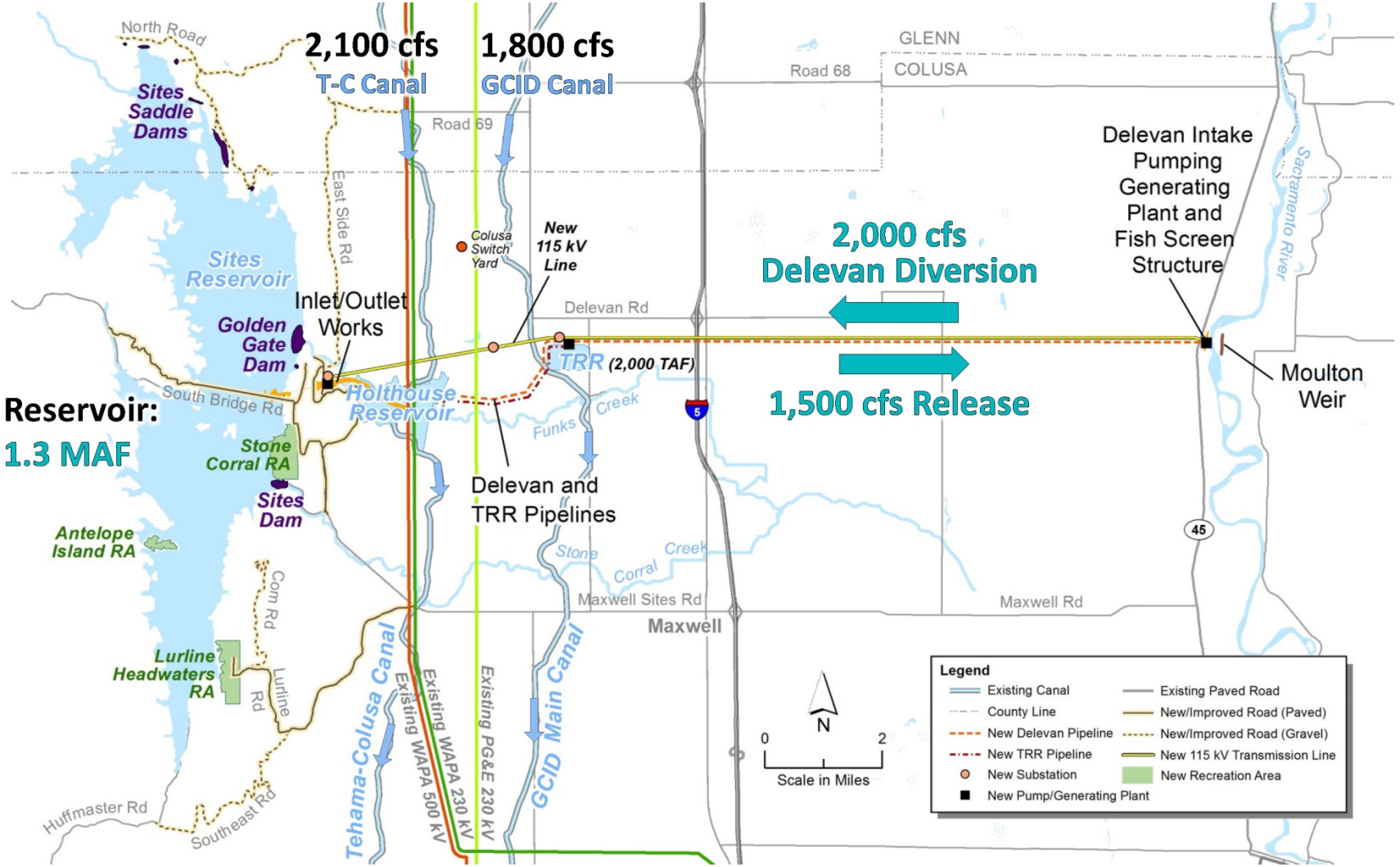

Figure ES-3. Features of NODOS Project Alternative A

The reservoir would require six saddle dams and two main dams (i.e., Sites Dam and Golden Gate Dam). Water would be diverted to fill the reservoir using the T-C Canal, GCID Main Canal, and Delevan Pipeline.

The Delevan Intake Pumping/Generating Plant would be a new screened intake on the Sacramento River capable of pumping up 2,000 cfs, and releasing up to 1,500 cfs back to the river. Electric power transmission lines to the Delevan Intake Pumping/Generating Plant would cross the valley with a west-to-east alignment to bring power from the existing transmission lines near Holthouse Reservoir.

Alternative A would also have three new recreation areas.

Large Reservoir with Existing Diversions (Alternative B)

Alternative B (Figure ES-4) is the same as Alternative A, but has a 1.8 MAF reservoir, and it does not include a new intake on the Sacramento River.

Alternative B operations would deliver water for agricultural and M&I supply (with approximately 90 percent export), incremental Level 4 refuge water supply, and Delta environmental water quality. Operations would be cooperative, with CVP and SWP operations to provide benefits to anadromous fish. Water stored during wet years would increase the reliability of water supply during dry years.

The reservoir would require nine saddle dams and two main dams (i.e., Sites Dam and Golden Gate Dam). The main dams would be larger than they are under Alternative A.

The Delevan Pipeline would allow the release of up to 1,500 cfs back to the Sacramento River. The Delevan Intake Pumping/Generating Plant is not included in this alternative. With only the two existing diversions, it would be more difficult to fill the reservoir than for the other alternatives, which have three diversions. No new electric power transmission lines would be needed to the Delevan Pipeline release structure.

Alternative B proposes three new recreation areas.

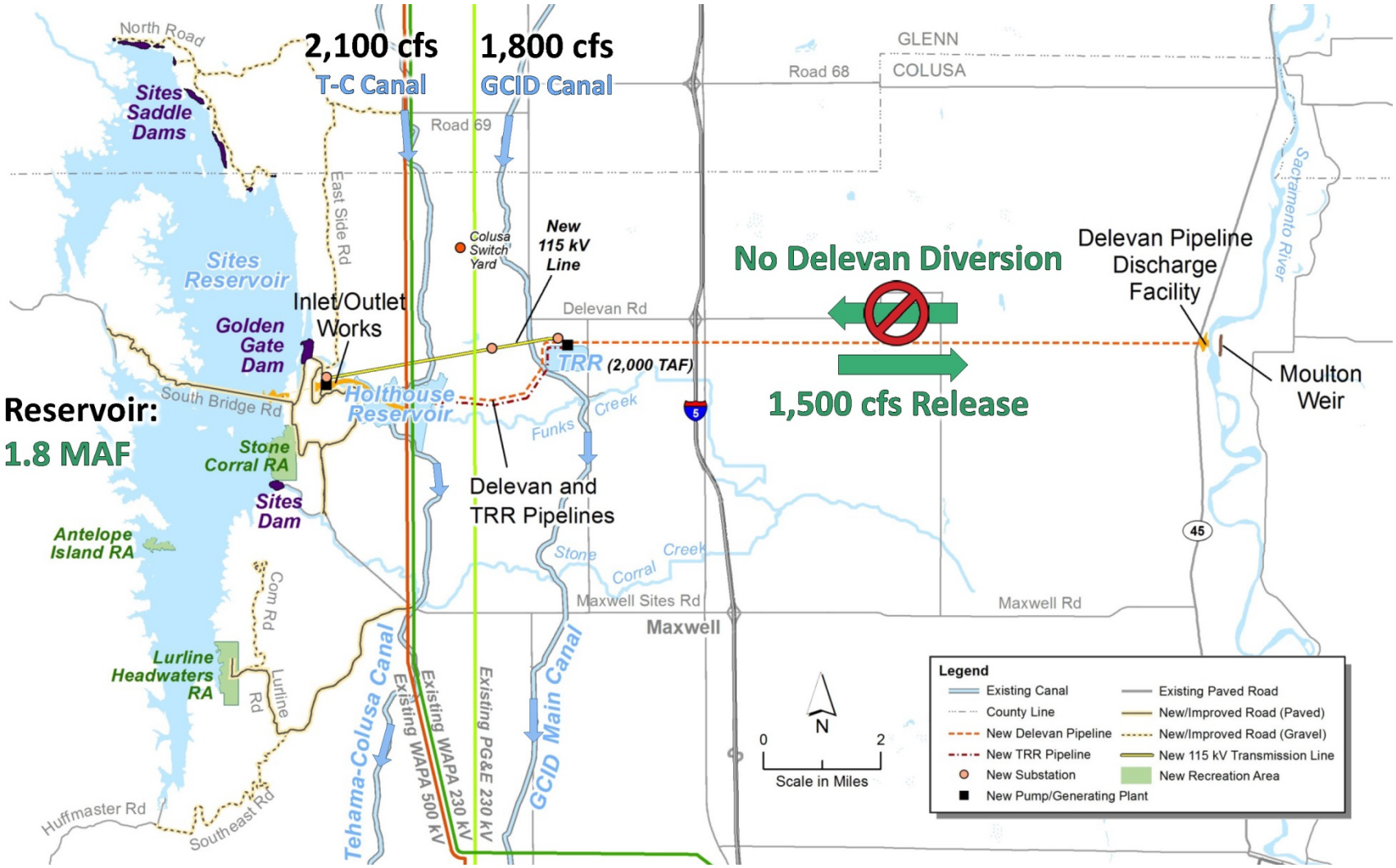

Figure ES-4. Features of NODOS Project Alternative B